

PHILOSOPHY AND ORGANIZATION  
OF INDUSTRIAL-ARTS TEACHER EDUCATION

by

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# PHILOSOPHY AND ORGANIZATION OF INDUSTRIAL-ARTS TEACHER EDUCATION

## CHAPTER I

### INTRODUCTION

The phenomenal advance in our technological society (3, p.781) demands a new approach to the teaching of industrial arts. If industrial progress continues at the same rate of increase as in the last few decades, man will no longer need to be a slave to his environment. He will need to learn to control his industrial products so as to utilize them to the fullest extent. The pupil in the school must be made cognizant of things industrial and ways to use them. As the shift in emphasis --from making projects for the sake of doing something and learning a skill to giving the student an orientation to industry--takes place, the teaching of industrial arts will become more complex and difficult. The teacher's training will become more exacting and diversified. At the same time, the industrial-arts teacher should not be different from teachers of other areas. He should be familiar with the general aims of education and the specific aims of industrial arts, be able to take his place effectively alongside other members of the staff in dealing with matters concerning the common good, and contribute something of his special technical skill and knowledge to assist in all school enterprises.

The industrial-arts teacher must realize that industrial arts is an integral part of general education and as such must contribute its share in a balanced development of the child. In modern society both girls and boys, more than ever before, need an orientation to industry.



There is considerable variation throughout the country in the preparation of industrial-arts teachers. These teachers are supposed to be prepared to teach approximately the same program, yet some receive as little as twenty semester hours of preparation in industrial arts while others receive as much as sixty-five. Can these differently equipped teachers do equally effective jobs in presenting to the child one part of the total school program necessary to his or her development? Is this one of the reasons that industrial arts is considered to be merely a course in which projects are constructed, rather than an orientation area important in the development of an understanding of industry and of the technological society in which we live? Is it possible for the industrial-arts programs throughout the nation's teacher-education institutions to be so arranged that there will be a greater similarity in content and requirements? Other professions have assumed the position that a degree of standardization is necessary and desirable. The medical profession has required that all students, regardless of place of preparation, shall take a basic program of courses fundamental to the making of a good doctor. Cannot the industrial-arts teacher-education institutions proceed in a similar manner with basic courses for certification? The program need not become standardized to such an extent that individual differences are disregarded, yet a higher degree of uniformity should be attained so that similar basic courses are offered wherever industrial-arts teachers are prepared.

The present disparity in preparation often means that industrial-arts teachers are lacking in common understandings. It is believed that until more uniformity is established there will be a dearth of coordinate thinking to promote professional harmony.

### Purposes of the Study

Because discrepancies exist in the preparation of industrial-arts teachers, there may be valid reason for trying to coordinate the thinking among the industrial-arts teachers in the public schools and the personnel in the teacher-education institutions.

The purposes of this study are as follows:

1. To analyze the replies of department heads in the industrial-arts teacher-education institutions surveyed, so as to formulate a philosophy of industrial-arts teacher education as valid as their judgments permit.
2. To interpret the industrial-arts teacher-education program in the light of listed objectives.
3. To synthesize the opinions of industrial-arts teachers in the field, concerning the desirable length of training, the minimum credit requirements, the standards for certification, and the desired general academic foundations.
4. To develop, from data collected, a suggested four-year baccalaureate program and a master's degree program.
5. To make available such information as may be of assistance to educators and others interested in the professional improvement of the industrial-arts teacher-education program.

### Location of the Study

To avoid the bias which might develop from an inquiry into the programs of the teacher-education institutions and the public-school industrial-arts teachers in any one area, the study was extended throughout the Continental United States. The maps on Pages 5 and 6 show the number and location of responding industrial-arts teachers from the various states.

### Methods Used in the Study

How might it be possible to evaluate the effectiveness of current programs of preparation? Should one criterion for judging the effectiveness of preparation be the judgment of experienced public-school teachers? These teachers should be able to recognize and estimate the values of the good points and the shortcomings of their own educational programs of preparation. Should another criterion be the opinions of heads of industrial-arts departments in teacher-education institutions, including their descriptions or interpretations of their programs?

Data for the study were obtained from three sources:

1. A survey by questionnaire to industrial-arts teachers in public schools.
2. A survey by questionnaire to the teacher-education institutions in the United States offering one curriculum or more in industrial-arts teacher education.
3. Catalogues and curriculum offerings of sixty-seven of the teacher-education institutions, used in item 2, in the United States.





This study required a representative sampling of the industrial-arts teachers in the United States. The only practical method was by questionnaire. During the 1949 Summer Session at Oregon State College, a preliminary questionnaire was submitted to thirty-five graduate students who were also experienced industrial-arts teachers, for their suggestions concerning changes and clarification. With these suggestions in mind, the questionnaire (Appendix A) was revised and mailed to the 1433 members of the American Industrial Arts Association, in 1948. This listing of industrial-arts teachers gave a representative sampling for the United States. An analysis of the returns from this questionnaire is shown in Appendix B. Thirty-nine per cent of those reached by mail returned the questionnaires in time for inclusion in the study.

One-hundred-twenty questionnaires (Appendix C) were mailed to the teacher-education institutions in the United States offering work in industrial-arts education. Ninety-one (seventy-six per cent) were returned. The names of the responding institutions are in Appendix D.

#### Definitions of Terms Used in the Study

1. Industrial arts: Industrial arts is one of the practical arts; a part of general education which provides learners with experiences, understandings, and appreciations of materials, tools, processes, products, and of the conditions and requirements incident generally to the manufacturing and mechanical industries. These outcomes are achieved through the design and construction of useful products in the shops, supplemented by readings, investigations, discussions, films,

reports, and similar activities characteristic of youthful interests and aptitudes in things industrial.

2. General Shop: The general shop offers a broad group of educative experiences. It provides for multiple industrial contacts of elementary and general nature at a minimum cost. At least three activities are presented at the same time by one instructor in one shop. The ideal general shop is one in which a project incorporates all phases of the industrial activities included in the shop. Many so-called general shops are a series of unit shops (isolated units) confined to one room.

3. Comprehensive General Shop: The comprehensive general shop is similar to the general shop, but includes a larger variety of industrial activities; in fact, it should include all of the major phases of industry.

4. Unit Shop: The unit shop is restricted to educative experiences within one industrial activity, such as sheet metal. If the shop includes related metal-working activities, such as forging, welding, and machine metal-work, it is then called a general metal shop. The pupil is usually rotated through a series of unit shops to give him a general industrial-arts program. This type of organization is usually too expensive for the smaller schools.

5. Philosophy: Philosophy when used in this study will be understood to mean: An integrated and consistent attitude expressed in beliefs, principles, or general concepts underlying industrial-arts teacher education.

### Limitations of the Study

The adequacy or inadequacy of interpretation of the data as received will constitute a limitation for which the writer must assume responsibility.

Personal interviews with industrial-arts teachers and department heads of teacher-education institutions would have made the survey more complete, but the broad geographical scope of the study made that impossible within the time and financial limits.

It is believed, however, the data are ample and sufficiently valid to warrant drawing conclusions which will indicate the philosophy and organization of industrial-arts teacher education as evidenced in the replies.

The study was made in 1950. A period of approximately one and one-half years has elapsed from the receiving of the data to the completion of the tabulations and the presentation of the study. This might constitute a limitation, but the writer believes that major changes do not occur in such short periods of time and that the study has not become invalidated.



## CHAPTER II

### PHILOSOPHY OF INDUSTRIAL-ARTS TEACHER EDUCATION

Industrial arts, as it is accepted by educators today, has passed through a relatively short, but slow evolution. The story of the progress of this educative area shows struggle, experimentation, and considerable inventiveness; but industrial arts has been slow in emerging into its presently accepted place as an integral part of general education. A slowly growing faith on the part of schoolmen has been based upon the belief that industrial arts if properly taught, possesses high educative values. As a subject in general education, it functions both educationally and vocationally in the lives of children.

The industrial-arts courses of today differ considerably in content and method from the shopwork, Russian joinery, or the sloyd system of not too many years ago; although many public schools have not progressed far beyond the old manual-training programs.

The teachers of subjects formerly offered under manual-training programs were men of high spirit, but often lacking in professional training for their work. True, they were pioneers, developing a new field and new teaching techniques. They experienced all the struggles and difficulties of pioneers, and out of their work--the old formal discipline "of the mind and hand" kind of manual training of a generation ago--has emerged the industrial-arts program of today.

Early teachers of the manual-training program were recruited largely from the trades and crafts. Most of them had little or no

formal education and very little teacher education. With the passing years, there have been three basic types of industrial-arts teachers:

1) skilled craftsmen, 2) engineering college graduates, and 3) normal school, teachers college, or school of education graduates.

The craftsman teacher probably appeared first, instructing in the engineering or agricultural colleges which introduced shopwork under encouragement offered through land grants, a result of the Morrill Act of 1862. Their personal skill, knowledge of subject-matter, and experience in production, were valuable assets in this particular type of teacher. Practical experience in production, in some trade, developed within him an acute appreciation of time value which is not at all understood by the average student. He was probably selected from a group of tradesmen, for a high degree of skill in some one trade rather than for teaching ability. This craftsman was handicapped by many weaknesses. He had no college education, and knew little about management, discipline, or methods of teaching. Often he did not have the most desirable personal qualities, and was seldom of a scholarly nature. He was also often a person of limited research experience or interest. This type of teacher was trained as a worker rather than as an educator. He could do good work, but often could not direct others in the same work.

The college of engineering graduates were taught craftwork by tradesmen teachers. They did not limit their learning to one trade, but contacted a variety of courses in the woodworking and metal-working areas. These were planned primarily to assist an engineer in designing and supervising engineering construction.

This type of teacher--the engineering graduate--possessed excellent qualities for supervision of craftwork, but, often was not trained as a teacher. His strong points were superior background in science, mathematics, engineering drawing, and general college education. He was trained to think in engineering terms, attack problems, and to reach solutions. He could devise projects and plan his work, had considerable knowledge of the various types of craftwork, usually without regard for the aesthetic values, and had limited construction skill along some lines of trade work. He could also organize and supervise the activities of other people.

Many of the famous industrial-arts teachers were trained as engineers. They frequently possessed great intellectual power, had strong personalities, and had the ability to meet and solve new and perplexing problems. This type of educator also had his weak points. He lacked teacher education, knew little of the teaching arts and skills, school discipline, school shop management, or skillful lesson preparation and presentation. The college-trained engineer had little or no training in job or trade analysis. In general, he was a resourceful man with an open and inquiring mind, but was often lacking wide knowledge and experience in the teaching methods and the subject-matter of industrial arts.

Graduates of the normal school, the teachers college, and the school of education are teacher trained. Some of the most successful men in industrial arts are currently employed in the teachers' colleges and universities for the purpose of training teachers in the most efficient manner of teaching industrial arts. Teachers of this

type are now almost the only men who can meet present-day qualifications.

With a more nearly uniform program of industrial-arts teacher education throughout the United States, industrial-arts teachers should be able to increase the effectiveness of industrial arts in general education because they will have a good background in teaching techniques, classroom management, shop discipline, and shop organization. They should have a greater variety of technical skills, be better able to design, solve problems, analyze teaching materials, and produce suitable teaching units. This type of teacher will have training in a practical school under the exacting supervision of a critic teacher. Some of these teachers will lack, to some extent, contact with real trade conditions and will not have developed a skill for production. Even though lacking these few items, they should teach good methods of work and select material which is valuable educationally. In fact they will have a better understanding of the place and purpose of industrial arts in general education.

#### Objectives of Industrial-Arts Teacher Education

There is much concern today about the philosophy of industrial-arts teacher education. If the program in the public schools must have aims, then certainly the teacher-education institution must have aims to prepare the teachers responsible for teaching industrial arts in the public schools. Since aims represent a philosophy, and philosophy deals with concepts, beliefs, and principles, then a teacher-education institution must have some sort of philosophy concerning

teacher education because preparing teachers is a primary objective of the institution.

For a representative sampling of the philosophies of teacher-education in industrial arts, heads of departments in one-hundred-twenty colleges and universities were asked to rank the aims compiled by the Manual Arts Conference in 1934 (8). This list of aims was chosen so that a comparison could be made with the ranks given the items in 1934, to see if there has been a major shift in emphasis in the aims since then.

TABLE I shows the ranks given the same items in 1934 and again in 1950, for this study. A statistical analysis of the ranks given these objectives is shown in Appendix E.

TABLE I  
Objectives Of Industrial-Arts Teacher Education

1934 Ranking	Objectives	1950 Ranking
3	To train the student in the technical subject-matter courses that may be selected as a part of the industrial-arts teacher-education program.	1
4	To train in the accepted professional methods of teaching.	2
6	To develop a philosophy of education, professional ideals, and desirable attitudes.	3
2	To inform teachers-in-training on the most widely accepted objectives in secondary education.	4
1	To interpret the requirements of the field for which teachers are trained.	5
8	To develop and strengthen character and personality.	6
7	To develop a code of professional ethics.	7
5	To develop habits or traits of perseverance, push, persuasiveness--the will to win in a just cause.	8
9	To select, recommend and use all reasonable efforts in placing graduates.	9
10	To promote favorable publicity and public contact.	10

From the data in TABLE I, it appears there has been a definite shift in emphasis in several of the aims from the 1934 rankings as compared to the 1950 rankings. The following aims: To train students in the selected technical subject matter; in the accepted professional methods of teaching; and, to develop a philosophy of education, professional ideals, and desirable attitudes, apparently are now considered more important than in 1934. This shift might be due to the influence of general education. In the past, industrial-arts teachers were trained primarily to be skillful in shopwork; and little attention was paid to the concept of industrial arts in general education. Too many industrial-arts teachers, present and past, teach industrial arts through the making of projects instead of trying to develop an orientation to industry. Within the last few years, the development of a knowledge of industry and its important place in our society have become more important than the idea of developing skills in things mechanical (12, p.36).

Another objective which has shifted in importance is the interpretation of the requirements of the field for which teachers are trained. The writer cannot ascertain the cause for this shift except on the basis that in most states, the departments of education now determine the requirements for teacher certification. The writer believes, however, that the requirements should be set up nationally rather than by individual states. This would facilitate a more uniform program of teacher preparation. With national standards, teachers--no matter in which part of the country they received their training--would be similarly trained.

A committee appointed by the American Vocational Association is sponsoring the setting up of a national accrediting board for industrial-arts teacher-education institutions. The function of the board will be to evaluate the industrial-arts programs in teacher-education institutions, to see if they meet certain prescribed standards. This program of evaluation is still in the embryonic stage.

Since the objectives as listed are very broad in nature, the writer asked questions of a controversial nature concerning these objectives on both questionnaires (Appendices A and C), so as to develop a better understanding of the objectives. The evaluations of these questions are given under the appropriate objectives. Not all of the objectives are discussed in this study because, in some cases, no questions were asked. The objectives used in the study are listed in rank order, 1950 ranking.

(1) To train the student in the technical subject-matter courses that may be selected as a part of the industrial-arts teacher-education program. This objective was considered to be the most important one in the list of ten. It is only reasonable to assume that an effective teacher must know his subject. This statement is becoming quite embarrassing to the industrial-arts teacher because of the very nature of the definition of industrial arts. Since industrial arts is to be representative of industry, but industry today is becoming so tremendously diversified the prospective teacher is amazed at the wealth of material from which a selection must be made.

It has been all too true, both in the past and the present, that the traditional courses in woodworking and mechanical drawing have



received the most emphasis. One reason for this might be that these two industrial areas are traditional in public schools and the teacher-education institutions tend to maintain the status quo. To give public-school pupils an overview of industry the program must be expanded to include all possible industrial areas. A clear-cut philosophy of industrial arts as a part of general education, and a full appreciation of the specific aims of education to be accomplished, will be of immeasurable assistance to the personnel of the teacher-education institutions in the matter of selection of areas of instruction.

There are several schools of thought concerning the method of preparation, in technical subjects, of industrial arts teachers. These are: a) unit-shop plan of teaching; b) comprehensive general shop plan; and, c) a combination of both.

(a) In the unit-shop plan of teaching the student's studies are confined to a series of separate, unconnected areas of learning, e.g., sheet-metal work, pattern-making, art metal, bench metal, machine metal, or welding, instead of including these under a general metal-working course. The student receives more training in each area than is possible in any other type of learning situation, but he does not have the opportunity to realize the over-all scope of industrial arts until he goes into the field. Industrial arts is a part of general education and, therefore, should not be made up of a group of isolated industrial areas.

(b) In the comprehensive general shop plan of teaching, the prospective teacher is trained under conditions similar to those existing

in most of the junior high schools and many of the senior high schools of the country. From this kind of program, the student realizes the whole function of industrial arts in general education, but does not receive as much technical and informational training as he would in the unit-shop type of program.

(c) The combination type of teacher-education program for industrial arts serves the function of the unit-shop plan and the comprehensive general shop plan. In this type of program, the prospective teacher starts his industrial-arts program with a comprehensive general-shop course, taught by seniors and graduate students under the close supervision of qualified staff members. In this course, the student sees the over-all picture of industrial arts as it should be offered in the public schools. At the same time, the student teachers receive valuable teaching experience which they will need later. After the comprehensive general-shop course, the students take a series of general area courses, such as general metals, general woods or general graphic arts. These courses give the student a more comprehensive view of each area, a higher degree of skill, and more technical information. After completing work in these areas, the student selects, under advisement, such unit courses as are needed to further his knowledge and skills. Last of all, the candidate, as a senior or graduate student, has his opportunity to put his training into practice, teaching the incoming new students in the comprehensive general-shop course. This teaching experience does not replace supervised teaching in the secondary schools, but is excellent preparation for it.

Is there a noticeable trend towards preparing the prospective teacher for general-shop teaching? According to Dr. John Ludington, specialist in industrial arts, Federal Office of Education, there are more general shops in public schools than unit shops, therefore the administrators desire teachers prepared to teach in many areas. The period of specialization in any one area is gradually becoming a thing of the past. Are the teacher-education institutions aware of this trend in demand for teachers? The college department heads and public school teachers were asked to give their opinions concerning general-shop preparation as compared to unit-shop preparation.

TABLE II shows the opinions of college department heads concerning the trend of industrial-arts training.

TABLE II  
Trend Of Industrial-Arts Shop Training

No. Respondents	General Shop	Unit Shop
91	74	17

Eighty-one per cent of the department heads believe the trend is towards general shop preparation. Even though the department heads believe there is a trend in this direction, very few colleges or universities offer this type of training program, according to the college catalogues published by these institutions.

It was also thought desirable to ascertain the opinions of the

experienced public school teachers concerning the type of preparation desirable for teaching industrial arts. Since most teachers were trained on a unit shop basis but are now teaching in a general shop, the teachers were asked if every industrial-arts teacher should be prepared to teach a general shop.

TABLE III shows the opinions of public school teachers concerning the type of shop preparation industrial-arts teachers need in order to teach well in the public schools.

TABLE III  
Industrial-Arts Teachers Should Be  
Prepared To Teach In A General  
Shop

No. Respondents	Yes	No
463	362	101

Seventy-eight per cent of these teachers believe industrial-arts teachers should be prepared to teach in a general shop. In addition to the general shop preparation, should each teacher be able to teach a unit shop? According to TABLE IV, eighty-four per cent of the teachers believe each industrial-arts teacher should be able to teach a unit shop in addition to a general shop.

TABLE IV

Unit Shop Preparation Is Desirable In  
Addition To General Shop Preparation

No. Respondents	Yes	No
485	447	38

If each industrial-arts teacher should be able to teach in a general shop and also a unit shop, how much preparation should the teacher have for teaching unit shops? Since the larger high schools have unit shops and many industrial-arts teachers desire to teach in this type of situation, the teachers were asked how many unit shops the individual should be prepared to handle. This question was asked primarily to determine the hours of technical preparation needed in a four-year industrial-arts teacher-education program. TABLE V shows the responses to this question.

TABLE V

The Number Of Unit Shops The Teacher  
Should Be Able To Teach

No. Respondents	1	2	3	4	5	6
447	68	198	119	43	19	0

In addition to being able to teach a general shop, the industrial-arts teacher should also be able to teach two or three unit-shop courses, as indicated from TABLE V.

From an analysis of the responding colleges' catalogues, there are twenty seven institutions in the United States that require a comprehensive general shop course in teacher education. If this type of course is becoming popular in the public schools, then more of the colleges should offer a course of this nature so the students are prepared to teach it. To the layman, this special training might not seem necessary, but the organization of such a class is more difficult, and project design and selection, related information and general teaching methods must be integrated more closely, than in the unit-shop type of teaching. Therefore, the public school industrial-arts teachers were asked, "Should each teacher-education institution offer a comprehensive general shop course"? TABLE VI shows the responses of these teachers.

TABLE VI  
Each College Should Offer A Comprehensive  
General Shop Course

No. Respondents	Yes	No
482	444	38

Ninety-two per cent of the responding teachers believe each college should offer a comprehensive general-shop course to prospective industrial-arts teachers. This might be due to the fact that most junior high schools offer a general-shop course and, if the prospective teacher has had no training in this particular type of

teaching, he might find teaching difficult for the first year or so.

Since most shop classes are taken in the freshman, sophomore, and junior years of college, would it be desirable to offer a series of short unit courses, in the senior year or on a graduate basis, in the subjects which the student will be qualified to teach, so as to give him a chance to brush-up on those courses taken earlier in his education program? If these courses were taken before the candidate starts his teaching career, it would seem to be of assistance in coordinating his training. TABLE VII shows the responses of the teachers as to the importance of a series of unit-shop refresher courses.

TABLE VII  
Importance Of A Series Of Unit-Shop  
Refresher Courses

No. Respondents	Not Important	Important	Absolutely Necessary
484	150	309	25

Sixty-nine per cent of the responding teachers favor a series of unit refresher courses. The writer believes that method would develop more effective teaching.

Should the recommendations of experienced industrial-arts teachers be considered by the teacher-education institutions when setting-up industrial-arts curricula? It would seem plausible that industrial-arts teachers with several years of teaching experience should be able to analyze their needs in the light of the importance of the subjects which they had completed. The industrial-arts

teachers were asked to check the technical industrial-arts courses which they believe each prospective industrial-arts teacher should take in a four-year program (Appendix A).

The results of this evaluation, TABLE VIII, together with the information obtained concerning the present organizational pattern of industrial-arts curricula in the teacher-education institutions, will be used for developing a suggested four-year, and a master's program in industrial arts, Chapter V. With careful study, the information embodied in TABLE VIII should be of valuable assistance to the teacher-education institutions when planning a curriculum for preparing industrial-arts teachers.

In summarizing this objective, the effective teacher, in the beliefs of these 456 experienced industrial-arts teachers, will be one who has been trained in the over-all function of industrial arts. He must be able to plan what is to be constructed and to operate machines or use hand-tools in a proper manner, so as to produce a workmanlike and finished product. He must be able to impart information concerning industrial areas increasingly important in an industrial age, which cannot be duplicated in the school shop.

(2) To train in the accepted professional methods of teaching.

The responding department heads ranked this objective second in importance. The professional training of a teacher of industrial-arts subjects is controlled by several factors. State certification laws may determine to a certain extent both the amount of professional training and the specific subject requirements. The requirements



TABLE VIII

Opinions Of 456 Experienced Teachers Concerning  
The Technical Subjects In Industrial-Arts Teacher  
Education Which Each Prospective Industrial-Arts  
Teacher Should Take In A Four-Year Program

Subjects	Per Cent in Favor			
	75 to 100	60 to 75	50 to 60	Less than 50
General Woodworking	X			
Bench Woodworking	X			
Machine Woodworking	X			
Wood Finishing	X			
General Mechanical Drawing	X			
Freehand Sketching	X			
Industrial-Arts Design	X			
General Metalwork	X			
Machine Shop	X			
Sheet Metalwork	X			
General Electricity	X			
General Graphic Arts	X			
Presswork (printing)	X			
Ceramics	X			
Leatherwork	X			
Plastics	X			
General Automotives	X			
Comprehensive General Shop	X			
Furniture Construction		X		
Wood Turning		X		
Architectural Drawing		X		
Sheet-metal Drawing		X		
Bench Metalwork		X		
Foundry		X		
Art Metalwork		X		
Elementary Electrical Theory and Construction		X		
Elementary Radio		X		
Bookbinding		X		
Composition (printing)		X		
Photography		X		
Household Mechanics		X		
Cabinet Construction			X	
Upholstery			X	
Machine Drawing			X	
Perspective Drawing			X	
Shop Sketching			X	
Forging			X	
Light and Power Wiring			X	
Joinery				X
Pattern Making				X
Wood Carving				X
Descriptive Geometry				X
Advanced Electrical Theory and Construction				X
Linotype Operation				X
Weaving (hand and loom)				X
Basketry				X
Cement Work				X
Jewelry				X
General Trades Course				X
Bricklaying				X
Carpentry				X
Concrete Construction				X
Millwork				X
Plastering				X
Painting and Decorating				X
Plumbing				X
Building and Construction				X
Electrical Wiring				X
Automotive Electrical Systems				X
Bodies				X
Engines				X
Chassis				X
Carburetion				X
Airplane Mechanics				X
Farm Shop				X

most commonly accepted by the state bodies include educational psychology, methods of teaching, and supervised teaching. Methods of teaching courses may include both general methods--courses offered for all teachers regardless of the major field--and special methods concerned with specific problems for the industrial-arts teacher. Supervised teaching is now receiving major emphasis in several of the teachers' colleges.

Professional training is also influenced by the institution in which the prospective teacher receives his education, and by the bias of the staff responsible for the teacher-education program.

There should be little difference of opinion concerning the fundamentals necessary for training an industrial-arts teacher. He must know and be able to apply the basic truths of educational psychology. He must know the approved methods and techniques for teaching given situations. Larger classes and diversified activities show a trend towards a comprehensive general-shop program. Consideration of individual differences, course analysis--what to teach and how to teach it--are some of the most important aspects for which adjustment and flexibility in methods are essential.

Pupil personnel organization calls for greater organizational ability. It is becoming a more complicated matter to so organize classes that the pupils share in carrying on the various activities of the industrial-arts courses in such a fashion that they may, at the same time, gain a better appreciation of modern industrial practice.

How important is a course in curriculum materials? This course should be designed to aid prospective teachers in developing a kit of

instructional materials pertinent to each area he will be qualified to teach. TABLE IX shows the opinions of the responding teachers concerning the importance of a course in curriculum materials.

TABLE IX  
Importance Of A Course In  
Curriculum Materials

No. Respondents	Negligible	Average Importance	Very Important	Absolutely Necessary
492	20	80	217	175

Approximately eighty per cent of the respondents believe that a course in curriculum materials is of great importance to the prospective industrial-arts teacher.

Many students starting an industrial-arts teacher-education program have had limited training in industrial arts in the public schools, and seldom have had a comprehensive industrial-arts program. As a consequence, the candidate does not realize the position of the industrial-arts teacher in the total picture of general education.

Would field trips to public schools offering a general industrial-arts program aid the prospective teacher in understanding better the function of industrial arts? Should students observe shop teaching in public schools before doing directed teaching? The writer believes that observation of good shop teachers in action would be of considerable help to the candidates. TABLES X and XI show the responses of experienced industrial-arts teachers concerning the relative importance of field trips to industrial-arts shops in public schools, and

the importance of observation of shop teaching before undertaking directed teaching.

TABLE X  
Importance Of Field Trips To Industrial-  
Arts Shops In Public Schools

No. Respondents	Negligible	Average	Very Important
489	6	146	337

TABLE XI  
Students Should Do Observation Of  
Shop Teaching Before Directed Teaching

No. Respondents	Yes	No
476	460	16

As indicated by TABLES X and XI, the majority of the responding teachers believe that field trips to industrial-arts shops in public schools, and that observation of shop teaching prior to directed teaching, are very important to the prospective industrial-arts teacher. These methods should add to the development of the candidate and help to orient the prospective teacher better than merely receiving classroom instruction.

Many industrial-arts teachers, in their education programs, take

courses in industrial-arts philosophy and teaching techniques. Is this philosophy practiced by the college instructors in college shop classes? Do the students, in addition to learning technical skills, learn to teach the subject; to give proper demonstrations? The writer has seen many college shop classes in which technical skill was given most emphasis, and has heard the complaints of many students concerning this condition. The public school teachers were asked several questions concerning this practice. TABLES XII, XIII, and XIV show the reactions of the respondents concerning the teaching methods and techniques used by the college shop instructors.

TABLE XII

The Number Of College Instructors  
That Practice Industrial-Arts Philosophy  
And Teaching Techniques In Shop Classes

No. Respondents	All	Many	Few	None
467	30	208	219	10

As indicated by TABLE XII, approximately half of the respondents believe that college shop instructors practice industrial-arts philosophy and teaching techniques as taught the students in general theory and methods classes.

Most educators, today, advocate learning by doing. How much of this is carried on in the college shop classes today? The teachers were asked to estimate the amount of "learning by doing" they experienced in their own educational programs, see TABLE XIII.

TABLE XIII

The Estimated Amount Of Learning  
By Doing In The Teacher-Education  
Program

No. Respondents	None	Little	Much
469	62	292	115

There seems to be a discrepancy between the responses in TABLES XII and XIII. In TABLE XII, the responses were divided approximately half and half as to the number of college shop courses taught on the basis of the industrial-arts philosophy as offered in theory classes; while in TABLE XIII, seventy-five per cent of the teachers claimed not to have had much opportunity to use "learning by doing" techniques of teaching. There should not be this difference unless the respondents interpreted the question for TABLE XIII to include all teacher-education courses instead of those courses applicable to industrial arts. If the industrial-arts professional courses advocate a certain philosophy of teaching, then certainly the college shop courses should be handled in the same manner.

Many of the college shop classes are concerned only with the development of skill in particular industrial areas. Several institutions do not require professional courses in teaching techniques, course construction, and the design and selection of suitable project material for school use. This is shown in TABLE XXXVIII on Page 68. How important is the development of teaching skill, project

design, and course construction in each shop course? If institutions do not require these courses on a professional basis, would it be desirable to teach them as a part of each shop class? TABLE XIV shows the responses concerning that question.

TABLE XIV

The Importance Of Developing Teaching Skill,  
Project Design, And Course Building In Each Shop Class

No. Respondents	Not Necessary	Very Important	Absolutely Necessary
473	49	301	123

As indicated by TABLE XIV, ninety-two per cent of the respondents believe it is important to develop in each shop course, teaching skills, project design, and course construction along with the skills fundamental to the subject.

Since the general-shop movement is rather definite, how important is a course in the philosophy and teaching methods inherent in the operation of this type of shop? Since the method of teaching a general-shop program differs materially from that of a unit-shop program it would seem important that all industrial-arts teachers be prepared for this type of teaching situation.

TABLE XV

Importance Of A Course In The Philosophy  
And Methods Of Operation Of The General Shop

No. Respondents	Negligible	Average	Very Important
496	16	184	296

Sixty-one per cent of the teachers believe that such a course is very important for the prospective industrial-arts teacher. Only four per cent of the respondents believe that this course is of no importance, to the beginning teacher.

What courses should constitute the industrial-arts professional training of the prospective industrial-arts teacher? Experienced industrial-arts teachers should be able to evaluate their educational programs so as to determine those courses which should be of value to the beginning industrial-arts teacher. These teachers were asked to check those professional courses, listed in TABLE XVI, which each prospective industrial-arts teacher should take in the four-year curriculum, as a result of their own teaching experience.



TABLE XVI

Opinions Of 456 Experienced Industrial-Arts Teachers  
Concerning The Professional Industrial-Arts Subjects  
Each Prospective Industrial-Arts Teacher Should Take  
In A Four-Year Program

Subjects	Per Cent In Favor			
	75 to 100	60 to 75	50 to 60	Less Than 50
Shop Organization and Management	X			
Supervision of Industrial-Arts Education	X			
Principles and Practices of Industrial- Arts Teaching	X			
Construction and Use of Visual Aids	X			
Classroom Organization and Management		X		
History of Industrial Arts		X		
Construction of Instruction Sheets		X		
Philosophy of Industrial Arts		X		
Industrial Arts Testing		X		
Course Construction		X		
Directed Teaching		X		
General Shop Theory and Problems		X		
Directed Observation			X	
Mathematics for Industrial-Arts Teachers			X	
Applied Science for Industrial-Arts Teachers			X	
Trade or Activity Analysis				X
Administration of Industrial-Arts Education				X
Philosophy of Vocational Education				X

There may be some overlapping of courses in TABLE XVI, but analysis will show those courses which the majority of the respondents believe important for the prospective industrial-arts teacher. By combining courses containing the same type of information, all of the courses checked by sixty per cent or more of the respondents,

could and should be offered in a four-year program. Over sixty per cent of the respondents believe course construction should be required, yet less than fifty per cent advocate trade or activity analysis. To the writer, it seems almost impossible to teach a course without breaking it down into its component parts, or to build a course of study without making an analysis of the area to be taught.

The industrial-arts teacher-education institutions should do their utmost to provide training in selection, organization, and presentation of subject matter; proper class-room methods and techniques of instruction; selection, development, and use of written and visual teaching aids; and any other professional courses which will tend to provide for better teaching in industrial arts.

(3) To develop a philosophy of education, professional ideals, and desirable attitudes. This objective was ranked third in importance by the responding department heads.

The development of a philosophy of education will, of course, depend upon the building of a broad concept of educational procedure, the parts played by the various major divisions and levels of the American system of education, and a definite concept of an integrated whole. It is believed that the student in a teacher-training institution of any sort, whether dealing with subject matter of a special nature, or with more general subject matter of the 'cultural' academic type, should be conversant with the general aims of education. (2)

Since the philosophy of education should include the aims to be accomplished, it might be of interest to review the aims down through the generations to the present, showing how they have changed. From the time of primitive man, whose aims consisted simply in learning how to get a living for himself and his family and

how to propitiate the unseen powers, to the age of the Greeks, education was mainly a conformity of the existing society. The Greeks were the first peoples to initiate education for the good of the society. There was considerable friction between the claims of individual freedom and social stability, which has existed to the present day.

With the advent of Christianity, education was aimed at the social efficiency in which humanitarianism and brotherly love would produce an ideal social order. Here were the real beginnings of preparing the individual to live in the society and also to improve the existing society. Later the purposes of education were aimed at the moral regeneration of the individual.

With the rise of the guild system, a practical education was founded. Its purpose was to prepare the individual for participation in the activities of the commercial and economic world. The Saracens came closest to the type of education which is advocated today--search for scientific knowledge and its applications in order to make life, as a whole, more comfortable and more worthwhile for the individual.

With the breakdown of feudal organization and the beginning of modern capitalistic organization, educational thinking has tried to keep pace with changing political, economic, and social developments. Application has lagged far behind the theory. The following changes are taking place in educational aims (11, p.656-7):

- a) From education for the privileged few to one that aims at a rich and full life for all.
- b) From education for the moral regeneration of society to that of a general social security.

- c) From education that prepares for the future to one that takes care of the immediate needs of the individual.
- d) From formal training to that of a free, creative self-expression.
- d) From that of training the individual for his own practical purposes to that of preparing individuals to contribute to the society.
- e) From the idea of adjusting the individual to an established and unchanging social pattern to that of preparing him to play his part in a changing society.

The teaching profession, as a whole, should command a high respect from the public. To obtain this respect, should the teacher-education institutions devote more time to the development of proper attitudes towards teaching? According to Micheels, the most important objective in the teacher education program is the development of proper attitudes towards teaching (9, p.506):

. . . The most important objective for any teacher education program is the development of a proper attitude towards teaching--an understanding of what a real teacher is and does.

.....

Even the briefest 'shot-in-the-arm' teacher training should help the recipients begin to develop a proper set of values or beliefs upon which their teaching efforts will be based. . .

TABLE XVII shows the opinions of 456 respondents concerning the developing of proper attitudes towards teaching. The public school industrial-arts teachers were asked whether the teacher-education institutions should devote more time to the development of a better understanding of what a real teacher is and does.

TABLE XVII

Teacher-Education Institutions Should  
Devote More Time To The Development  
Of Proper Attitudes Towards Teaching

No.Respondents	Yes	No
466	415	51

The development of proper attitudes towards teaching must be a shortcoming of most teacher-education institutions because eighty-nine per cent of the responding teachers believe that the institutions should devote more time to this problem.

In the opinions of these 466 teachers of industrial arts in the public schools, it is a responsibility of the teacher-education institutions to establish a policy for developing further a proper philosophy of education, proper ideals, and proper attitudes among effective teachers. If the teachers of industrial-arts subjects wish to progress as professional people, they must be able to state in simple terms the objectives of industrial arts and the manner in which these are to be accomplished. More than that, the teachers must see their goals as part of the larger goals of general education.

(4) To inform the teachers-in-training on the most widely accepted objectives in secondary education. This objective was ranked fourth in importance by the responding department heads. What are the aims of general education? No questions were asked concerning the aims of general education on either questionnaire and due to the fact that the aims as published in various texts are in a state of flux,

the writer is reluctant to discuss the matter. Wilber has the following to say about the aims of general education (12, p.3):

. . . Among the recent examples are the 'Seven Cardinal Principles of Secondary Education' and the 'Cardinal Objectives of the Elementary School'. Some of these statements have been broad and inclusive while have others have been specific. Careful consideration reveals, however, that when stripped of verbiage and special applications the various statements may be summed up as implying three basic purposes: (1) to transmit a way of life, (2) to improve and reconstruct that way of life, and (3) to meet the needs of individuals.

At present the only further comment the writer wishes to make is that whatever the objectives of secondary education might be, it is important that the teacher-education institutions show the ways and means of realizing those objectives in a vitalized manner.

(5) To interpret the requirements of the field for which teachers are trained. This objective was ranked fifth in importance by the responding department heads in the 1950 survey.

State certification requirements and placement opportunities determine to a large extent what the teacher-education institution will require of its graduates. Some high school administrators require the prospective teachers to meet standards above those required by the state department of education. Several state departments of education require only twenty-four semester hours as the minimum for an industrial-arts teaching major, but many of the institutions within these states require as much as sixty-five semester hours of credit for graduation from the institutions. It might be better for the profession as a whole if all states would set standards in more nearly the same amount, somewhat higher than the general average as of now.

Educational institutions could then train prospective teachers for teaching in any state without having to offer special courses to meet individual state requirements, except for state history and state school law.

There is a considerable difference among the various institutions in the requirements for the industrial-arts teaching major. Should the basic requirements for the preparation of industrial-arts teachers be more nearly the same throughout the United States? TABLE XVIII shows the number of semester hours of credit required for an industrial-arts major in eighty-nine collegiate institutions in the United States with teacher-education programs in industrial arts.

TABLE XVIII  
Semester Hours Of Credit Required  
For An Industrial-Arts Teaching Major

Range In Semester Hours	Frequency
20-22	2
23-25	7
26-28	6
29-31	11
32-34	7
35-37	11
38-40	10
41-43	12
44-46	5
47-53	3
54-60	4
61-Over	7
Total	89
Average	37.5

TABLE XVIII shows the wide variance in the requirements for the

industrial-arts major, ranging from a low of twenty semester hours of credit to a high of sixty-five semester hours of credit.

Departments heads in the various teacher-education institutions were asked to state whether the requirements are as high as they believe are necessary to train prospective industrial-arts teachers adequately. Sometimes institutional standards are lower than the department heads would like to have them. This might be due to maximum requirements set up by state boards, or to institutional requirements in other areas requiring so much of the students' time at the expense of credits in the area of concentration. TABLE XIX shows the opinions of ninety-three department heads concerning the number of credits which should be required in the training of industrial-arts teachers.

TABLE XIX

Semester Hours Of Credit Deemed  
Necessary For An Industrial-Arts  
Teaching Major

Range In Semester Hours	Frequency
24-30	2
31-35	5
36-40	19
41-45	25
46-50	14
51-55	13
56-60	3
61-65	4
66-70	6
71-Over	1
Total	93
Average	42.2



TABLE XIX indicates that the requirements are lower than the department heads deem necessary or would like to see in effect, when compared with TABLE XVIII. Fifteen of the respondents stated that the requirements would be increased within the next two years in their institutions.

Do the experienced teachers believe they had enough, too much, or too little preparation in industrial arts? What proportion of the four-year training program should be devoted to preparation in the major field of industrial arts? After several years of teaching experience, these people should realize the need for more or for less training than they had had in order to do a successful teaching job. The industrial-arts teachers in the public schools were asked, for this reason, to give their opinions concerning the percentage of the four-year program which should be devoted to the industrial-arts major. TABLE XX shows the opinions of 488 respondents concerning this question.

TABLE XX

Proportion Of The Four-Year Program  
Which Should Be Devoted To The Industrial-  
Arts Teaching Major

Percentage Of Four-Year Program	Frequency
30	72
40	92
50	119
60	127
70	62
80	16
Total 488	
Average 51 per cent	

The respondents believe the average time to be devoted to the industrial-arts major should be fifty-one per cent of the four-year program, or approximately sixty-three semester hours of credit. This amount is higher than that required by the institutions and higher than the department heads believe necessary. An analysis of TABLES XVIII and XX shows that many of the teachers believed that they had not received enough training in their educational programs.

As indicated in the college catalogues, there is a major trend towards general education in colleges for approximately the first two years, followed by concentration in the major and minor teaching fields. In the first two years, requirements cover approximately the same courses for all, since many students are not sure of their major interests, general subjects will contribute to all. By the time the student is a junior, he should have oriented himself to his proposed career or profession. With this trend towards the first two years in general-education subjects, are the remaining two years sufficient to prepare candidates for a major teaching field in industrial arts and a minor or two in other teaching areas? To upgrade the teaching profession, might it be necessary, in the near future, to require five years of preparation for industrial-arts teaching majors? The department heads of the various teacher-education institutions were asked to give their opinions concerning the length of time which should be devoted to the specialized preparation of industrial-arts teachers. What is the opinion of the experienced public school industrial-arts teacher concerning the length of time needed for preparation? Do they

believe there is need for five years of preparation or are they satisfied with the traditional four-year program? TABLE XXI shows the opinions of both of these groups to those questions.

TABLE XXI  
Length Of Time To Be Devoted To  
The Preparation Of Industrial-Arts Teachers

Respondents	4 Years	5 Years
92 Department Heads	38	54
487 Industrial-Arts Teachers*	326	156

\* Five industrial-arts teachers stated that three years were sufficient for training prospective industrial-arts teachers.

An analysis of TABLES XIX, XX and XXI shows that little difference exists between department heads' opinions and the experienced industrial-arts teachers' if the preparation is considered in terms of semester hours rather than number of years of training. The teachers believed that fifty-one per cent of the four-year program, or approximately sixty-five semester hours of credit, should be required for an industrial-arts teaching major; while the department heads believed that 42.2 semester hours of credit should be required in the four-year program, and that the program should be extended to include five years of preparation. If twenty semester hours of credit were allowed for the fifth year, that would make a total of approximately sixty-two semester hours. By this interpretation the opinions of both groups parallel each other, except that one

group believes four years are sufficient while the other group believes five years are necessary.

Most states grant teaching certificates which allow the teacher to teach only those subjects in his major and minor fields. A general-subject certificate, such as the State of Washington grants, might create a delicate situation as to whether the students are able to teach any subject sufficiently well, even with five years of training. Department heads and the industrial-arts teachers were asked to give their opinions concerning the type of certificate the states should grant a candidate teacher. TABLE XXII shows the responding department heads' opinions concerning teaching certificates.

TABLE XXII  
Types Of Teaching Certificates

Explanation	General	Specialized	Total
Certificates granted by states through the collegiate institutions	21	56	77
Type of certificate the department heads advocate	29	60	89

TABLE XXII indicates a large number of institutions granting general certificates, and also shows that many department heads are in favor of a general certificate. After the writer had obtained data from catalogues and other sources, he came to believe there was a misinterpretation of "general certificate" to mean a general industrial-arts certificate rather than a general school-subject certificate.

The industrial-arts teachers were asked their opinions concerning the practice of schools employing teachers to teach subjects other than those in their major and minor fields. Should this practice continue and, if not, should the state be responsible for enforcing the discontinuance of this practice? TABLE XXIII shows the opinions of the responding industrial-arts teachers to these questions.

TABLE XXIII  
Teachers Teaching Subjects Other Than  
Those In Their Major Or Minor Fields

Respondents' Opinions	In Favor	Against	Total
This practice should continue.	36	451	487
The states should enforce the discontinuance of this practice.	438	13	451

Ninety-three per cent of these teachers believe that teachers should not teach subjects for which they are not qualified. The respondents also believe that the states should assume the responsibility for the enforcement of the discontinuance of this practice. The question which arises is: when is a person qualified to teach a subject and who will determine what standards are necessary for this qualification? The writer believes the qualification standards should be set up on a national basis.

Many institutions offer a teaching minor in industrial arts. Since industrial arts is such a diversified field, could such limited training cause inferior teaching practices, in this area? The department

heads were asked to give their opinions concerning the teaching of industrial arts on the basis of a minor in that field. TABLE XXIV shows the opinions of the department heads concerning a teaching minor in industrial arts.

TABLE XXIV

## Advisability Of A Teaching Minor In Industrial Arts

No. Respondents	Not Advisable	Advisable
82	44	38

The department heads, as a group are undecided as to the advisability of offering a teaching minor in industrial arts. Approximately forty-six per cent of the respondents are in favor of the teaching minor. Those in favor of the minor gave the following reasons:

Yes, if adequate. We require thirty semester hours for a minor.

Desirable for teachers in small schools where a combination of two or more subjects is taught by the same teacher.

Certainly! Many of our minors later return as majors.

The consensus of opinion among those not in favor of a teaching minor in industrial arts is that this procedure tends to create marginal and inferior industrial-arts teachers.

Is it desirable for a prospective industrial-arts teacher to have industrial experience prior to his education program? Will this experience aid the teacher in his education program and later in his

teaching? Some educators say it is not essential to have prior industrial experience, and would rather have a candidate who had no trade training or experience. TABLE XXV shows the opinions of industrial-arts teachers concerning the desirability of industrial experience prior to the education program.

TABLE XXV  
Years, If Any, Of Industrial Experience  
Desirable Prior To The Education Program

No. Respondents	None	1 Year	2 Years	3 Years	4 Years
485	184	128	111	50	12

Thirty-eight per cent of the responding teachers believe that industrial experience is not necessary. The remainder, sixty-two per cent, believe that some industrial experience is desirable. The majority of those in favor of industrial experience believe that a prospective teacher should have from one to two years practical experience before starting his educational program.

The writer has heard expressions of discontent from industrial-arts teachers concerning the amount of academic subject-matter required in relation to the professional and technical industrial-arts subjects. The teachers were therefore asked to answer the following question: Do you believe that too much time is spent on academic subjects in the present teacher-education program? The responses are shown in TABLE XXVI.

TABLE XXVI

Too Much Time Is Devoted To Academic  
Subject-Matter In The Present Teacher-  
Education Program

No. Respondents	Yes	No
477	209	268

Forty-three per cent of the responding teachers believe too much time is devoted to academic subject-matter in the present four-year program. There might, therefore, be some justification for the discontent heard by the writer.

Several courses in the academic field are of special interest to the industrial-arts teacher, for example, mathematics, and applied science. Both subjects are applied in many phases of industrial arts. Should there be special courses designed to meet the needs of the industrial-arts teacher in those two fields? The responses of the responding teachers are shown in TABLE XXVII.

TABLE XXVII

Degree Of Importance Of Special Academic  
Courses For Industrial-Arts Teachers

Number of Respondents	Course	Degree of Importance			
		Low	Medium	High	Absolutely Necessary
488	Applied Mathematics	46	125	165	152
488	Applied Science	40	110	235	103



Approximately seventy per cent of the teachers surveyed believe these two courses, applied mathematics, and applied science, are of major importance to industrial-arts teachers and such special courses should be designed for them.

In the opinions of the responding department heads and public school industrial-arts teachers, it is desirable for a better organized educational program to be obtained through the setting of higher standards by many institutions, and in more nearly the same amount, so that teachers, no matter where they receive their training, are more similarly prepared in the basic courses essential to a good teacher. The public school administrators, teachers, college officials, and state department personnel, on a national basis, should get together and arrive at standards acceptable to all so that teachers prepared to teach industrial arts may present a similar industrial-arts program on the public school level, no matter where they may teach.

(6) To select, recommend and use all reasonable and ethical efforts in placing graduates. This objective was ranked ninth in importance by the responding department heads.

Industrial-arts departments of the teacher-education institutions should be concerned with the placement of their graduates. Lack of success of the graduates may reflect upon the training program of the institution; therefore, each recommendation should be made in such a manner that the graduate is placed in a position most nearly suited to his qualifications.

Should the teacher-education institutions be responsible, in part, for the orientation of the new teacher in his teaching position? Is it reasonably possible for the institutions in certain predesignated areas to employ supervisors of industrial arts whose duties would include visiting the beginning teachers within a reasonable area, to help in orientation, to assist in the solution of problems, to suggest improvements, and to give general supervision? TABLE XXVIII shows the opinions of the respondents concerning the problems of supervision for the first few years of the neophyte teacher.

TABLE XXVIII

Advisability Of Teacher-Education Institutions  
Employing Supervisors To Visit With Neophyte Teachers

No. Respondents	In Favor	Not In Favor
481	400	81

Eighty-three per cent of the responding teachers are in favor of such a system. The writer believes, if financial and geographic difficulties could be overcome, that such a program would be of value to the teacher-education institutions, beginning teachers, and the public.

Should college extracurricular activities be considered when an applicant seeks a teaching position, and how important are these activities? TABLE XXIX shows the opinions of the responding industrial-arts teachers who have experienced this problem when applying for teaching positions.

TABLE XXIX

Relative Importance Of College Extracurricular  
Activities When Applying For A Teaching Position

No. Respondents	Degree of Importance		
	Negligible	Average	Very Important
471	81	251	139

The majority of the teachers believe that college extracurricular activities are of some importance when applying for a position for teaching industrial arts.

Questions concerning the objectives; (g) to develop a code of professional ethics, (j) to promote favorable publicity and public contact, (h) to develop and strengthen character and personality were omitted from both questionnaires. The wording of these objectives was of such nature that results obtained from questions would probably be biased toward the promotion of reactions to the industrial-arts teacher-education program. Any discussion of these topics would likely be of a personal nature rather than objective. Perhaps another study should be made to determine the degree to which courses offered by industrial-arts departments of the teacher-education institutions are effective in accomplishing these objectives.

#### Philosophy of Industrial-Arts Teacher Education

In industrial-arts teacher education there is needed a clear, comprehensive outlook on the fundamental purposes and meanings of what is being done and what should be undertaken. It is only through the

achievement of these purposes that industrial-arts teaching will progress as a profession.

The following conditions serve as the bases of statements of the philosophy of industrial-arts teacher education (5, p.56):

A philosophy of industrial-arts teacher education, like the philosophy of the senior and junior high schools, should be based upon the analysis of the particular individuals to be served, their needs, interests, physical and mental capacities, aptitudes, abilities and shortcomings.

A philosophy of industrial-arts teacher education embraces present and reasonably possible future practices, conditions, and limitations such as are found or are possible in American public-school education.

A philosophy of industrial-arts teacher education embraces any and all factors such as: aims, subject-matter, personnel management, shop organization, methods, time, psychology, equipment, supplies, products, standards, evaluation, and other factors.

A philosophy of industrial-arts teacher education should be in harmony with the philosophy of public-school general education.

The over-all objective of teacher education is to prepare teachers for effective service in the public schools; therefore, the main function of industrial-arts teacher education is to prepare individuals for the effective use of teaching methods, and the skills, materials and tools of the various industrial areas common to the field, so they are able to teach industrial arts effectively in the elementary, junior high, and senior high schools. The minor objectives of industrial-arts teacher education are, therefore, supporting purposes to the over-all objective of all teacher education. The minor objectives as gathered from this study are:

- 1) To train students in the technical subject-matter courses that

may be selected as a part of the industrial-arts teacher-education program. Certain degrees of skill, techniques, and manipulative abilities must be developed commensurate with the candidate's needs. It is the responsibility of the institution to increase the student's knowledge of related technical information, industrial operations, and processes which are beyond the scope of the school shop.

2) To train the students in the accepted professional methods of teaching, so they will know how to select, organize, and present subject matter through the accepted classroom methods and techniques, both the general methods and the methods peculiarly suited to industrial arts, and to develop in the student the ability to select and use audio-visual teaching materials.

3) To develop a philosophy of education, professional ideals, and desirable attitudes so that the student may broaden his educational horizon, can understand educational trends, realize the place of industrial arts in general education, and develop social-civic, scientific, and industrial attitudes and appreciations.

4) To inform the teachers-in-training on the most widely accepted objectives in secondary education so that in the effort of developing skills, knowledges, and appreciations, industrial-arts teachers will not lose sight of the broader, fundamental goals of education toward which all education, including the practical arts, must contribute.

5) To interpret the requirements of the field for which teachers are trained, so that those trained will be of the type wanted by the public schools, will meet state requirements, will be in line with national trends; to strive for a more nearly uniform basic program

for the preparation of industrial-arts teachers, with higher standards than now exist as a national pattern.

6) To develop and strengthen character and personality vital to a good teacher.

7) To develop a code of professional ethics.

8) To develop habits or traits of perseverance, push, and persuasiveness--the will to win in a just cause.

9) To select, recommend, and use all reasonable and ethical efforts in placing graduates so that the teachers are placed in positions most nearly suited to the training and characteristics of the students.

10) To promote favorable publicity and public contacts.

These objectives, plus the basic precept that industrial arts is an integral part of general education, form the philosophy of industrial-arts teacher education.

The philosophy of industrial-arts teacher education emphasizes the individual and his all-around development as a prospective teacher and citizen. The goals inherent in this philosophy are as follows: to assist the individual to achieve that whole personality which is within the range of his potentiality; to develop in the student certain degrees of skill, techniques, manipulative abilities, professional methods of teaching, so he can select, organize and present subject matter through the accepted classroom methods and techniques; to help develop in the student a sound philosophy of industrial-arts, professional ideals, and desirable attitudes towards teaching, so

he may realize the place of industrial arts in general education; to develop an educational program meeting the needs of individuals so the teacher candidate may meet state requirements, and be the type of teacher desired by the public schools; and, finally, to be cognizant of the ever widening goals of industrial-arts education in order to improve the standards of teacher education on a national scale.

### CHAPTER III

#### AN ORGANIZATIONAL PATTERN FOR INDUSTRIAL-ARTS TEACHER EDUCATION

There seems to be little agreement concerning the course requirements for industrial-arts teacher education. There is no consistent basic core of required courses. The writer definitely believes in a basic core so that industrial-arts teachers are similarly prepared. It is difficult to conceive that so few courses are required in the professional fields and to justify the differences in training for industrial-arts teachers in the various parts of the United States.

This chapter presents the organizational patterns of sixty-seven of the ninety-one teacher-education institutions listed in Appendix D. Some of the institutions did not mail the requested information necessary for this part of the study. The writer therefore used the catalogues of sixty-seven of the institutions, random selection, to obtain the data rather than send out another questionnaire. It is assumed that the catalogues gave a true picture of requirements as actually administered.

The writer assumes responsibility for proper interpretation of the information embodied in the catalogues. Only those courses which were required of all industrial-arts teacher-education students are listed in the following tables.

Examination of the data in addition to the brief interpretation should bring forth other information as desired in relation to subject offerings in industrial-arts teacher education. The tables are largely self-interpretive.



The college general requirements were tabulated in broad areas rather than in detailed course offerings, since this study is primarily concerned with industrial-arts offerings.

These data will be compared with the data in CHAPTER IV to show a comparison between items gleaned from college catalogues and opinions of experienced public school industrial-arts teachers concerning the teacher-education program.

#### Offerings in General Education

TABLES XXX through XXXVI show the course requirements in the college general studies core curriculum. It should be noted that, as a whole, there is more agreement concerning the general studies program than for the professional education and technical studies programs.

Industrial-arts teachers need as much preparation in the language arts as do other teachers. Every teacher should have a good command of English, including spelling. This is the reason for all of the teacher-education institutions requiring language arts. TABLE XXX shows the variance in the number of credits required in the language arts by the various teacher-education institutions. Forty-four of the institutions require from nine to twelve semester hours of credit in the language arts.

TABLE XXX

GENERAL EDUCATION: Language Arts  
(English; Grammar; Composition; Literature; Speech)

Number of Institutions Requiring Courses in Language Arts											
Total	Semester Hours Credit										Mean
	1	3	5	7	9	11	13	15	17	19	
	to	to	to	to	to	to	to	to	to	to	
	2	4	6	8	10	12	14	16	18	20	
67	0	1	5	8	21	23	2	4	2	1	10.42

Social studies, believed to be important in the educational program of industrial-arts teachers, are required to a greater extent than ever before. This area should include the interpretation of the socio-economic and related fields and the influences of science and technology upon the industrial changes. It should be of value to the industrial-arts teacher.

TABLE XXXI shows that five institutions require from fifteen to sixteen semester hours of credit in the social studies field, possibly four courses. Thirty-four institutions require from nine to twelve semester hours of credit, possibly three courses.

TABLE XXXI

GENERAL EDUCATION: Social Studies  
(History; Political Science; Economics; Sociology)

Number of Institutions Requiring Courses in Social Studies										
Semester Hours Credit										
Total	1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	11 to 12	13 to 14	15 to 16	17 to 18	Mean
59 (a)	0	1	12	3	13	21	4	5	0	11.36

(a) Eight institutions do not require social studies courses.

Do industrial-arts teachers need courses in college mathematics? They need mathematics in some form, but it is questionable whether they need the higher forms of mathematics. Mathematics in some form, is required in only thirty-four of the sixty-seven of the responding institutions. Nineteen, or more than half of the institutions requiring mathematics, require only one to four semester hours of credit, probably only one course, as shown in TABLE XXXII.

TABLE XXXII

GENERAL EDUCATION: Mathematics  
(Algebra--intermediate and advanced; Trigonometry--  
plane and spherical; History of Mathematics; Analyt-  
ical Geometry; Calculus--differential and integral;  
Applied Mathematics)

Number of Institutions Requiring Courses in Mathematics						
Total	Semester Hours Credit					Mean
	1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	
34 (a)	6	13	11	4	0	4.27

(a) Thirty-seven institutions do not require courses in mathematics.

General courses in chemistry and physics should be of importance to the industrial-arts teacher. Through these courses the candidate should obtain technical and scientific information concerning such items as inks, glues, rubber, optics, films, and many others for which there is lack of time in the regular technical courses because of the teaching of skills and general information.

TABLE XXXIII shows that eight responding institutions require more than fourteen semester hours of credit in science courses. Fifteen of these institutions require from one to seven semester hours of credit, possibly two courses.

TABLE XXXIII

GENERAL EDUCATION: Science  
(Chemistry; Physics; Physical Science; Biological Science)

Number of Institutions Requiring Science Courses											
Semester Hours Credit											
Total	1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	11 to 12	13 to 14	15 to 16	17 to 18	19 to 20	Mean
59 (a)	1	4	10	14	6	12	4	5	2	1	9.43

(a) Eight of these institutions do not require science courses.

General psychology is required by forty of the sixty-seven institutions, as shown in TABLE XXXIV. Three to five credits seem to be the requirement in this course.

TABLE XXXIV

GENERAL EDUCATION: General Psychology

Number of Institutions Requiring General Psychology									
Semester Hours Credit									
Total	1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	11 to 12	13 to 14	Mean	
40 (a)	5	28	8	3	1	1	0	4.30	

(a) Twenty-seven institutions do not require general psychology.



Health and physical education are required by all of the responding institutions. Most of these institutions require from three to six semester hours credit in this area as shown in TABLE XXXVI. Several of these teacher-education institutions are also land-grant colleges, and require R.O.T.C. courses, and five require health and physical education, but do not give numerical credit for the courses.

TABLE XXXVI

## GENERAL EDUCATION: Health and Physical Education

Number of Institutions Requiring Health and Physical Education							
Total	Semester Hours Credit						Mean
	1	3	5	7	9	11	
	to 2	to 4	to 6	to 8	to 10	to 12	
62 (a)	7	28	18	8	1	0	4.47

(a) Five of these institutions require these courses but do not give numerical credit for them.

Nine institutions require a general orientation course for all students. Three schools require a separate course in library science, while others include this work in the orientation course or in one of the English courses.

Professional Education Offerings

There is a dearth of agreement concerning the requirements for the professional education program. Are the educators not sure which

courses should be basic for all teachers, or is there so much overlapping in courses that an individual subject loses its identity and may be covered in several courses? Is it not possible to form a basic core of professional education subjects that would be required of all prospective teachers, and then offer additional subjects which are desirable under certain conditions? Would not a system of this nature show maturity in the planning of the teacher-education curriculum rather than uncertainty?

TABLE XXXVII shows the various courses which comprise the professional education program. Principles of secondary education and educational psychology are the two courses which the majority of these colleges require. Such courses as: visual education, methods and materials, philosophy of education, and classroom management are required by relatively few of the institutions. Are these courses of importance to the teacher? Several members of the staffs of the teacher-education institutions say the students take the more important courses, which are not required, under "forced" advisement. If these courses are so important that institutions require them by this method, why could they not be listed as required subjects?

Not all of the courses listed in TABLE XXXVII could be required in a four-year program. Perhaps many of them could be combined, such as: history of education, and philosophy of education; theory and principles of teaching, and methods and materials; school law, and state history; administration and organization, and classroom management. These combinations would make possible a more complete coverage of the more important courses.



TABLE XXXVII  
PROFESSIONAL EDUCATION: General

Number of Institutions Requiring Professional Education Courses						
Fre- quency	Subjects	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
47	Educational Psychology	14	25	8	0	3.20
40	Principles of Secondary Education	18	17	4	1	2.90
29	Tests and Measurements	13	16	0	0	2.60
26	Theory and Principles of Teaching	10	11	5	0	3.12
25	Introduction to Education	12	13	0	0	2.54
18	Psychology of Adolescence	9	9	0	0	2.50
17	History of Education	10	7	0	0	2.32
15	Philosophy of Education	11	4	0	0	2.03
15	School Law	15	0	0	0	1.50
14	Administration and Organization	9	5	0	0	2.22
10	Curriculum	3	6	0	1	3.30
10	State History	10	0	0	0	1.50
9	Secondary Schools in American Life	4	5	0	0	2.62
5	Visual Education	4	1	0	0	1.90
4	Human Growth and Development	0	3	0	1	4.50
3	Classroom Management	1	2	0	0	2.84
3	Methods and Materials	3	0	0	0	1.50
1	Psychology of Adjustment	0	1	0	0	3.50
1	Current Trends in Education	1	0	0	0	1.50
1	Elementary Education	1	0	0	0	1.50

### Industrial-Arts Professional Education Offerings

There seems to be less agreement concerning required professional industrial-arts courses than for courses in general education and general professional-education subjects. Are courses such as; philosophy of industrial arts; course construction and analysis: general shop theory and problems; curriculum materials; and materials of industry, important to the industrial-arts teacher? According to TABLE XXXVIII few institutions require these courses in their four-year industrial-arts programs.

The two courses with the largest frequency of mention are: shop organization and management; and principles and practices of industrial-arts teaching. Several of the courses listed in TABLE XXXVIII might be combined to eliminate some titles. It would be interesting to know why more of the professional industrial-arts courses are not required.

TABLE XXXVIII  
PROFESSIONAL EDUCATION: Industrial Arts

Number of Institutions Requiring Professional Industrial-Arts Courses

Fre- quency	Subjects	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
33	Principles and Practices of Industrial-Arts Teaching	14	18	1	0	2.71
22	Shop Organization and Management	11	11	0	0	2.50
9	Industrial-Arts Mathematics	1	5	2	1	4.16
9	Introduction to Industrial Arts	3	6	0	0	2.84
9	Course Construction and Trade Analysis	5	4	0	0	2.40
7	Curriculum Materials	1	5	0	1	3.22
6	General Shop Theory and Problems	4	1	1	0	1.90
5	Philosophy of Vocational Education	2	2	1	0	3.10
5	History of Industrial Arts	2	3	0	0	2.70
4	Industrial-Arts Applied Science	0	4	0	0	3.50
4	Visual Aid Construction and Use	2	2	0	0	2.50
3	Industrial Arts in Modern Education	2	1	0	0	2.18
2	Philosophy of Industrial Arts	1	1	0	0	2.50
2	Administration of Industrial Arts	1	1	0	0	2.50
1	Safety	0	1	0	0	3.50
1	Materials of Industry	0	1	0	0	3.50
1	Industrial Hygiene	1	0	0	0	1.50
1	Elementary Industrial Arts	1	0	0	0	1.50
1	Secondary Industrial Arts	1	0	0	0	1.50

Student teachers should gain practice-teaching experiences under conditions that are typical as to type of pupil, class size, equipment, and full responsibility for handling classes (6, p.80). The majority of the institutions require from three to six semester hours of credit in directed teaching, as shown in TABLE XXXIX. Four institutions require from fifteen to sixteen semester hours of credit. Few schools offer a separate course in directed observation, but most of the institutions include the directed observation in the directed teaching course.

TABLE XXXIX  
PROFESSIONAL EDUCATION: Directed  
Teaching and Observation

Number of Institutions Requiring Directed Teaching and Observation										
Fre- quency	Subject	Semester Hours Credit								Mean
		1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	11 to 12	13 to 14	15 to 16	
6	Directed Observation	1	5	0	0	0	0	0	0	3.17
64 (a)	Directed Teaching	0	13	29	8	5	4	1	4	6.78

(a) Three institutions do not require directed teaching.

### Industrial-Arts Technical Education Offerings

There is more agreement concerning the technical subject-matter courses especially in woods, metals, and drawing than in any other area in the industrial-arts education program. The traditional courses receive more emphasis than any of the other industrial areas possible in this curriculum. Woodworking courses are predominant in the requirements in the four-year program. Only three institutions fail to require woodworking courses, as shown in TABLE XL. General woodworking received the largest frequency of mention.

TABLE XL  
TECHNICAL EDUCATION: Woodworking

Number of Institutions Requiring Woodworking Subjects						
Fre- quency	Subjects (a)	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
42	General Woodworking	10	15	13	4	4.24
17	Machine Woodworking	7	10	0	0	2.68
17	Cabinet Work	8	8	1	0	2.68
14	Bench Woodworking	3	8	3	0	3.50
9	Wood Finishing	8	1	0	0	1.72
8	Turning	5	3	0	0	2.25
7	Furniture Construction	2	5	0	0	2.93
4	Carpentry Work	0	4	0	0	3.50
4	Pattern Making	3	0	1	0	2.93
1	House Planning and Construction	0	1	0	0	3.50

(a) Three of these institutions do not require woodworking.

Drafting or mechanical drawing is second in frequency as a requirement. Only four of the responding institutions fail to require drafting courses in some form, as shown in TABLE XLI. General drawing, architectural drawing, and industrial-arts design received the largest number of mentions.

TABLE XLI  
TECHNICAL EDUCATION: Drafting

Number of Institutions Requiring Drafting Subjects								
Fre- quency	Subjects (a)	Semester Hours Credit						Mean
		1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	11 to 12	
55	General Drafting	9	32	12	1	0	1	3.82
31	Industrial-Arts Design	24	6	1	0	0	0	2.16
25	Architectural Drafting	12	12	1	0	0	0	2.62
19	Machine Drawing	13	6	0	0	0	0	2.14
7	Working Drawings	0	7	0	0	0	0	3.50
5	Descriptive Geometry	1	4	0	0	0	0	3.10
3	Freehand Drawing	3	0	0	0	0	0	1.50
2	Sheet Metal Drawing	2	0	0	0	0	0	1.50
2	Shop Sketching	2	0	0	0	0	0	1.50

(a) Four of these institutions do not require drafting courses.

Metalworking ranks third in importance among the technical subjects in these institutions. General metalwork, machine metalwork, and sheet metalwork received the largest number of mentions. Only six of the sixty-seven schools omit metalwork as a requirement as shown in TABLE XLII.

TABLE XLII  
TECHNICAL EDUCATION: Metalwork

Number of Institutions Requiring Metalworking Subjects							
Frequency	Subjects (a)	Semester Hours Credit					Mean
		1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	
37	General Metalworking	10	18	7	1	1	3.60
27	Machine Metalwork	12	12	3	0	0	2.89
22	Sheet Metalwork	14	7	1	0	0	2.32
14	Art Metalwork	13	1	0	0	0	1.64
11	Welding	10	1	0	0	0	1.68
9	Foundry	6	3	0	0	0	2.18
9	Bench Metalwork	2	7	0	0	0	3.06
6	Forging and Welding	5	1	0	0	0	1.84
2	Metal Processing	1	0	0	1	0	4.50
1	Ornamental Iron	1	0	0	0	0	1.50

(a) Six of these institutions do not require metalwork.

Electricity, comprehensive general shop, craftwork, graphic arts, and automotives follow in order of importance, on the basis of the number of schools requiring these subjects. General electricity is required by thirty-three institutions, as shown in TABLE XLIII.

TABLE XLIII  
TECHNICAL EDUCATION: Electricity

Number of Institutions Requiring Electricity Subjects						
Fre- quency	Subjects (a)	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
33	General Electricity	9	20	4	0	3.20
5	Elementary Electrical Theory and Construction	3	2	0	0	2.30

(a) Thirty-one of these institutions do not require courses in electricity in their industrial-arts curricula.



The general shop is the type most frequently used in the junior high schools. Only twenty-seven of the responding institutions require a comprehensive general-shop course. It would be interesting to obtain information about the reasons that more institutions do not include this type of shop in their programs, since the trend in the public school industrial-arts program is definitely towards the general-shop type of instruction. TABLE XLIV shows the number of institutions requiring a comprehensive general shop course.

TABLE XLIV

## TECHNICAL EDUCATION: Comprehensive General Shop

Number of Institutions Requiring a Comprehensive General-Shop Course							
Fre- quency	Subject (a)	Semester Hours Credit					Mean
		1	3	5	7	9	
		to 2	to 4	to 6	to 8	to 10	
27	Comprehensive General Shop	9	11	6	1	0	3.42

(a) Forty institutions do not require a comprehensive general-shop course in their industrial-arts curricula.

Craftwork, one of the areas which lends itself best for avocational interests, is required by only twenty-one of these institutions. Craftwork is being included more and more in industrial-arts classes in the public schools. General crafts received the largest frequency of mention, as shown in TABLE XLV.

TABLE XLV  
TECHNICAL EDUCATION: Craftwork

Number of Institutions Requiring Courses in Craftwork						
Frequency	Subjects (a)	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
16	General Crafts	6	9	1	0	2.88
5	Plastics	4	1	0	0	1.90
4	Ceramics	1	3	0	0	3.00
3	Photography	2	1	0	0	2.18
1	Leatherwork	1	0	0	0	1.50
1	Cementwork	0	1	0	0	3.50
0	Jewelry					
0	Weaving					
0	Basketry					

(a) Forty-six of these institutions do not require courses in craftwork in their industrial-arts curricula.

Graphic arts, the methods and processes (hand and mechanical) used to reproduce numbers of copies of pictorial, decorative, or typographical arrangements on paper or other media, ranks third in the nation in the number of establishments, fourth in the number of employees, and third in the value of production, according to the latest census. The graphic-arts area of instruction is required in few institutions. The writer wonders how the objectives of industrial arts can be attained satisfactorily without offering work in the graphic-arts field. TABLE XLVI shows the number of institutions requiring work in graphic arts.

TABLE XLVI  
TECHNICAL EDUCATION: Graphic Arts

Number of Institutions Requiring Graphic Arts Courses							
Fre- quency	Subjects (a)	Semester Hours Credit					Mean
		1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	
15	General Graphic Arts	6	9	0	0	0	2.70
2	Printing (Typography only)	0	1	0	0	1	6.50

(a) Forty-eight of these institutions do not require courses in graphic arts.

Automotives, the study of the automobile and its component parts, is required in only six of the sixty-seven teacher-education institutions. All six of these colleges require a general automotives course and one of them requires an additional course in automotive electrical systems, as shown in TABLE XLVII.

TABLE XLVII  
TECHNICAL EDUCATION: Automotives

Number of Institutions Requiring Courses in Automotives						
Fre- quency	Subjects (a)	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
6	General Automotives	1	4	1	0	3.50
1	Electrical Systems	0	1	0	0	3.50

(a) Sixty-one of these institutions do not require courses in automotives.

Courses such as: home mechanics, machine and tool maintenance, wood and metal finishing, and power and transportation are required by several institutions, as shown in TABLE XLVIII.

TABLE XLVIII  
TECHNICAL EDUCATION: Miscellaneous Subjects

Number of Institutions Requiring These Subjects						
Fre- quency	Subjects	Semester Hours Credit				Mean
		1 to 2	3 to 4	5 to 6	7 to 8	
16	Machine and Tool Maintenance	14	2	0	0	1.74
8	Wood and Metal Finishing	2	6	0	0	2.84
4	Power and Transportation	1	1	2	2	3.00
2	Home Mechanics	2	0	0	0	1.50

## Summary

In summarizing this chapter, it appears that the teacher-education institutions, as a whole, agree more on a basic core of general education or college general requirements than on the professional education (general and industrial arts), and technical courses in the four-year program for industrial-arts teachers. There is little evidence of a national basic core of required courses in the programs of professional education (general and industrial arts), and industrial-arts technical subjects. It is questionable whether this condition is desirable. Many courses may be taken on an elective basis and, with a good guidance program, the student will take those essential courses; but with a poor guidance program the course selection will be left to the discretion of the student. Most schools require courses in woods, metals, and mechanical drawing--the traditional courses-- but relatively few schools require courses in all of the major areas of industrial arts. Very few of the teacher-education institutions require courses in graphic arts, automotives, and craftwork. With the trend in the public school industrial-arts shops toward the general-shop type of presentation, too few teacher-education schools require preparation in a comprehensive general-shop course.

If the prospective industrial-arts teacher is to accomplish the objectives of industrial arts, in the public schools, more effectively, he should be trained in a more diversified industrial-arts program, in keeping with the general philosophy of industrial arts.

## CHAPTER IV

### OPINIONS OF EXPERIENCED TEACHERS CONCERNING THE ORGANIZATIONAL PATTERN FOR INDUSTRIAL-ARTS TEACHER EDUCATION

There is much talk at present, concerning the raising of standards in industrial-arts teacher education. The American Vocational Association has appointed a committee on standards to study this problem and to work on a national accrediting system. Baysinger, the secretary of this committee, in an article in the Industrial Arts and Vocational Education Magazine has this to say about the problem of standards (1, p.1-2):

The quality of industrial-arts education in the nation's schools depends to a large extent on the quality of preparation of industrial-arts teachers. Determining what is acceptable preparation has not been the responsibility of the profession but has, by legislative action, been delegated to chief state school officers who are responsible for establishing requirements and issuing certificates.

.....

It is evident that the profession must share responsibility for insuring adequate preparation of industrial-arts teachers, for certification alone is not enough.

Ericson made a study of teacher education in industrial arts. Two of his summarizing statements were (4, p.48):

There is need for greater uniformity in offerings in teacher education programs, even after giving due allowance for regional and local conditions. It appears difficult to justify the differentiation of 60 semester units of skill and craft courses in one institution and as low as 20 units in another, for the undergraduate teacher education program.

Further studies need to be undertaken in teacher education in industrial arts, leading to recommendations for minimum requirements and allocations of subjects to the three basic areas in the preparation of an industrial-arts teacher. Perhaps a suitable professional organization or an association of the colleges themselves may bring this about.

Experienced industrial-arts teachers should be able to help in setting up an industrial-arts teacher-education program because these people should have the ability to evaluate their college educational programs in view of their teaching experiences. It seems reasonable that public school industrial-arts teachers and the staffs of the teacher-education institutions should work together in planning a basic program which will meet the needs of the prospective industrial-arts teachers.

This chapter presents the opinions of 456 experienced industrial-arts public school teachers relative to the importance of the courses which they have taken, and those courses which they believe each prospective industrial-arts teacher should take in a four-year or in a five-year program.

#### College General Education Offerings

Many students will express a dislike for certain courses while in college. After several years of teaching experience, these same people will have a more valid basis for evaluating the courses. The teachers surveyed in this study were asked to do several things:

a) check those courses not included in their college educational programs but for which they believe a need exists; b) rank those courses



which they did take, on the basis of benefit to their present teaching; and c) check the courses which they think should be required in a four-year program and in a master's program. TABLE XLIX shows the reactions of these teachers to the courses usually offered in the college general studies program, which they did not take but for which they believe there is a need.

TABLE XLIX

Opinions Of 456 Experienced Teachers Concerning  
Subjects Not Taken In The General Education  
Program But For Which They Believe A Need Exists

General Education Subjects	Frequency
Art Design	147
Personality Development	102
Art Appreciation	97
Guidance	77
Library Methods	75
Character Education	70
Chemistry	69
Physics	60
Mental Hygiene	46
History of Mathematics	41
Biological Science	41
Music Appreciation	38
Physical Science	35
History of Western Civilization	35
Advanced College Algebra	34
Intermediate College Algebra	32
Spanish	30
American Government	25
American History	23
German	23
Music Theory	22
French	20
Latin	19
Grammar	16
Composition	13
English Literature	11
General Psychology	9

The frequencies listed in TABLE XLIX show the number of responding teachers who did not take the courses listed but which they believe they have needed in their teaching. It is surprising that one-hundred forty-seven of these teachers did not take a course in art design, but believe they need this training for their teaching, and that one-hundred two of the four-hundred fifty-six teachers did not have a course in personality development but believe there is a need for such a course. The frequencies as listed do not mean that the remainder of the teachers had completed these courses. For the most part they had not taken the courses and did not find a need for them in their teaching.

TABLE L shows the ratings by the teachers surveyed as to the importance of the courses which they had taken in their college educational programs, on the basis of their aid in teaching situations. A rating of (1) means that the subject has aided the teacher most in his teaching situation; (2) means the subject has been of some aid to his teaching situation; and (3) means that the subject has been of very little aid.

TABLE L  
Ratings Of 456 Experienced Teachers  
Concerning Subjects In The General  
Education Program

General Education Subjects	Rating		
	1	2	3
Grammar	230	108	12
Composition	200	149	24
General Psychology	196	129	22
Guidance	193	88	11
Art Design	182	41	10
Physics	165	120	21
Mental Hygiene	102	72	14
Personality Development	99	40	11
Art Appreciation	92	58	10
Chemistry	84	141	38
Intermediate College Algebra	84	127	72
Physical Science	75	80	25
Library Methods	73	77	48
American Government	68	148	83
American History	54	164	96
Character Education	47	45	7
Advanced College Algebra	40	72	67
Biological Science	32	87	70
English Literature	31	90	194
History of Western Civilization	24	83	117
History of Mathematics	13	17	59
Music Appreciation	1	20	86
Latin	1	11	61
Spanish	1	6	53
German	1	5	72
French	1	5	79
Music Theory	1	3	63

If one combines Ratings 1 and 2 in TABLE L he finds the following courses deemed as being of the most importance: grammar, composition, general psychology, guidance, art design, physics, chemistry, intermediate college algebra, American government, and American history.

What college general subjects should the prospective industrial-arts teacher be required to take in a four-year program? TABLE LI shows the opinions of the responding teachers concerning the general subjects each prospective industrial-arts teacher should be required to take in a four-year program.

TABLE LI  
Opinions Of 456 Experienced Teachers  
Concerning College General Subjects Which Should  
Be Required Of All Industrial-Arts Teachers In A  
Four-Year Program

General Education Subjects	Frequency
Composition	368*
Guidance	362*
General Psychology	347*
Physics	347*
Grammar	344*
American Government	284*
Chemistry	281*
American History	279*
Library Methods	244*
Art Appreciation	240*
Art Design	240*
Intermediate College Algebra	242*
Mental Hygiene	241*
Personality Development	232*
Character Education	199
Physical Science	170
English Literature	169
History of Western Civilization	142
Biological Science	141
Advanced College Algebra	119
Music Appreciation	95
History of Mathematics	75
Music Theory	47
Spanish	13
German	13
Latin	10
French	8

\* Fifty per cent and more of these teachers believe these courses should be required of all industrial-arts teacher candidates.

Since all courses cannot be included in a four-year educational program, which of the courses listed in TABLE LI should be included in a master's program? TABLE LII shows the opinions of the teachers surveyed concerning these college general subjects which should be taken in a master's program.

TABLE LII

Opinions Of 456 Experienced Teachers Concerning  
College General Subjects Which Should Be Required  
Of All Industrial-Arts Teachers In A  
Master's Program

General Education Subjects	Frequency
Guidance	82
Personality Development	66
Mental Hygiene	59
Character Education	48
Art Design	26
Library Methods	20
Art Appreciation	19
Advanced College Algebra	17
History of Mathematics	15
History of Western Civilization	14
General Psychology	13
Physical Science	12
English Literature	11
American Government	11
Chemistry	10
Music Appreciation	10
Composition	9
Physics	9
Biological Science	9
French	7
Music Theory	7
Grammar	6
Spanish	6
German	3
Latin	3
American History	3
Intermediate College Algebra	2

None of the courses listed in TABLE LII was believed to be essential in a master's program by as many as fifty per cent of these industrial-arts teachers.

#### Professional Education Offerings

Reactions of the teachers surveyed, to the professional education courses not included in their educational programs but for which they believe a need exists, are shown in TABLE LIII.

TABLE LIII  
Opinions Of 456 Experienced Teachers  
Concerning Subjects Not Taken In The Professional  
Education Program But For Which They Believe A  
Need Exists

Professional Education Subjects	Frequency
Visual Aids in Education	138
School Law	103
Classroom Management	52
Public School Administration and Organization	49
Curriculum Construction	45
Tests and Measurements	45
Educational Statistics	42
Thesis Writing	33
Research Techniques	26
Philosophy of Education	20
History of Education	16
Principles of Secondary Education	12
Theory and Principles of Teaching	11
Educational Psychology	8

Thirty per cent of the teachers surveyed had completed no course in visual aids but they believe there is need for such a course. Approximately twenty-three per cent of these people had no course in school law, but believe a need exists for it.

TABLE LIV shows the ratings given by the responding teachers to the importance of the professional education courses which they had completed in their college programs, on the basis of aid to their present teaching situations. A rating of (1) indicates the subject has aided the teacher most; (2) the subject has been of some aid to the teacher; and (3) the subject has been of very little aid to the teacher.

TABLE LIV  
Ratings Of 456 Experienced Teachers  
Concerning Professional Education Subjects

Professional Education Subjects	Ratings		
	1	2	3
Classroom Management	222	52	12
Curriculum Construction	192	85	14
Theory and Principles of Teaching	191	90	16
Educational Psychology	180	161	17
Tests and Measurements	176	135	29
Visual Aids in Education	153	56	19
Philosophy of Education	136	133	29
Principles of Secondary Education	107	117	63
Public School Administration and Organization	84	135	39
Research Techniques	79	87	34
History of Education	61	139	149
Thesis Writing	54	67	70
Educational Statistics	38	78	62
School Law	28	47	38

By combining Ratings 1 and 2 in TABLE LIV, the following courses would be deemed of importance to the industrial-arts teachers in the public schools: classroom management, curriculum construction, theory and principles of teaching, educational psychology, tests and measurements, visual aids in education, philosophy of education, if one accepts the ratings of more than fifty per cent of these teachers.

TABLE LV shows the opinions of the responding teachers concerning the professional education courses which should be required of all prospective industrial-arts teachers in a four-year program.

TABLE LV

Opinions Of 456 Experienced Teachers  
Concerning Professional Education Courses Which  
Should Be Required Of All Industrial-Arts Teachers  
In A Four-Year Program

Professional Education Courses	Frequency
Visual Aids in Education	328 *
Educational Psychology	311 *
Tests and Measurements	302 *
Classroom Management	284 *
Curriculum Construction	266 *
Theory and Principles of Teaching	263 *
Principles of Secondary Education	256 *
Philosophy of Education	246 *
History of Education	214
Public School Administration and Organization	157
School Law	129
Educational Statistics	93
Research Techniques	72
Thesis Writing	43

\* Fifty per cent and more of these teachers believe these courses should be required of all industrial-arts teachers.



Since all courses cannot be required in the four-year program, which of these courses listed in TABLE LV should be taken in the master's program? TABLE LVI shows the opinions of the teachers surveyed concerning those courses which should be required in the master's program.

TABLE LVI

Opinions Of 456 Experienced Teachers Concerning  
Professional Education Subjects Which Should Be  
Required Of All Industrial-Arts Teachers In A  
Master's Program

Professional Education Subjects	Frequency
Research Techniques	267*
Thesis Writing	250*
Educational Statistics	190
Public School Administration and Organization	171
Curriculum Construction	133
School Law	133
Philosophy of Education	115
Tests and Measurements	73
History of Education	68
Principles of Secondary Education	62
Theory and Principles of Teaching	47
Visual Aids in Education	45
Educational Psychology	41
Classroom Management	25

\* Fifty per cent and more of these teachers believe these courses should be required of all industrial-arts teachers.

Only two of the courses listed in TABLE LVI --research techniques and thesis writing--are believed to be essential in a master's program by as many as fifty per cent of these industrial-arts teachers. Such courses as: public school administration and

organization, history of education, educational statistics, and school law are deemed necessary, but the teachers are undecided as to when these courses should be taken, in the four-year or the master's program.

#### Industrial-Arts Professional Education Offerings

Reactions of the responding teachers to the industrial-arts professional courses not included in their educational programs, but for which they believe there is a need, are shown in TABLE LVII.

TABLE LVII

Opinions Of 456 Experienced Teachers Concerning  
Subjects Not Taken In The Industrial-Arts Professional  
Education Program But For Which They Believe A Need Exists

Industrial-Arts Professional Subjects	Frequency
Applied Science For Industrial-Arts Teachers	157
Mathematics for Industrial-Arts Teachers	130
Construction and Use of Visual Aids	114
Industrial-Arts Testing	101
Trade or Activity Analysis	67
Supervision of Industrial-Arts Education	53
Construction of Instruction Sheets	50
Administration of Industrial-Arts Education	45
General Shop Theory and Problems	45
Course Construction	44
Philosophy of Vocational Education	33
History of Manual and Industrial Arts	33
Classroom Management	32
Directed Observation	32
Philosophy of Industrial Arts	31
Shop Organization and Management	26
Directed Teaching	25
Principles and Practices of Industrial-Arts Teaching	18

Quite a few of the teachers believed there was a need for courses not personally completed, as follows: industrial-arts testing, construction and use of visual aids, mathematics for industrial-arts teachers, and applied science for industrial-arts teachers.

TABLE LVIII shows the ratings given by the responding teachers to the courses completed in their program of industrial-arts professional work, on the basis of aid to their present teaching situations. A rating of (1) indicates the subject has aided the teacher most; (2) the subject has been of some aid to the teacher; and (3) the subject has been of very little aid.

TABLE LVIII  
Ratings Of 456 Experienced Teachers  
Concerning Industrial-Arts Professional Subjects

Industrial-Arts Professional Subjects	Ratings		
	1	2	3
Shop Organization and Management	276	53	2
Principles and Practices of Industrial-Arts Teaching	254	63	10
Directed Teaching	230	47	18
Philosophy of Industrial Arts	186	90	15
Course Construction	178	66	9
General Shop Theory and Problems	178	81	6
Classroom Management	177	62	4
Construction of Instruction Sheets	160	93	27
Construction and Use of Visual Aids	143	44	6
Directed Observation	142	58	15
Industrial-Arts Testing	138	69	19
History of Manual and Industrial Arts	108	132	60
Trade or Activity Analysis	100	64	53
Administration of Industrial-Arts Education	99	81	16
Supervision of Industrial-Arts Education	89	89	16
Mathematics for Industrial-Arts Teachers	78	47	8
Philosophy of Vocational Education	76	83	33
Applied Science for Industrial-Arts Teachers	58	37	7

By combining Ratings 1 and 2 in TABLE LVIII, the following courses would be deemed of importance to the industrial-arts teachers in the public schools: classroom management, history of manual and industrial arts, construction of instruction sheets, philosophy of industrial arts, shop organization and management, course construction, principles and practices of industrial-arts teaching, general shop theory and problems, and directed teaching in industrial arts.

TABLE LIX shows the opinions of the responding teachers concerning industrial-arts professional courses which should be required of all prospective industrial-arts teachers.

TABLE LIX

Opinions Of 456 Experienced Teachers Concerning  
Industrial-Arts Professional Courses Which  
Should Be Required Of All Industrial-Arts Teachers  
In A Four-Year Program

Industrial-Arts Professional Courses	Frequency
Shop Organization and Management	346*
Principles and Practices of Industrial-Arts Teaching	341*
Construction and Use of Visual Aids	335*
General Shop Theory and Problems	326*
Directed Teaching	320*
Industrial-Arts Testing	315*
Construction of Instruction Sheets	308*
Philosophy of Industrial Arts	305*
Classroom Management	303*
History of Manual and Industrial Arts	290*
Course Construction	288*
Applied Science for Industrial-Arts Teachers	273*
Directed Observation	269*
Mathematics for Industrial-Arts Teachers	264*
Trade or Activity Analysis	182
Administration of Industrial-Arts Education	129
Philosophy of Vocational Education	127
Supervision of Industrial-Arts Education	126

\* Fifty per cent or more of the teachers believe these courses should be required of all industrial-arts teachers.

Since not all of the industrial-arts professional courses are adapted to the four-year program, which ones should be a part of the master's program? TABLE LX shows the opinions of the responding teachers concerning the courses listed.

TABLE LX

Opinions Of 456 Experienced Teachers Concerning  
Industrial-Arts Professional Subjects Which  
Should Be Required Of All Industrial-Arts Teachers In  
A Master's Program

Industrial-Arts Professional Courses	Frequency
Administration of Industrial-Arts Education	307*
Supervision of Industrial-Arts Education	288*
Philosophy of Vocational Education	204
Philosophy of Industrial Arts	150
Course Construction	145
Trade or Activity Analysis	143
Industrial-Arts Testing	99
History of Manual and Industrial Arts	90
General Shop Theory and Problems	65
Construction of Instruction Sheets	63
Principles and Practices of Industrial-Arts Teaching	63
Construction and Use of Visual Aids	59
Classroom Management	55
Directed Observation	52
Shop Organization and Management	49
Applied Science for Industrial-Arts Teachers	36
Directed Teaching	30
Mathematics for Industrial-Arts Teachers	20

\* Fifty per cent and more of these teachers believe these subjects should be required of all industrial-arts teachers in the master's program.

Only two of the courses listed in TABLE LX--administration of industrial-arts education and supervision of industrial-arts education --are believed to be essential in a master's program by as many as fifty per cent of these industrial-arts teachers. Such courses as: trade or activity analysis and philosophy of vocational education are deemed necessary, but the teachers are undecided as to when these courses should be taken, in the four-year or the master's program.

Technical Industrial-Arts Offerings

The technical industrial-arts courses received a higher frequency of mention than any of the other listed courses. TABLE LXI shows the opinions of the responding teachers concerning the courses which should be required in the technical industrial-arts program for all prospective industrial-arts teachers.

TABLE LXI

Opinions Of 456 Experienced Teachers Concerning  
Technical Industrial-Arts Courses Which Should Be  
Required In A Four-Year Program

Subjects	Frequency
General Woodworking	456*
General Mechanical Drawing	454*
General Metalwork	451*
General Graphic Arts	450*
General Electricity	447*
Industrial-Arts Design	423*
Bench Woodworking	420*
Wood Finishing	410*
Machine Woodworking	407*
Printing (presswork)	395*
Leatherwork	392*
Plastics	387*
Machine Shop	375*
Ceramics	364*
General Automotives	363*
Freehand Sketching	349*
Sheet Metal	346*
Comprehensive General Shop	342*
Household Mechanics	329*
Bench Metalwork	317*
Bookbinding	313*
Elementary Electrical Theory and Construction	312*
Art Metal	312*
Wood Turning	310*
Foundry	304*
Elementary Radio	302*
Photography	297*
Architectural Drawing	292*
Sheet Metal Drawing	292*
Printing (composition)	285*
Furniture Construction	281*
Perspective Drawing	270*
Machine Drawing	267*
Forging	262*
Cabinet Making	253*
Upholstery	236*
Light and Power Wiring	213
General Trades Course	189
Pattern Making	183
Farm Shop	183
Carpentry	174
Jewelry	174
Weaving (hand and loom)	173
Cement Work	168
Basketry	161
Automotive Electrical Systems	150
Electrical Wiring	143
Joinery	141
Building and Construction	134
Descriptive Geometry	132
Engines	131
Advanced Electrical Theory and Construction	127
Chassis	123
Woodcarving	123
Carburetion	118
Painting and Decorating	114
Plumbing	103
Bodies (automotives)	102
Airplane Mechanics	102
Millwork	93
Plastering	84
Concrete Construction	79
Bricklaying	76
Advanced Radio	76
Linotype Operation	51

\* Fifty per cent and more of these teachers believe these  
courses should be required of all industrial-arts teachers.



How many semester hours of credit should be required in the various technical-subject areas in the four-year program? The teachers surveyed were asked to estimate the number of semester hours of credit needed in the various areas, for general-shop preparation and also for unit shop preparation. TABLE LXII shows the opinions of the teachers.

TABLE LXII

Opinions Of 456 Experienced Teachers Concerning The  
Semester Hours Of Credit Which Should Be Required  
In The Various Technical-Subject Areas In A Four-  
Year Program

Semester Hours Credit															
Technical-Subject Areas	General Shop Preparation							Unit Shop Preparation							
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 and Over	Mean	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 and Over	Mean	
Woodworking	24	181	96	51	32	20	11.33	0	36	129	94	88	53	17.00	
Drafting	40	169	91	40	25	9	9.85	4	49	104	91	67	59	16.62	
Metalworking	48	190	123	24	16	1	9.18	8	43	123	102	80	43	16.16	
Electricity	79	184	56	9	0	0	6.13	21	69	82	65	53	42	14.80	
Graphic Arts	63	234	39	11	0	0	7.47	7	51	162	59	48	21	14.60	
Craftwork	110	167	43	21	12	4	7.38	13	83	89	65	52	29	14.22	
Building Trades	49	90	13	13	12	3	7.76	17	31	45	49	60	69	17.74	
Automotives	167	100	17	9	4	2	6.15	41	55	70	67	42	43	13.93	
Farm Shop	4	9	14	19	24	0	2.13	88	36	8	0	4	0	4.50	
Airplane Mechanics	129	0	0	0	0	0	2.00	84	28	3	0	0	0	3.45	
Household Mechanics	195	12	0	0	0	4	2.76	92	20	8	0	0	0	2.95	
Comprehensive General Shop	97	80	12	3	20	32	9.20								

Comparison Between Teachers' Opinions of Required  
Courses and Existing Requirements of Sixty-Seven  
Industrial-Arts Teacher-Education Institutions

The over-all or main objective of an industrial-arts teacher-education department is that of training or preparing teachers for service in the public schools. Experienced teachers will evaluate their teaching in the light of their training programs. If these teachers, as a group, believe there is need for a certain type of training, or for certain subjects, the teacher-education institutions should provide the training. Otherwise the institutions are not meeting their objectives.

It appears desirable to show a comparison between the teacher-education institutions' requirements and the beliefs of experienced teachers concerning required subjects in the education programs. Many courses which the teachers believe should be required are already offered on an elective basis, but prospective candidates often do not know what a basic core for industrial-arts teachers should be. It may be true that the counselors will advise the students to take certain courses, but specific requirements for a basic core would leave little doubt of the nature of a professional program.

Some industrial-arts departments may be handicapped by institutional or state limitations on the number of hours which may be required for this field of preparation. In that case the department should set up a program which will best meet the needs of the students and, at the same time, strive to remove the restrictions.

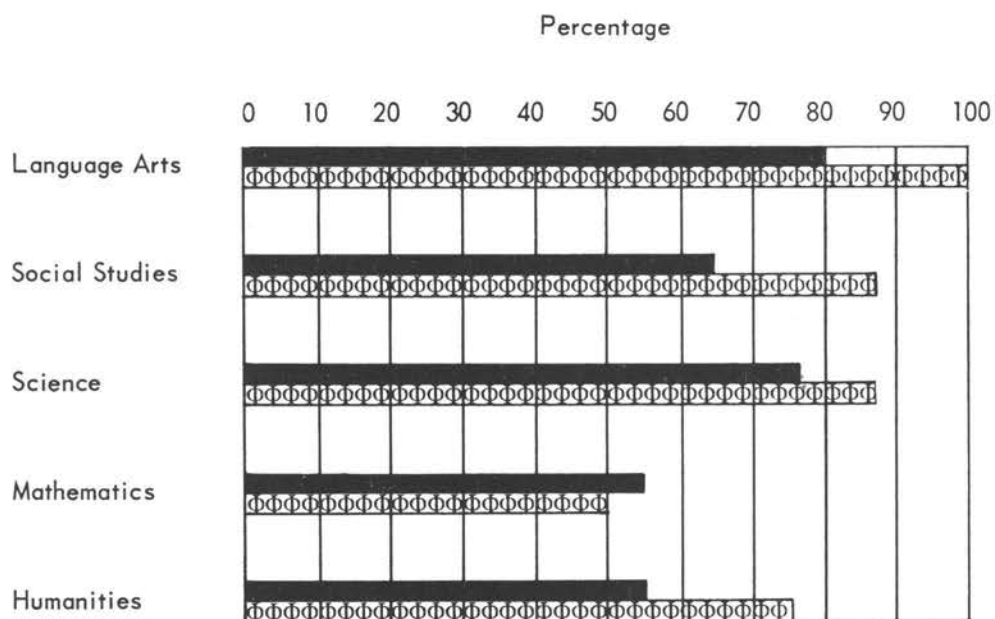
CHARTS I through V show graphic comparisons between the teacher-education institutions' requirements and beliefs of

experienced teachers, for the several groups of subjects which make up the total program of industrial-arts teacher-education.

An analysis of CHART I shows that in all areas, except mathematics, existing catalogue requirements are higher than respondents believe necessary.

CHART I

Comparison Between 456 Experienced Teachers' Opinions  
And 67 Industrial-Arts Departments Concerning Requirements In  
College General Courses In The Four-Year Program



Teachers believe these courses should be required.

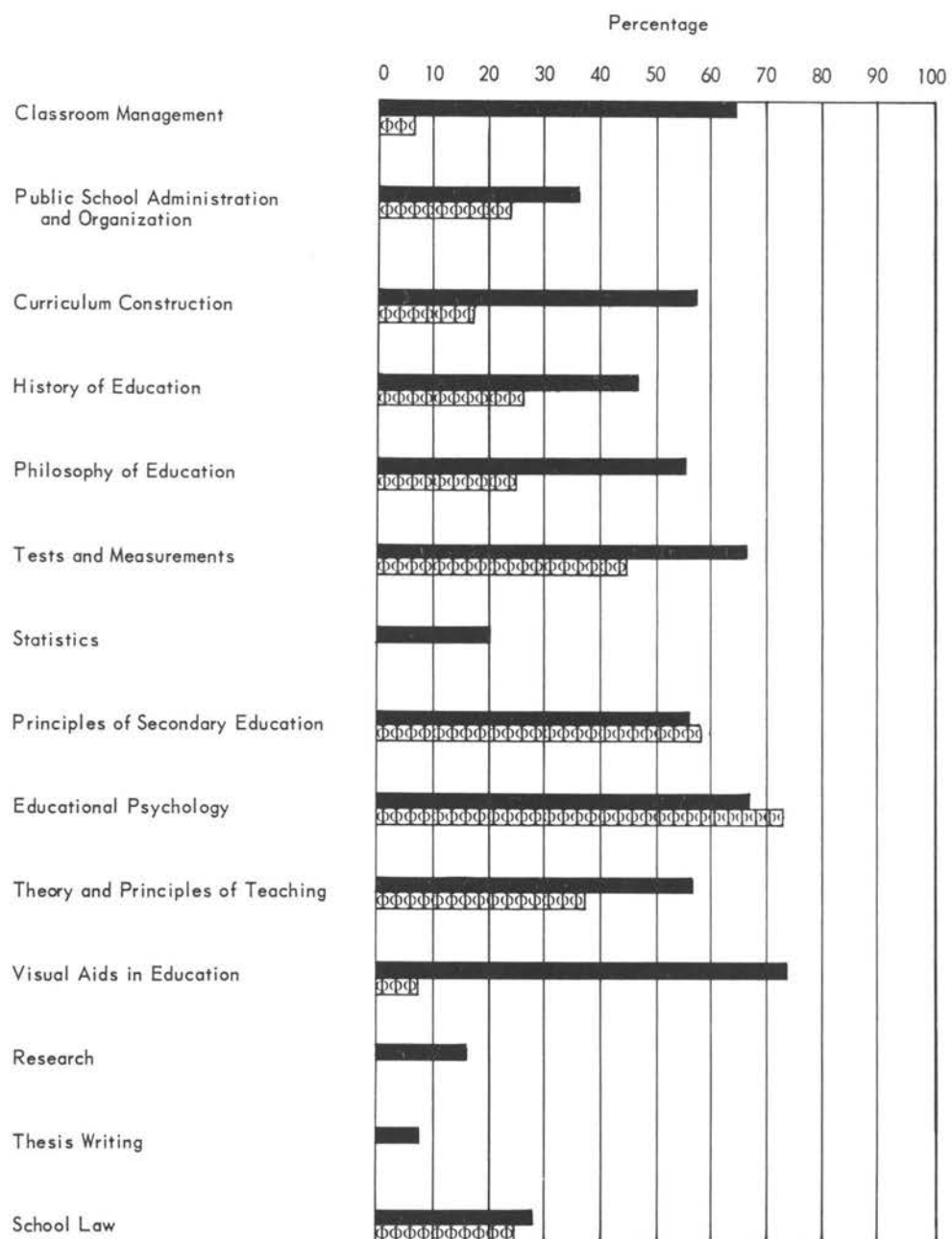
Existing catalogue requirements.

#### Interpretation:

Eighty per cent of the responding teachers believe language arts should be required of all industrial-arts teacher candidates, and one hundred per cent of the responding institutions require language arts of all industrial-arts teachers.

CHART II

Comparison Between 456 Experienced Teachers' Opinions  
And 67 Industrial-Arts Departments Concerning Requirements In  
Professional Education Courses In The Four-Year Program



 Teachers believe these courses should be required.

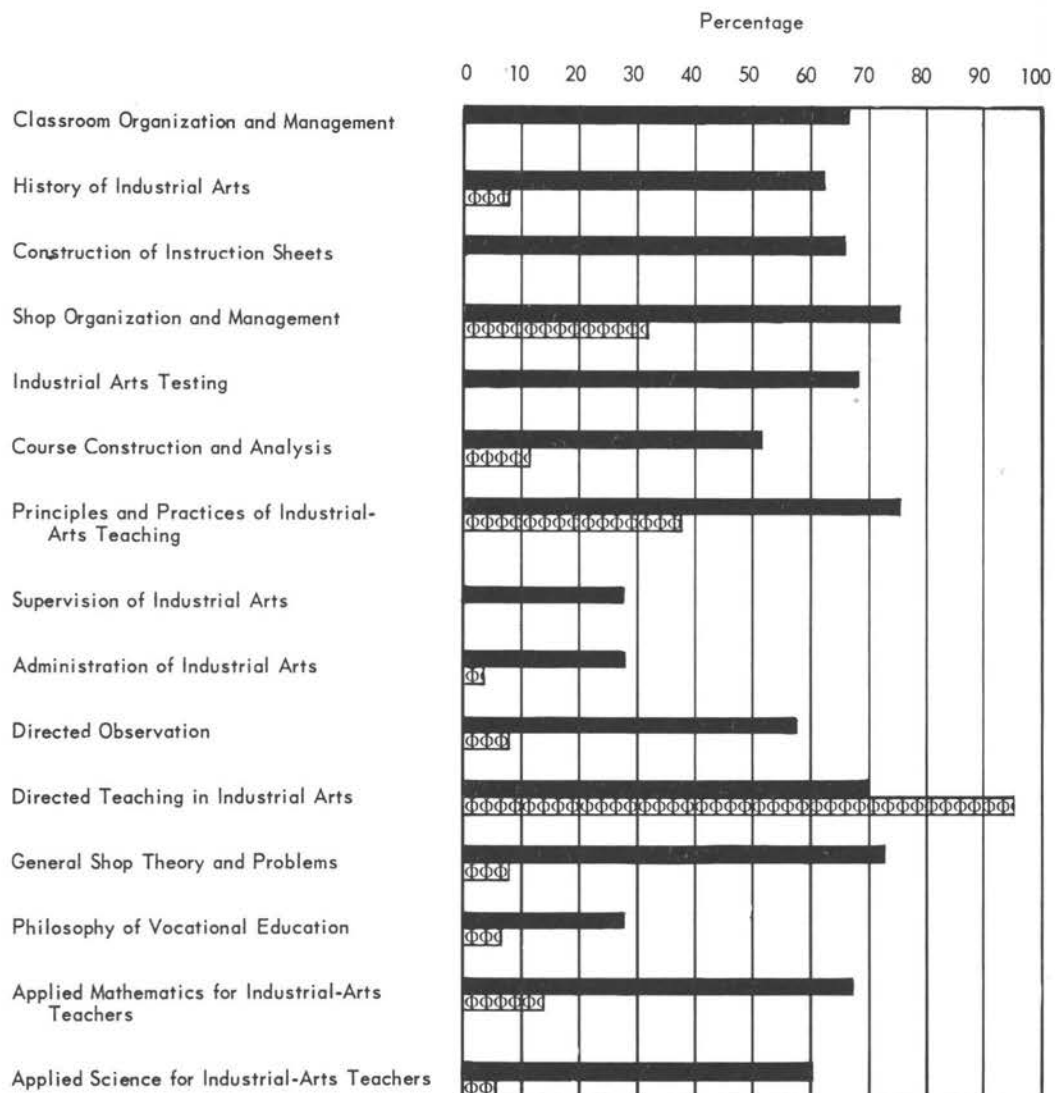
 Existing catalogue requirements.

An analysis of CHART II shows that in all courses, except principles of secondary education and educational psychology, the respondents believe the listed courses should be required to a larger extent than the institutions presently include in their programs.

Approximately sixty-five per cent of the respondents believe classroom management should be required, while approximately five per cent of the institutions surveyed require this course. Visual aids in education is another subject which shows a great difference between opinions of the respondents and practices of the institutions. Fifty per cent and more of the teachers surveyed believe the following courses should be required: curriculum construction, philosophy of education, tests and measurements, theory and principles of teaching. In most cases considerably less than fifty per cent of the institutions list these courses as requirements in the four-year program.

CHART III

Comparison Between 456 Experienced Teachers' Opinions  
And 67 Industrial-Arts Departments Concerning Requirements In  
Professional Industrial-Arts Courses In The Four-Year Program



Teachers believe these courses should be required.



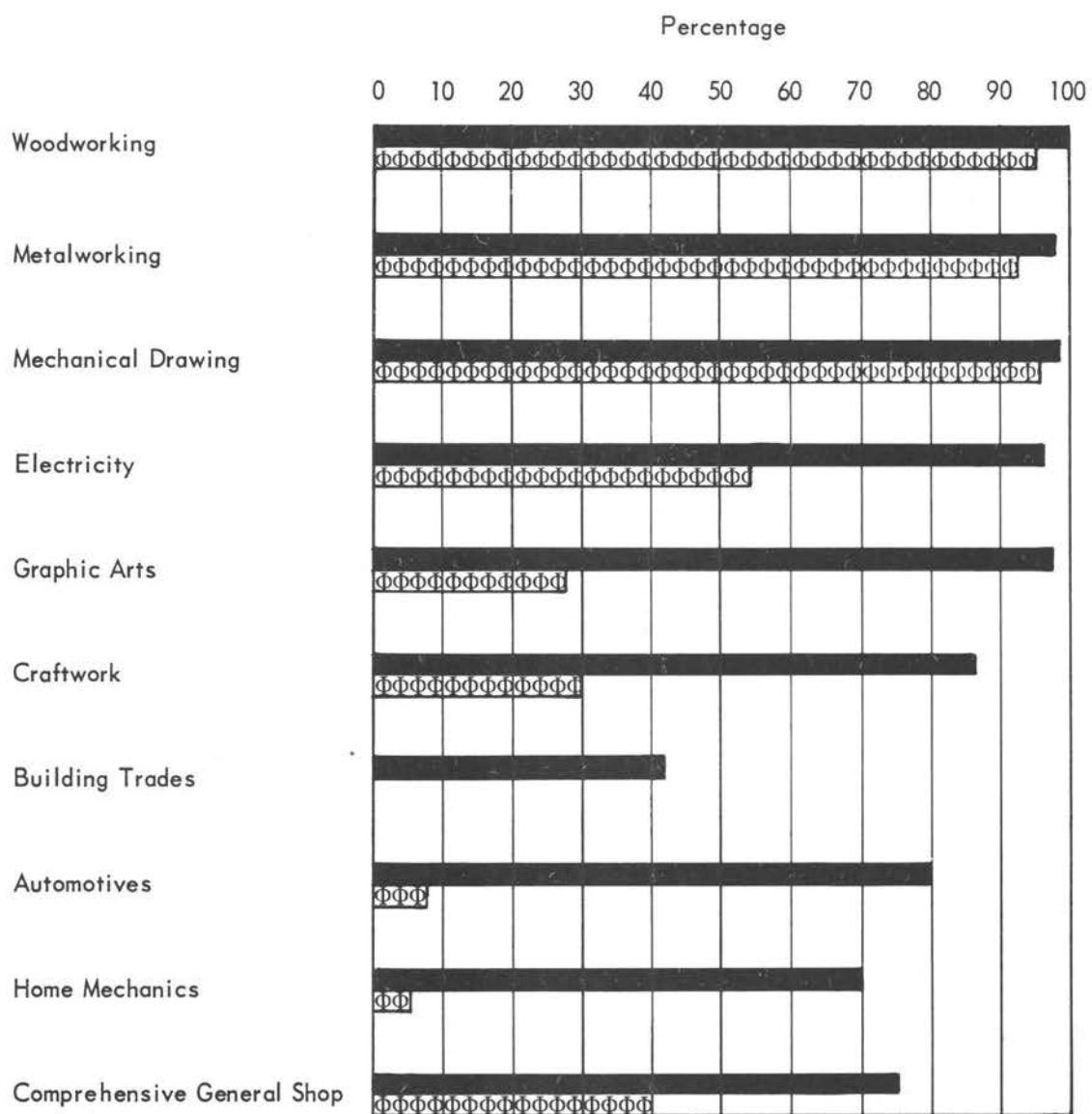
Existing catalogue requirements.



An analysis of CHART III shows that directed teaching is the only course which is required to a larger extent than the teachers surveyed believe necessary. More than fifty per cent of the teachers believe the following courses should be required: classroom organization and management, history of industrial arts, construction of instruction sheets, shop organization and management, industrial-arts testing, course construction and analysis, directed observation, general shop theory and problems, mathematics for industrial-arts teachers, and applied science for industrial-arts teachers. In all subjects except one, less than twenty per cent of the institutions surveyed list these courses as requirements in the four-year program.

CHART IV

Comparison Between 456 Experienced Teachers' Opinions  
And 67 Industrial-Arts Departments Concerning Requirements In  
Technical Industrial-Arts Courses In The Four-Year Program



Teachers believe these courses should be required.

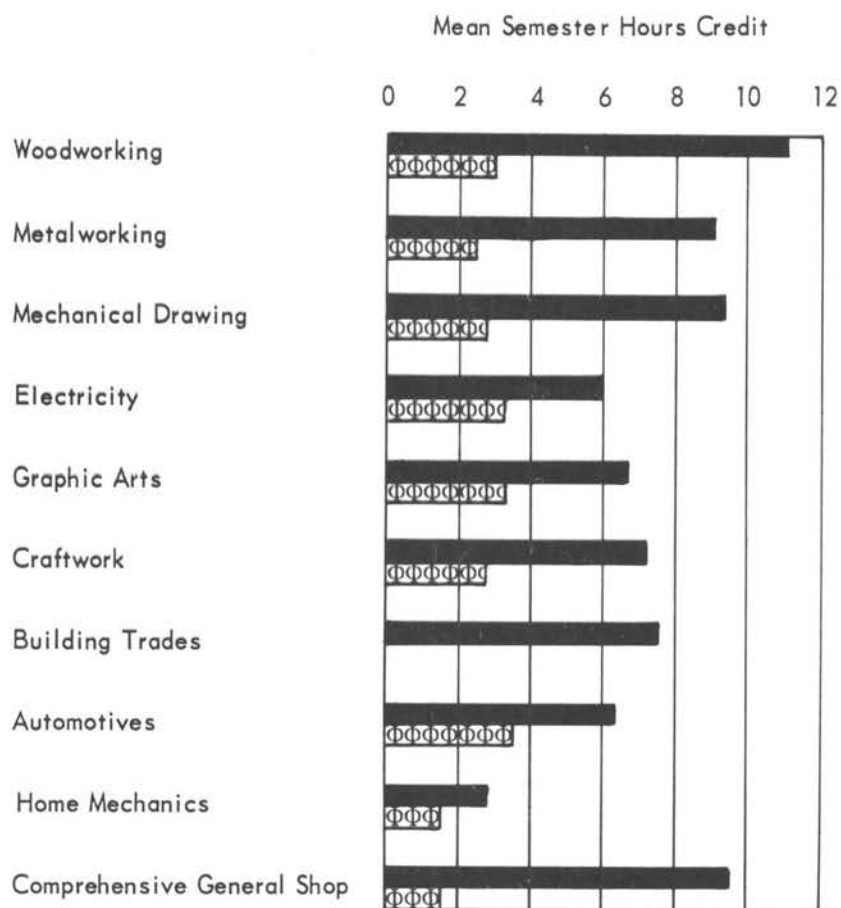
Existing catalogue requirements.

An analysis of CHART IV shows that in the traditional courses-- woodworking, metalworking, and mechanical drawing-- the opinions of the teachers surveyed and the institutional requirements are very nearly the same. Seventy per cent or more of the teachers believe the following courses should be required: electricity, graphic arts, craftwork, automotives, home mechanics, and comprehensive general shop. In all except electricity, forty per cent or fewer of the institutions list these subjects in the four-year program.

Approximately forty per cent of the responding teachers believe that a course in building trades should be included in the four-year program, but none of the responding institutions require such a course.

CHART V

Comparison Between 456 Experienced Teachers' Opinions  
And 67 Industrial-Arts Departments Concerning The Semester  
Hours Of Credit Which Should Be Required For General Shop  
Preparation In The Four-Year Program



Teachers believe these semester hours of credit should be required.

Existing industrial-arts departments' semester hours of credit required.

#### Interpretation:

The responding teachers believe that all prospective industrial-arts teachers should be required to take eleven semester hours of credit in woodworking for general shop preparation, but the responding industrial-arts departments require only three semester hours credit in woodworking.

An analysis of CHART V shows that the teachers' suggested mean semester hours of credit which should be required for general-shop training in the various industrial-arts areas are double or more those existing in the responding institutions.

### Summary

In summarizing this chapter, the teachers' opinions concerning the requirements in a basic industrial-arts teacher-education program are:

- a) The general subjects required by most colleges are greater than the teachers believe necessary.
- b) Professional education courses required by teacher colleges are lower, in all cases, except in principles of secondary education and educational psychology, than the teachers believe are necessary for a four-year program.
- c) The professional industrial-arts course requirements are considerably lower in all cases, than the teachers believe necessary, except in directed teaching. The responding teachers believe that such courses as: classroom organization and management, construction of instruction sheets, and industrial-arts testing should be required in the four-year program.
- d) The catalogue requirements in the traditional industrial-arts courses--woodworking, metalworking, and mechanical drawing--correspond closely with the opinions of the teachers. Other shop course requirements set by the colleges are much lower than the teachers believe necessary. Forty per cent of the responding

teachers believe a general course in the building trades should be required in the four-year program.

e) The number of semester hours of credit required in technical subject-matter courses is considerably lower than the teachers believe necessary.

It might be conducive to a good public-relations policy and a stronger professional program if experienced public-school industrial-arts teachers, state department personnel, and college of education staffs, on a national basis, could work together to formulate a basic core of subjects for a really professional industrial-arts program. Since the teacher-education institutions have been assigned the responsibility for preparing people for public-school service, then experienced public-school teachers could well have some advisory responsibility in the organization of the industrial-arts teacher-education program.

## CHAPTER V

### PROPOSED FOUR-YEAR AND MASTER'S DEGREE PROGRAMS IN INDUSTRIAL- ARTS TEACHER EDUCATION

To formulate a good industrial-arts teacher education program, the cooperation of the following people is needed: experienced industrial-arts teachers, staffs of industrial-arts education departments, and state department of education personnel. With these people working together, an industrial-arts teacher-education program which will meet the needs of the individual and the public schools should be formulated and kept abreast of changes as they occur.

What comprises a good teacher-education program? Gallington lists the following six evaluative criteria for a good teacher education program (7, p.163-171):

1. There should be objectives which determine the educational program of industrial arts teachers; they should be thoroughly and precisely stated; and they should be completely understood and agreed upon by a large percentage of these persons responsible for and concerned with the program.
2. The teaching field should be characterized by breadth although practical teaching situations demand limited specialization.
3. Professional education should be based on a careful analysis of industrial-arts teachers' need and should be broad enough to provide prospective teachers with the breadth of vision by all teachers.
4. The program should be organized in such a manner as to afford a high degree of continuity with respect to student development.

5. Methodology in industrial-arts teacher education should demonstrate the best that is known in teaching practice, but it should be specifically characterized by certain marked teaching methods.
6. Effectiveness of the teacher-education program of industrial arts should be continually evaluated in as objective a manner as possible. Periodically a mere extensive study should be made of fundamental assumptions, principles and plans.

In a study made by Pawelek, eighty-four jurors listed the professional preparation of industrial-arts teachers as of about the following percentages (10, p.75):

a. Shopwork and drawing	30 per cent
b. Industrial-arts education professional courses	8 per cent
c. Supervised student teaching	6 per cent
d. General academic courses	38 per cent
e. General education profes- sional courses	18 per cent

The teachers surveyed in this study expressed the opinion that the industrial-arts teacher-education institutions should require approximately sixty-five semester hours of credit for an industrial-arts teaching major.

The department heads expressed the opinion that a minimum of forty-two semester hours credit should be required for the industrial-arts teaching major, but the existing average is thirty-seven semester hours.

Based upon these figures, plus the opinions of the teachers as shown in Chapter IV concerning required courses, the writer proposes the following four-year program for industrial-arts teacher education.



General College Courses - 38 Semester Hours Credit

Language Arts	9
Science	6
Humanities	
(Fine Arts)	3
Social Studies	6
Electives for a	
teaching minor	14

General Education Professional Courses - 20 Semester Hours Credit

Philosophy of Education	3
Principles of Secondary	
Education	3
Educational Psychology	3
Visual Aids in Education	3
Educational Measurements	3
Electives	5

Professional Industrial Arts - 20 Semester Hours Credit

Orientation to Industrial Arts	1
History and Philosophy of	
Industrial Arts	3
Course Construction and	
Analysis	3
Curriculum Materials and	
Construction of Instruction	
Sheets	2
Principles and Practices of	
Industrial-Arts Teaching	2
General Shop Theory and Problems	3
Applied Mathematics for	
Industrial-Arts Teachers	3
Applied Science for Industrial-Arts	
Teachers	3

Technical Industrial-Arts Courses - 40 Semester Hours Credit

Comprehensive General Shop	4
General Drawing	3
General Woodworking	3
General Metalworking	3
General Graphic Arts	3

General Electricity, General Automotives, General Crafts,  
General Trades -- Elect 6 credits from these

## Unit Shop Electives 18

### Student Teaching - 12 Semester Hours Credit

Directed Observation	1
Directed Teaching	8
Comprehensive General Shop Teaching (College Level)	3

The unit shop electives of eighteen semester hours credit should be applied to those shop courses which the student expects or wishes to teach.

Since four years are not considered enough to train an industrial-arts teacher, some program should be established whereby the teacher may teach a maximum of two years and then be required to take a fifth year of college work for continued certification. During this period of apprenticeship or internship, the student should be able to recognize his weaknesses and indentify problems sufficiently to work on them in the graduate program.

Since few institutions require many specific courses in the master's program, the writer resorted to the opinions of the teachers as shown in Chapter IV, to arrive at the following proposals for the master's degree program.

### General Education Professional Courses

Research Techniques	3
Introduction to Graduate Study	3

### Industrial-Arts Professional Courses

Supervision of Industrial Arts Education	3
Administration of Industrial Arts Education	3

### Industrial-Arts Technical Courses

Electives	18
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Comprehensive written examination during first semester, to screen students for degree status.

Acceptable research papers in selected courses, in lieu of a thesis.

Final written comprehensive examination.

## CHAPTER VI

### SUMMARY AND RECOMMENDATIONS

Most of the industrial-arts departments of the teacher-education institutions in the United States have long been concerned with the problems of developing adequately prepared public-school industrial-arts teachers. To strengthen industrial-arts teacher preparation, the first problem in this study was to determine a common philosophy of the industrial-arts departments concerning teacher education. This was attempted by surveying opinions of industrial-arts teacher-education department heads and experienced public-school industrial-arts teachers.

The second problem was that of determining the present organization of the industrial-arts departments in teacher education to see if there existed a basic core of subjects for all industrial-arts teachers. This information was obtained by an analytical study of college catalogues.

The third problem was that of determining if industrial-arts teachers were satisfied with teacher-education programs they had completed. Experienced industrial-arts teachers were asked to rate subjects completed and to indicate those subjects which each prospective industrial-arts teacher should include in a four-year program or in a master's degree program. They were also questioned concerning credit requirements for an industrial arts major, for certification, and related problems.

The fourth problem was the gathering of information necessary

to establish a basic recommendation for a four-year program and a graduate program.

### General Summary

The overall objective of industrial-arts teacher education is that of preparing people to teach successfully in the public schools. The following supporting objectives should be considered as part of the philosophy of an industrial-arts teacher-education department:

1. To train students in the technical subject-matter courses essential to the development of knowledge and ability in the areas of work basic to an industrial-arts teacher-education program. Certain degrees of skill, techniques, and manipulative abilities must be developed, commensurate with the candidate's needs.

2. To train students in the accepted professional methods of teaching, so they will know how to select, organize, and present subject matter through the accepted classroom methods and techniques, both the general methods and the methods peculiarly suited to industrial arts, and to develop in the student the ability to select and use audio-visual teaching materials.

3. To develop a philosophy of education, professional ideals, and desirable attitudes so the student may broaden his educational horizon, understand educational trends, realize the place of industrial arts in general education, and develop social-civic, scientific, and industrial attitudes and appreciations.

4. To inform the teachers-in-training on the most widely accepted objectives in secondary education so that in the effort of

developing skills, knowledges, and appreciations, industrial-arts teachers will not lose sight of the broader, fundamental goals to which all education, including the practical arts, must contribute.

5. To interpret the requirements of the field for which teachers are trained so that those trained will possess the qualities needed by the public schools, will meet state certification requirements, will conform somewhat to national trends: also, to strive for a more nearly uniform basic program for the preparation of industrial-arts teachers, with higher standards than now exist as a national pattern.

6. To develop and strengthen the character and the personality vital to a good teacher.

7. To develop a code of professional ethics.

8. To develop habits or traits of perseverance, push, persuasiveness--the will to win a just cause.

9. To select, recommend, and use all reasonable and ethical efforts in placing graduates, so that graduates are placed in positions most nearly suited to the training and characteristics of the student.

10. To promote proper and effective publicity and public relations.

Further summarizing statements may be made from this study as follows:

1. Eighty-one per cent of the responding department heads believe the trend in industrial-arts teacher education is toward more preparation for teaching a general-shop program.

2. Seventy-eight per cent of the responding teachers believe industrial-arts teachers should be prepared to teach in a general shop.

3. Eighty-four per cent of the responding teachers believe each industrial-arts teacher should specialize to the extent of his ability to teach two or three unit shops, as well as to serve in a general shop.

4. Ninety-two per cent of the responding teachers believe each college should offer a comprehensive general-shop course.

5. Sixty-nine per cent of the responding teachers favor a series of unit refresher courses.

6. Approximately eighty per cent of the responding teachers believe that a course in curriculum materials is of great importance to the prospective industrial-arts teacher.

7. Approximately sixty-eight per cent of the responding teachers believe that field trips to industrial-arts shops in the public schools are very important to the industrial-arts teacher candidate.

8. Approximately ninety-eight per cent of the responding teachers believe students should do observation of shop teaching before doing directed teaching in industrial arts.

9. Approximately fifty per cent of the responding teachers believe that the college shop instructors practice industrial-arts philosophy and teaching techniques as taught the students in their theory classes.

10. Seventy-five per cent of the responding teachers did not have much opportunity in putting into practice "learning by doing"

techniques of teaching in their education classes.

11. Ninety-two per cent of the responding teachers believe it is important to develop, in each shop course, teaching skills, project design, and course construction, along with the skills fundamental to the course.

12. Sixty-one per cent of the responding teachers believe a course in the philosophy and methods of operation of the general shop is very important for the prospective industrial-arts teacher.

13. Eighty-nine per cent of the responding teachers believe the teacher-education institutions should devote more time to the development of proper attitudes toward teaching.

14. A wide variance exists in the requirements for an industrial-arts teaching major, ranging from a low of twenty semester hours of credit to a high of sixty-five semester hours of credit.

15. The average of the requirements for an industrial-arts teaching major in the responding institutions is 37.5 semester hours of credit.

16. The department heads of the responding institutions believe the requirements for an industrial arts major are lower than they deem necessary or would like to see in effect.

17. The responding teachers believe the average time to be devoted to the industrial-arts teaching major should be fifty-one per cent of the four-year program or approximately sixty-three semester hours credit.

18. Approximately seventy per cent of the responding institutions grant specialized teaching certificates, through the state boards.



19. Approximately sixty-eight per cent of the responding department heads favor the specialized teaching certificate.

20. Ninety-three per cent of the responding teachers believe that teachers should not teach subjects for which they are not qualified.

21. Approximately ninety-seven per cent of the responding teachers believe the state should assume responsibility for enforcing proper teaching qualifications.

22. Approximately fifty-four per cent of the responding department heads believe an industrial-arts minor is inadequate for satisfactory teaching service.

23. Approximately sixty-two per cent of the responding teachers believe that some industrial experience is desirable prior to starting the educational program. The majority of those in favor of this industrial experience believe a prospective industrial-arts teacher should have from one to two years of industrial experience.

24. Approximately forty-three per cent of the responding teachers believe that too much time is devoted to academic subject-matter in the present four-year program.

25. Eighty three per cent of the responding teachers favor the employment of supervisors, by the teacher-education institutions, to orient and help neophyte teachers.

26. In the language arts, social studies, science, and humanities, existing catalogue requirements of the responding institutions are higher than the responding teachers believe necessary.

27. Approximately fifty-four per cent of the responding teachers believe mathematics courses should be required to a greater extent than existing catalogue requirements show.

28. Requirements in the professional education subjects are considerably lower than the responding teachers believe necessary for the preparation of good teachers.

29. Professional industrial-arts requirements are considerably lower than the responding teachers believe necessary for the preparation of strong teachers.

30. Requirements in the technical subject-matter courses, on the whole, are much lower than the responding teachers believe necessary--except for traditional courses in woodworking, metal-working, and mechanical drawing, which are believed to be satisfactory.

31. The responding teachers believe more time should be spent in each of the shop courses--more time than is currently required by the institutions.

### Recommendations

Since there has been a definite shift in the emphasis given to the objectives of industrial-arts teacher education, it is assumed that a comparable shift in thinking has taken place concerning the philosophy of industrial-arts teacher education. With this shift of opinion in mind and the information gained from this study, the following recommendations are offered:

1. When plans are made for industrial-arts courses or for

changing the industrial-arts curricula, these plans should be made more consistent with (a) changing emphases as indicated by the shift in objectives; (b) stated needs of teachers-in-service; and (c) the changing concepts of industrial arts in the public schools.

2. There is evidence of a need for cooperation between teachers, college department staffs, and personnel of state departments, on the local, state, regional, and national levels, to formulate an acceptable industrial-arts teacher-education program which will prepare industrial-arts teachers better for public-school service.

Therefore, it is recommended that through cooperation of some organized plan the state departments, the college personnel, and the public school industrial-arts teachers get together on: (a) the developing of a greater uniformity for certification; (b) the organization of a basic undergraduate program and a fifth year program for advanced work patterned somewhat after the findings in this study.

Other recommendations within the framework of the industrial-arts curricula are as follows:

1. The teacher-education institutions with industrial-arts curricula should require more preparation for teaching a general-shop program.

2. The teacher-education institutions should devote more time to the development of proper attitudes toward teaching.

3. Teacher-education institutions should employ supervisors to orient and assist the neophyte teachers.

4. Each college shop instructor should, in each shop class, aid the student in developing teaching skills, project design, and

course construction, along with the skills fundamental to the course.

5. Teachers should not teach subjects for which they are not qualified.

#### Suggested Further Studies

When one considers the magnitude of such a study of industrial-arts teacher education, it is realized that not all of the important areas will be covered in one study. It is, therefore, suggested that possible studies of the following areas could be made to be of further service to the field of teacher education in industrial arts:

1. Further study should be made concerning a basic core of required subjects for industrial-arts teacher education. The proposed four-year and master's programs should receive further study, by presenting the programs to a jury of experts to determine whether these programs would meet the objectives of industrial-arts education.

2. Further study should be made concerning the objectives of industrial-arts teacher education to determine if these objectives are being attained through the courses offered in teacher education.

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APPENDIX A

SAMPLE OF QUESTIONNAIRE MAILED TO  
1433 INDUSTRIAL-ARTS TEACHERS

OREGON STATE COLLEGE  
SCHOOL OF EDUCATION  
CORVALLIS, OREGON

OFFICE OF THE DEAN

September 28, 1949

Dear industrial arts instructor:

There are many practices in the industrial-arts teacher-education program which, with your help, may be improved. One of the major items is the number of credits required in the major field of preparation. There appears to be too large a spread in the requirements in our colleges today-- some institutions require as little as 24 semester hours, while others require as many as 65 semester hours, yet, teachers leave the various institutions to teach approximately the same industrial arts program. Other important items such as certification, length of training, academic preparation and many others need to be thought through more carefully. Also, connected with this study I would like to develop a model four and five year education program, but, I will need all the help that you possibly can give.

Most of us have given serious thought to the teacher education program and believe a study should be made in which the teachers in the field can and should contribute to the planning of a better program.

You were selected as one of the 1500 respondents because you are a member of the American Industrial Arts Association and as such I believe that you are interested in the professional improvement of the industrial-arts teacher-education program.

I realize that many questionnaires cross your desk in a years time, yet, the problem of teacher education is too important for anyone to regard this as just another questionnaire. It will require approximately 50 minutes of your valuable time to complete this questionnaire, but I believe that you will not regret the time devoted to such an important topic. Please do not lay this questionnaire aside, but, keep it on your desk and give it your earliest possible attention.

All information received will be treated impersonally. Names and places will not be mentioned, nor in any way reflected in handling the data. A summary of the study will be furnished to all who cooperate, either through publication in one of the professional magazines serving our field, or by direct mailing.

May I please have the completed questionnaire returned by October 15, 1949?

Sincerely yours,

Ray A. Schwalm  
Coordinator

Approved by

Dr. F. R. Zeran, Dean  
School of Education  
Oregon State College





The chart on this page is concerned with shop offerings. In column (A) check those subjects which you feel every industrial arts teacher should take in the traditional four year curriculum. In column (B) place the number of semester hours credit after each major area which should be required as a minimum for "General Shop" preparation. In column (C), after each major area, place the number of semester hours credit which should be required for a "Unit Shop" preparation.

Note: To convert term hours to semester hours multiply the term hours by  $\frac{2}{3}$ .

SUBJECTS	A	B	C	SUBJECTS	A	B	C
WOODWORKING				CRAFT WORK			
General woodworking				Weaving (loom and hand)			
Cabinet making				Basketry			
Bench woodworking				Ceramics			
Joinery				Leather work			
Machine woodworking				Plastics			
Pattern making				Cement work			
Furniture construction				Jewelry			
Upholstery				Photography			
Wood carving							
Wood finishing				BUILDING TRADES			
Wood turning				Bricklaying			
				General trades course			
DRAFTING OR MECHANICAL DRAWING				Carpentry			
General mechanical drawing				Concrete construction			
Architectural drawing				Mill work			
Freehand sketching				Plastering			
Machine drawing				Painting and decorating			
Perspective drawing				Plumbing			
Sheet metal drawing				Building and construction			
Shop sketching				Electrical wiring			
Industrial arts design							
Descriptive geometry				AUTOMOTIVES			
				General automotives			
METALWORKING				Automotive electrical systems			
General metalwork				Bodies			
Bench metalwork				Engines			
Forging				Chassis			
Foundry				Carburetion			
Machine shop							
Sheet metal				MISCELLANEOUS			
Art metal				Airplane mechanics			
				Farm shop			
ELECTRICITY				Household mechanics			
General electricity							
El. Elec. theory & constr.				COMPREHENSIVE GENERAL SHOP			
Ad. Elec. theory & constr.				This course would include the			
Elementary radio				following areas: woodworking,			
Advanced radio				metal work, graphic arts,			
Light and power wiring				electricity, and craft work.			
GRAPHIC ARTS							
General graphic arts							
Printing (press work)							
Bookbinding							
Composition							
Linotype operation							

PLACE A CIRCLE AROUND THE MOST SUITABLE ANSWER IN EACH QUESTION	
1.	Some states are requiring five years of preparation for secondary school industrial arts teachers. How many years do you feel are necessary to prepare industrial arts teachers? None : 3 : 4 : 5 : 6
2.	How many years practical industrial experience should a prospective industrial arts teacher have before starting an industrial arts teacher education program? None: 1 : 2 : 3
3.	Do you feel that too much time is spent on academic subjects in the present teacher education program? Yes : No
4.	What proportion of the four year program should be devoted to the preparation in the major field (industrial arts)? 20% : 30% : 40% : 50% : 60% : 70% : 80%
5.	To what degree do you feel that a General Mathematics course for industrial arts teachers is important? Low : Medium : High : Absolute necessity
6.	To what degree do you feel that an Applied Science course for industrial arts teachers is important? Low : Medium : High : Absolute necessity
7.	Should all industrial arts teachers be prepared to teach "general shop"? Yes : No
8.	In addition to a general shop preparation, should the teacher also be prepared to teach a unit shop? Yes : No. If yes, how many unit shops should the teacher be prepared to teach? 1 : 2 : 3 : 4 : 5
9.	What is your opinion of a series of short unit refresher courses in subjects which the student is qualified to teach? Many of the shop subjects are taken in the sophomore and junior years. These refresher courses would give the student a chance to brush up on those courses taken early in the education program. Circle one of the following: Not important : Important : Absolute necessity
10.	How important is a course in curriculum materials -- designed to aid the student in developing a kit of instructional materials for each subject he is qualified to teach? Average : Very : Absolute necessity : Negligible
11.	Throughout the education program, how important are field trips to public schools, to observe existing conditions? Negligible : Average : Very important :
12.	Should students observe shop teaching before doing directed teaching? Yes : No
13.	How important is a course in the philosophy and methods of operation of the general shop? Negligible : Average : Very important
14.	Should finishing methods and techniques in woodworking and metalworking be offered as a separate course; in connection with each class in woodworking and metalworking or as a separate course and in each class in woodworking and metalworking? Separate : With each course : Both
15.	Should a course be offered in which the student would learn how to make inexpensive shop tools and equipment so that industrial arts courses in the public schools can create more interest in home workshops? Yes : No
16.	Many of our colleges offer only a series of unit shop courses in the teacher education program. Do you feel that each college should offer a comprehensive general shop course in which the student would become acquainted with this type of shop organization, since it is in operation in many of our public schools -- in a course of this nature the student could see the problems which arise and could be taught how to operate this type of shop efficiently? Yes : No
17.	Should an industrial arts student be allowed to complete his master's degree without having had teaching experience? Yes : No. If no, how much graduate work should the student be allowed to take before having teaching experience? None: All except the thesis. How many years teaching experience should the student have before working on his master's degree? 1 : 2 : 3 : 4 : 5
18.	Many colleges do not offer shop courses for graduate credit. In your opinion should the colleges offer shop courses for graduate credit? Yes : No. If yes, should research be required in each shop course? Yes : No
19.	For the master's program would it be a good idea to require all candidates to work in several different trades for a month or two in summers so that the teacher would keep up to date in the various subjects which he is teaching -- providing this work experience would count towards his master's degree? Yes : No. If yes, how many credits (semester hours) should be allowed for this work? 1 : 2 : 3 : 4 : 5 : 6

20.	Do you feel that college industrial arts teachers should have several years teaching experience in the public schools? Yes : No. If yes, how important is this experience? Negligible : Average : Very : Absolute necessity
21.	In how many college shop courses did the instructors practice what you were taught in industrial arts philosophy, teaching techniques, etc.? All : Many : Few : None
22.	How much learning by doing do we have in teacher education --e.g. did you have any chance to put to practice in your college classes, under supervision, how to teach the various subjects you took in the education program? None : Little : Much
23.	Do you feel that our teacher education institutions should spend more time in the development of proper attitudes towards teaching; to better understand what a real teacher is and does? Yes : No.
24.	How important is the development of teaching skill, project design, and course building in each shop subject -- e.g. in a sheet metalwork class, should the instructor devote half of the course to the teaching of the fundamental skills and information; and the other half to <u>how to teach sheet metalwork in secondary schools, how to make a course of study in sheet metalwork, and how to design and select suitable projects for school use?</u> Not necessary : Very important: Absolute necessity
25.	Do you think it advisable for each teacher education institution to employ a supervisor of industrial arts whose duty would be to visit with the beginning teacher in his area for the beginner's first two years -- to help him solve problems, suggest improvements and general supervision? Yes : No
26.	How important are college extra-curricular activities when applying for an industrial arts teaching position? Negligible : Average : Very important
27.	Many of our public schools employ teachers with general certificates to teach subjects for which the teachers are not qualified. Should this practice continue? Yes: No. If no, would you suggest that each state allow the teacher to teach only those subjects for which he is qualified? Yes : No
28.	Should a study be made to determine the minimum content that should be covered in each industrial arts subject for each grade level? Yes : No. If yes, should this study include the junior high school, the senior high school, and the college? Circle the ones that should be covered in the study: junior high : senior high : college
29.	Please feel free to criticise this questionnaire. Add any questions concerning industrial arts teacher education which you feel would be pertinent to this study.

## APPENDIX B

AN ANALYSIS OF THE RETURNS OF  
THE QUESTIONNAIRES MAILED TO  
1433 INDUSTRIAL-ARTS TEACHERS

TABLE LXIII  
Analysis Of The Returns Of The Questionnaires  
Mailed To 1433 Industrial-Arts Teachers

State	Sent Out	Returned No Forwarding Address	Adjusted Number Sent Out	Returned	Per Cent Returned
Alabama	41	30	11	2	18
Arizona	2	0	2	2	100
California	26	3	23	18	78
Colorado	5	0	5	4	80
Connecticut	24	5	19	10	51
Delaware	2	0	2	2	100
Washington, D.C.	13	5	8	3	38
Florida	69	20	49	25	51
Georgia	8	0	8	4	50
Illinois	135	10	125	43	34
Indiana	47	4	43	14	31
Iowa	105	21	84	16	17
Kansas	8	0	8	4	50
Kentucky	13	2	11	6	55
Louisiana	26	1	25	10	40
Maine	7	0	7	3	43
Maryland	44	3	41	13	32
Massachusetts	25	2	23	11	48
Michigan	14	0	14	9	64
Minnesota	19	0	19	11	58
Mississippi	1	0	1	1	100
Missouri	69	5	64	20	32
Nebraska	5	0	5	2	40
New Hampshire	1	0	1	1	100
New Jersey	181	12	169	52	31
New Mexico	6	0	6	3	50
New York	49	3	46	18	40
North Carolina	42	2	40	11	28
North Dakota	1	0	1	1	100
Ohio	301	12	289	99	34
Oklahoma	18	0	18	7	40
Oregon	10	0	10	6	60
Pennsylvania	45	3	42	20	48
Rhode Island	3	0	3	1	33
South Dakota	2	0	2	2	100
Tennessee	7	0	7	2	28
Texas	13	0	13	9	69
Utah	3	0	3	0	0
Vermont	1	0	1	1	100
Virginia	12	0	12	6	50
Washington	6	0	6	6	100
West Virginia	14	0	14	8	57
Wisconsin	9	0	9	5	56
Wyoming	1	0	1	1	100
Totals 44 States	1433	145	1288	496	39

TABLE LXIV

Analysis Of The Questionnaires Returned  
By The Industrial-Arts Teachers Concerning  
Degrees Held And Years Of Teaching Experience

Degree Held	Not Checked	Years of Teaching Experience						Totals
		0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 & Over	
Bachelor's	17	66	28	19	19	21	19	189
Master's	12	40	49	63	28	47	42	281
Doctor's	2	1	0	4	6	3	10	26

## APPENDIX C

SAMPLE OF THE QUESTIONNAIRE MAILED  
TO 120 TEACHER-EDUCATION INSTITUTIONS  
WITH INDUSTRIAL-ARTS DEPARTMENTS



**OREGON STATE COLLEGE**  
**SCHOOL OF EDUCATION**  
 CORVALLIS, OREGON

DEPARTMENT OF  
 INDUSTRIAL EDUCATION  
 INDUSTRIAL-ARTS EDUCATION  
 INDUSTRIAL-VOCATIONAL EDUCATION

March 1, 1950

Department Head of Industrial  
 Arts Education

Dear Sir:

There are many practices in the industrial arts teacher education program which, with your help may be improved. One of the major items is the number of credits required in the major field of preparation. There appears to be too large a spread in the requirements in our colleges today--some institutions require as little as 24 semester hours, while others require as many as 65 semester hours, yet, teachers leave the various institutions to teach approximately the same industrial arts program. Other important items such as certification, length of training, academic preparation and many others need to be thought through more carefully. Also, connected with this study I would like to develop a model four and five year education program, but, I will need all the help that you possibly can give.

I would like to have your program of required and elective courses for the 4 and 5 year programs and the catalog description of the courses.

All information will be treated impersonally. Names and places will not be mentioned, nor in any way reflected in handling the data. A summary of the study will be furnished to all who cooperate.

Would you please answer the few questions on the remainder of this page and the next one and return the papers with the requested information as soon as possible.

Sincerely yours,

Ray A. Schwalm

	Answer	Comments
1. How many semester hours should be devoted to industrial arts in the four year program?		
2. In your opinion, is the trend of industrial arts training for unit shop or general shop preparation?		
3. Since the trend in most colleges is for app. 2 years of general education, should our training institutions devote 4 or 5 years to the preparation of industrial arts teachers?		

	Answer	Comments
4. Do you advocate a general certificate or a specialized certificate?		
5. What type of certificate do you grant your industrial arts teachers?		
6. How many credits do you require for an industrial arts major in the four year curriculum?		
7. Should our training institutions allow a minor in industrial arts for teachers?		
8. Would you rate the following objectives of industrial arts teacher preparation by placing a (1) after those items which are most important, a (2) after those next important etc.		
a. To interpret the requirements of the field for which teachers are trained.		
b. To inform the teachers-in-training on the most widely accepted objectives in secondary education.		
c. To train the students in the technical subject-matter courses that may be selected as a part of the industrial arts teacher education program.		
d. To train in the accepted professional methods of teaching.		
e. To develop habits or traits of perseverance, push, persuasiveness--the will to win in a just cause.		
f. To develop a philosophy of education, professional ideals and desirable attitudes.		
g. To develop a code of professional ethics.		
h. To develop and strengthen character and personality.		
i. To select, recommend and use all reasonable and ethical efforts in placing graduates.		
j. To promote favorable publicity and public contact.		

9. Are you planning any major changes in your curriculum for the next two years? If so would you please state the anticipated changes if permissible?

- 
10. Since the trend in colleges is towards general education, would it be advisable to include a general industrial arts course in the general education program?
-

## APPENDIX D

### LIST OF THE RESPONDING INSTITUTIONS USED IN THIS STUDY

TEACHER-EDUCATION INSTITUTIONS  
PARTICIPATING IN THE STUDY

*Arizona State College,	Tempe, Arizona
*Chico State College,	Chico, California
*San Jose State Teachers College	San Jose, California
University of California	Santa Barbara, California
*Colorado State College of Ed.,	Greeley, Colorado
*Colorado A & M College,	Fort Collins, Colorado
*University of Florida,	Gainesville, Florida
*Florida Southern College,	Lakeland, Florida
*Georgia Teachers College,	Collegebora, Georgia
*Eastern State College,	Charleston, Illinois
James Millikin University,	Decatur, Illinois
*Western Illinois State College,	Macomb, Illinois
University of Illinois,	Urbana, Illinois
*Ball State Teachers College,	Muncie, Indiana
*Westmar College,	LeMars, Iowa
Kansas State Teachers College,	Emporia, Kansas
*Fort Hays Kansas State College,	Hays, Kansas
Bethel College,	North Newton, Kansas
*Kansas State Teachers College,	Pittsburg, Kansas
*Murray State Teachers College,	Murray, Kentucky

\* These institutions' catalogues were used to obtain information concerning the organization of industrial-arts teacher education.

Louisiana State University,	Baton Rouge, Louisiana
*Northwestern State College,	Natchitoches, Louisiana
*Gorham State Teachers College,	Gorham, Maine
*University of Maryland,	College Park, Baltimore, Md.
*State Teachers College,	Fitchburg, Massachusetts
Wayne University,	Detroit, Michigan
*Western Michigan College of Ed.,	Kalamazoo, Michigan
*Michigan State Normal College,	Ypsilanti, Michigan
State Teachers College,	Bemidji, Minnesota
*Moorhead State Teachers College,	Moorhead, Minnesota
*State Teachers College,	St. Cloud, Minnesota
*Mississippi State College,	State College, Mississippi
*University of Missouri,	Columbia, Missouri
Northwest Missouri State Teachers,	Maryville, Missouri
*Southwest Missouri State College,	Springfield, Missouri
*Central State Teachers College,	Warrensburg, Missouri
*Montana State Normal College,	Dillon, Montana
*Nebraska State Teachers College,	Chadron, Nebraska
*Nebraska State Teachers College,	Kearney, Nebraska
*Peru State College,	Peru, Nebraska
*State Teachers College,	Wayne, Nebraska
*University of New Mexico,	Albuquerque, New Mexico
*New Mexico State Teachers College,	Silver, City, New Mexico
Columbia University Teachers College,	New York, New York
*New York University of Education,	New York, New York
*State Teachers College,	Oswego, New York

*East Carolina Teachers College,	Greensville, North Carolina
North Carolina State College,	Raleigh, North Carolina
*State Teachers College,	Dickinson, North Dakota
*State Normal & Industrial College,	Ellendale, North Dakota
University of North Dakota,	Grand Forks, North Dakota
*State Teachers College,	Minot, North Dakota
Kent State University,	Kent, Ohio
*Ohio Northern University,	Ada, Ohio
*Bowling Green State University,	Bowling Green, Ohio
*Ohio State University,	Columbus, Ohio
*Miami University,	Oxford, Ohio
*Willimington College,	Willimington, Ohio
*East Central State College,	Ada, Oklahoma
Central State College,	Edmond, Oklahoma
Panhandle A. & M. College,	Goodwell, Oklahoma
Langston University,	Langston, Oklahoma
*Oklahoma A. & M. College,	Stillwater, Oklahoma
*Northwestern State College,	Tahlequah, Oklahoma
*Southwestern Institute of Tech.,	Weatherford, Oklahoma
*Oregon State College,	Corvallis, Oregon
*State Teachers College,	California, Pennsylvania
Cheyney Training School of Teachers	Cheyney, Pennsylvania
*State Teachers College,	Millersville, Pennsylvania
*Pennsylvania State College,	State College, Pennsylvania
*Northern State Teachers College,	Aberdeen, South Dakota

*General Beadle State Teachers College,	Madison, South Dakota
*Southern State Teachers College,	Springfield, South Dakota
Austin Peoy State College,	Clarksville, Tennessee
*Sue Ross State Teachers College,	Alpine, Texas
The A. & M. College of Texas,	College Station, Texas
*West Texas State College,	Canyon, Texas
*East Texas State Teachers College,	Commerce, Texas
*North Texas State Teachers College,	Denton, Texas
John Tarelton Agricultural College,	Stephenville, Texas
*Western Washington College of Ed.,	Bellingham, Washington
*Eastern Washington College of Ed.,	Cheney, Washington
*Central Washington College of Ed.,	Ellensburg, Washington
*The State College of Washington,	Pullman, Washington
Fairmont State College,	Fairmont, West Virginia
*West Virginia University,	Morgantown, West Virginia
*West Virginia State College Institute,	Institute, West Virginia

## APPENDIX E

### STATISTICAL ANALYSIS OF THE RATINGS GIVEN THE LISTED OBJECTIVES OF INDUSTRIAL-ARTS TEACHER EDUCATION



TABLE LXV  
Statistical Analysis Of The Ratings Given The Listed  
Objectives Of Industrial-Arts Teacher Education

Total Responses	Objectives	Rankings									
		1	2	3	4	5	6	7	8	9	10
87	a. To interpret the requirements of the field for which teachers are trained.	44	24	4	2	4	2	3	2	1	1
86	b. To inform the teachers-in-training on the most widely accepted objectives in secondary education.	40	30	3	6	3	0	1	1	1	1
89	c. To train the student in the technical subject-matter courses that may be selected as a part of the industrial-arts teacher-education program.	74	8	3	1	1	1	0	1	0	0
91	d. To train in the accepted professional methods of teaching.	62	13	3	6	3	3	1	0	0	0
88	e. To develop habits or traits of perseverance, push, persuasiveness--the will to win in a just cause.	31	31	5	2	5	2	1	2	2	1
91	f. To develop a philosophy of education, professional ideals, and desirable attitudes.	62	9	9	3	4	2	2	0	0	0
86	g. To develop a code of professional ethics.	48	17	3	0	2	7	4	3	1	1
86	h. To develop and strengthen character and personality.	50	14	4	3	2	1	4	6	1	1
85	i. To select, recommend and use all reasonable and ethical efforts in placing graduates.	38	23	4	0	0	4	4	1	5	6
86	j. To promote favorable publicity and public contact,	27	31	5	1	0	2	3	2	11	3