

ABSTRACT OF THESIS

-----

A PATTERN OF PROFESSIONAL AND GENERAL  
EDUCATION COURSES FOR INDUSTRIAL ARTS MAJORS  
AT PERU STATE TEACHERS COLLEGE

Submitted by  
Ernest J. Rawson

In partial fulfillment of the requirements  
for the Degree of Master of Education  
Colorado State College  
of  
Agriculture and Mechanic Arts  
Fort Collins, Colorado

August, 1944

**LIBRARY**  
COLORADO STATE COLLEGE OF A. & M. I  
FORT COLLINS, COLORADO

S-1-08A-20-02-035



U18400 9073929

S

378.788

A O

1944

10a

## ABSTRACT OF A THESIS

The broadening of industrial arts offerings and the expansion of various phases of industry have made it necessary for the continuous revamping and expansion of teacher training curricula. These changes and expansions have characterized the immediate past and the trends of the future appear to be similar but accelerated (19).

The need for versatility in order to cope with industrial changes seems to be a common need of all industrial arts teachers. For this reason the faculty at Peru State Teachers College held monthly meetings throughout the year, 1942, for the purpose of curriculum study. As a result of these faculty meetings, conversation with former graduates, and a review of the records of Peru State Teachers College Placement Bureau, it was concluded that a study should be made to determine "What patterns of professional and general education courses should be provided for industrial arts majors at Peru State Teachers College?"

This research study received its direction from an analysis of the problem:

- A. What patterns are provided for industrial arts majors in other state teachers colleges?
- B. What subjects have been taught most frequently in the past ten years by Peru graduates who have industrial arts majors?
- C. What curriculum patterns are provided for industrial arts majors at Peru State Teachers College at the present time?
- D. What are the state requirements that govern the training of industrial arts teachers?
- E. What does the comparison of the findings reveal and what recommendations can be made?

The sources of data used in this study were:

Peru State Teachers College files of student records which are used by the registrar in making all official transcripts; Peru State Teachers College graduates who have majored in industrial arts during the past 10-year period, 1932-42, and who were actually teaching; Peru State Teachers College catalog, 1942-43, which provided an accurate description of the present policies that students must follow in preparing themselves for teaching; the official college catalogs from 44 other state teachers colleges offering majors in industrial arts; authoritative records of the division of certification of the Nebraska State Department of Public Instruction; and the permanent records of the Peru State Teachers College Placement Bureau.

Four methods were used in gathering data:

1. Tabulation of data was made from official permanent student records. Every tabulation was checked twice to assure accuracy and reliability.
2. A written request for college catalogs was sent to 107 state teachers colleges. Information taken from catalogs of those schools offering majors in industrial arts was tabulated as explained above.
3. A written inquiry was sent to the State Department of Public Instruction, Lincoln, Nebraska, requesting specific requirements for certification of industrial arts teachers.
4. A questionnaire was used for obtaining information from Peru graduates of the past 10-year period who were teaching industrial arts. The form and content of the questionnaire, used in securing this information, were adapted from those used by Whitney (23), Inman (9), Fryklund (8), and Talley (22).

The application of these methods to the sources revealed three specific patterns of requirements for industrial arts majors. The first was a pattern of academic subjects; the second, a pattern of professional subjects; and the third, a pattern of shop subjects (Tables 18, 19, 20, and 21).

Table 18.--PATTERNS OF REQUIRED ACADEMIC SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
English	8.7	8	-0.7
Mathematics	2.8	8	-2.1
Sciences	7.3	8	-2.1
Social studies	9.1	8	-1.1
Educational psychology	4.9	4	-0.9
Music	0.4	2	+1.6
Fine arts	1.5	2	+0.5
Language	1.0	0	-1.0
Physiology and hygiene	0.0	2	+2.0
Total	35.7	34	-1.7

Table 19.--PATTERNS OF REQUIRED PROFESSIONAL SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
Classroom management	0.5	2	+1.5
Curriculum	0.5	0	-0.5
Education and voc. guidance	0.4	0	-0.4
Public school organ. & adminis.	0.4	0	-0.4
History & principles of sec. educ.	3.4	2	-1.4
Library methods	0.1	0	-0.1
Philosophy of education	0.4	4	+3.6
Tests and measurements	1.5	2	+0.5
Class organ. & mgmt. (Indus.Arts.)	0.1	0	-0.1
Course and shop organization	1.3	0	-1.3
Supervision of Industrial Arts	0.1	0	-0.1
Adminis. of Industrial Education	0.2	0	-0.2
Methods of teach. Indus. Arts	2.2	4	+1.8
Directed observation of Indus.Arts	0.5	0	-0.5
Directed teaching of Indus. Arts	5.7	4	-1.7
History of Industrial Arts	0.4	0	-0.4
Philosophy of Indus. Arts Educ.	0.05	0	-0.05
Individual instruction sheets	0.2	0	-0.2
Vocational education	0.3	0	-0.3
General shop theory	0.1	0	-0.1
Trade or activity analysis	0.1	0	-0.1
Materials of engineering	0.05	0	-0.05
Total	18.5	18	-0.5

Table 20.--PATTERNS OF REQUIRED SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
Woodworking	7.7	8	+0.3
Drafting	7.1	6	-1.1
Metal working	3.7	2	-1.7
Electricity	1.1	2	+0.9
Arts and crafts	1.2	0	-1.2
Graphic arts	2.0	0	-2.0
Mechanics	1.2	2	+0.8
Aeronautics	0.0	0	0.0
Miscellaneous	1.8	2	+0.2
Total	25.8	22	-3.8

Table 21.--PATTERNS OF ELECTIVE SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
Woodworking	9.0	12	+3.0
Drafting	8.1	4	-4.1
Metal working	4.3	6	+1.7
Electricity	1.6	2	+0.4
Arts and crafts	2.7	1	-1.7
Graphic arts	4.0	0	-4.0
Mechanics	2.2	4	+1.8
Aeronautics	1.1	4	+2.9
Miscellaneous	1.4	1	-0.4
Total	34.4	34	-0.4

The answer to question A, "What patterns are provided for industrial arts majors in other state teachers colleges?" is given in Tables 18, 19, 20, and 21, Column 1. The answer to question C, "What curriculum patterns are provided for industrial arts majors at Peru State Teachers College at the present time?" is shown in Column 2 in Tables 18, 19, 20, and 21.

The answer to question B, "What subjects have been taught most frequently in the past ten years by Peru graduates who have industrial arts majors?" follows.

Woodworking, 43; mechanical drawing, 25; general metals, 17; sheet metal, 15; elementary electricity, 12; blueprint reading, 12; general mechanics, 11; architectural drawing, 8; leather craft, 5; construction hobbies, 4; radio, 3; wood turning, 3; auto mechanics, 2; plastics, 2; engine lathe, 2; and 9 other subjects each taught once. Academic subjects that were taught by industrial arts teachers are: coaching, 18; mathematics, 10; social studies, 9; science, 7; commerce, 7; music, 3; and English, 1.

The need for teacher certification to teach these subjects in accredited schools in Nebraska gives rise to question D, "What are the state requirements that govern the training of industrial arts teachers?" These requirements are: completion of a four-year college teacher training course with baccalaureate

degree and recommendation of the college; a minimum of 18 hours in education (3 in supervised teaching, grades 7 to 12), 2 hours in physiology and hygiene, and 15 semester hours in two teaching fields. These state requirements in general are the same as those of the North Central Association.

The answer to question E, "What does the comparison of the findings reveal and what recommendations can be made?" follows.

The comparison of the findings revealed that the patterns of academic, professional, and shop subjects for industrial arts majors at Peru State Teachers College were complying with recommendations of the North Central Association and the requirements of Nebraska. The patterns of professional and shop subjects, however, were not meeting the average requirements of other schools. The graduates also expressed a need for additional training in various subjects within these two fields. For this reason changes were recommended and new patterns were proposed.

The summary of the recommendations for continuing or changing Peru's present patterns to meet graduates expressed needs and the standards of other colleges follows.

1. The present pattern of academic requirements for industrial arts majors, at Peru State Teachers College should be continued without

- change.
2. The present pattern of professional requirements at Peru should be changed to incorporate an additional two semester hours of student teaching and one semester hour of history and principles of secondary education.
  3. The present industrial arts methods and observation course requirement at Peru should be continued and a study conducted to determine what specific changes should be made in this course to meet the requests of graduates for more complete training.
  4. The industrial arts methods and observations course should continue to be required for industrial arts majors but counted as elective education credit and not shop credit.
  5. One semester hour in the bench and hand woodworking course should be devoted to training in the use of hand woodworking tools.
  6. The required machine woodworking course should be revised to include a unit of one semester hour in carpentry.
  7. A two semester hour architectural drawing course should be added to the required shop pattern.
  8. The required mechanical drawing course should be revised to include a unit of one semester

hour in machine drawing.

- 9. A two semester hour elective mechanical drawing course should be added to the elective shop pattern.
- 10. An additional two semester hour general metals course should be added to the required shop pattern.
- 11. A two semester hour elective general metals course should be added to the elective shop pattern.
- 12. An investigation should be made to determine what type and quantity of metal working equipment should be purchased for the general metals shop at Peru.
- 13. Metal working equipment should be purchased for the general metals shop to make possible these additions.
- 14. A one semester hour elective elementary electricity course should be added to the elective shop pattern.
- 15. A unit of one semester hour in leather craft should be added to the required shop pattern at Peru.
- 16. A one semester hour printing course should be added to the industrial arts requirement for majors.
- 17. The auto mechanics elective offering should be

decreased two semester hours and a farm shop elective of two semester hours added to the shop offerings.

18. A study should be made to determine what type of farm shop training is most desirable for industrial arts majors at Peru State Teachers College.
19. The present elective aeronautical offerings should be continued.
20. The first one-third of each beginning required shop course should be devoted to work of an exploratory nature.
21. A study should be made to determine what is the best method of planning and organizing exploratory work in the beginning required industrial arts courses at Peru State Teachers College.
22. Arrangements should be made to permit industrial arts majors to receive elective training in the home planning course offered by the home economics department.
23. When counseling and guiding prospective industrial arts teachers the recommendations of the North Central Association, the requirements of the state in which they plan to teach, and the subject combinations being taught in the field should be presented for consideration.

24. A study should be made to determine the best method of organizing the multiple-unit courses at Peru in order that industrial arts graduates may receive the maximum training.

Since the proposed patterns, as set forth in the recommendations above, in academic, professional, and shop courses for Peru meet the North Central Association recommendations and the Nebraska state requirements, compare favorably with the patterns of other schools, meet the expressed needs of graduates, and provide opportunities for prospective graduates to minor in the subjects frequently taught with industrial arts, it is recommended that the three proposed patterns for industrial arts majors be considered for adoption by the Peru State Teachers College faculty.

**LIBRARY**  
**COLORADO STATE COLLEGE OF A. & M. A.**  
**FORT COLLINS COLORADO**

T H E S I S

-----

A PATTERN OF PROFESSIONAL AND GENERAL  
EDUCATION COURSES FOR INDUSTRIAL ARTS MAJORS  
AT PERU STATE TEACHERS COLLEGE

Submitted by  
Ernest J. Rawson

In partial fulfillment of the requirements  
for the Degree of Master of Education  
Colorado State College  
of  
Agriculture and Mechanic Arts  
Fort Collins, Colorado

August, 1944

LIBRARY  
COLORADO STATE COLLEGE OF A. & M. A  
FORT COLLINS, COLORADO

378.788

AD  
1944  
10

COLORADO STATE COLLEGE

OF

AGRICULTURE AND MECHANIC ARTS

=

August 7, 1944

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY Ernest J. Rawson

ENTITLED A Pattern of Professional and General Education Courses for Industrial Arts Majors at Peru State Teachers College

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF Education

MAJORING IN Industrial Arts Education

CREDITS 3

*A. A. Linderman*  
In Charge of Thesis

APPROVED

*George H. Terry*  
Head of Department

Examination Satisfactory

Committee on Final Examination

*A. A. Linderman*  
*Russell & Britton*

*George H. Terry*

*E. J. Rawson*  
Dean of the Graduate School

Permission to publish this thesis or any part of it must be obtained from the Dean of the Graduate School.

ACKNOWLEDGMENTS

The writer wishes to express his appreciation to members of the Colorado State College summer session faculty for their aid in writing this paper: to George F. Henry, Professor of Industrial Arts Education, of Colorado State College, for his interest and help in guiding this study; to Dr. R. A. Hinderman, Director of Research and Vocational Education, Denver Public Schools, Denver, Colorado, and Director of Educational Research, Colorado State College, for his ready assistance and guidance; and James G. Hodgson, Librarian of Colorado State College.

Grateful acknowledgment is also made to A. V. Larson, to E. H. Hayward, to the office force at Peru State Teachers College, and the 52 Peru State Teachers College graduates for their cooperation in helping gather the data.

The writer wishes to express his appreciation for aid and inspiration given by his wife during the preparation of this paper.

CONTENTS

	Page
CHAPTER I: INTRODUCTION - - - - -	9
CHAPTER II: REVIEW OF RESEARCH- - - - -	18
CHAPTER III: MATERIALS AND METHODS- - - - -	48
CHAPTER IV: FINDINGS- - - - -	54
CHAPTER V: DISCUSSION - - - - -	95
CHAPTER VI: SUMMARY - - - - -	140
APPENDIX - - - - -	149
BIBLIOGRAPHY - - - - -	156

LIST OF TABLES

Table	Page
1. Academic and professional courses required of industrial arts majors - - - - -	56
2. Required and elective shop courses for industrial arts majors- - - - -	57
3. Courses taught by industrial arts majors - -	77
4. Combinations of industrial arts courses being taught by Peru graduates- - - - -	78
5. Frequency of industrial arts course combinations - - - - -	82
6. Combinations of high school subjects taught by industrial arts majors- - - - -	83
7. Quality of industrial arts training as rated by teachers - - - - -	84
8. Industrial arts courses as suggested by teachers in which more teacher training should be offered - - - - -	85
9. Additional industrial arts courses requested by teachers - - - - -	89
10. Quality of professional training as rated by industrial arts majors - - - - -	90
11. Professional courses listed by teachers in which more teacher training should be required- - - - -	91
12. Preferred minors by industrial arts teachers	93
13. A comparison of academic requirements for industrial arts majors in Peru and 45 selected colleges- - - - -	98
14. A comparison of professional requirements for industrial arts majors in Peru and 45 selected colleges- - - - -	104

## LIST OF TABLES

Table	Page
15. Present and recommended pattern of professional requirements for industrial arts majors at Peru - - - - -	106
16. A comparison of shop subjects for industrial arts majors in Peru and 45 selected colleges- - - - -	108
17. Present and recommended industrial arts curriculum pattern at Peru State Teachers College - - - - -	127
18. Patterns of required academic subjects for industrial arts majors - - - - -	143
19. Patterns of required professional subjects for industrial arts majors - - - - -	143
20. Patterns of required shop subjects for industrial arts majors - - - - -	144
21. Patterns of elective shop subjects for industrial arts majors - - - - -	144

## LIST OF FIGURES

Figure	Page
1. Location of Peru graduates teaching in- dustrial arts - - - - -	55
2. Courses in woodworking as reported in state teachers college catalogs - - - - -	59
3. Courses in drafting as reported in state teachers college catalogs - - - - -	61
4. Courses in metalworking as reported in state teachers college catalogs - - - - -	62
5. Courses in electricity as reported in state teachers college catalogs - - - - -	63
6. Courses in arts and crafts as reported in state teachers college catalogs - - - - -	64
7. Courses in graphic arts as reported in state teachers college catalogs - - - - -	65
8. Courses in general mechanics as reported in state teachers college catalogs - - - - -	67
9. Aeronautical courses in the industrial arts department as reported by state teachers colleges- - - - -	68
10. Miscellaneous courses as reported in state teachers college catalogs - - - - -	69
11. Academic courses as reported in state teachers college catalogs - - - - -	70
12. Courses in education as reported in 45 state teachers college catalogs in five regional areas - - - - -	71
13. Courses in education as reported in 33 state teachers college catalogs in the North Central Association - - - - -	72
14. Courses in education as reported in state teachers college catalogs--Fryklund's study of Industrial Arts teacher education	73

## LIST OF FIGURES

Figure	Page
15. Courses in education as reported in Peru State Teachers College catalog - - - - -	74
16. Industrial arts courses as suggested by teachers in which more teacher train- ing should be offered- - - - -	87
17. Professional courses listed by teachers in which more teacher training should be required - - - - -	92
18. Minors industrial arts majors from Peru would choose - - - - -	94
19. A comparison of subject requirements for industrial arts majors in Peru and 45 selected colleges - - - - -	99
20. A comparison of elective subjects for industrial arts majors in Peru and 45 selected colleges - - - - -	111

Chapter I  
INTRODUCTION

General background of the study

Industrial arts has a definite place in a school curriculum, and is considered a fundamental part of general education by all leading educators (18). One of its major objectives is that of enabling the pupil to gain an understanding of the industrial age in which he lives. This aim is accomplished by providing learning experiences comparable to those of industry in which tools and materials are used (1). This type of work, of necessity, is subject to change as conditions in industry change. At the present time there is a great emphasis being placed on air training as a means of helping students understand present roles that are to be played by air transportation (2).

Teacher training for industrial arts teachers is subject to these same changes. This is true because the teachers of industrial arts must revise their curricula and procedures so that the pupils will be kept abreast with the times. For these reasons it may be worth-while to consider briefly some of the more important changes that have taken place in high school industrial arts and teacher training curricula since 1900.

Snidow stated, "During the early years of the present century it was commonly assumed that manual training was vocational in purpose (21:59)." Teachers were not sure of their objectives. Manual training at this time consisted chiefly of a series of graded exercises which were in the form of either isolated operations performed in sequence, or projects prescribed in logical order. The main objective was that of developing skill in the use of tools (5).

A new philosophy for industrial education, formed in the early twenties, proposed that all aims of shop work should serve the aims of general education, inasmuch as a need was felt for broadening content of courses and including more learning experiences and opportunities. During this time the "general shop" program was organized, first in the junior high school and later in the senior high school, to afford opportunity for exploratory work (15).

Two of the general shop objectives which apply to this study are, first, providing opportunities in a number of activities and, second, providing opportunities for giving instruction in industrial processes and materials (17). Included in the first objectives are activities in sheetmetal, machine shop practice, electricity, radio, printing, auto mechanics, photography, ceramics, rope work, concrete, and crafts in addition to the older established courses, such as

woodworking and drawing. Included in the second objectives are the broadening of industrial arts offerings, the development of new materials, and the expansion of various phases of industry which have made it necessary for the continuous revamping and expansion of teacher training curricula.

Change and expansion have characterized the immediate past, and the trends of the future appear to be similar but accelerated. Four of the future trends as reported by Proffitt (19) are:

1. A broadening program of activities, which can be analyzed into three parts:
  - (a) To increase the number of shop activities included and the variety of media used, thus affording enriched opportunities for manipulative work--for values inherent in self-expression and exploration (19:3).
  - (b) To include provision, as a part of the industrial arts program, for the acquisition of information about industrial products and services for users' values (19:10).
  - (c) To include provisions, as a part of the industrial arts program, for the acquisition of information about industry and its influence on human affairs (19:11).

2. The general shop form of organization.

If a single outstanding trend of the present were to be used to predict the future of industrial arts work, it would most certainly be the trend toward the organization of pupil experiences for instructional purposes around the central idea of the general shop (19:12).

3. Increasing qualifications of teachers.

. . . Probably no great advantage will accrue

from having industrial arts teachers merely take more of the academic subjects. A great advantage may be had, however, from giving industrial arts teachers a baptism of professional education, including attention to present movements in the whole field of education, to administrative practices governing the organization and operation of public-school systems, to the psychology of child life and development, and to the study of changing social patterns in life and the part that industrial life plays in such changes (19:14-15)

4. A keener realization of the value of industrial arts for girls.

Teachers in industrial arts education keenly regret that they cannot report a strong trend in practice toward providing industrial arts work for girls. It is a fact, however, that there is a growing consciousness on the part of educational leaders that industrial arts ought to be extended to girls in accordance with its values for the realization of educational objectives of first importance. One of the retarding factors in the extension of industrial arts opportunities to girls is the reluctance--partly but not wholly due to administrative problems involved--of school administrators and also industrial arts teachers to reorganize school programs so that girls may be accommodated in a satisfactory program of activities in industrial arts (19:17).

In addition to this analysis of trends more information about the future is given by the staff of the aviation education research project.

The world has entered upon the "air age." This creates new responsibilities for teachers and school administrators. They are obligated to orient children, youth and adults to the problems arising from the development of transportation and communication by air. This holds equally true for peace as well as war times. . . . The "air conditioning" of America is primarily the concern of teachers in elementary and secondary schools. The responsibility is a challenging one and is being accepted by educators throughout the nation with tremendous enthusiasm (2:12) . . .

This report seems to indicate the need for a more rapid change in education than ever before. It appears that the statement of trends by Proffitt and the report, New Education for the Air Age, point to the need for rapid changes in the industrial arts program. Teacher training institutions, therefore, will have to reorganize their curricula to meet these demands.

The faculty members at Peru State Teachers College, Peru, Nebraska, are interested in reorganizing their curricula as a step toward meeting these new trends. This interest resulted from a study of the Peru State Teachers College Placement Bureau records. These findings revealed that frequently during normal times a Peru graduate's first position was in a small community. In these smaller schools a teacher usually has to teach a variety of subjects and direct some type of extracurricular activity (6). After having gained experience in the teaching field, he seeks advancement and when moving from one school to another finds that shop conditions differ. Some of these conditions may be equipment, shop offerings, and fewer subject combinations with industrial arts. These problems have been frequently discussed with the graduates of Peru State Teachers College.

The curriculum for training teachers in industrial arts courses is a principal part of the larger division of teacher training. Because

acquaintance with tools, machines, etc., is important to industrial arts majors, the shops at Peru have been organized to simulate typical aspects of industry. Prospective teachers may gain experience by working with woods, metals, ceramics, electricity, auto mechanics, tapestries, finishes, etc. In addition, graduates sometimes are encouraged to secure employment in industry located in larger cities in the surrounding communities, during summer vacations. In this way the students have opportunities for further broadening their training by making direct contacts with machines, tools, and methods of production used in industry. This emphasis on industrial contacts and a variety of shop facilities provides a basis for training Peru graduates for positions in the surrounding area, especially in Nebraska. The emphasis appears to have been in the right direction because returning graduates uniformly express a need for more extensive training in some fields and additional training in new fields which would more adequately prepare them for meeting frequent course combinations in the teaching field. Over a period of time these comments and suggestions from students have pointed out a rather general problem that confronts industrial arts teachers.

### The Problem

There is a need for greater versatility on the part of industrial arts teachers. This is shown in

a statement made by Bawden (4):

. . . Realization of the fact that the accepted aims of industrial arts cannot be attained without a broader varied program of experiences and instruction is stimulating the demand for teachers who can teach one or more shop subjects in addition to woodworking (4:221).

According to Dean (7), high-school teachers today more than ever before need a broader vision than can be gained in a specialized field of study.

Works (25) stated the following:

The college curriculum for teachers must be so revised as to insure a background of reasonable acquaintance with each of the major fields of learning, plus specialized preparation in two areas organized in terms of broad, related fields rather than in terms of the traditional, departmentalized subjects. Imposition on the prospective teacher of the patterns of specialization as they now exist in most institutions of higher education is largely responsible for the chaos in the relationship between preparation and assignment of teacher (25:241). . . .

While Works has described the general need for revamping curricula for training all types of teachers, it is apparent that there is a more immediate need for revision of industrial arts training curricula than there is for curricula revision in such fields as mathematics or language in teacher training institutions. The faculty of Peru State Teachers College held monthly meetings throughout the year 1942 for the purpose of curricula study. As a result of these faculty meetings, conversation with former graduates, and a review of the records of the Peru State Teachers College Placement Bureau, a need for this study arose. The

problem stated in question form is, What patterns of professional and general education courses should be provided for industrial arts majors at Peru State Teachers College?

Delimitation.--Peru graduates who have received degrees in education with a major in industrial arts during the past ten-year period, 1932-42, were asked to contribute the information used in this study.

The present curriculum provides for training prospective teachers in general background subjects and specialized methods. This type of training is called "general education." Specialized training in courses in education, such as techniques of administration and supervision, principles and practices, and methods of teaching, is termed "professional education." With the need for both general and professional training, the question of emphasis arises. For this reason it is necessary for the student to divide his time in order that he may earn 26 hours of professional and 30 hours of general education, the remaining 69 hours being acquired in the major and minor fields. The allocation of time and determination of content are termed patterns of training. An analysis of the teaching duties and other activities in terms of patterns that are needed by teachers in preparing for industrial arts teaching positions raised a number of minor questions.

Analysis of the problem

## Subordinate questions:

- A. What patterns are provided for industrial arts majors in other state teachers colleges?
- B. What subjects have been taught most frequently in the past ten years by Peru graduates who have industrial arts majors?
- C. What curriculum patterns are provided for industrial arts majors at Peru State Teachers College at the present time?
- D. What are the state requirements that govern the training of industrial arts teachers?
- E. What does the comparison of the findings reveal and what recommendations can be made?

Many who are involved in teacher training are interested in the subject combinations being taught by graduates. A review of research was conducted to secure further information on the problem.

Chapter II  
REVIEW OF RESEARCH

Teachers colleges are concerned with the re-organization of curricula to meet the changing demands for teacher training in the various departmentalized fields of education.

The research findings that pertain to question number one, "What patterns are provided for industrial arts majors in other state teachers colleges?" are:

Fryklund (3) in his study, Industrial Arts Teacher Education in the United States, in 1940, sent 180 questionnaires to institutions that were assumed to be involved in industrial arts teacher education. This information was combined into a set of findings, part of which follow:

Shop offerings

1. Fifty-four responding schools had a requirement in fine arts. "Fine arts and industrial arts have many things in common (8:45)."
2. Thirty-six schools did not report a requirement in fine arts.
3. Woodworking exceeded other shop offerings in industrial arts teacher education.
4. Woodworking, in its elementary form, was

required in 67 institutions in the Junior division and 17 institutions in the Senior division.

5. Woodworking was an elective in 33 institutions.
6. Drafting in various forms was a close second to woodworking.
7. Most courses in drafting were required in the first and second years of training.
8. Metalworking was third in the order of the number of institutions offering it and was first in the number of credits required in the schools in which it was offered.
9. Electrical courses, in the elementary form, were required in more schools than were elementary metalworking courses.
10. There were more institutions that required advanced metalwork than advanced electrical work.
11. Building-trade courses were required in several schools.
12. A few general courses in auto mechanics were required in 26 schools. The average work was four semester credits.

. . . Auto mechanics is one of the most rapidly changing and most difficult offerings to teach in college and public school industrial arts (8:50).

13. Many institutions were covering auto mechanics as a semi-laboratory offering with emphasis on owner's and driver's needs.

14. A few scattered institutions offered craft work in various forms.
15. Printing was required in 28 schools.
16. There were but few schools having general shop offerings.

Fryklund stated:

Several years ago there were advocates of the information concept in industrial arts; they said that knowing how and having much shop information should be major outcomes in industrial arts education in the public schools. At the same time there were advocates of a reality concept: let the nature of the work indicate what the outcomes should be in terms of information and manual abilities. Another group was committed to a belief in manual abilities alone (8:95).

#### Industrial Arts Professional offerings

1. Most schools require courses in history, philosophy, techniques of administration and supervision, curriculum principles and practices, methods of teaching, student teaching, and evaluation in the Senior division.
2. Fifty schools reported directed teaching in the Senior division, and five schools, in the Junior division.
3. Many schools do not have professional courses other than methods of teaching and directed teaching.
4. Fifteen schools require philosophy of industrial arts education.
5. Only 12 schools reported requirements of courses in general shop theory.

Academic offeringsEnglish

1. English is required in all colleges, but the total number of hours required is not uniform.
2. Thirty-five colleges require 11 to 12 semester credits.
3. Thirty colleges require five to six semester credits.
4. Two schools require three to four semester credits in English.
5. Six schools require 15 to 16 semester credits.
6. Most required English courses are offered in the Junior division.

Social Studies

1. Thirty-nine responding institutions require at least five to six semester hours credit.
2. Twenty-eight institutions require 12 semester credits.
3. Six respondents did not report on social studies; therefore, it was assumed that they do not have a requirement.

Mathematics

1. Seventy-two responding institutions require in some amount mathematics.
2. Eighteen institutions did not report a mathematics requirement.
3. Most mathematics requirements are given in the Junior division.

Sciences

1. Sciences are required in some amount and combination in 82 institutions.

Psychology or Educational Psychology

1. All except one school reported psychology or educational psychology as a requirement.
2. Three to six credits seem to be required in most schools.

Music

1. One to eight semester credits in music was reported required in 16 responding institutions.

Educational offerings

1. Two schools require character education in the Junior division, and the average is one semester credit.
2. One school requires character education in the Senior division. The average is two semester credits.
3. Thirty-two institutions require tests and measurements in the Senior division, and the average is 2.6 semester credits.
4. Eighteen institutions require philosophy of education in the Senior division, and the average is 2.7 semester credits.
5. Twenty-two institutions require classroom management in the Senior division and the average is 2.7 semester credits.

. . . The returns showed that the information or the skill concepts, alone, had a negligible number of followers in teacher education for industrial arts. Eighty of the respondents follow the "balance", or reality concept. The nature of the work determines the extent of information and manual work covered in a shop course. Three respondents stressed information; four respondents stressed manipulative abilities (8:96).

This information is indicative of emphasis that should be given in professional courses for industrial arts teachers.

Pawelek, (16) in making his study, "Some Aspects of Industrial-Arts Teacher Preparation," in 1941, sent a 26-item inquiry blank to 142 colleges and universities in the United States and Puerto Rico, which were assumed to prepare industrial arts teachers. One hundred complete forms from 38 states and Puerto Rico were returned. A brief summary of the findings that pertain to this study follow:

1. In 82 per cent of the industrial-arts education departments, any student admitted to the institution is automatically admitted to the department . . . .
2. Seventy-six per cent of all shops and drafting rooms are under the direct control of the industrial-arts education departments. . . .
3. Eighty-nine per cent of the departments professionalize some of all shop and drawing courses, while only 73 per cent of the jurors favor professionalization. Those who object, do so because they feel professionalization detracts from the development of fundamental skills in shopwork and drawing.
4. Eighty-two per cent of all the departments offer shop and drawing courses during all four years of the students' college career. . . .

. . . . .

6. Seventy-four per cent of the departments offer strictly professional industrial-arts education courses for the first time in the junior year.  
. . . .
7. Thirty-two per cent of the departments offer supervised student teaching for the first time in the junior year, and 61 per cent in the senior year. . . .
9. . . . . The jurors' composite judgments indicate the following percentages of the total number of credits to be devoted to the five divisions of the industrial-arts education curriculum: (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, 38 per cent; (e) general professional education, 18 per cent.
10. The following is a summary of practices and judgments with regard to supervised student teaching:
- (a) Eighty per cent of the departments conduct extensive student teaching. Under this plan the students carry other courses at the time of student teaching. A majority of jurors feel that this is the best plan.
- (b) In 31 per cent of the departments, industrial-arts education students are required to do academic student teaching as well as the industrial arts. Fifty-seven per cent of the jurors consider this the best practice.
- (c) In 28 per cent of the departments, student teaching is required on more than one grade level; and in 48 per cent of the departments, in more than one area (wood, drawing, metal, etc.). Ninety per cent of the jurors consider these practices best.
- (d) Fifty-one per cent of the jurors feel that the campus-laboratory school does not provide the best student teaching experiences. The chief argument against this was that the "whole situation is artificial."
11. About 50 per cent of the jurors are opposed to the practice of having industrial-arts teachers coaching athletics, leading bands,

and performing other duties which take a great amount of out-of-school or after-school time. The best subject combinations with industrial arts, they feel, are mathematics and science. The poorest subjects to combine with industrial arts are dramatics, music, athletics, and English.

14. Most of the departments (93 per cent) indicate that they are doing something about supervision and follow-up of recent graduates who are on their first job, but the practices are not at all uniform. Sixty-three per cent indicate that they keep in touch by means of personal correspondence, 28 per cent issue a departmental newsletter, and 46 per cent make periodic or unscheduled visits at least once a year. The majority of the jurors consider the latter as being the best, but often impractical because of distance, time, and cost.

#### Some Educational Implications

1. The situation wherein no definite standards of admission to industrial-arts education departments obtains is not a desirable one. It is a certainty that the best industrial-arts teachers will not be produced until the candidates for this profession are selected with care.
3. Observation of teaching ought to begin at least in the sophomore year followed by supervised student teaching in the junior and senior years (16:147-149).

According to the above, prospective industrial arts teachers should be selected with care. These prospective teachers should be trained in observation of teaching during their sophomore year followed by supervised student teaching in their junior or senior year. There should also be a follow-up after these graduates are teaching in the field.

Briggs, (6) in 1937, in his study, "Demand for Teachers Prepared to Guide and Direct Extra-Class

Activities," sent a questionnaire to 161 secondary school principals in 45 states. He found that 3,794, or 76.2 per cent of 4,981 teachers employed, participated in guiding and directing extra-class activities. He also found that the greater percentage of teachers were in favor of teacher training institutions providing opportunities for prospective teachers to study extra-class activities while in college. The summary from this study is as follows:

(1) Approximately three fourths (76 per cent.) of the high-school teachers of the nation participate in guiding and directing extra-class activities in high school.

(2) Those high-school teachers guiding and directing extra-class activities are rated among the best one third of all high-school teachers.

(3) Teacher-training institutions should provide opportunity for prospective teachers to participate in extra-class activities while in college.

(4) Teacher-training institutions should provide opportunity for prospective teachers to study (take courses in) extra-class activities while in college.

(5) Teacher-training institutions should provide opportunity for prospective teachers to practice in guiding and directing extra-class activities while in college.

(6) Four out of every five high-school principals want teachers to have special training in conducting assembly programs.

(7) Seventeen out of every twenty high school principals want teachers to have special preparation for guiding and directing student councils.

(8) Approximately four out of every five high-school principals consider special preparation for guiding and directing clubs desirable.

(9) Nine out of every 10 high-school principals believe high school teachers should have special preparation for guiding and directing extra-class forensic activities.

(10) Approximately nine out of 10 high-school principals recommend that high-school teachers have special preparation for guiding and directing student publications.

(11) Three-fourths of the high school principals consider special preparation for guiding and directing religious activities desirable for high-school teachers.

(12) Sixty-eight per cent. of the high-school principals recommend special preparation for guiding and directing social activities.

(13) Nine out of every ten high-school principals consider special preparation for guiding and directing extra-class music activities important for high-school teachers.

(14) Seven out of every eleven high school principals approve special training for guiding and directing class organizations as desirable preparation for high-school teachers.

(15) High-school principals desire teachers prepared to guide and direct extra-class activities in high school.

(16) Teachers agencies gather information concerning the ability of applicants to guide and direct extra-class activities in high school. It is considered, therefore, a desirable preparation for obtaining a position.

(17) Only sixty-one state teachers colleges report that their placement bureaus keep extra-class activities records of prospective teachers.

(18) Preparation for guiding and directing extra-class activities helps in placement of teachers (6:696).

According to the importance assigned to the above-mentioned duties, teachers should have training in extra-class activities.

Whitney, (23) in his study, Survey of Industrial Arts Curricula in State Teachers Colleges Accredited by the North Central Association, made in 1932, sent questionnaires to 22 teachers colleges accredited by the North Central Association.

The information was combined into a set of findings part of which follow:

Professional Subjects in the Curricula.-

Table VIII shows that there is a considerable diversity in the number of Industrial Arts professional courses offered by the various schools. The range in number of courses offered is from one to eight. As shown in the table 10 schools offered but one professional subject; 2 schools offered two professional subjects; 1 school offered three; 3 schools offered four; 1 school, five; 1 school, eight; 3 schools, nine; and 1 school, twelve.

Not only is there a wide diversity in the number of courses, but there is almost as wide a diversity in the titles of courses. For example, in each of the following groups, judging by the descriptions given in the various catalogs, for all their difference in titles the courses in each group seem to be equivalent in content.

Group 1.

1. Industrial Education
2. Vocational and Industrial Education
3. History and Organization of Industrial Education
4. Industrial and Vocational Education
5. Theory of Industrial Education (23:40)

Group 2.

1. Teaching of Industrial Arts
2. Methods of Teaching Industrial Arts
3. The Teaching of Manual Arts
4. Technique of Teaching Manual Arts
5. Teaching Industrial Arts in High Schools
6. Teaching in Jr. High Schools
7. The Teaching of Industrial Arts
8. The Teaching of Manual Arts

Table VII. General Curricular Distribution of Total Credits for Graduation in Industrial Arts.

Teachers Colleges	:Profes- :sional :Credits	:Acade- :mic :Credits	:Shop :Cred- :its	:Total Cre- :dits for :Graduation	
<u>Quarter-Hour Basis</u>					
1. Ariz. St. Teach. Col.	: 18	: 42	: 52	: 192	q.h.c.
2. Ark. St. Teach. Col.	: 14	: 78	: 44	: 180	
3. Ball St. Teach. Col. (Ind.)	: 32	: 40	: 36	: 192	
4. Colo. St. Teach. Col.	: 22	: 128	: 32	: 192	
5. Western St. Teach. Col. (Colo.)	: 2	: 50	: 38	: 180	
6. Ill. St. Normal Univ.	: 12	: 48	: 36	: 207	
7. Eastern Ill. St. Teach. Col.	: 4	: 36	: 74	: 192	
8. Southern Ill. St. Normal	: 4	: 36	: 6	: 192	
9. Northern Ill. St. Teach. Col.	: 4	: 44	: 32	: 192	
10. Western Ill. St. Teach. Col.	: 2	: 12	: 48	: 192	
11. Ind. St. Teach. Col.	: 48	: 20	: 68	: 192	
12. Iowa St. Teach. Col.	: 5	: 40	: 40	: 180	
13. Northern St. Teach. Col. (Mich.)	: 12	: 41	: 60	: 192	
14. Western St. Teach. Col. (Mich.)	: 4	: 32	: 54	: 192	
<u>Semester-Hour Basis</u>					
15. Central St. Teach. Col. (Mo.)	: 2½	: 45	: 22½	: 120	s.h.c.
16. Northwestern St. Teach. Col. (Mo.)	: 17½	: 42	: 46	: 126	
17. Ariz. St. Teach. Col.	: 25	: 30	: 12	: 120	
18. Kans. St. Teach. Col. (Ft. Hays)	: 2	: 26	: 28	: 120	
19. Kans. St. Teach. Col. (Emporia)	: 6	: 61	: 41	: 120	
20. Kans. St. Teach. Col. (Pittsburg)	: 8	: 30	: 25	: 120	
21. Southeastern St. Teach. (Missouri)	: 3	: 30	: 45	: 120	
22. Oshkosh St. Teach. Col. (Wisconsin)	: 16	: 52	: 48	: 128	

(23:38)

Table VIII. Current Curricular Subjects Required by Each Training Institution as Limited to Such Schools as Have Minimum and Maximum Requirements.

Professional

Teachers Colleges	: Number of : Professional : Courses	: Length of : Each Course : in Weeks	: Average : Credits : Per Course	: Years in Which : Courses are : Offered
<u>Minimum Requirements</u>	:	:	:	:
Southeastern St. Teach. Col. (Mo.)	1	18	3	3,4
Western St. Teach. Col. (Mich.)	1	12	4	3,4
Western Ill. St. Col.	1	12	2	2
Central St. Teach. Col. (Mo.)	1	12	2½	4
<u>Maximum Requirements</u>	:	:	:	:
Oshkosh St. Teach. Col. (Wis.)	8	18	2	2,3,4
Ball St. Teach. Col. (Ind.)	8	12	4	2,3,4
Colo. St. Teach. Col.	9	12	2½	2,3,4
Ariz. St. Col.	8	18	3	2,3,4

(23:39)

9. The Teaching of Industrial Arts in Secondary Schools

Group 3.

1. Organization of Manual Arts
2. Shop Organization
3. Principles and Practices in Industrial Arts
4. Organization of Industrial Arts
5. History and Organization of Industrial Arts
6. Organization and Supervision of Industrial Arts
7. Organization and Administration of Manual Arts
8. Organization and Administration of Industrial Arts
9. Organization and Administration of Industrial and Vocational Education (23:41)

.....  
 Of these 22 schools, 50 percent agree on two professional courses or their seeming equivalents. Since the titles are not the same for similar courses the best that can be done is to place in a group such courses as are equivalent. There will thus be two groups:

Group 1.

1. Practice Teaching
2. Class Teaching
3. Technique of Teaching
4. The Teaching of Manual Arts
5. Technique
6. Teaching in the Junior High Schools
7. Teaching of Shop Subjects

Group 2.

1. Principles of Vocational Education
2. Administration of Vocational Education
3. Vocational Education
4. History of Vocational Education
5. Teaching of Vocational Subjects
6. Theory and Administration of Vocational Education
7. Vocational and Industrial Education (23:42)

Academic Subject in the Curriculum.— Table IX shows the great diversity of the required academic subject in the Industrial Arts curricula of the various Teachers colleges. There seems to

Table IX. Current Curricular Subjects Required in the 22 Teachers Colleges.

Academic

Teachers Colleges	:Division of Academic Required Credits:						Academic Credits
	: Eng-lish:	: Mathe-matics:	: Hist-ory:	: Natural-science:	: Social Science:		
<u>Quarter-Hour Basis</u>							
1. Ariz. St. Teach. Col.	: 12	: 12	: 6	: 12	: 0	: 42	
2. Ark. St. Teach. Col.	: 18	: 21	: 9	: 21	: 9	: 78	
3. Ball St. Teach. Col. (Indiana)	: 12	: 8	: 8	: 12	: 0	: 40	
4. Colo. St. Teach. Col.	: 36	: 12	: 32	: 32	: 16	: 128	
5. Western St. Teach. Col. (Colo.)	: 12	: 9	: 9	: 8	: 12	: 50	
6. Ill. St. Normal Univ.	: 12	: 0	: 12	: 12	: 12	: 48	
7. Eastern Ill. St. Teach. Col.	: 16	: 0	: 8	: 8	: 4	: 36	
8. Southern Ill. St. Normal	: 6	: 6	: 9	: 6	: 9	: 36	
9. Northern Ill. St. Teach. Col.	: 12	: 8	: 8	: 12	: 4	: 44	
10. Western Ill. St. Teach. Col.	: 12	: 0	: 0	: 0	: 0	: 12	
11. Ind. St. Teach. Col.	: 12	: 8	: 0	: 8	: 0	: 28	
12. Iowa St. Teach. Col.	: 15	: 5	: 5	: 10	: 5	: 40	
13. Northern St. Teach. Col. (Mich.)	: 9	: 16	: 12	: 1	: 3	: 41	
14. Western St. Teach. Col. (Mich.)	: 12	: 4	: 4	: 4	: 8	: 32	
Total	96	109	119	146	82	651	
Average	14	7.1	8.7	10.4	8.2	42.2	
<u>Semester-Hour Basis</u>							
15. Central St. Teach. Col. (Mo.)	: 7½	: 7½	: 7½	: 22½	: 0	: 45	
16. Northwestern St. Teach. Col. (Mo.)	: 6	: 16	: 0	: 8	: 12	: 42	
17. Ariz. St. Teach. Col.	: 6	: 6	: 6	: 6	: 6	: 30	
18. Kans. St. Teach. Col. (Ft. Hays)	: 6	: 5	: 5	: 5	: 5	: 26	
19. Kans. St. Teach. Col. (Emporia)	: 6	: 4	: 17	: 17	: 17	: 61	
20. Kans. St. Teach. Col. (Pittsburg)	: 8½	: 5	: 0	: 10	: 7½	: 30	
21. Southeastern St. Teach. Col. (Mo.)	: 6	: 6	: 6	: 6	: 6	: 30	
22. Oshkosh St. Teach. Col. (Wis.)	: 16	: 6	: 6	: 12	: 12	: 52	
Total	61	55½	47½	86½	65½	316	
Average	7.6	6.9	5.9	10.8	8.2	39.5	
						(23:43)	

Table X. Current Curricular Subjects Required by the Teachers Colleges as Limited to Such Schools as Have Minimum and Maximum Requirements.

Shop

Teachers Colleges	:Number :of Shop :Courses:	: Length of :Each Course : In Weeks	: Total :Credits:	: Year in :Which Courses : Are Offered
<u>Minimum Required Subjects</u>	:	:	:	:
Ill.St.Normal Univ.	: 3	: 12	: 36	: 1,2
Western St.Teach.Col. (Mich.)	: 5	: 12	: 54	: 1,2,3,4
Central St.Teach.Col. (Mo.)	: 5	: 18	: 22.5	: 1,2,3,4
Northern St.Teach.Col.(Mich.)	: 5	: 12	: 60	: 1,2,3,4
<u>Maximum Required Subjects</u>	:	:	:	:
Ind.St.Teach.Col.	: 18	: 12	: 32	: 1,2,3,4
Northern Ill.St.Teach.Col.	: 9	: 12	: 32	: 1,2,3,4
Ark.St.Teach.Col.	: 16	: 12	: 44	: 1,2,3,4
Ariz.St.Teach.Col.	: 15	: 12	: 46	: 1,2,3

(23:51)

Table XI. Majors and Minors Relative to Number of  
Credit Hours Required for Graduation in 22  
Teachers Colleges.

Teachers Colleges	Credits Required		
	Shop		Minors
	Majors	Shop	Academic
<u>Quarter-Hour Basis</u>	:	:	:
1. Ariz. St. Teach. Col.	: 52	: 24	: 24
2. Ark. St. Teach. Col.	: 52	: 24	: 21
3. Ball St. Teach. Col. (Ind.)	: 40	: 27	: 0
4. Colo. St. Teach. Col.	: 48	: 24	: 24
5. Western St. Teach. Col. (Colo.)	: 43	: 20	: 20
6. Ill. St. Normal Univ.	: 48	: 24	: 24
7. Eastern Ill. St. Teach. Col.	: 76	: 36	: 24
8. Southern Ill. St. Normal	: 21	: 0	: 0
9. Northern Ill. St. Teach. Col.	: 32	: 20	: 20
10. Western Ill. St. Teach. Col.	: 30	: 15	: 30
11. Ind. St. Teach. Col.	: 48	: 20	: 40
12. Iowa St. Teach. Col.	: 40	: 20	: 30
13. Northern St. Teach. Col. (Mich.)	: 36	: 24	: 24
14. Western St. Teach. Col. (Mich.)	: 54	: 0	: 25
Total	620	278	306
Average	44.4	19.1	21.7
<u>Semester-Hour Basis</u>	:	:	:
15. Central St. Teach. Col. (Mo.)	: 25	: 15	: 15
16. Northwestern St. Teach. Col. (Mo.)	: 30	: 12	: 12
17. Ariz. St. Teach. Col.	: 30	: 15	: 20
18. Kans. St. Teach. Col. (Ft. Hays)	: 30	: 20	: 20
19. Kans. St. Teach. Col. (Emporia)	: 36	: 15	: 15
20. Kans. St. Teach. Col. (Pittsburg)	: 25	: 15	: 15
21. Southeastern St. Teach. Col. (Mo)	: 45	: 0	: 15
22. Oshkosh St. Teach. Col. (Wis.)	: 41	: 0	: 15
Total	242	92	127
Average	30.2	11.5	15.8

(23:56)

be a marked lack of agreement on the number of academic credits required for graduation (23:44).

This information may be used as a comparison with the findings from the Peru study.

The research findings that pertain to question two, "What subjects have been taught most frequently in the past ten years by Peru graduates who have industrial arts majors?" are:

Meyer, (14) in his study concluded in 1940, "Follow-up Study of Industrial-Arts Graduates," sent questionnaires to 195 industrial arts graduates of Oregon State College, Corvallis, Oregon. Seventy per cent of the questionnaires were returned.

The information was combined into a set of findings as follows:

1. Woodworking and drawing were the most numerous teaching combinations.
2. Auto mechanics was losing favor.
3. Art metal, metal spinning, electrical work, and printing were increasing in popularity.
4. Ninety per cent of the industrial arts graduates are employed as teachers.
5. Seventy-five per cent of these graduates obtained their employment in a specific or general field of their training.
6. Sixty per cent stated that their reason for selecting the industrial arts field of training

was due to the fact that they had a distinct liking for this type of work.

7. Approximately 18 per cent of this group of industrial arts men made their choice during high school days.
  - a. Twenty-four per cent before entering college.
  - b. Twenty-three per cent during freshman year.
  - c. Nineteen per cent sophomore year.
  - d. Fourteen per cent in their junior year.
8. Some of the younger students, usually undergraduates, thought too much time was devoted to cultural studies.
9. More than 80 per cent of the graduates replied that for the value received from cultural studies, their time was well spent.
10. Sixteen per cent replied that the cultural studies were indispensable.
11. Others requested that more time be spent on literature, economics, arts, and similar studies.
12. These industrial arts teachers rated the four types of training as follows:
  - a. Technical - - - - - - - - -74.0 per cent
  - b. Professional- - - - - - - -20.5 per cent
  - c. Scientific- - - - - - - - - 4.3 per cent
  - d. Cultural- - - - - - - - - - 1.2 per cent

13. The most important extra-curricular activities were school clubs, fraternity life, athletics, music, and publications.

This information may be used as a comparison with the findings from the Peru study.

Ridgway, (20) in his study, A Comparative Study of the Training and Teaching Combinations of Kansas High School Teachers, which included about 5,000 Kansas school teachers during the year of 1931, stated:

The data for this subject were obtained at the office of the state superintendent of public instruction. They were taken from high school principals' reports made at the beginning of the last school year. These are the official reports made annually to the state office, and furnish the most reliable sources of information concerning the high schools of Kansas (20:6).

The information was combined into a set of findings as follows:

1. Approximately 43 per cent of the senior high school teachers are teaching in one field only.
2. Fifty-seven per cent are teaching in two to five fields.
3. Teaching combinations in order of rank from 4,421 Kansas high school teachers of industrial arts are as follows:

<u>Subject</u>	<u>Per cent</u>
a. Industrial arts alone	26
b. Industrial arts and science	19
c. Industrial arts and physical education	 13

<u>Subject</u>	<u>Per cent</u>
d. Industrial arts and mathematics	13
e. Industrial arts and agriculture	13
f. Industrial arts and social science	10
g. Industrial arts and commerce	4
h. Industrial arts and English	1
i. Industrial arts and music	1
j. Industrial arts and home mechanics	0
k. Industrial arts and Latin	0
l. Industrial arts and modern language	0

4. Teaching combinations in Missouri high schools.

<u>Subject</u>	<u>Frequency</u>
a. Manual training and physical education	1st
b. Manual training and agriculture	2nd
c. Manual training and science	3rd

5. Teaching combinations in Kansas

<u>Subject</u>	<u>Frequency</u>
a. Industrial arts and science	1st
b. Industrial arts and physical education	2nd
c. Industrial arts and mathematics	3rd

Ridgway recommends that "students should prepare themselves in the subjects they are most likely to be called upon to teach" (20:9). The above-mentioned

studies in Kansas and Missouri relative to subject combinations in the teaching field should make an interesting comparison with a similar study from Peru State Teachers College.

Kirby, (10) in 1926, made a study, "Subject Combinations in High School Teachers' Programs," of the exact teaching program of 1,478 teachers in Iowa high schools representing proportionately the high schools of various sizes in the state.

The data from this study were combined into a set of findings, part of which follow:

1. Seventy-six of the 1,478 teachers taught manual arts predominantly.
2. Thirty-two per cent of these 76 manual arts teachers did not teach subjects outside their own field.
3. The combinations with the manual arts field seemed to be a matter of chance.

The conclusion Kirby reached relative to the manual arts field is as follows:

Adequately preparing students to teach the variety of subjects classified in this field of instruction while providing a liberal education is one of our future problems (10:498).

The research findings that pertain to question three, "What curriculum patterns are provided for industrial arts majors at Peru State Teachers College at the present time?" are as follows:

Works, (25) in a directed study, Preparation

of Secondary School Teachers; the Problem in Colleges of Liberal Arts, made during the year of 1940, had a committee send out two letters of inquiry to all member institutions of the North Central Association.

The replies to these letters of inquiry were tabulated and conclusions were made as follows:

a. Teacher-training institutions should make certain that faculty members participating in the education of high school teachers are aware of the nature of the institution in which these teachers will work and conscious of its problems. The American high schools now serve approximately two-thirds of all youth of high school age. The problems of this major institution of American society cannot be understood from the isolated viewpoints of mathematics, biology, English, or any other single subject.

b. The college curriculum for teachers must be so revised as to insure a background of reasonable acquaintance with each of the major fields of learning, plus specialized preparation in two areas organized in terms of the traditional, departmentalized subjects. Imposition of the prospective teacher of the patterns of specialization as they now exist in most institutions of higher education is largely responsible for the chaos in the relationship between preparation and assignment of teachers (25:241-42).

There should be a correlated curriculum in order that a candidate in one field may also have an acquaintance with other fields such as biology, mathematics, history, English, etc.

In the fall of 1938, Baker (3) published an article, "Those Who Watch Our Ramparts," in which he reported on a study made in cooperation with six different state teachers colleges. This study included the administration of "The 1938 Iowa Every Pupil Test

in Understanding of Contemporary Affairs" to 406 students enrolled in teacher training classes in these institutions. The schools cooperating were located in the Mississippi Valley and the Great Lakes Region. The information from these tests was compiled into a set of findings as follows:

1. Sixty-four and three-tenths per cent of the college freshmen fell below the median for high school seniors.
2. Forty-one and seven-tenths per cent of the college sophomores fell below the median for high school seniors.
3. Thirty-nine and seven-tenths per cent of the college juniors fell below the median for high school seniors.
4. Nineteen and eight-tenths per cent of the college seniors fell below the median for high school seniors.
5. The results of tests given to the freshmen and sophomores indicated a serious situation because in four states students may teach after finishing one year's work.

According to Baker the following conditions are indicative of weakness in the teacher training program:

1. In most cases the work which bears on the vital topics is elective. While requiring students to take work which obviously they should want may not be the ideal way, certainly the certifying agencies are justified in requiring

prospective teachers to meet a reasonable standard of social intelligence.

2. In many cases prospective elementary teachers are excluded from the courses because (a) the courses are open only to upper classmen in states requiring only one or two years of college work for elementary teachers, and (b) the courses are open only to majors or minors in the social sciences. The training of many elementary teachers is too general to allow them to accumulate the prerequisites for such courses (3:517).

Inasmuch as the above information indicates that work which bears on vital topics is often elective, special care should be exercised before cataloging a course as either required or elective.

The research findings that pertain to question four, "What are the state requirements that govern the training of industrial arts teachers?" are:

Woellner and Wood, (24) in 1941, in their study, Requirements for Certification of Teachers and Administrators for Elementary Schools, Secondary Schools, and Junior Colleges, collected data from federal, state, and regional association officers. This information was compiled into a summary. Recommendations of regional and national associations are as follows:

. Middle States Association

- I. Completion of a four years' course in a college approved by the Association or in a college of equal rank for a teacher of academic subjects. Due consideration shall be given to teachers with other than this preparation who have demonstrated their ability through successful experience, provided that at least three-fourths of the teachers of academic subjects

meet the standards of preparation.

- II. Professional requirements--teachers should have had professional training or should have had successful teaching experience.

A school to be accredited shall have a salary schedule which is sufficient to secure teachers with the foregoing qualifications (24:3).

New England Association

- I. Teachers of academic subjects should have completed at least four years of study in institutions of collegiate grade.
- II. Professional requirements--training in semester hours, 12
- III. Teachers of non-academic subjects should have completed at least two years of study beyond the secondary school, including courses in the subject taught (24:3).

North Central Association

- I. Bachelor's degree from an institution approved by the Association.
- II. Academic requirements--semester hours in the academic subject taught: English, 15, Mathematics, 15; Foreign Language (15 in the subject taught); Science, 15 (5 in the science taught); Social Studies, 15 (including preparation in specific subjects taught). Deduction in fields of Foreign Language and Mathematics 2 semester hours for each high school unit, not to exceed 6.
- III. Professional requirements--semester hours in education 15

The Association recommends the following types of courses: Educational Psychology, Principles of Secondary Education, Theory of Teaching, Special Methods (in subject taught). Observation and Practice Teaching, History of Education, Educational Sociology, and School Administration and Supervision.

Note: Until the professional courses are defined by the Association, it will accept as such only courses certified as

Education by the institution in which they were earned (24:3).

.....

Northwest Association

- I. Graduation (bachelor or equivalent degree) from a college or university approved by the Northwest Association of Secondary and Higher Schools, by a similar accrediting association, or by the educational authorities of the state in which the college is located.

Note: Teachers of special subjects who meet the requirements set up by the state for certification for the teaching of such subjects shall be considered eligible.

- II. All teachers in new schools and all new teachers in secondary schools must teach in the fields of their major and minor specialization in college preparation. A minor shall be interpreted to mean not less than 12 semester hours.

Note: Two or more years of successful experience in teaching a subject may, on recommendation of the state committee, be accepted in lieu of major or minor college specialization.

- III. Professional requirements--semester hours in education 15

This should include special study of the subject to be taught (24:4).

Southern Association

- I. Degree from a college approved by the Southern Association.
- II. Teachers should not teach outside the fields of their college specialization.
- III. Professional requirements--semester hours in education 12

Courses in Psychology, Methods and Principles of Teaching, History of Education, Observation and Directed Teaching, Tests and Measurements, etc. (24:4)

.....

Western Association of Colleges and Secondary Schools

The Association is composed of institutions of secondary and collegiate rank within the boundaries of the State of California. It has no accrediting regulations for member institutions (24:4).

The requirements for teacher certification in Nebraska are as follows:

High School

- I. Graduation from a standard four-year college.
- II. Academic requirements in various subjects in semester hours:
  - A. English.....15
  - B. Any foreign language.....15
 

Note: 6 hours in addition to 2 High School units will be accepted as a teaching minor.
  - C. History (including Economic History) plus 3 hours in each subject taught.....15
  - D. Other Social Sciences (including Economic Geography) plus 3 hours in each subject taught.....15
  - E. Mathematics.....15
 

Note: 6 hours in addition to 3 High School units will be accepted as a teaching minor.
  - F. Biological Sciences--any combination (botany, physiology, etc.) plus 3 hours in each subject taught....15
  - G. Physical Sciences--any combination (astronomy, chemistry, geography, etc.) plus 3 hours in each subject taught.....15
- III. Professional requirements--semester hours in education (at least 3 hours of which must be in Supervised or Practice Teaching).....18

- IV. Special requirements for non-academic subjects, as Art, Music, etc.
- V. Physiology and Hygiene (with special reference to evil effects of narcotics and stimulants on the human system)--semester hours..... 2  
(24:53)

The above information answers the question of teacher qualifications in general. It remains to be found if there are any specific qualifications for industrial arts teachers in the state of Nebraska.

The following information that pertains to this study has been found:

1. The pattern of industrial arts courses provided in other state teachers colleges.
2. Subject combinations being taught in Kansas, Missouri, and Iowa.
3. The state requirements that govern the certification of teachers.

Information on the following items was not found in the review of literature:

1. The academic patterns of subjects provided for industrial arts majors in other state teachers colleges.
2. The subjects which have been taught most frequently in the past 10 years by Peru graduates who have industrial arts majors.
3. The curriculum patterns which are provided for industrial arts majors at Peru State Teachers College.

4. Recommendations for course revision at Peru.

Methods for finding the answers to the subordinate questions are described in Chapter III.

### Chapter III

#### MATERIALS AND METHODS

Research currently available has supplied some evidence that will be useful in determining what changes are necessary in the Peru plan for training industrial arts majors. Further information needed was obtained from the following sources:

1. Peru State Teachers College files of student records which were kept on file in the registrar's office. The registrar keeps an accumulative report of each student from the date entering to the date leaving, majors, minors, and marks received in each course. These records are used by the registrar in making all official transcripts.
2. Peru State Teachers College graduates with industrial arts majors during the past ten-year period, 1932-42, because these industrial arts majors are engaged in teaching, they are being confronted by the problems common to the teaching field such as: teaching a variety of subjects, subject combinations, new subjects, and keeping abreast of the times. For these reasons a report on the effectiveness of their

training would provide valid information on the following: industrial arts courses being taught; subject combinations being taught with industrial arts; rating of professional and industrial arts training; professional subjects in which teachers thought more training should be required; industrial arts courses in which teachers thought more training should be given; industrial arts courses which should be offered but were not when they received their training; the minors industrial arts majors would choose should they repeat their training.

3. Peru State Teachers College catalog, 1942-43, which provided an accurate description of the present and active policies which the student must follow in preparing himself to teach.
4. College catalogs from 44 other state teachers colleges offering industrial arts majors, which gave descriptions of the course offerings in the specific college. This information is descriptive of requirements in other parts of the United States.
5. Nebraska State Department of Public Instruction, records of the division of certification. This department makes annual compilations of state certification requirements for all types of teaching certificates. These compilations

form the basis of certification of teachers in Nebraska.

6. The records of the Peru State Teachers College Placement Bureau. The chairman of the bureau keeps an accumulative record of each student placed by the bureau. In addition annual records are kept of the number of calls for each subject and subject combinations.

#### METHODS

This information was obtained by four methods.

1. Tabulation of data from official permanent records was used in obtaining new information. Every tabulation was checked twice to assure accuracy and reliability. This method was applied to files of student records, catalogs from other teachers colleges, 1941-42, and the Peru State Teachers College Catalog, 1942-43. Conferences with the registrar at Peru were held frequently for the purpose of being assured that correct information was derived from the records. The head of the department of industrial arts checked the list of graduates and added the present address of several.
2. A written request for college catalogs was sent to 107 state teachers colleges. The material taken from these catalogs was tabulated as explained above.

3. A written inquiry was sent to the State Department of Public Instruction, Lincoln, Nebraska. Information was requested concerning specific requirements for certification of industrial arts teachers.
4. A questionnaire was used for obtaining information from Peru graduates of the past ten-year period who were teaching industrial arts (Appendix A). Peru graduates with industrial arts majors are teaching in 19 states throughout the United States. For this reason, it was impossible to conduct a personal interview as a method of obtaining the desired new information. A questionnaire seemed the only feasible way of securing the desired data concerning subject combinations graduates were teaching, expressions of attitudes, opinions, and judgments regarding minors they would choose should training be repeated, and how they would rate the type of training received at Peru. To assure a better response, a personal letter was written, a self-addressed stamped envelop was enclosed, and the respondents were offered a summary of the findings (11). The questionnaire form was as short as possible requiring brief responses and entries of the simple types (11). In securing

somewhat similar information from studies made in this field the content of the questionnaire was based upon the categories used by Whitney (23), Inman (9), Fryklund (8), and Talley (22). These categories covered industrial arts courses graduates were teaching, additional industrial arts courses requested by teachers, subject combinations taught by industrial arts majors, rating of professional and industrial arts courses, professional and industrial arts courses in which graduates desired more training, and selection of minor fields in combination with an industrial arts major. A picture is given in Chart 1, on the following page, to show how these four methods are applied to the six sources in obtaining the necessary information.

The data resulting from the sources and methods just described are tabulated and presented in Chapter IV.

Chart 1.--MATERIALS AND METHODS

Sources	Authenticity	Materials secured	Techniques	Adequacy
Peru State Teachers College files of student records.	Information secured from official records in the registrar's office.	List of industrial arts majors who had graduated in the past ten years, 1932-42.	Tabulation of material taken from records and student registration cards. Credit hours individual had received in industrial arts was checked and rechecked to make sure he was an industrial arts major.	83 industrial arts majors.
All Peru State Teachers College graduates with industrial arts majors during the past ten-year period, 1932-42.	Information secured from Peru graduates with industrial arts majors who were actually teaching shop courses.	Industrial arts courses being taught. Subject combinations with industrial arts. Rating of professional and industrial arts training. Professional subjects in which teachers thought more training should be required. Industrial arts courses in which teachers desired more training. Additional industrial arts courses requested by teachers. Minors industrial arts majors would choose if they were to repeat their training.	Questionnaire and follow-up letter four weeks later was sent to industrial arts majors.	52 returned questionnaires from Peru graduates teaching in 19 states. 2 of the above were returned unanswered.
Peru State Teachers College catalog, 1942-43.	Information secured from Peru's authorized 1942-43 catalog.	Industrial arts major requirements. Electives in industrial arts. Professional requirements. General education requirements.	Tabulation of material taken from catalog, checked twice. Conferences with the registrar.	Includes authoritative policies which the student must follow in preparing himself to teach in Nebraska.
Nebraska State department of Public Instruction, records of the division of certification.	Information secured directly from the state department of certification of teachers.	Personal letter. "Certification Digest," a sheet on which is listed the various types of certificates issued.	A letter of inquiry was sent to the office of State Superintendent.	Includes official state requirements for certification of teachers in Nebraska.
The records of Peru State Teachers College Placement Bureau.	Information secured from the annual summary sheets.	Number of calls for subject combinations. Number of calls for each subject.	Tabulation of data.	The only place where records of requests for Peru teachers are available.

## Chapter IV

## FINDINGS

Curriculum characteristics in academic subjects, professional subjects, and shop subjects have been found by the application of methods to sources. In addition, information has been secured from Peru graduates on the needs for additional training in terms of their teaching experiences. The graduates of Peru State Teachers College are distributed throughout the states of the North Central Association area and some of them are scattered more widely (Figure 1). Other information was secured on such subjects as state requirements for certification of teachers in Nebraska, industrial arts courses and subject combinations industrial arts majors were teaching, rating of industrial courses, rating of professional courses, and minors industrial arts majors would choose should they repeat their training. This information is presented in a set of tables. The material taken from the college catalogs was compiled into Tables 1 and 2 which follow. These tables contain information on academic subjects required of industrial arts majors, professional subjects industrial arts majors are required to take, and elective and required shop courses of each teacher

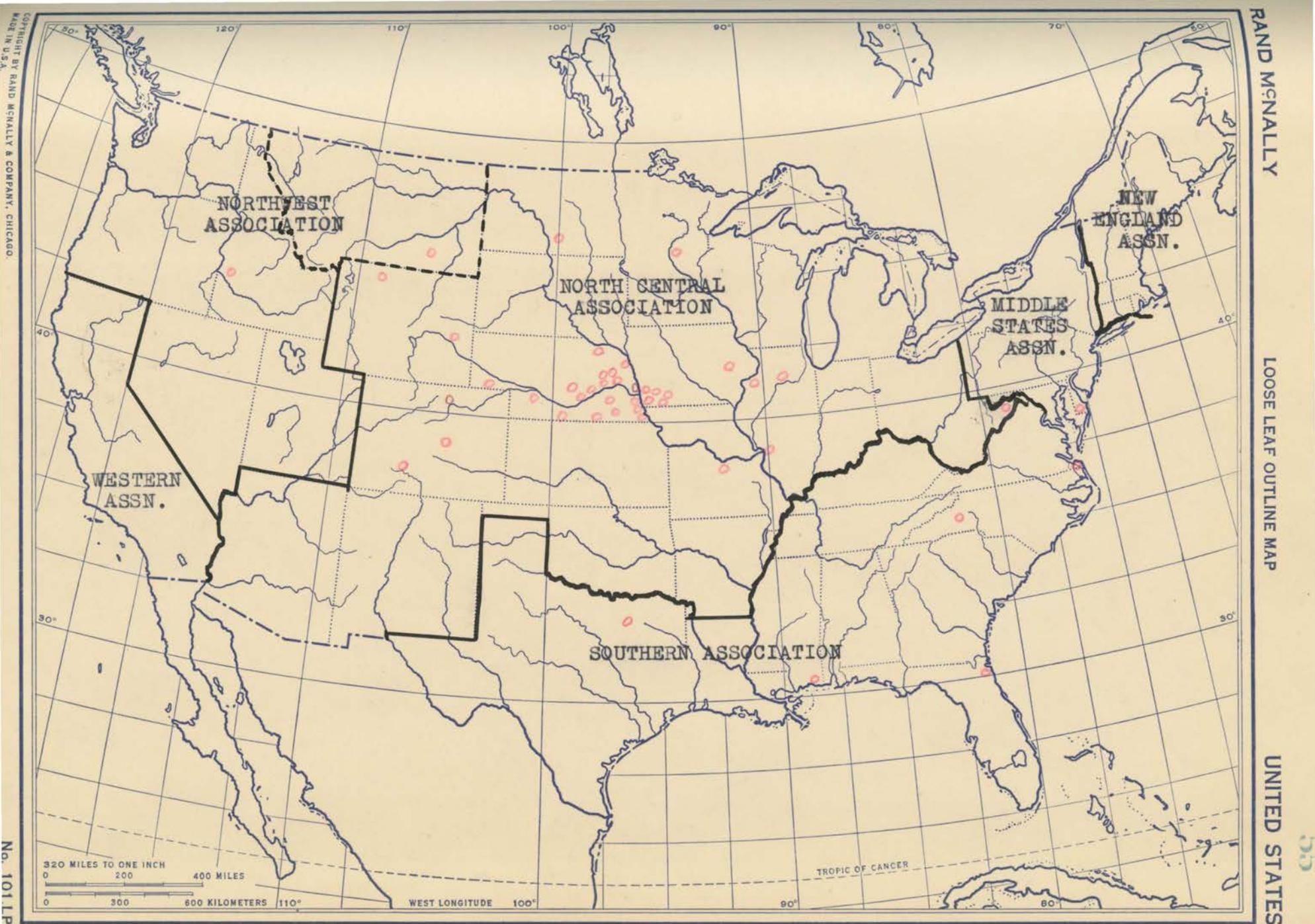


Figure 1.--Location of Peru graduates teaching industrial arts.





training institution listed. The number of semester hours of credit for each subject and the average credit which the schools offer for the various courses are also shown. This material was summarized in graphic forms for purposes of comparison and consideration.

By applying the method of tabulating industrial arts offerings from college catalogs, it was found that woodworking exceeds other shop offerings in industrial arts teacher education (Figure 2). By referring to this figure it can be noticed that 43 of the 45 institutions in five regional areas require an average of 3.4 semester hours credit in bench and hand woodworking. Thirty-four of the 45 schools offer an average of 4.5 semester hours elective credit. Thirty-one schools of the 33 studied in the North Central Association area require woodworking in the elementary form. The average credit is 3.4 semester hours. Twenty-six of the 33 teacher training institutions in this same area offer elective credits in elementary woodworking. These elective credits average 3.6 semester hours. Fryklund (8:47) found that 84 institutions of 90 reporting required an average of 3.4 semester hours credit in bench and hand woodworking. The electives were not recorded. Wood turning is required in 12 of the 45 colleges in the five regional areas and is also required in 34 of the schools in Fryklund's study (8:47).

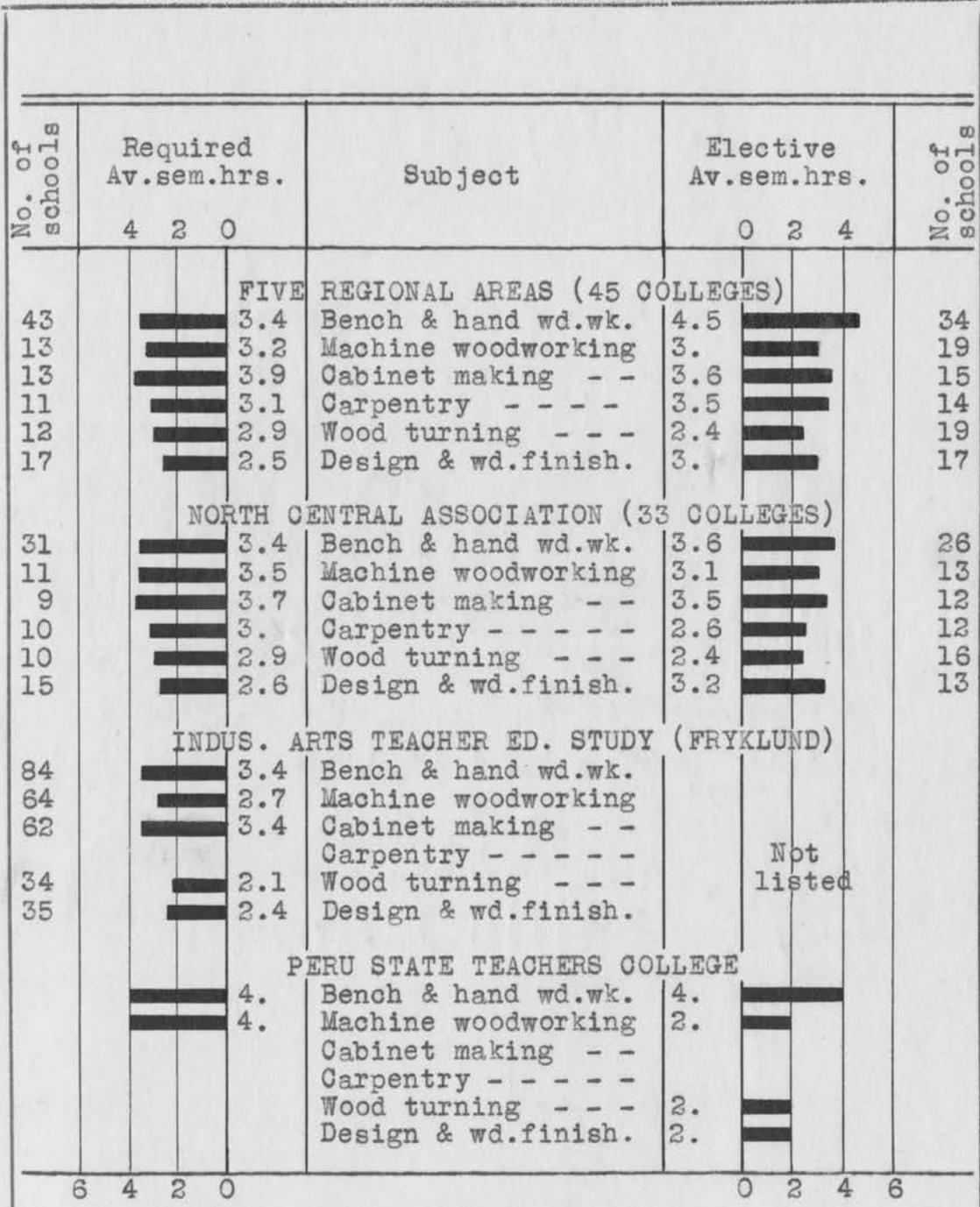


Figure 2.--Courses in woodworking as reported in state teachers college catalogs.

Similar data have been gathered on drafting (Figure 3). An average of 4.6 semester credits was required in 25 of the 33 colleges in the North Central Association area. Architectural drawing exceeds all elective offerings in the drafting department of the 45 schools throughout the five regional areas.

Metalworking follows drafting in the number of schools offering it (Figure 4). General metals was required in 20 of the 33 schools in the North Central Association area. One of the 33 colleges in this area required a separate course in forge and foundry practice.

Elementary electricity is the highest electrical requirement in the 45 institutions studied in the five regional areas (Figure 5). Eighteen of these 45 schools offer elective electricity courses.

These findings also revealed that arts and crafts courses were required in 22 of the 45 colleges in the five regional areas (Figure 6). Seventeen of the schools in Fryklund's study (8:51) required an average of 2.3 semester credits in art metal.

In the same study Fryklund (8:52) found that 28 schools had an average of 2.9 credits required in printing (Figure 7). Six of the 33 schools in the North Central Association area offer an average of 11 elective semester hours in printing.

Six schools in the same area have an average

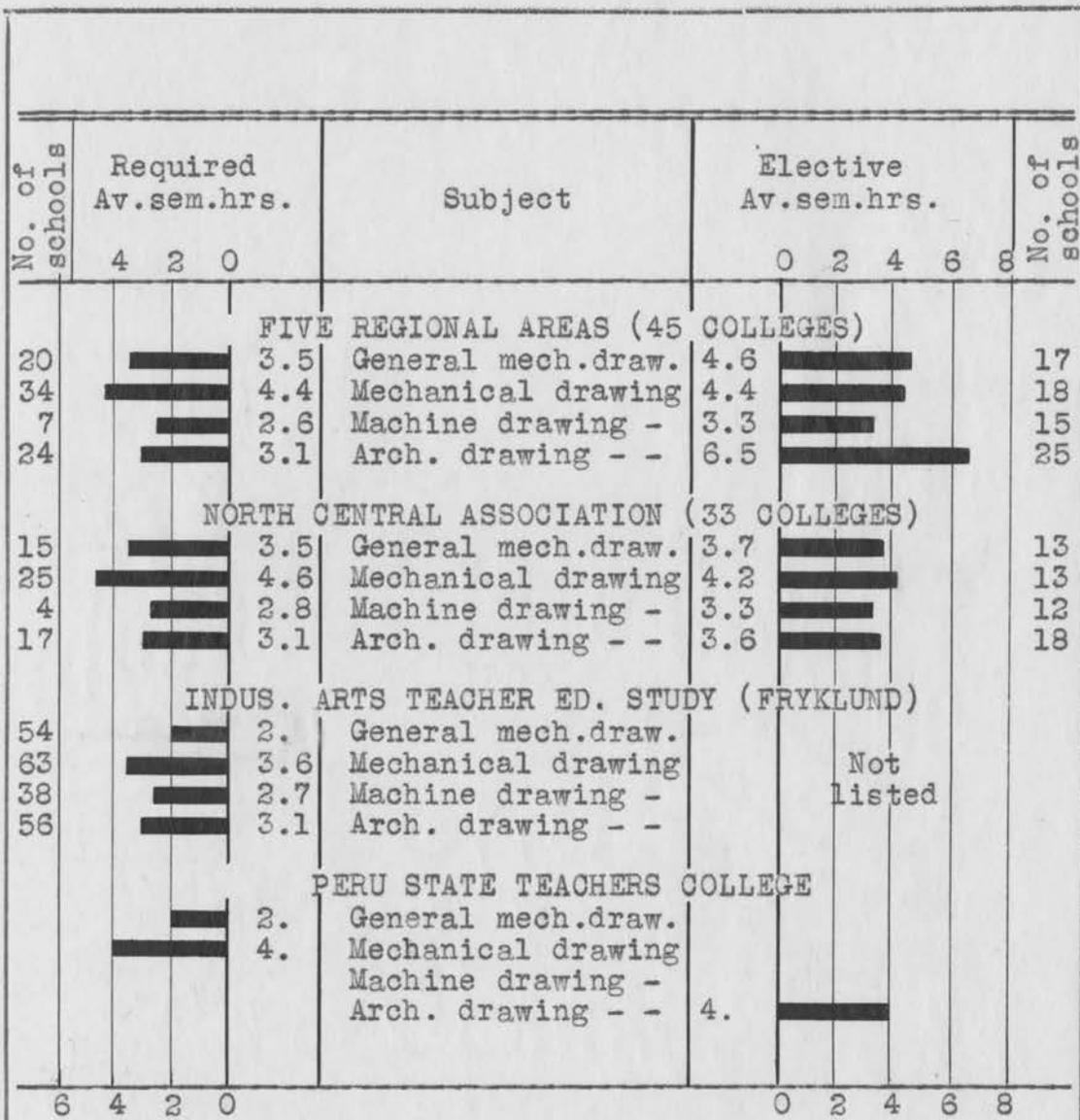


Figure 3.--Courses in drafting as reported in state teachers college catalogs.

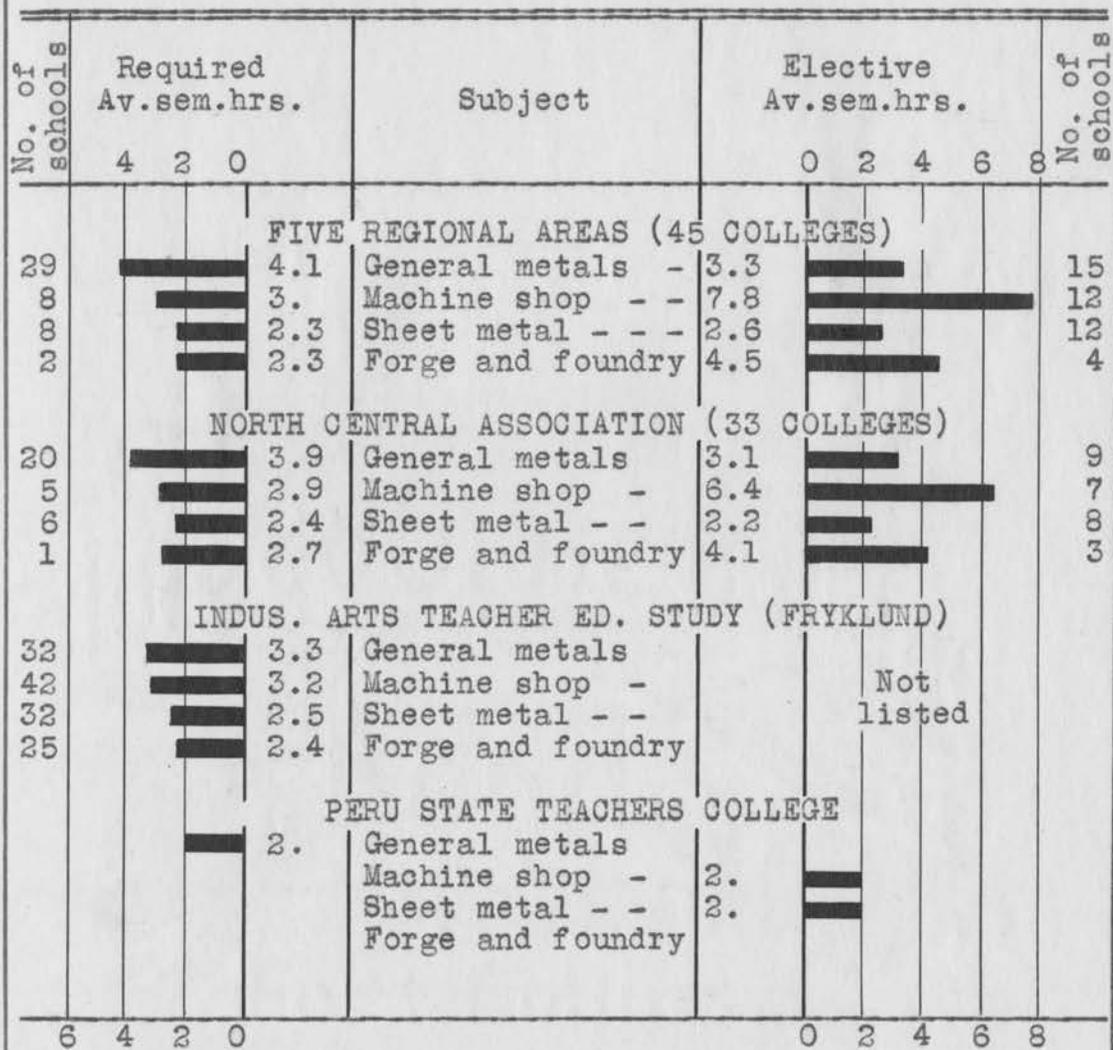


Figure 4.--Courses in metalworking as reported in state teachers college catalogs.

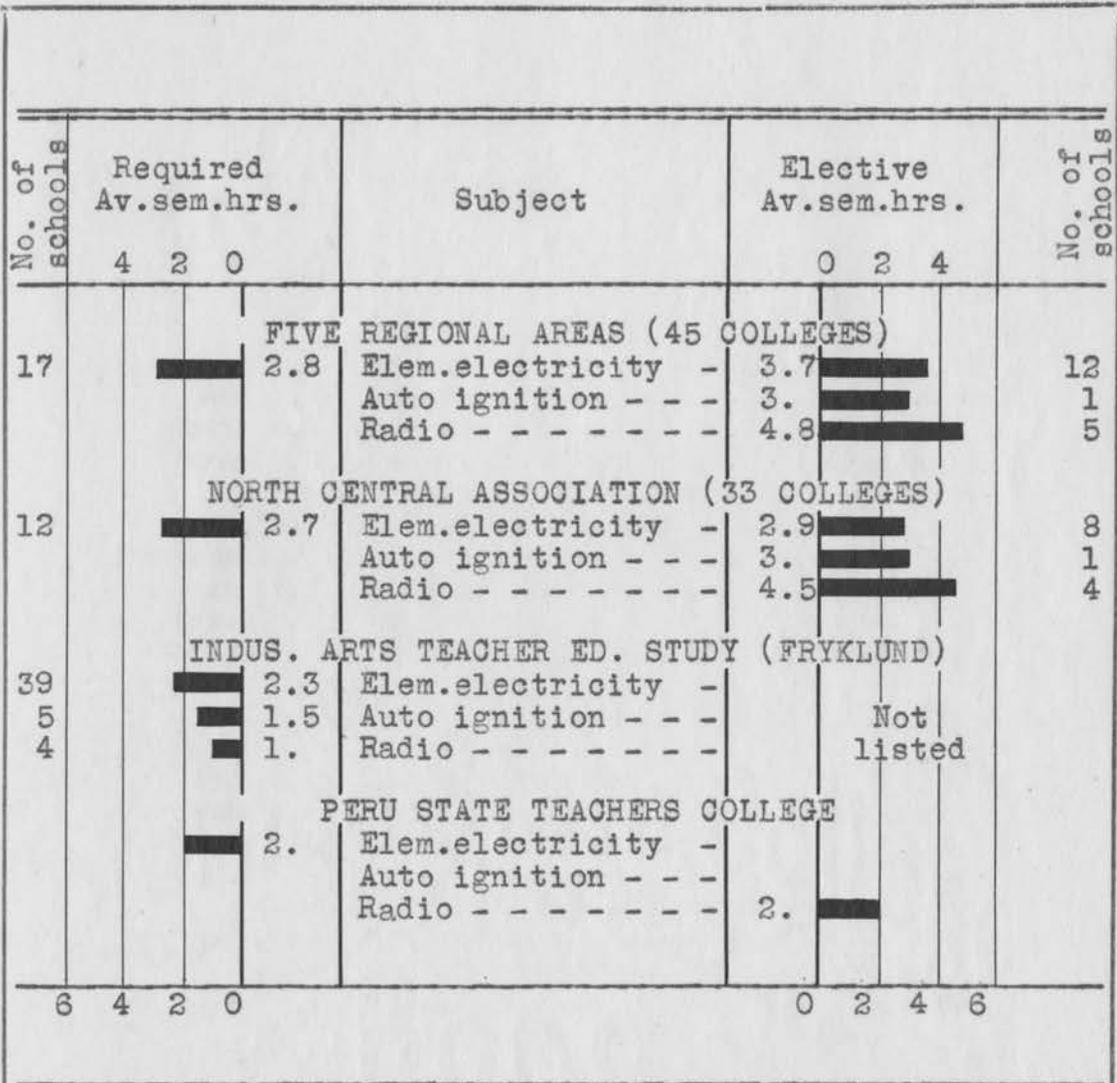


Figure 5.--Courses in electricity as reported in state teachers college catalogs.

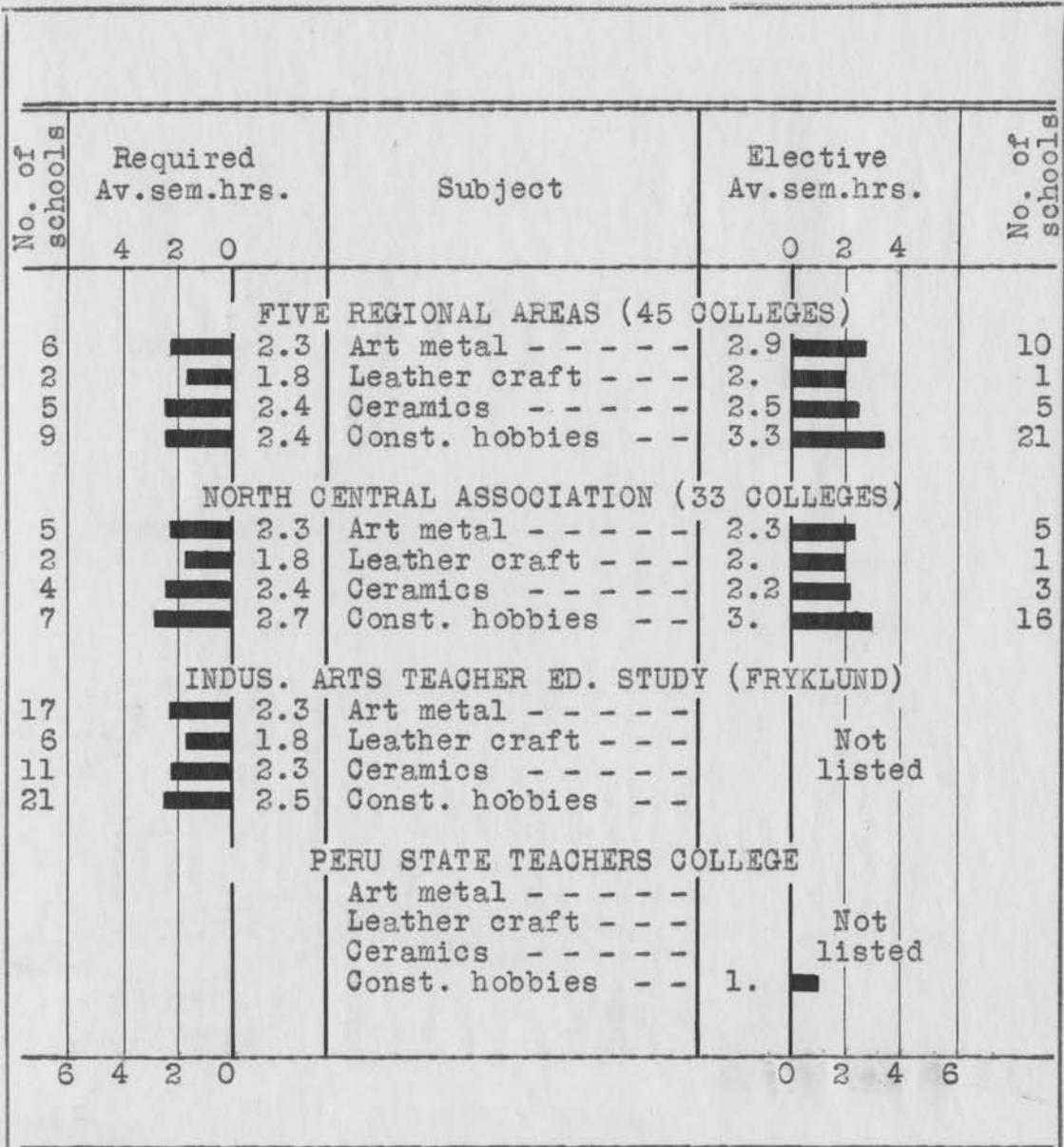


Figure 6.--Courses in arts and crafts as reported in state teachers college catalogs.

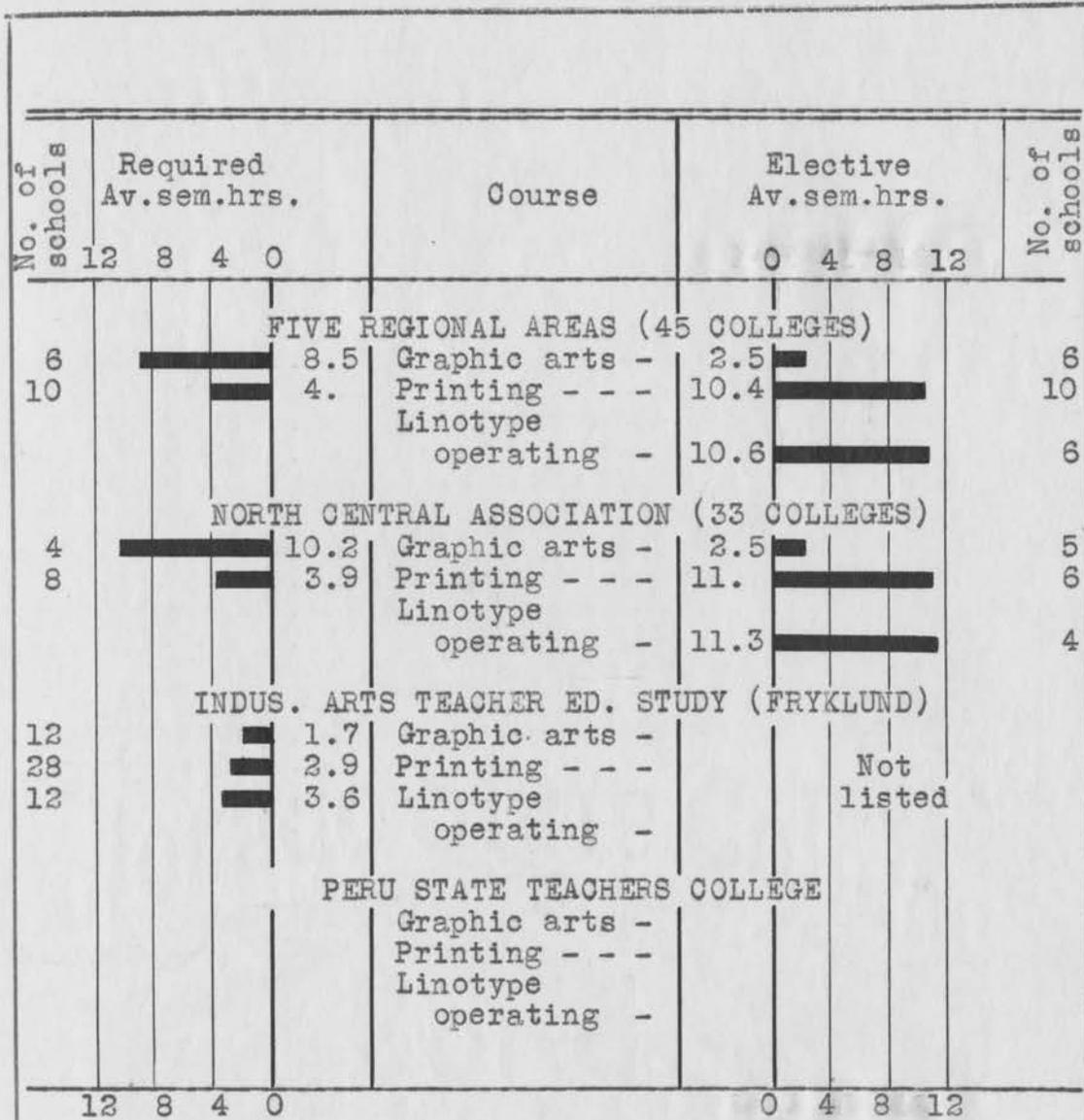


Figure 7.--Courses in graphic arts as reported in state teachers college catalogs.

requirement of 3.6 semester credits in auto mechanics (Figure 8). Elective credits averaging 6.4 semester hours were offered in auto mechanics by 11 schools of the 45 in the five regional areas.

Two institutions in the Western Association area listed mechanics courses in the aeronautical division (Figure 9). All offerings in this division are elective. Of the 45 colleges in the five regional areas, two were found that offered training in airplane engines and three in pilot ground school.

Other industrial arts courses not listed above were grouped in a miscellaneous division (Figure 10). It will be noticed that seven schools of the 33 schools in the North Central Association area require an average of 1.8 credits in shop maintenance.

The findings revealed that industrial arts majors are required to take specific patterns of general and professional education courses in addition to shop courses enumerated above (Figures 11, 12, 13, 14, and 15). After tabulating data from the catalogs it was found that English was required in 30 institutions studied in the North Central Association area (Figure 11). Sixteen of the schools studied in the five regional areas required an average of 5.4 semester credits in mathematics. Sciences were required in 24 of the 33 colleges in the North Central Association area.

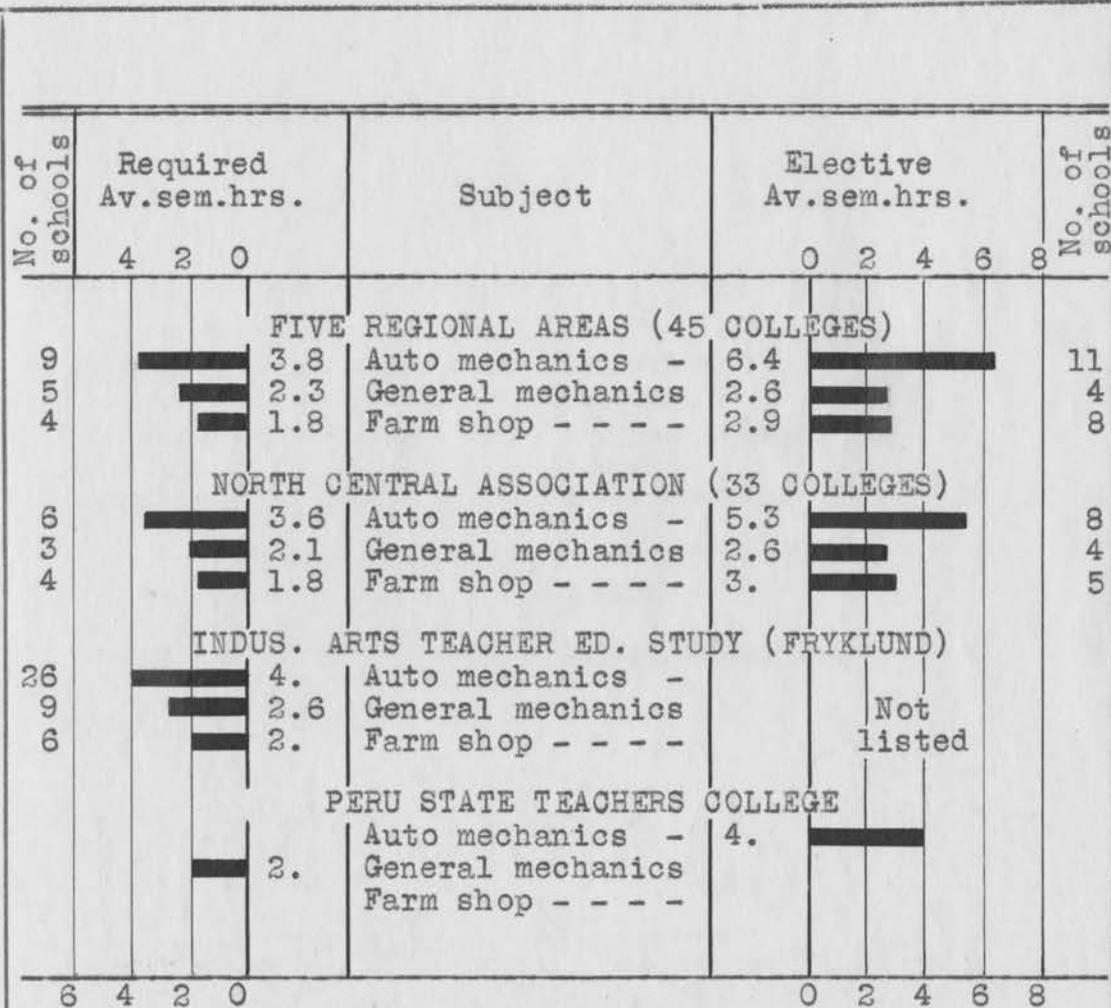
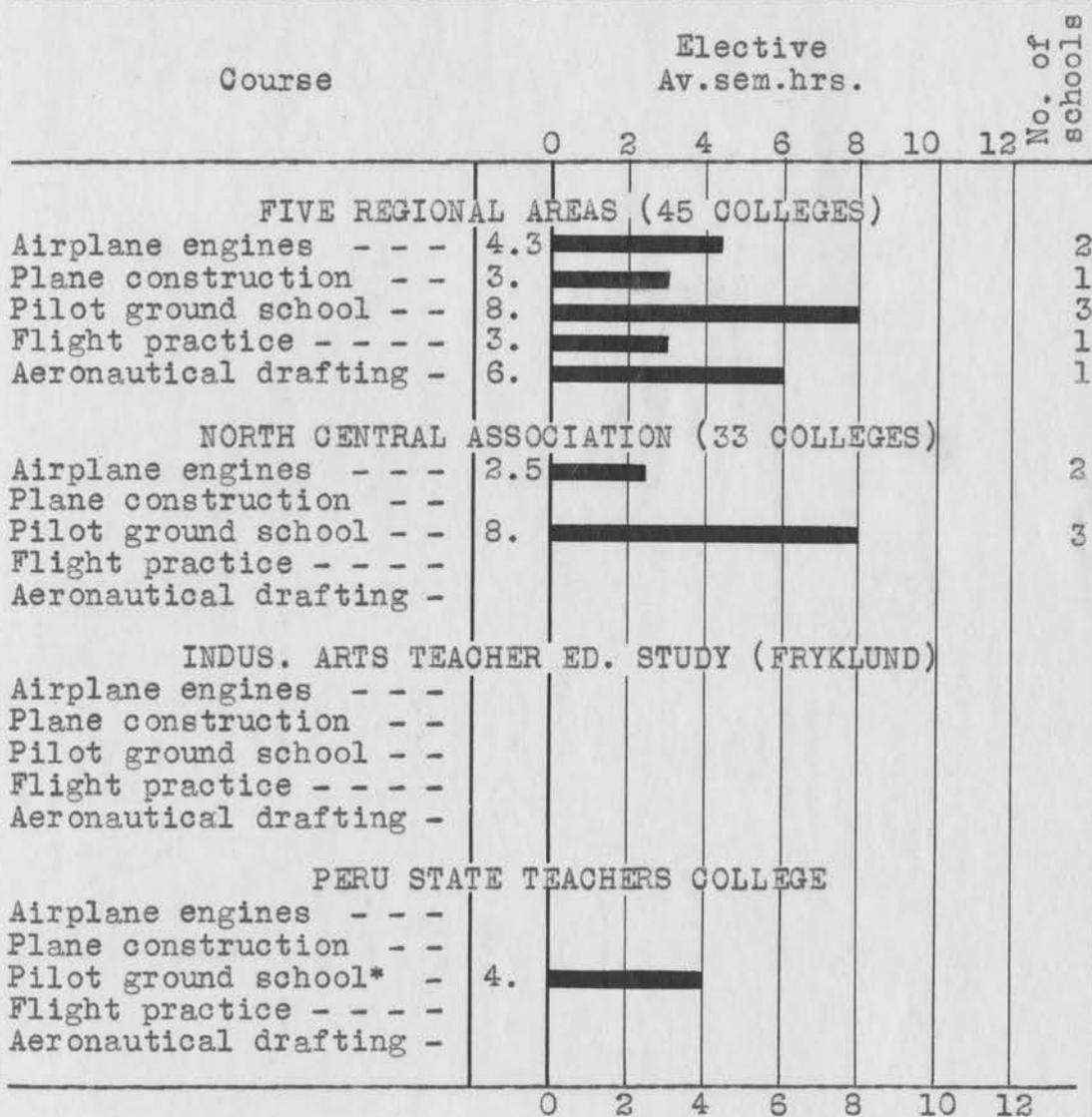


Figure 8.--Courses in general mechanics as reported in state teachers college catalogs.



\*Pilot ground school is taught in the science department.

Figure 9.--Aeronautical courses in the industrial arts department as reported by state teachers colleges.

No courses required

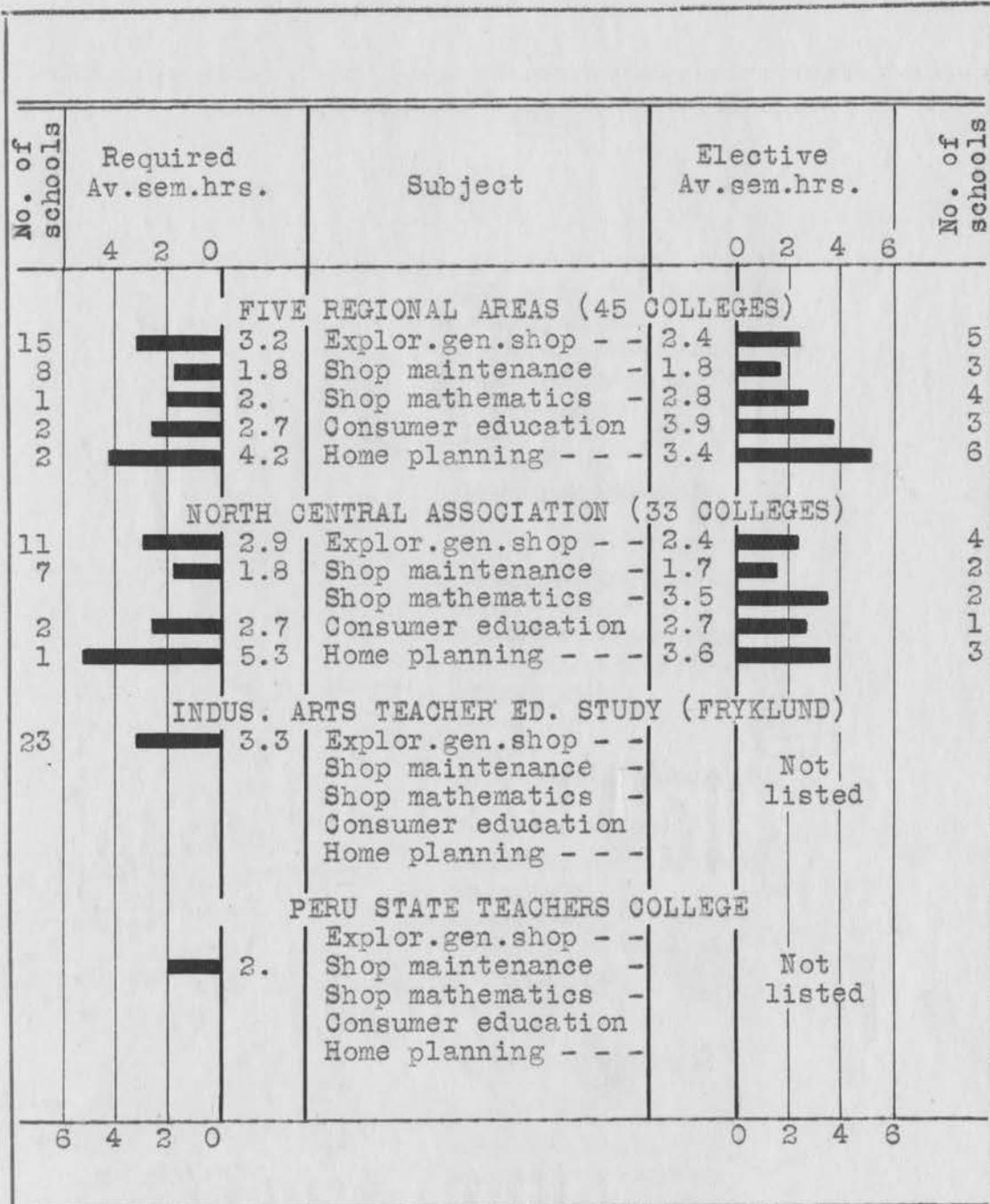
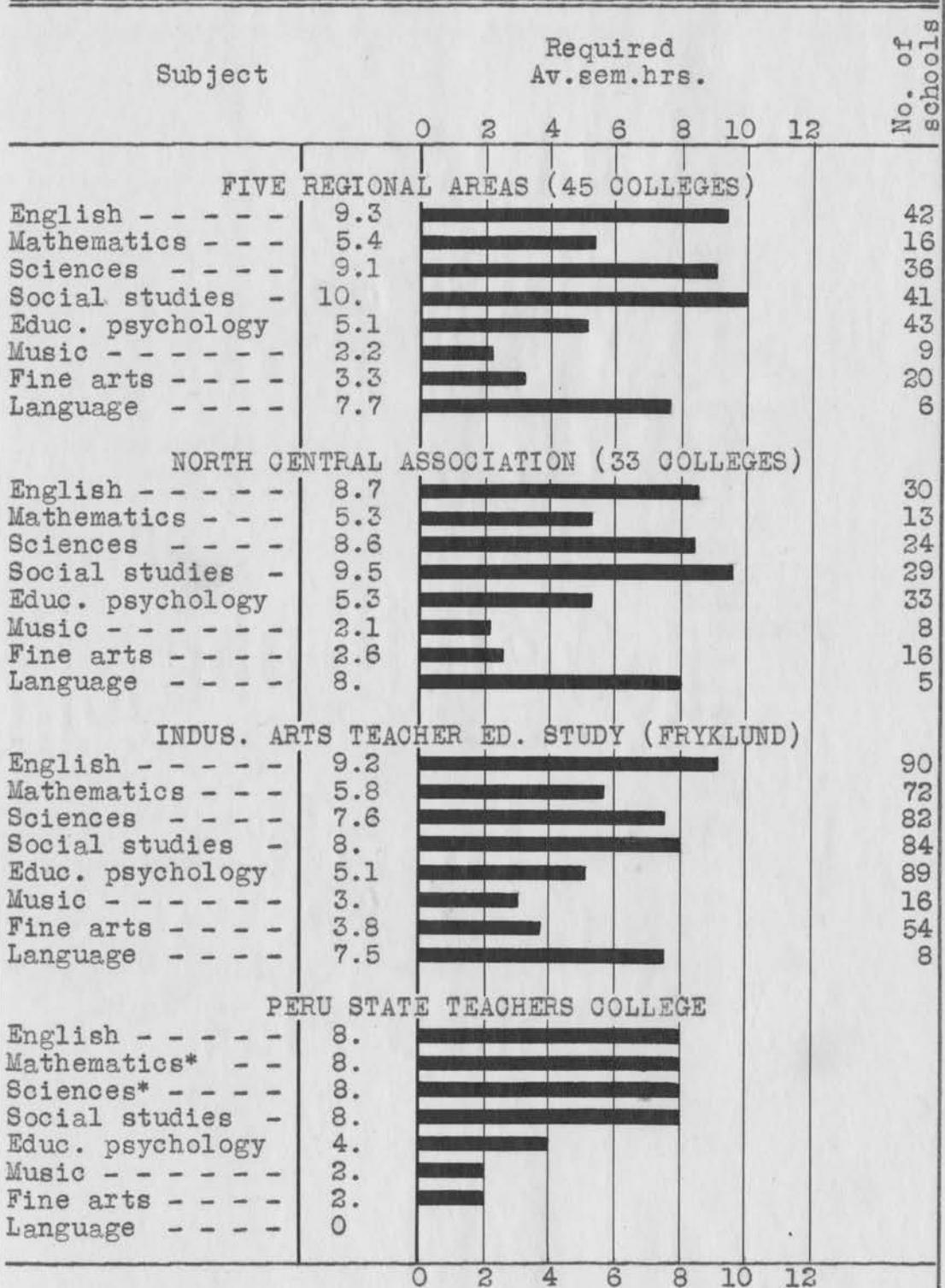


Figure 10.--Miscellaneous courses as reported in state teachers college catalogs.



\*Students have a choice of eight hours of mathematics or science.

Figure 11.--Academic courses as reported in state teachers college catalogs.

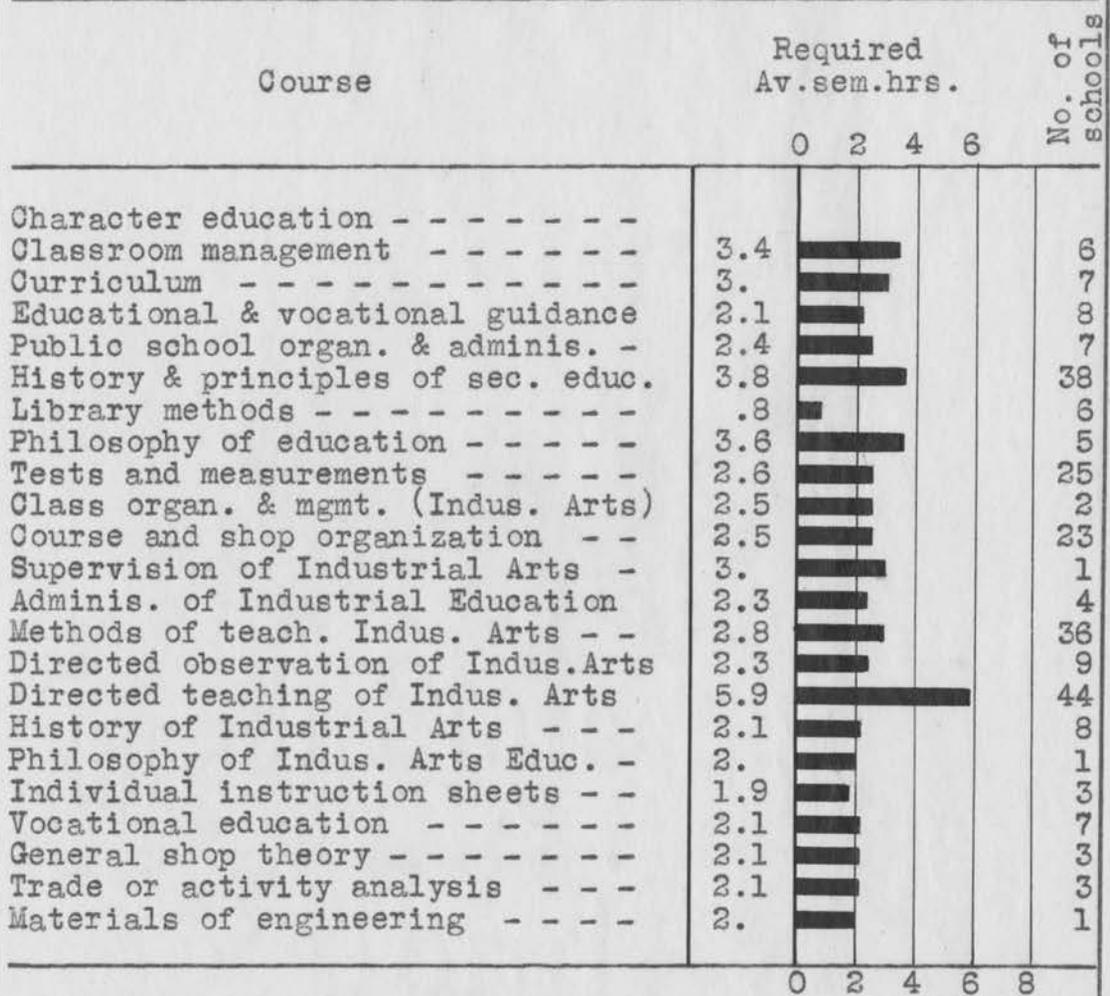


Figure 12.--Courses in education as reported in 45 state teachers college catalogs in five regional areas.

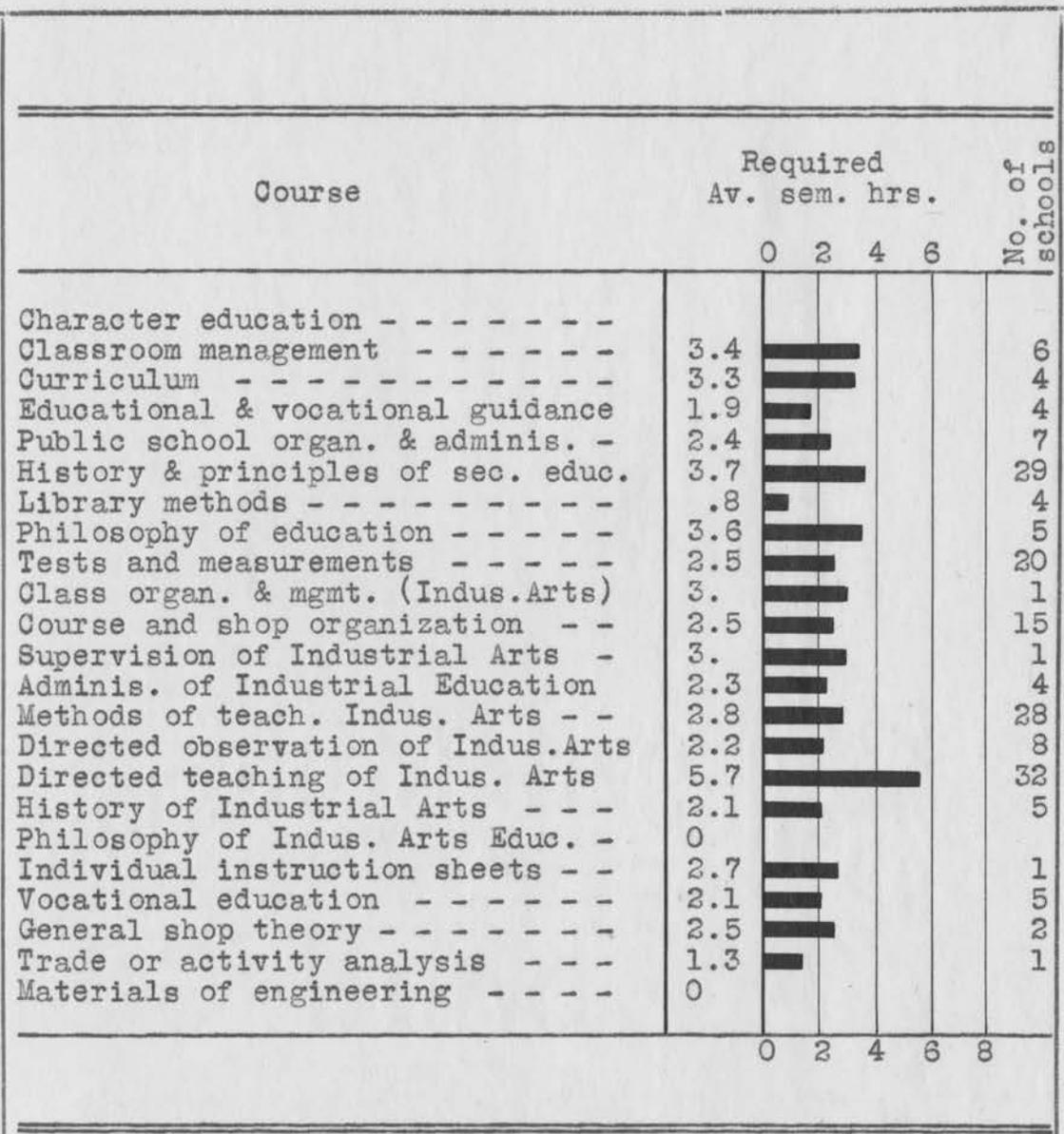


Figure 13.--Courses in education as reported in 33 state teachers college catalogs in the North Central Association.

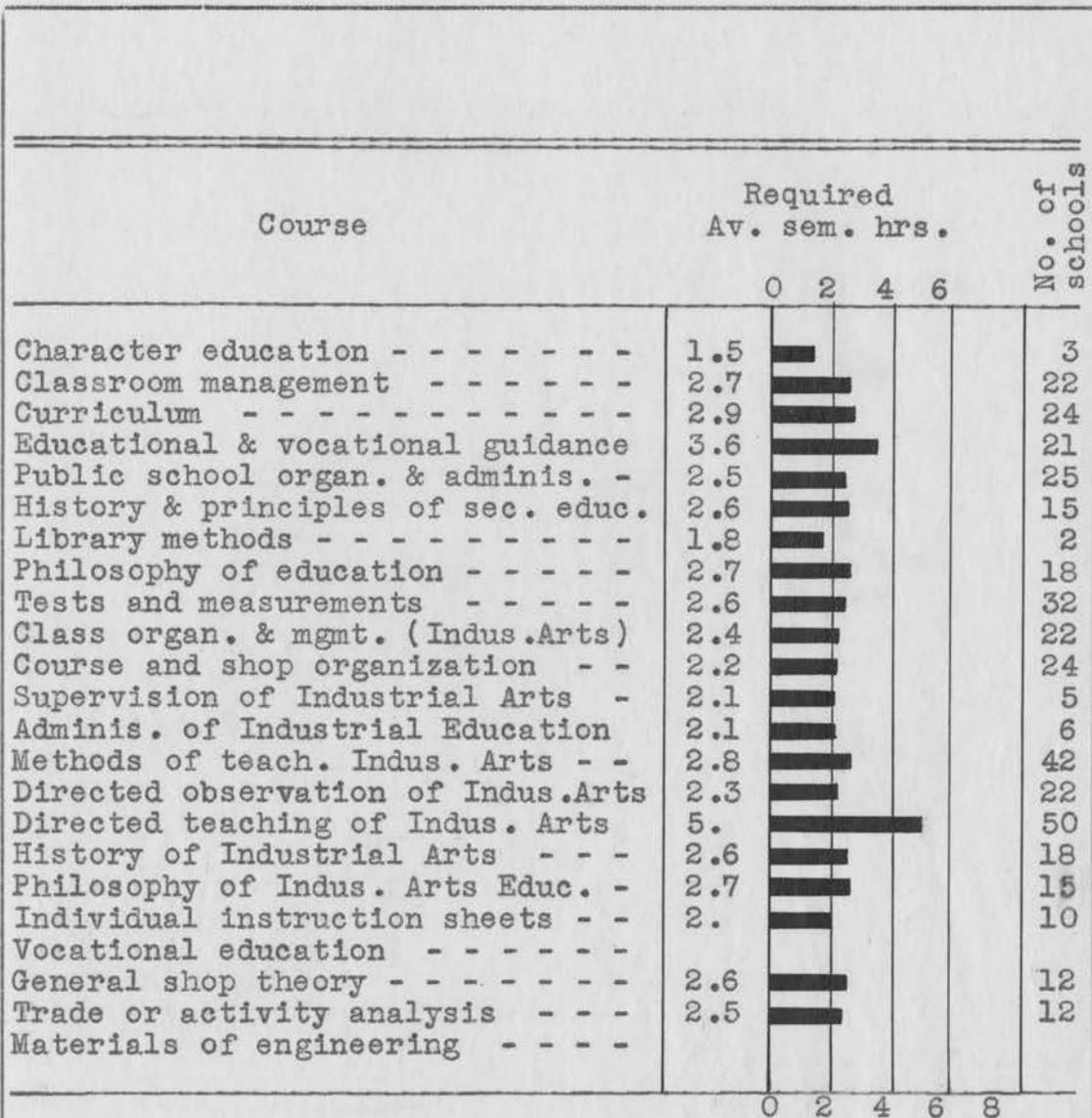


Figure 14.--Courses in education as reported in state teachers college catalogs--Fryklund's study of Industrial Arts teacher education.

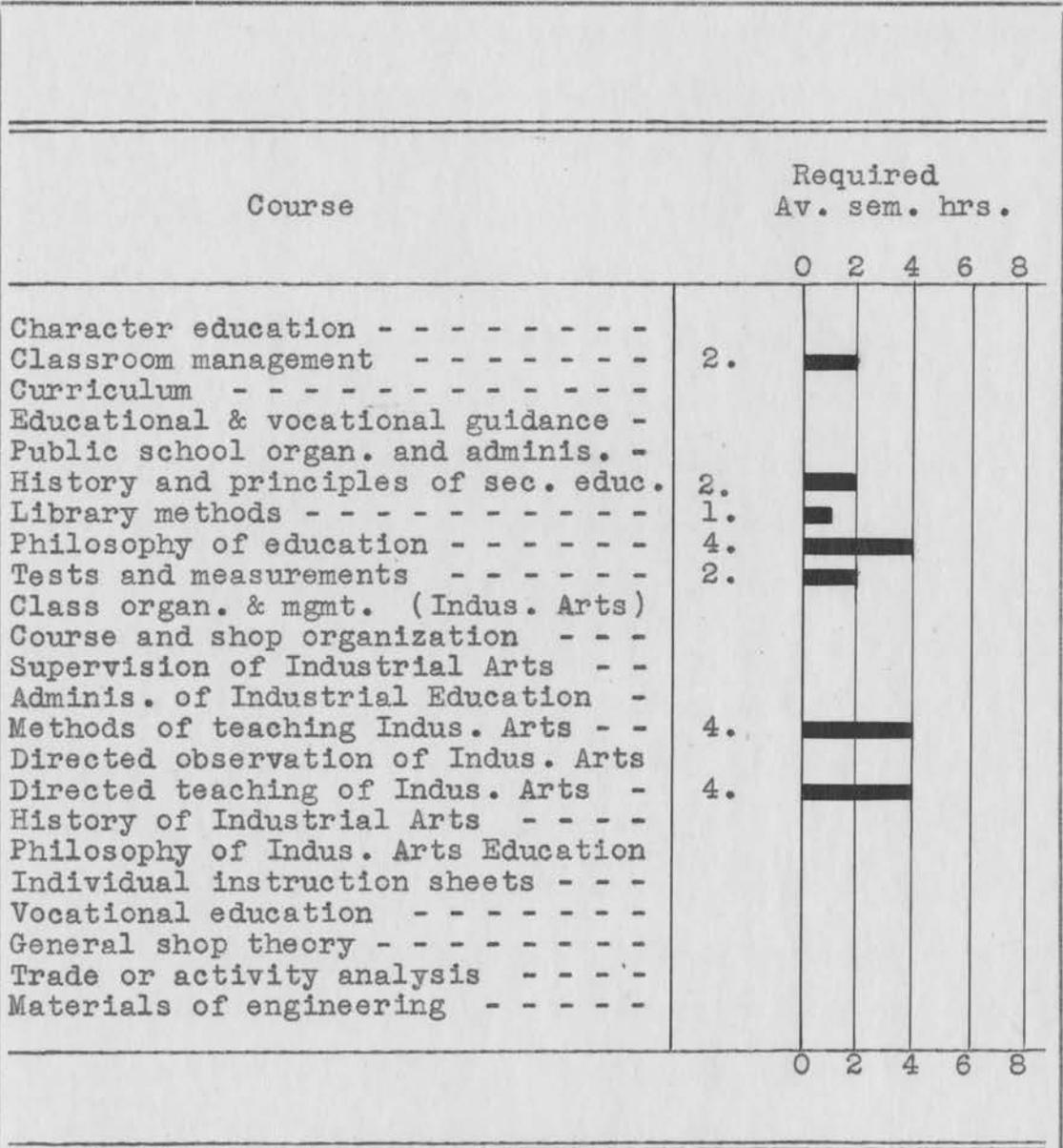


Figure 15.--Courses in education as reported in Peru State Teachers College catalog.

The educational courses required of graduates in addition to the academic subjects are shown in Figures 12, 13, 14, and 15. In Figure 12 it will be noted that 44 of the 45 schools in the five regional areas required directed teaching in industrial arts. Five and nine-tenths hours was the average required credit for the 44 institutions. Nine institutions of this same group required directed observation of industrial arts teaching. In Figure 13 it will be noted that 32 of the 33 teachers colleges in the North Central Association required an average of 5.7 semester credits in directed teaching of industrial arts. Methods of teaching industrial arts was required by 28 schools in this same area. The mean semester credits was 2.8 hours. Fryklund (8:53) found that 50 of 83 teacher training institutions reporting required an average of five semester hours credit in directed teaching of industrial arts (Figure 14). Four semester hours in methods of teaching industrial arts are required of shop majors at Peru (Figure 15).

Industrial arts teachers, as well as other teachers, are required to complete specific educational requirements before they are eligible for teaching certificates. These requirements for types of certificates are shown on a sheet called "Certification Digest" (Appendix B). The credential required of all prospective teachers who plan to be certified for teaching in

the Nebraska secondary schools includes the completion of a four-year college teacher training course, baccalaureate degree, recommendation of school, minimum of 18 hours in education, (three in supervised teaching of grades seven to 12), two hours in physiology and hygiene, and 15 semester hours in two teaching fields. In addition to the above requirements, a prospective industrial arts teacher who wishes to teach shop courses in high schools of the state must have specialized training in industrial arts.

The majors from Peru are certified teachers who are teaching throughout several states (Figure 1, page 55). By using the questionnaire method, as described in Chapter III, and by tabulating the data received, it was found that 40 of the responding industrial arts majors were teaching woodworking (Table 3).

Mechanical drawing ranked second in frequency taught and metalworking ranked third. By glancing at the table it will be noted that art metal, handicrafts, forge practice, and ceramics were each mentioned once.

Woodworking was taught alone nine times (Table 4). Five different two-course combinations in industrial arts were reported. Four different six-course combinations of shop courses were also found. One industrial arts major was teaching 12 different shop courses.

The frequency of any two industrial arts

Table 3.--COURSES TAUGHT BY INDUSTRIAL ARTS MAJORS IN  
1941-42

Course	Alone	Frequency	Percentage
Woodworking (All) - - -	2	40	24.1
Mechanical drawing- - -		25	15.1
Metal working (General)		17	10.3
Sheet metal - - - - -		15	8.5
Blueprint reading - - -		12	7.3
Electricity - - - - -		12	7.3
Home mechanics- - - - -		11	6.7
Architectural drawing -		8	4.9
Leather craft - - - - -		5	3.0
Radio - - - - -		3	1.9
Wood turning- - - - -		3	1.9
Auto mechanics- - - - -		2	1.2
Plastics- - - - -		2	1.2
Machine lathe - - - - -		2	1.2
Gas welding - - - - -		1	.6
Fibre and furniture weaving- - - - -		1	.6
Handicrafts - - - - -		1	.6
Art metal - - - - -		1	.6
Airplane mechanics- - -	1	1	.6
Machine and detail drawing- - - - -		1	.6
Forge practice- - - - -		1	.6
Ceramics- - - - -		1	.6
Shop maintenance- - - -		1	.6
Total	3	166	100.0

Table 4.--COMBINATIONS OF INDUSTRIAL ARTS COURSES  
BEING TAUGHT BY PERU GRADUATES

Course Combinations	Number Teaching
<b>One Course</b>	
Woodworking- - - - -	9
Airplane mechanics - - - - -	1
Total teaching one course - -	10
<b>Two Courses</b>	
Woodworking and mechanical drawing -	4
Woodworking and general metals - - -	2
Woodworking and blueprint reading- -	2
Woodworking and home mechanics - - -	1
Mechanical and architectural drawing	1
Total teaching two courses- -	10
<b>Three Courses</b>	
Woodworking, home mechanics, and mechanical drawing - - - - -	3
Woodworking, general metals, and leather craft- - - - -	1
Woodworking, general metals, and sheet metal- - - - -	1
Total teaching three courses- -	5
<b>Four Courses</b>	
Woodworking, general metals, sheet metal, and home mechanics- - - - -	1
Woodworking, general metals, sheet metal, and mechanical drawing- - -	1
Woodworking, electricity, home me- chanics, and mechanical drawing- -	1
Mechanical drawing, architectural drawing, blueprint reading, and machine and detailed drawing - - -	1
Home mechanics, mechanical drawing, architectural drawing, and leather craft- - - - -	1
Total teaching four courses - -	5
<b>Five Courses</b>	
Woodworking, general metals, elec- tricity, sheet metal, and mechan- ical drawing - - - - -	1
Woodworking, general metals, elec- tricity, sheet metal, and blue- print reading- - - - -	1

Table 4.--COMBINATIONS OF INDUSTRIAL ARTS COURSES  
BEING TAUGHT BY PERU GRADUATES (continued)

Course Combinations	Number Teaching
<b>Five Courses (con't.)</b>	
Woodworking, home mechanics, mechanical drawing, architectural drawing, and leather craft - - - -	1
Total teaching five courses - -	3
<b>Six Courses</b>	
Woodworking, general metals, sheet metal, mechanical drawing, blueprint reading, and leather craft -	1
Woodworking, electricity, sheet metal, mechanical drawing, leather craft, and ceramics- - - -	1
Woodworking, electricity, sheet metal, mechanical drawing, blueprint reading, and shop maintenance- - - - - - - - - - - - - - -	1
Woodworking, general metals, electricity, sheet metal, mechanical drawing, and leather craft - - - -	1
Total teaching six courses- -	4
<b>Eight Courses</b>	
Woodworking, general metals, sheet metal, mechanical drawing, blueprint reading, architectural drawing, plastics, and art metal -	1
Woodworking, general metals, electricity, sheet metal, auto mechanics, mechanical drawing, blueprint reading, and architectural drawing- - - - - - - - - - - - - - -	1
General metals, electricity, sheet metal, home mechanics, mechanical drawing, radio, blueprint reading, and architectural drawing - -	1
Total teaching eight courses-	3
<b>Nine Courses</b>	
Woodworking, general metals, electricity, sheet metal, home mechanics, mechanical drawing, radio, blueprint reading, and machine lathe- - - - - - - - - - -	1

Table 4.--COMBINATIONS OF INDUSTRIAL ARTS COURSES  
BEING TAUGHT BY PERU GRADUATES (continued)

Course Combinations	Number Teaching
<b>Nine Courses (con't.)</b>	
Woodworking, general metals, elec- tricity, home mechanics, mechan- ical drawing, blueprint reading, architectural drawing, wood turn- ing, and handicraft- - - - -	1
Total teaching nine courses-	2
<b>Ten Courses</b>	
Woodworking, general metals, elec- tricity, sheet metal, mechanical drawing, architectural drawing, wood turning, forge practice, plastics, and machine lathe- - - -	1
Total teaching ten courses -	1
<b>Twelve Courses</b>	
Woodworking, general metals, elec- tricity, sheet metal, home me- chanics, auto mechanics, mechan- ical drawing, radio, blueprint reading, gas welding, fibre fur- niture weaving, and wood turning -	1
Total teaching twelve courses	1

courses being taught by graduates is given in Table 5. The woodworking and mechanical drawing combination was reported 16 times. Woodworking and handicrafts were found to have been taught once. Leather craft and home mechanics were taught together twice.

Besides teaching various industrial arts course combinations these graduates were also teaching other academic subjects in the school curriculum (Table 6). Seventeen were teaching industrial arts and one other subject. Ten of the 17 were teaching shop and were coaching. Eight were teaching industrial arts and two other subjects. Mathematics and coaching were the most frequent two-subject combinations with shop work. Six graduates were teaching industrial arts and three other subjects. One was teaching five subjects in addition to shop courses.

Since these industrial arts graduates were teaching numerous shop courses and subject combinations, they were asked to rate the quality of industrial arts training given at Peru State Teachers College in terms of their experiences (Table 7). Industrial arts training was rated good by 60.8 per cent of the respondents. Twenty-three and nine-tenths per cent rated the training excellent.

The industrial arts courses in which more teacher training was requested are listed in Table 8. Additional training in general metals was requested 18



Table 6.--COMBINATIONS OF HIGH SCHOOL SUBJECTS TAUGHT BY INDUSTRIAL ARTS MAJORS IN 1941-42

Subject	Number Teaching	Subject	Number Teaching
Industrial Arts (Alone)- - - - -	14	Industrial Arts and Three Subjects -	
Industrial Arts and One Subject		Mathematics, Coaching, and Biology	1
Coaching- - - - -	10	Commerce, Music, and Geography- -	1
Mathematics - - - - -	2	History, Social Science, and Music	1
Commerce- - - - -	2	Mathematics, Coaching, and Social	
Physical Education- - - - -	1	Science- - - - -	1
Physical Science- - - - -	1	History, Coaching, and Commerce -	1
Biology - - - - -	1	History, Coaching, and Social	
Total Teaching Industrial Arts		Science- - - - -	1
and One Subject- - - - -	17	Total Teaching Industrial Arts	
Industrial Arts and Two Subjects		and Three Subjects - - - - -	6
Mathematics and Coaching- - - - -	3	Industrial Arts and Four Subjects- -	
Mathematics and Physical Science-	1	Coaching, Agriculture, Physical	
Mathematics and Commerce- - - - -	1	Science, and Biology - - - - -	1
Physical Education and Social		Total Teaching Industrial Arts	
Science- - - - -	1	and Four Subjects- - - - -	1
English and History - - - - -	1	Industrial Arts and Five Subjects	
Physical Education and Commerce -	1	Mathematics, English, History,	
Total Teaching Industrial Arts		Commerce, and Music	1
and Two Subjects - - - - -	8	Total Teaching Industrial Arts	
Total Teaching		and Five Subjects- - - - -	1
Mathematics - - - - -	10	Total Teaching (con't.)	
English - - - - -	2	Social Science- - - - -	4
History - - - - -	5	Agriculture - - - - -	1
Physical Education- - - - -	3	Physical Science- - - - -	3
Coaching- - - - -	18	Biology - - - - -	3
Commerce- - - - -	7	Music - - - - -	3
		Geography - - - - -	1

Table 7.--QUALITY OF INDUSTRIAL ARTS TRAINING AS RATED  
BY TEACHERS SINCE 1932

Rating by Graduates	Number of Respondents	Percentage
Excellent - - - - -	11	23.9
Good- - - - -	28	60.8
Fair- - - - -	7	15.3
Poor- - - - -	0	0
Totals*	46	100.0

\*Of the 52 respondents some did not answer all of the questions.

Table 8.--INDUSTRIAL ARTS COURSES AS SUGGESTED BY TEACHERS IN WHICH MORE TEACHER TRAINING SHOULD BE OFFERED

Course	Frequency	Percentage
General metals - - - - -	18	12.2
Electricity- - - - -	14	9.5
Sheet metal- - - - -	11	7.4
Auto mechanics - - - - -	10	6.8
Machine lathe- - - - -	8	5.5
Farm and home mechanics- - - - -	7	4.7
Gas welding- - - - -	6	4.1
Arc welding- - - - -	6	4.1
Mechanical drawing - - - - -	5	3.4
Forge practice - - - - -	5	3.4
Hand woodworking - - - - -	5	3.4
Art metal- - - - -	5	3.4
Carpentry- - - - -	5	3.4
Architectural drawing- - - - -	4	2.6
Machine shop - - - - -	4	2.6
Radio- - - - -	3	2.0
Crafts - - - - -	3	2.0
Plastics - - - - -	3	2.0
Blueprint reading- - - - -	3	2.0
General shop - - - - -	2	1.3
Leather craft- - - - -	2	1.3
Shop mathematics - - - - -	2	1.3
Freehand sketching - - - - -	1	.6
Upholstery - - - - -	1	.6
Wood carving - - - - -	1	.6
Vocational guidance- - - - -	1	.6
Building construction or trades-	1	.6
Shop maintenance - - - - -	1	.6
Aeronautics- - - - -	1	.6
Ordering of supplies and materials - - - - -	1	.6
Design - - - - -	1	.6
Foundry- - - - -	1	.6
Engineering drawing- - - - -	1	.6
Advanced woodworking - - - - -	1	.6
Drafting - - - - -	1	.6
Farm shop- - - - -	1	.6
Graphic arts - - - - -	1	.6
Machine drawing- - - - -	1	.6
Pattern making - - - - -	1	.6
Totals	148	100.0

times and sheet metal 11 times. The frequency of the courses mentioned is shown by the bar graph (Figure 16).

Additional industrial arts courses requested by graduates are shown in Table 9. Leather craft was mentioned 13 times. Photography, aircraft, and aircraft drafting were each requested once.

The quality rating of professional training by respondents is given in Table 10. A rating of excellent was given professional training by 22.4 per cent of those answering the question. Sixty-one and two-tenths per cent rated this training good.

Table 11 contains professional courses listed by teachers in which more teacher training should be required. Methods of teaching ranks first in the number of requests for extra training. Directed teaching of industrial arts was second in frequency mentioned. This information is shown in less detail by the bar graph (Figure 17).

The minors industrial arts graduates would choose, were they to repeat training, are given in Table 12. Mathematics was preferred by 38 individuals. Science ranked second in choice. Physical training was chosen by nineteen graduates. This is shown in graphic form (Figure 18).

A discussion of these findings follows in Chapter V.

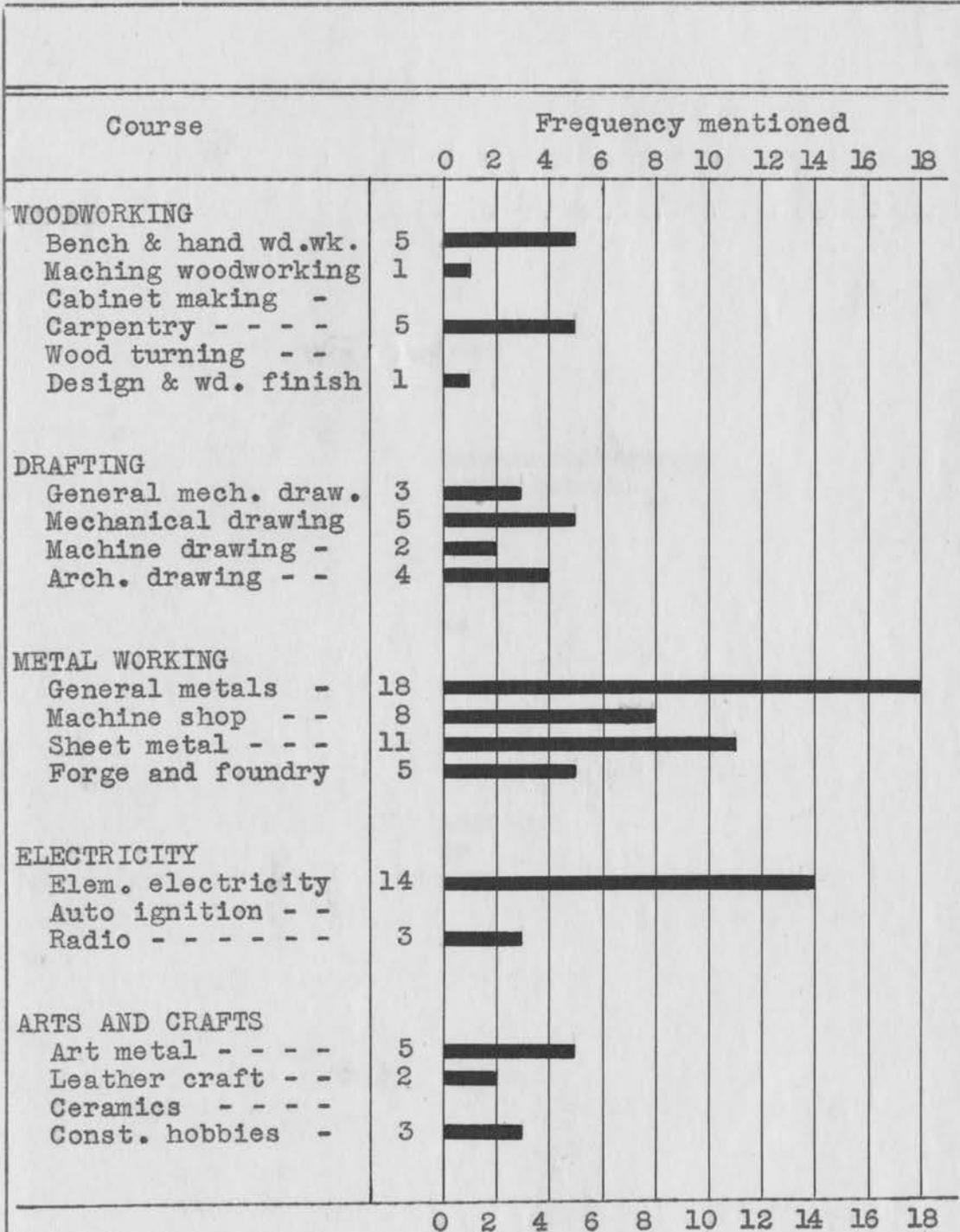


Figure 16.--Industrial arts courses as suggested by teachers in which more teacher training should be offered.

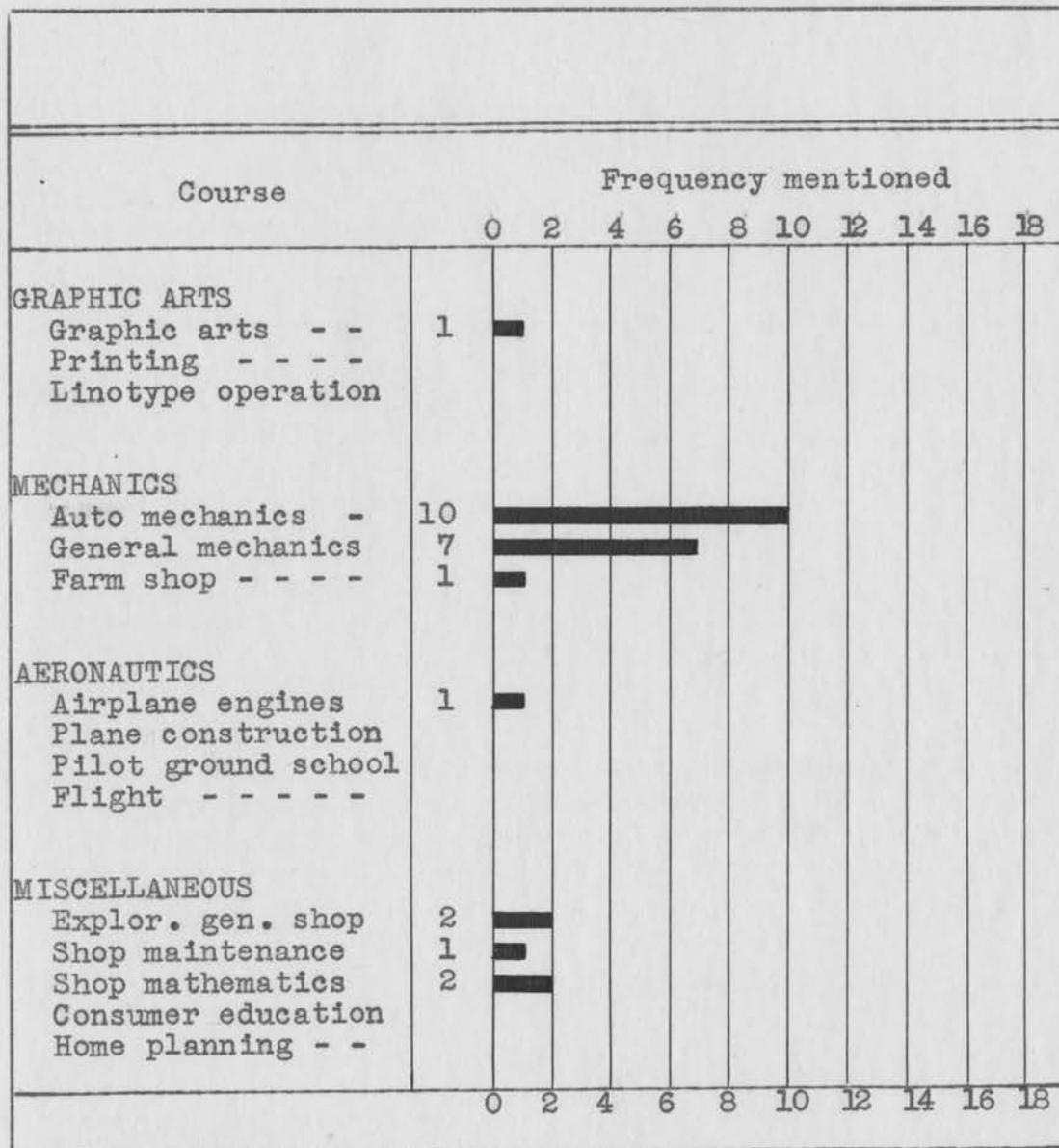


Figure 16.--Industrial arts courses as suggested by teachers in which more teacher training should be offered (continued)

Table 9.--ADDITIONAL INDUSTRIAL ARTS COURSES REQUESTED  
BY TEACHERS

Course	Frequency	Percentage
Leather craft- - - - -	13	12.2
Sheet metal- - - - -	8	7.5
Machine lathe- - - - -	8	7.5
Arc welding- - - - -	7	6.5
Art metal- - - - -	5	4.8
Crafts- - - - -	4	3.8
Carpentry- - - - -	4	3.8
Ceramics - - - - -	4	3.8
Gas welding- - - - -	4	3.8
Plastics - - - - -	4	3.8
Machine shop - - - - -	4	3.8
Farm shop- - - - -	3	2.8
Radio- - - - -	3	2.8
Printing - - - - -	3	2.8
Shop mathematics - - - - -	3	2.8
Pattern making - - - - -	3	2.8
Design - - - - -	3	2.8
Forge practice - - - - -	2	1.9
Foundry practice - - - - -	2	1.9
Electricity- - - - -	2	1.9
Aeronautics- - - - -	1	.9
Veneering- - - - -	1	.9
Photography- - - - -	1	.9
Archery- - - - -	1	.9
Vocational agriculture - - - - -	1	.9
Book binding - - - - -	1	.9
General shop - - - - -	1	.9
Jewelry- - - - -	1	.9
Bench metal- - - - -	1	.9
Metal spinning - - - - -	1	.9
Sheet metal spinning - - - - -	1	.9
Aircraft - - - - -	1	.9
Ordering of supplies and materials	1	.9
Judging tool quality - - - - -	1	.9
Wood finishing - - - - -	1	.9
Aircraft drafting- - - - -	1	.9
General metals - - - - -	1	.9
Blueprint reading- - - - -	1	.9
Total	107	100.0

Table 10.--QUALITY OF PROFESSIONAL TRAINING AS RATED BY  
INDUSTRIAL ARTS MAJORS SINCE 1932

Rating by Graduates	Number of Respondents	Percentage
Excellent- - - - -	11	22.4
Good - - - - -	30	61.2
Fair - - - - -	7	14.3
Poor - - - - -	1	2.1
Totals*	49	100.0

\*Of the 52 respondents some did not answer all questions.

Table 11.--PROFESSIONAL COURSES LISTED BY TEACHERS IN WHICH MORE TEACHER TRAINING SHOULD BE REQUIRED

Course	Frequency	Percentage
Methods of teaching - - - - -	27	29.4
Student teaching- - - - -	24	26.0
Techniques of administration and supervision- - - - -	13	14.0
Curriculum principles and practices- - - - -	7	7.6
Psychology- - - - -	4	4.3
Vocational and occupational opportunities- - - - -	2	2.2
Specialized training within the industrial arts major- -	2	2.2
Guidance- - - - -	2	2.2
Classroom management- - - - -	2	2.2
History - - - - -	1	1.1
Industrial requirements of other states - - - - -	1	1.1
Teaching aids (visual, graphic, etc.)- - - - -	1	1.1
Public speaking - - - - -	1	1.1
Courses in leadership - - - - -	1	1.1
History of industrial and vocational education - - - -	1	1.1
Philosophy of industrial education- - - - -	1	1.1
Philosophy of education - - - -	1	1.1
Educational measurements- - - -	1	1.1
<b>Total</b>	<b>92</b>	<b>100.0</b>

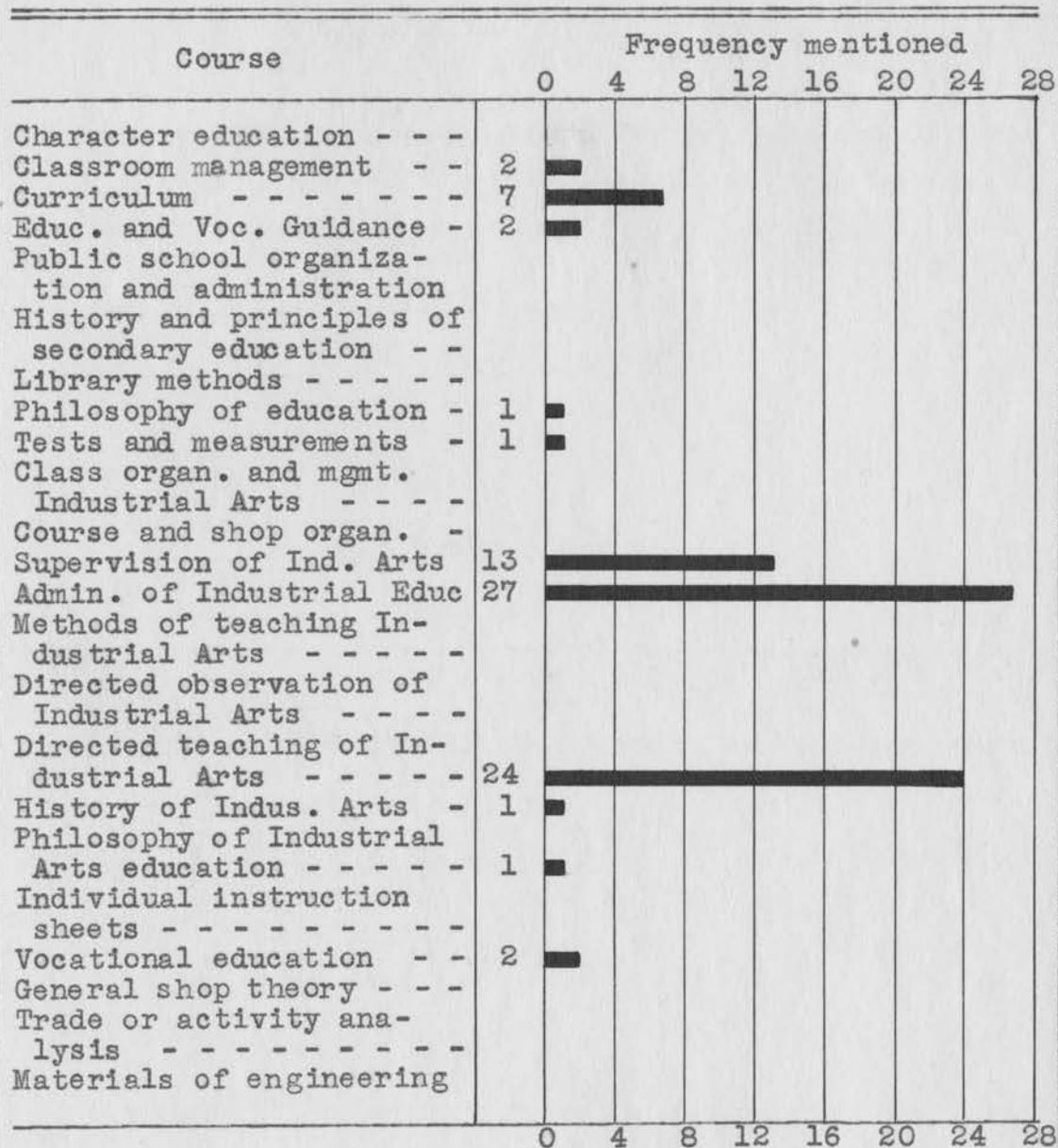


Figure 17.--Professional courses listed by teachers in which more teacher training should be required

Table 12.--PREFERRED MINORS BY INDUSTRIAL ARTS TEACHERS  
IF THEY WERE TO REPEAT TRAINING

Minor	Number of Respondents	Percentage
Mathematics- - - - -	38	28.2
Science- - - - -	27	20.0
Coaching - - - - -	24	17.8
Physical training- - - - -	19	14.1
Commerce - - - - -	9	6.7
Social science - - - - -	6	4.4
History- - - - -	5	3.7
Music- - - - -	3	2.2
English- - - - -	3	2.2
Agriculture- - - - -	1	.7
Total	135	100.0

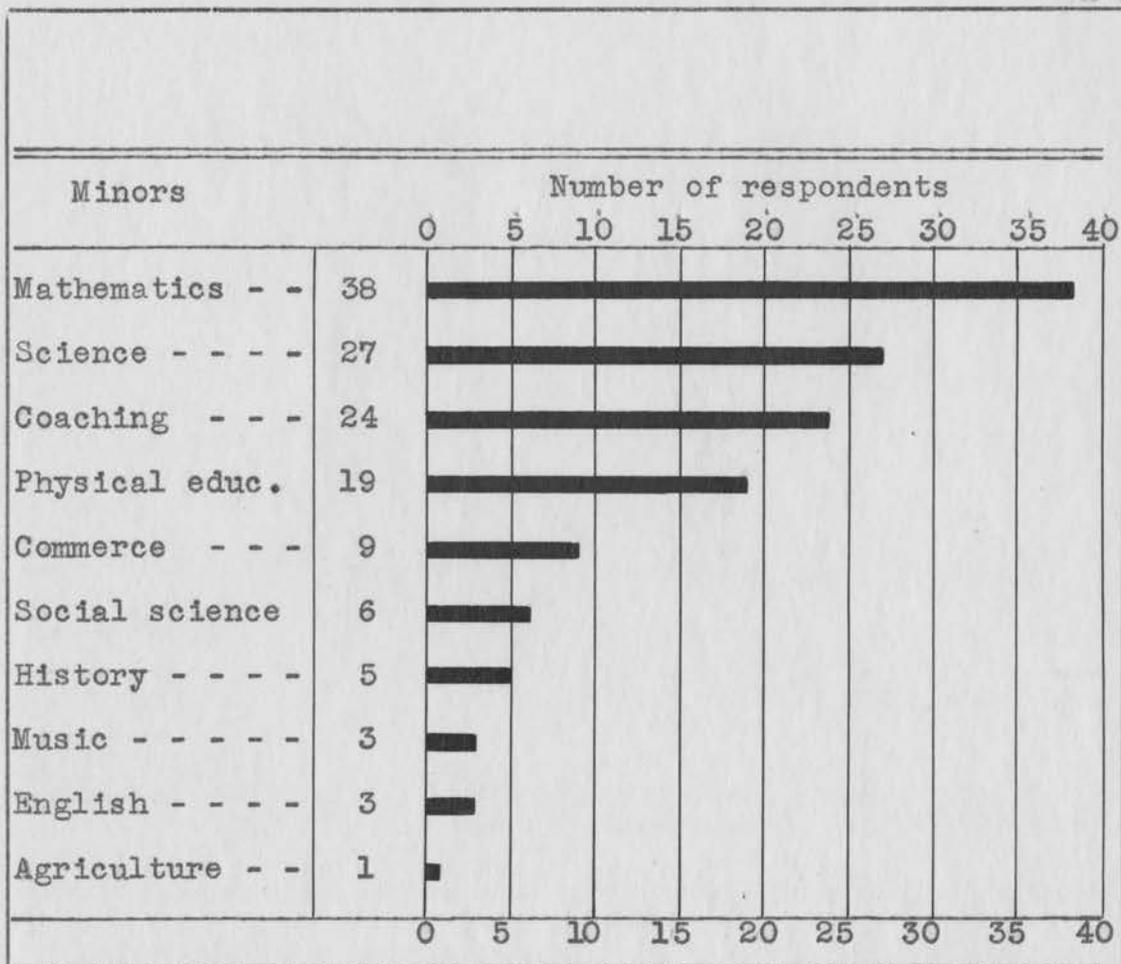


Figure 18.--Minors industrial arts majors from Peru would choose

Chapter V  
DISCUSSION

Many changes have taken place in the industrial aspects of society during this decade. For this reason it seems important to consider the findings of this study in terms of shifts in emphasis, extensions in subject matter, and possible changes in methods that are desirable in the preparation of industrial arts teachers.

For the purpose of this discussion the findings that relate to subordinate question C, "What curriculum patterns are provided for industrial arts majors at Peru State Teachers College at the present time?" will be compared with the findings that relate to subordinate question A, "What patterns are provided for industrial arts majors in other state teachers colleges?" They will also be compared with data from related reviews of research, and the findings on subordinate question D, "What are the state requirements that govern the training of industrial arts teachers?" These comparisons are made in order to arrive at needed recommendations.

A summary of the findings reveals three specific patterns of requirements for industrial arts

majors: one pattern of general college requirements, a second pattern of special professional requirements, and a third pattern of laboratory and shop subjects.

#### General college requirements

A high percentage of the Peru graduates with industrial arts majors are teaching in the North Central Association area (Figure 1, page 55).

No specific general college requirements are recommended for industrial arts teachers by the North Central Association area except a bachelor's degree from an institution approved by the association. The general college requirement for these teachers, therefore, is determined by the individual institution approved by the association (24).

In addition to the above requirements, prospective industrial arts teachers for Nebraska must meet the state requirements for the certification of teachers (Appendix B). The state requirements agree with the North Central Association recommendations and add a two hour requirement in physiology and hygiene.

Since the general college patterns were not stated by the North Central Association and the state of Nebraska, a further investigation of 45 teacher training institutions was made to determine the general pattern. Outstanding characteristics of the pattern of academic requirements as revealed by this study are: all institutions have a minimum academic requirement listed for

students receiving a baccalaureate degree; English in some form is required in all of the 45 schools studied (Table 1, page 56); only 16 schools have specific requirements in mathematics; a science requirement is designated by 36 schools; 41 institutions have a requirement in social studies; and fine arts is required by 20 colleges listed. When all subjects are grouped together and a mean determined for the 45 institutions studied, the average academic requisite is 35.7 semester hours (Table 13). It may also be noted that the range of requirements in this field varied from 12.7 to 55.5 semester hours (Figure 19).

A comparison with Fryklund's (8) and Whitney's (23) studies shows close agreement. They found that all schools require English. Converting the quarter hours as listed in Whitney's study (Table 9, page 89) to semester hours, it was found that 8.5 semester hours was the average requirement in English for the 22 institutions studied, as compared with a requirement of 8.7 semester hours found in the present study (Table 13). Fryklund was also in close agreement (Figure 11, page 70). Again converting the total number of quarter-hour credits to semester-hour credits in Whitney's study (Table 9, page 89) it was found that 33.8 semester hours comprised the average academic requirement in comparison to 35.7 as found in the present study.

Table 13.--A COMPARISON OF ACADEMIC REQUIREMENTS FOR INDUSTRIAL ARTS MAJORS IN PERU AND 45 SELECTED COLLEGES

Subject	Av.sem.hr. require. for all schools listed	Present patterns required at Peru	Difference between Peru's require.and av. for all sch.	State requirements	No. of graduates teach. subject	No.of grad-uates sug- gesting additional training	No.of grad-uates req- uesting additional courses
English	8.7	8	-0.7	Bacca-	2	0	0
Mathematics	2.8	8	-2.1	laure-	10	0	0
Sciences	7.3	8	-1.1	ate	8	0	0
Social studies	9.1	8	-0.9	degree	9	0	0
Educ. Psychology	4.9	4	+1.6	15 sem.	0	4	0
Music	0.4	2	+0.5	hours	3	0	0
Fine Arts	1.5	2	-1.	in subj.	0	0	0
Language	1.	0	+2.	field	0	0	0
Physiology and hygiene	0.	2		taught, & 2 sem. hrs. in physi- ogy & hy- giene.	0	0	0
Total	35.7	34	-1.7				



As a result of this investigation there has been determined the following pattern of general college requirements: English, 8.7 semester hours; mathematics, 2.8 semester hours; sciences, 7.3 semester hours; social studies, 9.1 semester hours; educational psychology, 4.9 semester hours; music, .4 semester hours; fine arts, 1.5 semester hours; and language, 1 semester hour (Table 13).

In general the academic requirements at Peru match this pattern. Peru, however, in order to meet the Nebraska state requirements, requires an additional two hours of credit in physiology and hygiene. The average of the total requirement in academic courses for all schools is 35.7 semester hours as compared with 34 semester hours at Peru. In terms of semester hours required in these subjects, compared with the average for all schools studied, fewer semester hours are required in the following subjects at Peru (Table 13) English, .7 semester hours; social studies, 1.1 semester hours; educational psychology, .9 semester hours; and language, 1.0 semester hours.

Peru State Teachers College requires additional training in the following subjects as follows: mathematics or science, .7 semester hours; music, 1.6 semester hours; and fine arts, .5 semester hours.

On the basis of the foregoing comparison it appears that the pattern of academic requirements at

Peru State Teachers College is adequately meeting the general pattern of academic offerings in other schools analyzed, the recommendations of the North Central Association, and the Nebraska State requirements.

Therefore, it seems advisable to continue without change the present pattern of academic requirements for industrial arts majors.

The next pattern to be discussed is a pattern of professional requirements.

#### Professional requirements

Recommendations set forth by the North Central Association (24) are 15 semester hours of credit in education selected from recommended types of courses: principles of secondary education, theory of teaching, special methods (in subject taught), observation and practice teaching, history of education, and school administration and supervision.

The state requirements agree with the North Central Association recommendations and add three hours in supervised teaching of grades seven to 12.

A further check to determine the pattern of professional requirements of the 45 institutions revealed the following outstanding characteristics: a minimum requirement must be met by all the graduates; directed teaching of industrial arts is required in 44 of the 45 schools studied (Figure 12, page 71);

36 schools require methods of teaching industrial arts; history and principles of secondary education is required by 38 schools; 25 schools have a requirement in tests and measurements; only five schools have a requirement in philosophy of education; and there is wide diversity in the titles of these offerings. When combining all professional courses the average requirement of all schools was found to be 18.5 semester hours (Figure 19, page 99). The range of requirements is from 14 to 29.3 semester hours. A comparison from Pawelek (16), Fryklund (8), and Whitney (23) reveals close agreement. Pawelek found that 82 per cent of the departments offered student teaching. He also found that 31 per cent of the industrial arts graduates are required to do academic student teaching in addition to industrial arts teaching.

The following general pattern of professional courses has been determined from this study (Table 14): classroom management, .5 semester hours; curriculum, .5 semester hours; educational and vocational guidance, .4 semester hours; public school organization and administration, .4 semester hours; history and principles of secondary education, 3.4 semester hours; philosophy of education, .4 semester hours; tests and measurements, 1.5 semester hours; course and shop organization, 1.3 semester hours; methods of teaching industrial arts, 2.2 semester hours; directed observation of industrial

arts, .5 semester hours; directed teaching, 5.7 semester hours; history of industrial arts, .4 semester hours. Other courses were listed by a few schools (Table 14).

The average of the total requirement in professional courses for all schools was 18.5 semester hours compared with a requirement of 18 semester hours at Peru. A further comparison of the professional requirements at Peru with the average of the schools analyzed reveals that fewer semester credits in the following subjects are required at Peru (Table 14) as follows: directed teaching of industrial arts, 1.7 semester hours; and history and principles of secondary education, 1.4 semester hours.

The comparison also reveals that additional training is required in the following courses as follows: methods of teaching industrial arts, 1.8 semester hours; tests and measurements, .5 semester hours; classroom management, 1.5 semester hours; and philosophy of education, 3.6 semester hours.

This information would indicate that the general pattern of professional requirements at Peru State Teachers College meets the recommendations of the North Central Association and the Nebraska state requirements. With the exception of principles of secondary education and student teaching the professional pattern in general at Peru is also meeting, and in a few cases exceeding, the general pattern of professional

Table 14.--A COMPARISON OF PROFESSIONAL REQUIREMENTS FOR INDUSTRIAL ARTS MAJORS IN PERU AND 45 SELECTED COLLEGES

Subject	Av.sem.hr. require. for all schools listed	Present patterns required at Peru	Difference between Peru's require.& av. for all sch.	State requirements	No.of grad-ates teach subject	No.of grad-ates sug-esting additional training	No.of grad-uates re-questing additional courses
Character education	0	0	0	Bacca-	0	0	0
Classroom management	0.5	2	+1.5	laure-	0	2	0
Curriculum	0.5	0	-0.5	ate	0	7	0
Educ. and voc. guid.	0.4	0	-0.4	degree	0	4	0
Pub.sch.organ.& admin.	0.4	0	-0.4	18 sem.	0	0	0
Hist.& prin.of sec.ed.	3.4	2	-1.4	hours	0	0	0
Library methods #	0.1	0	-0.1	in	0	0	0
Philosophy of educ.	0.4	4	+3.6	educ.	0	0	0
Tests & measurements	1.5	2	+0.5	(3 in	0	1	0
Class.organ.& mgmt.	0.1	0	-0.1	super-	0	0	0
Course & shop organ.	1.3	0	-1.3	vised	0	0	0
Supervision of I.A.	0.1	0	-0.1	teach-	0	13	0
Admin.of indus.arts	0.2	0	-0.2	ing	0	0	0
Methods of teach.I.A.	2.2	4	+1.8	grades	0	27	0
Directed obser.of I.A.	0.5	0	-0.5	7-12)	0	0	0
Dir.teach.of I.A.	5.7	4	-1.7		0	24	0
Hist.of indus.arts	0.4	0	-0.4		0	1	0
Philos.of I.A.educ.	0.05	0	-0.05		0	1	0
Individ.instr.sheets	0.2	0	-0.2		0	0	0
Vocational educ.	0.3	0	-0.3		0	0	0
Gen.shop theory	0.1	0	-0.1		0	0	0
Tr.or activity anal.	0.1	0	-0.1		0	0	0
Materials of engin.	0.05	0	-0.05		0	0	0
Total	18.5	18	-0.5	#A part of the English course at Peru			

requirements of other schools.

Because of these two variations and the fact that,

. . . Carefully planned and supervised practice teaching can contribute more toward the preparation of industrial arts teachers than is accomplished by any other education course (13:167). . . .

it seems advisable to change the present pattern of professional requirements for industrial arts majors at Peru. This change should include an additional requirement of two semester hours in student teaching and one semester hour in history and principles of secondary education.

The professional elective requirement could be decreased three semester hours in order to allow for the additional requirements as stated above.

The philosophy of education requirement is three and six tenths semester hours higher than the average for other schools, however, industrial arts teachers should be given more training in professional education (19). For this reason it seems advisable to continue with the philosophy of education requirement.

The present and recommended pattern of professional requirements for industrial arts majors is shown in Table 15.

Table 15.--PRESENT AND RECOMMENDED PATTERN OF PROFESSIONAL REQUIREMENTS FOR INDUSTRIAL ARTS MAJORS AT PERU

Courses	Semester Hours Credit		
	Existing Offerings	Proposed Offerings	Amount of Change
Requirements			
Classroom management	2	2	0
History and principles of secondary education	2	3	+1
Philosophy of education	4	4	0
Educational psychology*	4	4	0
Tests and measurements	2	2	0
Indus.arts meth.and observ.	0	4	+4
Dir. teach. indus. arts	4	6	+2
Electives	8	1	-7
Total	26	26	0

\*Counted as education credit at Peru.

Having discussed and outlined the pattern of general college and professional requirements, the next pattern to be discussed is that of shop offerings for industrial arts majors.

#### Shop offerings

Industrial arts course requirements do not appear in the list of recommendations as set forth by the North Central Association (24). The Nebraska state requirements, however, designate that the teacher must have specialized training in industrial arts, though the

amount of training was not shown (24).

As revealed by this study, 25.8 semester hours is the average total requirement in shop courses, as compared to Peru's total of 22 semester hours (Table 16). It will be noted that woodworking is required more frequently than is any other shop offering. This agrees with Fryklund's (8) and Whitney's (23) studies. The general pattern of woodworking offerings as indicated in this study has the following notable features: bench and hand woodworking was required by more schools than other courses in this division, more elective credits were offered in this subject, few schools required a course in carpentry (Figure 2, page 59), the average woodworking requirement for all schools was 7.7 semester hours, the range requirement was from zero to 18 semester hours (Figure 19, page 99), the elective offering in this division ranged from zero to 43 semester hours (Figure 20).

The pattern of required courses as determined by this study is: bench and hand woodworking, 3.2 semester hours; machine woodworking, .9 semester hours; cabinet making, 1.1 semester hours; carpentry, .8 semester hours; woodturning, .8 semester hours; and design and wood finishing, .9 semester hours (Table 16). The average of the total required woodworking courses for all schools is 7.7 semester hours compared to 8 semester hours required at Peru. Comparing Peru's

Table 16.--A COMPARISON OF SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS IN PERU AND 45 SELECTED COLLEGES

Subject	Av.sem.hr. offerings for all schools listed		Present patterns offered at Peru	Difference between Peru's offerings and av. for all sch.	State requirements	No.of graduates teach. subject	No.of graduates sug- gesting additional training	No.of graduates re- questing additional courses		
	Req.Elec.	Req.Elec.	Req. Elec.	Req. Elec.						
<b>WOODWORKING</b>										
Bench&hand wd.wk.	3.2	3.4	4	4	+0.8	+0.6	Bacca-	5	0	
Machine wd.wk.	.9	1.3	4	2	+3.1	+0.7	laure-	40	1	0
Cabinet making	1.1	1.2	0	0	-1.1	-1.2	ate	0	0	0
Carpentry	.8	1.1	0	2	-0.8	+0.9	degree	0	6	4
Woodturning	.8	0.9	0	2	-0.8	+1.1	and	3	0	0
Design&wd.finish.	.9	1.1	0	2	-0.9	+0.9	spec-	0	2	4
Total wd.wk.	7.7	9.	8	12	+0.3	+3.	ializ-	43	14	8
							ation			
							in			
<b>DRAFTING</b>										
Gen. mech. draw.	1.6	1.8	2	0	+0.4	-1.8	indus-	12	3	0
Mechanical draw.	3.4	1.8	4	0	+0.6	-1.8	trial	25	5	0
Machine drawing	.4	1.1	0	0	-0.4	-1.1	arts	1	2	0
Arch. drawing	1.7	3.4	0	2-4	-1.7	+0.6		8	4	0
Total drafting	7.1	8.1	6	4	-1.1	-4.1		46	15	0
<b>METALWORKING</b>										
General metals	2.6	1.1	2	0	-0.6	-1.1		17	Weld- ing 12	Weld- ing 11
Machine shop	.6	2.1	0	4	-0.6	+1.9		2	18	1
Sheet Metal	.4	0.7	0	2	-0.4	+1.3		15	12	12
Forge & foundry	.1	0.4	0	0	-0.1	-0.4		1	11	9
Total metal	3.7	4.3	2	6	-1.7	+1.7		35	6	4
									59	37

Table 16.--A COMPARISON OF SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS IN PERU AND 45 SELECTED COLLEGES (CONTINUED)

Subject	Av.sem.hr. offerings for all schools listed		Present patterns offered at Peru	Difference between Peru's offerings and av. for all sch.		State requirements	No.of graduates teach. subject	No.of graduates sug- gesting additional training	No.of graduates re- questing additional courses
	Req.Elec.	Req.Elec.	Req.Elec.	Req.	Elec.				
<b>ELECTRICITY</b>									
Elem.electricity	1.1	1.	2	0	+0.9	-1.	12	14	2
Auto ignition	0	.1	0	0	0	-0.1	0	0	0
Radio	0	.5	0	2	0	+1.5	3	3	3
Total elec.	1.1	1.6	2	2	+0.9	+0.4	15	17	5
<b>ARTS and CRAFTS</b>									
Art metal	.3	.6	0	0	-0.3	-0.6	1	5	5
Leather craft	.1	.1	0	0	-0.1	-0.1	5	2	13
Ceramics	.3	.3	0	0	-0.3	-0.3	1	0	4
Const. hobbies	.5	1.7	0	1	-0.5	-0.7	4	6	3
Total arts	1.2	2.7	0	1	-1.2	-1.7	11	13	25
<b>GRAPHIC ARTS</b>									
Graphic arts	1.1	.3	0	0	-1.1	-0.3	0	0	1
Printing	.9	2.3	0	0	-0.9	-2.3	0	0	3
Linotype oper.	0	1.4	0	0	0	-1.4	0	0	0
Total graph.arts	2.0	4.0	0	0	-2.0	-4.0	0	0	4
<b>MECHANICS</b>									
Auto mechanics	.7	1.5	0	4	-0.7	+2.5	2	10	0
General mechanics	.3	.2	2	0	+1.7	-0.2	11	0	0
Farm shop	.2	.5	0	0	-0.2	-0.5	0	8	3
Total mechanics	1.2	2.2	2	4	+0.8	+1.8	13	18	3

Table 16.--A COMPARISON OF SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS IN PERU AND 45 SELECTED COLLEGES (CONTINUED)

Subject	Av.sem.hr. offerings for all schools listed		Present patterns offered at Peru		Difference between Peru's offerings and av. for allsch.		State require-ments	No.of gradu-ates teach. subject	No.of grad-uates sug-gesting additional training	No.of grad-uates re-questing additional courses
	Req.Elec.		Req.Elec.		Req. Elec.	Elec.				
<b>AERONAUTICS</b>										
Airplane engines	0	.2	0	0	0	-0.2		1	0	0
Plane construction	0	.1	0	0	0	-0.1		0	0	0
Pilot ground sch.	0	.6	0	4	0	+3.4		0	0	0
Flight practice	0	.1	0	0	0	-0.1		0	0	0
Aeronaut.draft.	0	.1	0	0	0	-0.1		0	0	0
Total aeronaut.	0	1.1	0	4	0	+2.9		1	0	0
<b>MISCELLANEOUS</b>										
Explor.gen.shop	1.1	.3	0	0	-1.1	-0.3		0	2	1
Shop maintenance	.3	.1	2	0	+1.7	-0.1		1	1	0
Shop mathematics	.1	.2	0	0	-0.1	-0.2		0	2	3
Consumer educ.	.1	.3	0	0	-0.1	-0.3		0	0	0
Home planning	.2	.5	0	0	-0.2	-0.5		0	0	0
Total Misc.	1.8	1.4	2	0	+0.2	-1.4		1	5	4
<b>Total</b>	<b>25.8</b>	<b>34.4</b>	<b>22</b>	<b>32</b>	<b>-2.4</b>	<b>-3.4</b>				



required offerings to this general pattern of woodworking reveals that Peru required no training in carpentry and woodturning. Neither are specific courses required in cabinet making and design and wood finishing, since this type of training is covered in the machine woodworking course at Peru.

In order to give variety and provide a similar pattern in woodworking to that given by other schools, it seemed advisable to require training in carpentry. This could be accomplished by re-organizing the course content of machine woodworking to include a unit in carpentry. A unit as used in this study means one semester hour of credit.

The pattern of elective offerings in woodworking is: bench and hand woodworking, 3.4 semester hours; machine woodworking, 1.3 semester hours; cabinet making, 1.2 semester hours; carpentry, 1.1 semester hours; woodturning, .9 semester hours; and design and wood finishing, 1.1 semester hours (Table 16, page 108). The average of the total elective credits in woodworking for all schools is 9 semester hours compared to 12 semester hours given at Peru. Elective training in a separate course in cabinet making is not offered at Peru inasmuch as the machine woodworking elective is largely training in cabinet making. Further elective training is offered in the following: bench and hand woodworking, .6 semester hours; machine woodworking,

.7 semester hours; carpentry, .9 semester hours; woodturning, 1.1 semester hours; and design and wood finishing, .9 semester hours.

This comparison reveals that the elective offerings in the woodworking division of the industrial arts department at Peru exceed the average for other institutions. Therefore, it seems advisable to continue without change the elective pattern of woodworking for industrial arts majors.

The next general pattern is drafting which has the following outstanding characteristics as found by this study: drafting follows woodworking in the number of schools offering it, more mechanical drawing is required than any other subject in this field, more elective than required credit is offered in this field, the range requirement is from zero to 14 semester hours (Figure 19, page 99), the elective range of offerings is from zero to 84 semester hours (Figure 20, page 111).

The pattern of required drafting courses is: general mechanical drawing, 1.6 semester hours; mechanical drawing, 3.4 semester hours; machine drawing, .4 semester hours; and architectural drawing, 1.7 semester hours. The average of the total requirement in drafting for all schools is 7.1 semester hours as compared to six semester hours required at Peru. Peru is found to require no training in machine drawing and

architectural drawing, but does require more training as follows: general mechanical drawing, .4 semester hours; and mechanical drawing, .6 semester hours.

Considering the above information it may be feasible to change the present pattern at Peru and require two semester hours of training in architectural drawing and add a unit, one semester hour, of machine drawing to the mechanical drawing requirement. This would raise Peru's requirements to 8 semester hours which matches more closely the average for all schools analyzed.

The pattern of elective offerings in drafting is: general mechanical drawing, 1.8 semester hours; mechanical drawing, 1.8 semester hours; machine drawing, 1.1 semester hours; and architectural drawing, 3.4 semester hours. The average of the total elective credits in drafting for all schools is 8.1 semester hours compared to 4 semester hours at Peru. No elective training is offered in the following drafting courses at Peru: general mechanical drawing, mechanical drawing, and machine drawing. Peru offers .6 semester hours more elective training in architectural drawing.

This comparison indicates that in order to follow the example of other schools, Peru should offer an elective of two semester hours in mechanical drawing. This course could consist of units organized for advanced training in types of drawing such as: machine

drawing, descriptive geometry, and layout. This would provide an opportunity for the student to gain a broader vision in drafting.

Metalworking follows drafting in the number of schools offering it (Figure 19, page 99 ). Fryklund found this to be true also. The outstanding features in this division are: general metals is required by 29 of the 45 schools studied, machine shop ranks second in number of institutions requiring it, Fryklund (8) found machine shop to rank first in number of schools requiring it. This variation could be due to classifying and grouping of various courses of general metals description under the heading general metals. The range requirement for metalworking is zero to 10.7 semester hours (Figure 19, page 99 ). The elective range is from zero to 29 semester hours (Figure 20, page 111).

The required pattern in metalworking based on average credits for all schools is: general metals, 2.6 semester hours; machine shop, .6 semester hours; sheet metal, .4 semester hours; and forge and foundry, .1 semester hour (Table 16, page 108). The average of the total requirements in metalworking courses for all schools is 3.7 semester hours compared to two semester hours at Peru. Comparing Peru's required metalworking courses to the general pattern it is found that except for a forge unit in the general metals course, no training is required in the following: machine shop, sheet

metal, and forge and foundry. Six-tenths semester hours less training is required in general metals at Peru than the average of all schools listed, and no more training is required in any metals course at Peru.

This comparison reveals that changes should be made in the metalworking department at Peru in order to meet the standards set by other institutions. By increasing the general metals requirement two semester hours and adding units in each of the following: machine shop, sheet metal, and forge and foundry, Peru's metalworking department would compare more favorably with this division in other schools. In order to carry out this plan, it would be necessary to purchase more equipment. The type of equipment should be determined with care so that training conditions will match actual conditions in industry. The quantity of equipment would have to be determined on the basis of future enrollment in the course.

The pattern of elective offerings in metalworking is: general metals, 1.1 semester hours; machine shop, 2.1 semester hours; sheet metal, .7 semester hours; and forge and foundry, .4 semester hours. The average of the total elective credits for all schools is 4.3, compared to six given at Peru. Peru offers no elective training in general metals and forge and foundry practice, but more elective credit is offered in the following courses: machine shop (lathe and welding), 1.9

semester hours; sheet metal, 1.3 semester hours.

The comparison of electives indicates that if Peru would offer a two-semester hour elective in general metals their elective pattern would compare more favorably with that of other institutions. This could be realized by offering a general metals course which would consist of units in such training as: forge and foundry practice, sheet metal, arc welding, machine shop, etc. These units would provide opportunities for students to extend their abilities in the metalworking field. The same carefully chosen equipment as mentioned above would make this possible.

Electrical offerings are not as numerous as those of woodworking, drafting, or metalworking (Figures 19 and 20, pages 99, 111). Fryklund (8) also found this to be true. The outstanding characteristics of this division of industrial arts are: only 17 schools have a general requirement in elementary electricity, there are more elective than required offerings, the range requirement is from zero to 5.3 semester hours (Figure 19, page 99), the elective range is from zero to 18 semester hours (Figure 20, page 111).

The required pattern of electrical offerings based on the average for all schools is: elementary electricity, 1.1 semester hours. The average of the total for all schools is, therefore, 1.1 semester hours as compared with two hours at Peru. Meyer (14) found

that electrical courses were increasing in popularity. For this reason it seems advisable to continue without change the present pattern of electrical requirements for industrial arts majors.

The pattern of elective electrical offerings as found in this study is: elementary electricity, 1 semester hour; auto ignition, .1 semester hour; and radio, .5 semester hours.

The average of the total elective credits for all schools is 1.6 semester hours as compared with two given at Peru. Peru offers no elective training in the following: elementary electricity, and auto ignition as a separate course. The auto ignition training is given in the auto mechanics offering. Further elective training of 1.5 semester hours in radio is offered at Peru.

Since Meyer (14) found an increase in popularity for electrical work and no elective training is offered in elementary electricity at Peru, a change in the elective pattern of electricity would be advisable in order to match the trend in this area of industrial activity. An increase of one semester hour elective in elementary electricity in Peru's offerings would match the average for other schools.

The noticeable features of the pattern in arts and crafts are: construction hobby courses exceed other offerings in this division (Figure 6, page 64 ),

art metal ranks second in number of schools requiring it, leather craft is required by fewer schools than any other course in this division, the range requirement in this field is from zero to 5.3 semester hours, the elective range is from zero to 19 semester hours.

The pattern of required arts and craft courses is: art metal, .3 semester hours; leather craft, .1 semester hour; ceramics, .3 semester hours; and construction hobbies, .5 semester hours. The average of the total required arts and craft courses is 1.2 semester hours as compared with no required courses at Peru. A unit in art metal is given in the general metals division at Peru, and a unit in ceramics is also given at Peru in the general household mechanics course. Therefore, it is assumed that sufficient training is given in these two courses. Since training in leather craft is not offered at Peru the arts and crafts pattern should be changed to include one semester hour training in leather craft. A course of this content is given in the art department at Peru State Teachers College. For this reason it seems advisable to ask the art department if this course might be made available for industrial arts majors.

The pattern of elective offerings in arts and crafts is: art metal, .6 semester hours; leather craft, .1 semester hour; ceramics, .3 semester hour; and construction hobbies, 1.7 semester hours. The

average of the total elective credits for all institutions is 2.7 semester hours as compared with one semester hour at Peru. No elective training is offered in art metals, leather craft, or ceramics at Peru. Peru offers .7 more semester hours training in construction hobbies than the average of other schools (Table 16, page 108).

If the required pattern of arts and crafts is adopted by Peru it seems advisable to continue with the present elective schedule for industrial arts majors.

Graphic arts is the next pattern to be discussed. Outstanding features of this division are: printing is required by more schools than any other course in this division (Figure 7, page 65), the required range in this field is from zero to 24 semester hours (Figure 19, page 99), the average requirement is two semester hours, more elective than required credits are offered in graphic arts, this range is from zero to 43 semester hours (Figure 20, page 111). The required pattern is as follows: graphic arts, 1.1 semester hours; and printing, .9 semester hours. Graphic arts as used here includes such courses as drawing, layout work, silk screening process, show card painting, etc., since a few schools offer these courses in the graphic arts division. Peru offers no training in graphic arts as compared with the average of two semester hours required and four semester hours elective for

all schools.

The elective pattern is: graphic arts, .3 semester hour; printing, 2.3 semester hours; and lino-type operating, 1.4 semester hours.

Since Peru offers no training in this field it seems reasonable to require one semester hour of printing which would serve as an exploratory course to acquaint students with this field. If this recommendation should be adopted and favorable results obtained, it may be desirable to increase the requirement to two semester hours.

At the present time Peru State Teachers College does not possess printing equipment and to purchase the necessary equipment at this time would be rather difficult. As a solution to this problem it may be possible to teach the theory of printing in the college and make arrangements for laboratory training in the local print shop.

The next pattern to be considered is that of mechanics. Auto mechanics, general household mechanics, and farm shop are grouped under this heading. Notable features of this division are: more schools require auto mechanics than other courses in this field (Figure 8, page 67), the range requirement in mechanics is zero to 6 semester hours (Figure 19, page 99), the range in electives is from zero to 15 semester hours (Figure 20, page 111), Meyer (14) found that auto

mechanics was losing favor while art metal, metal spinning, and printing were increasing in popularity.

The required pattern in mechanics is: auto mechanics, .7 semester hour; general mechanics, .3 semester hour; and farm shop, .2 semester hour. The average of the total required mechanics courses is 1.2 semester hours as compared with two semester hours at Peru. Peru does not require training in auto mechanics or farm shop. One and seven-tenths semester hours more training in general mechanics are required at Peru than the average for other institutions. Since Meyer (14) found auto mechanics courses were decreasing in number and the mechanics pattern at Peru in general matches that of other schools, it seems advisable to continue the present pattern at Peru.

The elective pattern in mechanics is: auto mechanics, 1.5 semester hours; general mechanics, .2 semester hour; and farm shop, .5 semester hour. The average of the total elective mechanics credits is 2.2 semester hours compared with four semester hours at Peru. Peru offers no elective training in general mechanics and farm shop, but 2.5 semester hours more elective training is offered in auto mechanics.

Since the auto mechanics courses were decreasing in number (14) it may be well to discontinue the two-hour elective in auto mechanics and add an elective offering of two hours in farm shop. After the

auto mechanics elective is decreased two hours Peru still offers .5 more semester hours of training than the average of the total for other schools studied. This released time could be used advantageously in a farm shop offering. This change could be accomplished without additional costs by using the general metals equipment.

The aeronautical field is a recent newcomer to the public schools, and for this reason few schools have offerings in it (Table 2, page 57). The outstanding characteristics in this field are: no schools require training in any course (Table 16, page 108), pilot ground school seems to be the largest elective offering (Figure 9, page 68), the range of elective offerings is from zero to 26 semester hours (Figure 20, page 111).

There is no required pattern in this division, and this elective pattern is: airplane engines, .2 semester hour; plane construction, .1 semester hour; pilot ground school, .6 semester hour; flight, .1 semester hour; and aeronautical drafting, .1 semester hour. Since this is a new field in the educational program, it is deemed advisable by college authorities to leave the offerings of the group together until plans are more definitely made. Because of this fact, aeronautical drafting was left in this division. The average of the total elective offerings for all schools

is 1.1 semester hours compared to four semester hours at Peru.

No training is offered in the following fields at Peru: airplane engines, plane construction, flight practice, and aeronautical drafting. Peru offers 3.4 semester hours further training in pilot ground school. An airport was constructed at Peru, equipment was set up, and classes were organized at the college in "Civilian Pilot Training." Since this airport and equipment would be available for continuance of this training, it seems advisable to continue with the same pattern of aeronautical offerings at Peru. If airplane engines and plane construction are not covered in the pilot ground course, it may be profitable to emphasize them in this course.

Outstanding characteristics of the miscellaneous offerings are: exploratory general shop is required by 15 of the 45 schools studied (Figure 10, page 69), the range requirement in the field is from zero to nine semester hours, the elective offerings range from zero to 12 semester hours.

The required pattern is as follows: exploratory general shop, 1.1 semester hours; shop maintenance, .3 semester hours; shop mathematics, .1 semester hours; consumer education, .1 semester hour; and home planning, .2 semester hours. The average of the total required miscellaneous courses is 1.8 semester hours as compared

with two semester hours at Peru. Peru does not require training in the following: exploratory general shop, shop mathematics, consumer education, and home planning, and 1.7 more semester hours of training are required in shop maintenance at Peru than the average for all schools. Since Peru does not offer an exploratory general shop course, it might be desirable if the first one-third of each beginning required offering were devoted to exploration, orientation, and tryout in the field of learning. In this way the student would get a better understanding of the field as a whole and would become better adapted to his working conditions.

The elective pattern of this division is: exploratory general shop, .3 semester hour; shop maintenance, .1 semester hour; shop mathematics, .2 semester hour; consumer education, .3 semester hour; and home planning, .5 semester hour. The average of the total elective credits is 1.4 semester hours as compared with no offerings at Peru.

The home economics department at Peru offers a course in home planning. Therefore, it seems advisable to ask the home economics department if this course might be made available for industrial arts majors. The credit for this course could be counted as elective industrial arts credit. The present and recommended shop pattern for industrial arts majors is shown in

Table 17.

The previous discussion has presented a comparison between the general pattern for industrial arts majors at Peru State Teachers College and that of other schools. As a result of this comparison, recommendations were made for placing the professional subjects and shop offerings on an equal level with other schools studied.

Having satisfied accrediting agencies requirements and the best practice of subject patterns, the next question for consideration is:

- B. What subjects have been taught most frequently in the past ten years by Peru graduates who have industrial arts majors?

The summary of the questionnaire received from the graduates revealed that they were teaching 20 different industrial arts subjects (Table 16, page 108). Woodworking was taught more frequently than was any other subject. Mechanical drawing, general metals, sheet metal, blueprint reading, electricity, and general mechanics followed woodworking in order of frequency taught by industrial arts graduates.

Of the 52 respondents the numbers of those teaching the various subjects were as follows: wood-working (bench, machine, and cabinet-making), 40; mechanical drawing, 25; general metals, 17; sheet metal, 15; elementary electricity, 12; blueprint reading, 12;

Table 17.--PRESENT AND RECOMMENDED INDUSTRIAL ARTS CURRICULUM PATTERN AT PERU STATE TEACHERS COLLEGE

Courses	Semester Hours		Credit Amount of Change
	Existing Offer- ings	Proposed Offer- ings	
<b>Major requirements</b>			
Bench woodworking	4	4	0
Machine woodworking	4	4	0
Blue print reading	2	2	0
Gen. mechanical draw.	4	4	0
Architectural drawing	0	2	+2
General metals	2	4	+2
Practical electricity	2	2	0
Leather craft	0	1	+1
Printing	0	1	+1
General mechanics	2	2	0
Shop maintenance	2	2	0
Indus. arts methods and observations	4	0	-4
Electives	6	4	-2
Total	32	32	0
<b>Electives</b>			
Machine woodworking	2	2	0
Woodturning	2	2	0
Shop prob. for rural sch.	2	2	0
Indus. arts for elem. teach.	2	2	0
Upholstery and wood finish.	2	2	0
Mechanical drawing	0	2	+2
Architectural drawing	2-4	2-4	0
General metals	0	2	+2
Sheet metal	2	2	0
Eng. lathe practice	2	2	0
Oxy acetylene welding	2	2	0
Practical electricity	0	1	+1
Amateur radio	2	2	0
Fibre furn. weaving	1	1	0
Auto mechanics	2-4	2	-2
Farm shop	0	2	+2
Pilot ground school #	4	4	0
Home planning	0	2	+2
Safety education	2	2	0
Total	33	40	+7

#Pilot ground school is taught in the science department.

general mechanics, 11; architectural drawing, 8; leathercraft, 5; construction hobbies, 4; radio, 3; wood turning, 3; auto mechanics, 2; plastics, 2; engine lathe, 2; nine other subjects were each taught once (Table 3, page 77).

Only nine of the 52 respondents were teaching woodworking alone. All others were teaching industrial arts subject combinations (Table 4, page 78).

Two shop course combinations in industrial arts were taught by 10 respondents as follows (Table 4, page 78): woodworking and mechanical drawing, 4; woodworking and general metals, 2; woodworking and blueprint reading, 2; woodworking and home mechanics, 1; mechanical and architectural drawing, 1.

Three shop course combinations in industrial arts were taught by five respondents as follows (Table 4, page 78): woodworking, home mechanics, and mechanical drawing, 3; woodworking, general metals, and leathercraft, 1; woodworking, general metals, and sheet metal, 1.

Eighteen respondents taught 4, 5, 6, 8, 9, 10, and 12 shop course combinations in industrial arts (Table 4, page 78). These course combinations appear to be a matter of chance since only one respondent was teaching any given combination. The information gathered showed that graduates were teaching subjects which were not required at Peru (Table 16, page 108).

The most frequent of these as taught by the respondents were: sheet metal, 15; architectural drawing, 8; leathercraft, 5.

Since graduates were teaching these subjects, it appears that Peru should offer training in them. The recommended pattern for industrial arts majors provides for this needed training by requiring credit in these subjects. In addition the recommended pattern provides for two semester hours of elective training in sheet metal and architectural drawing for those students who wish to become more versatile in these fields.

These graduates who were teaching various subjects and subject combinations in the industrial arts field requested additional training in industrial arts subjects (Table 8, page 85 ). The outstanding requests from the respondents were as follows: carpentry, 6; mechanical drawing, 5; architectural drawing, 4; general metals, 18; sheet metal, 11; forge and foundry, 6; welding, 12; elementary electricity, 14; construction hobbies, 6; and farm shop, 8.

These graduates also requested training in courses not offered at Peru at the present time (Table 16, page 108). The outstanding additional courses as requested by the respondents are as follows: machine shop (including lathe), 12; sheet metal, 9; welding, 11; and leather craft, 13. These requests for additional training and new courses further indicate the need for

revising and reorganizing the shop offerings at Peru in order to provide the necessary training for prospective industrial arts teachers. Opportunities would be provided to the prospective industrial arts graduates taking leathercraft for gaining broader experiences in manipulative skills which should be of value to them when sponsoring extra-class activities (6).

Requests of Peru graduates in industrial arts for new courses and for additional training in other courses were satisfied in the recommended pattern of shop offerings (Table 17, page 127). Therefore, additional changes in the pattern will not be necessary.

The graduates who were teaching shop subjects expressed a need for additional training in two professional offerings, methods of teaching industrial arts and student teaching (Table 14, page 104).

When Peru's professional pattern was compared with the average for other schools, it was found that 1.9 semester hours more training in methods of teaching industrial arts were required at Peru. This indicates a need for revising and shifting the emphasis in course content rather than requiring any change of time in the recommended professional pattern (Table 15, page 106). Because the graduates requested additional training in student teaching, two semester hours were added to this requirement. According to Pawelek's (13) findings it may be feasible to require the above mentioned two

hours of student teaching in an academic field.

Seventy-three per cent of these graduates who were teaching industrial arts subjects were also teaching academic subjects. Seventeen were teaching industrial arts and one other subject and eight were teaching industrial arts and two other subjects (Table 6, page 83 ). These subjects when arranged according to frequency taught are: coaching, 18; mathematics, 10; social studies, 9; sciences, 7; commerce, 7; music, 3; and English, 1. Ridgeway's (20) findings in Missouri indicated that physical education, agriculture, and sciences were most frequently taught in combination with industrial arts. His findings in Kansas indicated that science, physical education, and mathematics were most frequently taught in combination with industrial arts. Kirby (10) found the subject combinations in Iowa to be a matter of chance. Pawelek.(16) found the best subject combinations with industrial arts to be mathematics and science. He also found the poorest subjects to combine with industrial arts were dramatics, music, athletics, and English. According to the Peru College Placement Bureau records of requests for industrial arts teachers over a period of four years, the most frequent subjects they were asked to teach were boy's athletics, mathematics, sciences, and social science (Appendix C). The teachers in the field reported that their choice of academic subjects to teach

in addition to industrial arts in order of preference (Table 12, page 93) are: mathematics, social sciences, coaching, and physical education. From the above information it appears that the outstanding academic subjects most frequently taught with industrial arts were coaching, mathematics, social studies, sciences, and commerce.

The North Central Association recommends that industrial arts graduates meet the following minimum academic requirement in semester hours: English, 15; mathematics, 15; sciences, 15 (5 in science taught); social studies, 15 (including preparation in subject taught); foreign language, (15 in subject taught). A deduction of two semester hours for each high school unit, but not to exceed six, may be made in the fields of foreign language and mathematics (24).

In addition to the above requirements prospective industrial arts teachers for Nebraska must meet the state requirements for the certification of teachers (Appendix B). These requirements are graduation from an accredited four-year college, including the following academic requirements in semester hours: English, 15; mathematics, 15 (six hours in addition to three high school units); physical sciences (any combination), 15 (three hours in each subject taught); biological sciences (any combination), 15 (three hours in each subject taught); history (including economic

history), 15 (three hours in each subject taught); other social sciences (including economic geography), 15 (three hours in each subject taught); foreign language, 15 (six hours in addition to two high school units); and two semester hours of physiology and hygiene (24).

From the recommendations of the North Central Association and the requirements of the state of Nebraska, it can be noted that in order for an industrial arts graduate to qualify for teaching academic subjects, the highest requirement is a minor of 15 semester hours in the field taught. Therefore, an industrial arts major, since he must have a major and two minors to graduate, must have 30 semester hours which he can devote to taking these academic subjects.

A check was made of the recommended plan to determine if sufficient semester hours would be available for a student to have a major in industrial arts and a minor in two separate academic fields, which are not included in the general college requirements. A student who had 34 semester hours in general college requirements, 26 semester hours in professional requirements, and 32 semester hours in industrial arts, making a total of 92 semester hours, would have 33 semester hours left from which he could choose two minors. Sixteen semester hours are required for a minor. This indicates that if necessary under the recommended pattern, industrial arts majors could minor

in two fields outside of the general college requirement.

When counseling and guiding prospective industrial arts majors relative to the selection of minor courses and fields allied to their major and minor subjects, it would seem advisable to acquaint them with the North Central Association recommendations and the state requirements in the area in which they plan to teach. In guiding the teacher trainee in selecting minor fields, subjects which graduates are teaching in the field should be considered (12). For this reason it would probably be wise if industrial arts majors would choose a minor from the following fields: coaching, mathematics, social studies, science, or commerce.

The recommended pattern for these industrial arts majors at Peru State Teachers College has been compared with the patterns for majors at other schools, the North Central Association recommendations, the Nebraska requirements, the industrial arts and other subject combinations which Peru graduates are teaching, and the expressed needs of teachers actually in the field. This gives rise to the final question:

- E. What does the comparison of the findings reveal and what recommendations can be made?

The comparison of the findings revealed that the patterns of academic, professional, and shop subjects for industrial arts majors at Peru State Teachers

College were complying with recommendations of the North Central Association and the requirements of Nebraska. The patterns of professional and shop subjects, however, were not meeting the average requirements of other schools. The graduates also expressed a need for additional training in various subjects within these two fields. For this reason changes were recommended and new patterns were proposed.

The summary of the recommendations for continuing or changing Peru's present patterns to meet graduates expressed needs and the standards of other colleges follows.

1. The present pattern of academic requirements for industrial arts majors, at Peru State Teachers College, should be continued without change.
2. The present pattern of professional requirements at Peru should be changed to incorporate an additional two semester hours of student teaching and one semester hour of history and principles of secondary education.
3. The present industrial arts methods and observation course requirement at Peru should be continued and a study conducted to determine what specific changes should be made in this course to meet the requests of graduates for more complete training.

4. The industrial arts methods and observations course should continue to be required for industrial arts majors but counted as elective education credit and not shop credit.
5. One semester hour in the bench and hand woodworking course should be devoted to training in the use of hand woodworking tools.
6. The required machine woodworking course should be revised to include a unit of one semester hour in carpentry.
7. A two semester hour architectural drawing course should be added to the required shop pattern.
8. The required mechanical drawing course should be revised to include a unit of one semester hour in machine drawing.
9. A two semester hour elective mechanical drawing course should be added to the elective shop pattern.
10. An additional two semester hour general metals course should be added to the required shop pattern.
11. A two semester hour elective general metals course should be added to the elective shop pattern.
12. An investigation should be made to determine what type and quantity of metal working

- equipment should be purchased for the general metals shop at Peru.
13. Metal working equipment should be purchased for the general metals shop to make possible these additions.
  14. A one semester hour elective elementary electricity course should be added to the elective shop pattern.
  15. A unit of one semester hour in leather craft should be added to the required shop pattern at Peru.
  16. A one semester hour printing course should be added to the industrial arts requirement for majors.
  17. The auto mechanics elective offering should be decreased two semester hours and a farm shop elective of two semester hours added to the shop offerings.
  18. A study should be made to determine what type of farm shop training is most desirable for industrial arts majors at Peru State Teachers College.
  19. The present elective aeronautical offerings should be continued.
  20. The first one-third of each beginning required shop course should be devoted to work of an exploratory nature.

21. A study should be made to determine what is the best method of planning and organizing exploratory work in the beginning required industrial arts courses at Peru State Teachers College.
22. Arrangements should be made to permit industrial arts majors to receive elective training in the home planning course offered by the home economics department.
23. When counseling and guiding prospective industrial arts teachers the recommendations of the North Central Association, the requirements of the state in which they plan to teach, and the subject combinations being taught in the field should be presented for consideration.
24. A study should be made to determine the best method of organizing the multiple-unit courses at Peru in order that industrial arts graduates may receive the maximum training.

Since the proposed patterns, as set forth in the recommendations above, in academic, professional, and shop courses for Peru meet the North Central Association recommendations and the Nebraska state requirements, compare favorably with the pattern of other schools, meet the expressed needs of graduates, and provide opportunities for prospective graduates to minor in the subjects frequently taught with industrial arts,

it is recommended that the three proposed patterns for industrial arts majors be considered for adoption by the Peru State Teachers College faculty.

## Chapter VI

## SUMMARY

The broadening of industrial arts offerings and the expansion of various phases of industry have made it necessary for the continuous revamping and expansion of teacher training curricula. These changes and expansions have characterized the immediate past and the trends of the future appear to be similar but accelerated (19).

The need for versatility in order to cope with industrial changes seems to be a common need of all industrial arts teachers. For this reason the faculty at Peru State Teachers College held monthly meetings throughout the year, 1942, for the purpose of curriculum study. As a result of these faculty meetings, conversation with former graduates, and a review of the records of Peru State Teachers College Placement Bureau, it was concluded that a study should be made to determine "What patterns of professional and general education courses should be provided for industrial arts majors at Peru State Teachers College?"

The sources of data used in this study were: Peru State Teachers College files of student records which are used by the registrar in making all official

transcripts; Peru State Teachers College graduates who have majored in industrial arts during the past 10-year period, 1932-42, and who were actually teaching; Peru State Teachers College catalog, 1942-43, which provided an accurate description of the present policies that students must follow in preparing themselves for teaching; the official college catalogs from 44 other state teachers colleges offering majors in industrial arts; authoritative records of the division of certification of the Nebraska State Department of Public Instruction; and the permanent records of the Peru State Teachers College Placement Bureau.

Four methods were used in gathering data:

1. Tabulation of data was made from official permanent student records.
2. A written request for college catalogs was sent to 107 state teachers colleges.
3. A report of specific requirements for certification of industrial arts teachers in Nebraska was obtained.
4. A questionnaire was used for obtaining information from Peru graduates of the past 10-year period who were teaching industrial arts.

The application of these methods to the sources revealed three specific patterns of requirements for industrial arts majors. The first was a pattern of academic subjects; the second, a pattern of professional

subjects; and the third, a pattern of shop subjects (Tables 18, 19, 20, and 21).

The comparison of the findings revealed that the patterns of academic, professional, and shop subjects for industrial arts majors at Peru State Teachers College were complying with recommendations of the North Central Association and the requirements of Nebraska. The patterns of professional and shop subjects, however, were not meeting the average requirements of other schools. The graduates also expressed a need for additional training in various subjects within these two fields. For this reason changes were recommended and new patterns were proposed.

The summary of the recommendations for continuing or changing Peru's present patterns to meet graduates expressed needs and the standards of other colleges follows.

1. The present pattern of academic requirements for industrial arts majors, at Peru State Teachers College should be continued without change.
2. The present pattern of professional requirements at Peru should be changed to incorporate an additional two semester hours of student teaching and one semester hour of history and principles of secondary education.
3. The present industrial arts methods and obser-

Table 18.--PATTERNS OF REQUIRED ACADEMIC SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
English	8.7	8	-0.7
Mathematics	2.8	8	-2.1
Sciences	7.3	8	-1.1
Social studies	9.1	8	-1.1
Educational psychology	4.9	4	-0.9
Music	0.4	2	+1.6
Fine arts	1.5	2	+0.5
Language	1.0	0	-1.0
Physiology and hygiene	0.0	2	+2.0
Total	35.7	34	-1.7

Table 19.--PATTERNS OF REQUIRED PROFESSIONAL SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
Classroom management	0.5	2	+1.5
Curriculum	0.5	0	-0.5
Education and voc. guidance	0.4	0	-0.4
Public school organ. & adminis.	0.4	0	-0.4
History & principles of sec. educ.	3.4	2	-1.4
Library methods	0.1	0	-0.1
Philosophy of education	0.4	4	+3.6
Tests and measurements	1.5	2	+0.5
Class organ. & mgmt. (Indus.Arts.)	0.1	0	-0.1
Course and shop organization	1.3	0	-1.3
Supervision of Industrial Arts	0.1	0	-0.1
Adminis. of Industrial Education	0.2	0	-0.2
Methods of teach. Indus. Arts	2.2	4	+1.8
Directed observation of Indus.Arts	0.5	0	-0.5
Directed teaching of Indus. Arts	5.7	4	-1.7
History of Industrial Arts	0.4	0	-0.4
Philosophy of Indus. Arts Educ.	0.05	0	-0.05
Individual instruction sheets	0.2	0	-0.2
Vocational education	0.3	0	-0.3
General shop theory	0.1	0	-0.1
Trade or activity analysis	0.1	0	-0.1
Materials of engineering	0.05	0	-0.05
Total	18.5	18	-0.5

Table 20.--PATTERNS OF REQUIRED SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
Woodworking	7.7	8	+0.3
Drafting	7.1	6	-1.1
Metal working	3.7	2	-1.7
Electricity	1.1	2	+0.9
Arts and crafts	1.2	0	-1.2
Graphic arts	2.0	0	-2.0
Mechanics	1.2	2	+0.8
Aeronautics	0.0	0	0.0
Miscellaneous	1.8	2	+0.2
Total	25.8	22	-3.8

Table 21.--PATTERNS OF ELECTIVE SHOP SUBJECTS FOR INDUSTRIAL ARTS MAJORS

Subject	Other Schools	Peru	Differences
Woodworking	9.0	12	+3.0
Drafting	8.1	4	-4.1
Metal working	4.3	6	+1.7
Electricity	1.6	2	+0.4
Arts and crafts	2.7	1	-1.7
Graphic arts	4.0	0	-4.0
Mechanics	2.2	4	+1.8
Aeronautics	1.1	4	+2.9
Miscellaneous	1.4	1	-0.4
Total	34.4	34	-0.4

vation course requirement at Peru should be continued and a study conducted to determine what specific changes should be made in this course to meet the requests of graduates for more complete training.

4. The industrial arts methods and observations course should continue to be required for industrial arts majors but counted as elective education credit and not shop credit.
5. One semester hour in the bench and hand woodworking course should be devoted to training in the use of hand woodworking tools.
6. The required machine woodworking course should be revised to include a unit of one semester hour in carpentry.
7. A two semester hour architectural drawing course should be added to the required shop pattern.
8. The required mechanical drawing course should be revised to include a unit of one semester hour in machine drawing.
9. A two semester hour elective mechanical drawing course should be added to the elective shop pattern.
10. An additional two semester hour general metals course should be added to the required shop pattern.
11. A two semester hour elective general metals

- course should be added to the elective shop pattern.
12. An investigation should be made to determine what type and quantity of metal working equipment should be purchased for the general metals shop at Peru.
  13. Metal working equipment should be purchased for the general metals shop to make possible these additions.
  14. A one semester hour elective elementary electricity course should be added to the elective shop pattern.
  15. A unit of one semester hour in leather craft should be added to the required shop pattern at Peru.
  16. A one semester hour printing course should be added to the industrial arts requirement for majors.
  17. The auto mechanics elective offering should be decreased two semester hours and a farm shop elective of two semester hours added to the shop offerings.
  18. A study should be made to determine what type of farm shop training is most desirable for industrial arts majors at Peru State Teachers College.
  19. The present elective aeronautical offerings

should be continued.

20. The first one-third of each beginning required shop course should be devoted to work of an exploratory nature.
21. A study should be made to determine what is the best method of planning and organizing exploratory work in the beginning required industrial arts courses at Peru State Teachers College.
22. Arrangements should be made to permit industrial arts majors to receive elective training in the home planning course offered by the home economics department.
23. When counseling and guiding prospective industrial arts teachers the recommendations of the North Central Association, the requirements of the state in which they plan to teach, and the subject combinations being taught in the field should be presented for consideration.
24. A study should be made to determine the best method of organizing the multiple-unit courses at Peru in order that industrial arts graduates may receive the maximum training.

Since the proposed patterns, as set forth in the recommendations above, in academic, professional, and shop courses for Peru meet the North Central Association recommendations and the Nebraska state requirements, compare favorably with the patterns of

other schools, meet the expressed needs of graduates, and provide opportunities for prospective graduates to minor in the subjects frequently taught with industrial arts; it is recommended that the three proposed patterns for industrial arts majors be considered for adoption by the Peru State Teachers College faculty.

## APPENDIX

Appendix	Page
A. Questionnaire - - - - -	150
B. Certification digest- - - - -	153
C. Peru State Teachers College placement bureau records - - - - -	154



(Underline your choice)

excellent          good          fair          poor

2. List those professional subjects (history, philosophy, techniques of administration and supervision, curriculum principles and practices, methods of teaching, student teaching, etc.), if any, in which you think more teacher training should be required.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

3. Express your opinion of the extent of adequate industrial arts training. (Underline your choice)

excellent          good          fair          poor

4. List those industrial arts courses in which you think more teacher training should be given.

_____	_____
_____	_____
_____	_____
_____	_____

5. List those industrial arts courses which you think should be offered but were not at the time you secured your training.

_____	_____
_____	_____
_____	_____

6. If you were working on an industrial arts major, what minors would you choose? Place an X in front of your choice or list in blanks below if not given.

<input type="checkbox"/> Mathematics	<input type="checkbox"/> Coaching	<input type="checkbox"/> Social Science
<input type="checkbox"/> Science	<input type="checkbox"/> Commerce	<input type="checkbox"/> Physical train-
<input type="checkbox"/> History	<input type="checkbox"/> Music	<input type="checkbox"/> ing
_____	_____	<input type="checkbox"/> English
_____	_____	_____
_____	_____	_____

You may have a copy of the results of this study if you wish. Please check.  Yes.  No.

# CERTIFICATION DIGEST

## OF TEACHERS' CERTIFICATES

Authorized by Law in Nebraska

TITLE	PLAN	TERM	WHERE VALID		REQUIREMENTS ABOVE HIGH SCHOOL GRADUATION	SUBJECTS IN WHICH VALID	RENEWALS	
			SCHOOL	GRADE			HOW MANY	REQUIRE
NEBRASKA THIRD GRADE ELEMENTARY SCHOOL CERTIFICATE	One	3 yrs.	(a)	K-8	12 semester hours college credit including 6 hours in education and 2 hours in physiology and hygiene plus 17 teachers examination grades (Ave. 80, minimum grade 70.)	All Elementary	One	9(3)
	Two	3 yrs.	(a)	K-8	*Nebr. High School Normal Training plus 17 teachers examination grades (Ave. 80, minimum grade 70.)	All Elementary	One	9(3)
NEBRASKA GENERAL ELEMENTARY SCHOOL CERTIFICATE	Initial	3 yrs.	(a)	K-8	Plan 1. Completion of one-year college teacher training course in Nebr. college offering course and recommendation of school. Plan 2. Third Grade Elementary Certificate plus 24 semester hours including 6 in education and 4 years experience.	All Elementary	One	9(2)
	Provisional	3 yrs.	(a)	K-8	Third Grade Elementary Certificate valid after August 31, 1938, or Initial General Elementary, and total of 39 semester hours including 6 in education and 1 year experience.	All Elementary	One	9(2)
	Professional	3 yrs.	(a)	K-8	Third Grade Elementary Certificate valid after August 31, 1938, or Initial or Provisional General Elementary and total 48 semester hours including 14 in education and 3 years experience.	All Elementary	Any No.	9(2)
NEBRASKA JUNIOR ELEMENTARY SCHOOL CERTIFICATE	Initial	3 yrs.	All	K-8	Completion two-year college teacher training course and recommendation of school. Minimum 15 hours in education (3 in supervised teaching grades K to 8) and 2 in physiology and hygiene.	All Elementary	One	9(2)
	Provisional	3 yrs.	All	K-8	Nebr. certificate of equal or lower rank valid after August 31, 1938 and same requirements as Initial Junior Elementary plus 9 semester hours including 2 in education, one year experience.	All Elementary	One	9(2)
	Professional	3 yrs.	All	K-8	Nebr. certificate of equal or lower rank valid after August 31, 1938 and same requirements as Initial Junior Elementary plus 18 semester hours including 4 in education and three years experience.	All Elementary	Any No.	9(2)
NEBRASKA SENIOR GRADE SCHOOL CERTIFICATE	Initial	5 yrs.	All	K-10	Completion three-year college teacher training course and recommendation of school. Minimum 15 hours in education (3 in supervised teaching grades K to 10), and 2 in physiology and hygiene.	All Elementary and Junior H. S.	One	9(2)
	Provisional	5 yrs.	All	K-10	Nebr. certificate of equal or lower rank valid after August 31, 1938 and same requirements as Initial Senior Grade plus 9 semester hours including 2 in education, one year experience.	All Elementary and Junior H. S.	One	9(2)
	Professional	Life	All	K-10	Nebr. certificate of equal or lower rank valid after August 31, 1938 and Baccalaureate degree (minimum 18 hours in education) and 3 years experience.	All Elementary and Junior H. S.	Any No.	9(2) Gr.
NEBRASKA SECONDARY SCHOOL CERTIFICATE	Initial	5 yrs.	All	7-12	Completion four-year college teacher training course with Baccalaureate degree and recommendation of school. Minimum 18 hours in education (3 in supervised teaching grades 7-12) and 2 hours in physiology and hygiene. 15 semester hours in two teaching fields.	All Junior and Senior High School	One	9(3) Gr.
	Provisional	5 yrs.	All	7-12	Nebr. certificate of equal or lower rank valid after August 31, 1938 and same requirements as Initial Secondary plus 9 semester hours graduate credit including 3 in education, one year experience grades 7-12.	All Junior and Senior High School	One	9(3) Gr.
	Professional	Life	All	7-12	Nebr. certificate of equal or lower rank valid after August 31, 1938 and same requirements as Initial Secondary plus 18 semester hours graduate credit including 6 in education, 3 years experience grades 7-12.	All Junior and Senior High School	Any No.	9(3) Gr.
NEBRASKA ADMINISTRATIVE and SUPERVISORY CERTIFICATE	Initial	5 yrs.	(b)	K-12	Completion of four-year college teacher training course with Baccalaureate degree and recommendation of school. Minimum 18 hours in education (3 in supervised teaching) and 2 hours in physiology and hygiene. 15 semester hours in two teaching fields.	All subjects in all grades	One	9(3) Gr.
	Provisional	5 yrs.	All	K-12	Nebr. certificate valid after August 31, 1938 and same requirements as Initial Admin. and Superv. plus 9 semester hours graduate credit including 5 in education and 2 years experience as superintendent, principal, or supervisor.	All subjects in all grades	One	9(3) Gr.
	Professional	Life	All	K-12	Nebr. certificate valid after August 31, 1938 and Masters degree with major (16 semester hours) in education and 4 years experience as superintendent, principal, or supervisor.	All subjects in all grades	Any No.	9 Gr.
Special Music Certificate		3 yrs.	All	K-12	Valid for music only. Satisfactory grades in examinations and recommendation from three responsible persons.	Music	Any No.	Successful Experience

NOTE. This chart reads as follows: The Third Grade Elementary Certificate, Plan 1, is valid for a period of three years in Article III schools, in the kindergarten to the eighth grade inclusive. The requirements are, satisfactory grades in the 17 state teachers examinations and 12 semester hours of college credit including 6 hours in

education courses and 2 hours in Physiology and Hygiene. This certificate may be renewed once by presenting 9 additional semester hours of college credit including 3 hours in education.

(a) refers to Article III schools.

(b) reads: All schools but Article 25, 26 and 27 schools.

Gr. stands for graduate credit.

Under the Requirements and Renewal columns, the first figure is the total amount of college hours of credit and the figure in parenthesis is the amount of these hours that must be in education. \*N. T. taken over 3 years ago must be brought up to date by earning 2 sem. hrs. college credit with 2 in educ. 2 phy. & hygiene.

PERU COLLEGE PLACEMENT BUREAU--1941  
 Number of subjects and subject combinations required in U.S. Teacher calls for years 1937-41 inclusive.

	One Subj.	Two subj.	Three Subj.	Four or more	Mathematics	English	Latin	History	Social Sci.	Science--All	Phys. Sci.	Biology	Normal Tr.	Commerce	Typing	Home Ec.	Manual Arts	Music--All	Inst. Music	Vocal Music	Boys Ath.	Gymnastics	Boys Ath.	Swimming	Track	Tennis	Baseball	Softball	Football	Ice Skating	Other
Mathematics	7	54	103	15	0	20	13	12	9	68	18	14	1	19	9	2	12	15	16	4	46	7	4	1	1	1	1	1	1	1	1
English	8	140	146	39	16	0	75	47	21	6	1	14	4	29	20	37	2	80	14	44	11	83	15	9	2	8	3	1	1	1	
Latin	0	7	4	2	1	5	0	3	1	2	0	3	2	4	4	5	0	15	1	3	2	3	3	1	0	2	0	0	0	0	
History	0	6	9	0	4	14	2	0	15	2	2	2	0	1	1	1	4	5	1	0	19	2	1	1	0	0	0	0	0	0	
Social Sci.	1	24	42	1	3	5	4	10	0	2	2	6	0	5	1	3	2	4	2	4	28	4	3	0	0	0	0	0	0	3	
Science--All	3	46	44	4	39	7	3	3	2	0	0	1	0	1	4	0	21	3	1	0	46	2	3	1	0	0	0	1	1	1	
Phys. Sci.	0	5	8	2	3	0	0	1	2	0	0	0	0	0	0	0	4	0	3	0	9	0	0	0	0	0	0	0	1		
Biology	1	0	2	3	1	1	0	2	2	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	
Normal Tr.	1	51	23	1	6	16	8	9	9	1	0	2	0	4	3	10	0	8	0	2	3	4	3	0	0	1	0	0	0	0	
Commerce	81	139	75	6	29	56	12	17	16	7	6	4	2	0	0	11	3	20	3	8	25	24	5	1	0	1	1	0	0	0	
Home Ec.	26	82	69	16	10	56	21	17	22	15	3	10	5	12	8	0	0	26	3	4	0	9	14	0	0	1	1	1	1	1	
Manual Arts	55	44	50	6	22	11	3	10	15	21	7	6	1	5	2	0	0	5	4	0	52	1	0	0	0	0	0	0	3		
Music	76	164	85	5	23	119	29	30	33	10	2	5	1	22	7	8	7	0	0	0	3	12	3	0	1	0	3	1	1	1	
Boys Ath.	4	98	130	23	95	23	3	35	53	88	19	16	0	11	5	1	67	1	2	0	8	1	0	0	0	0	0	0	3		
Principal	4	17	46	24	33	19	8	16	22	15	4	1	1	2	5	0	14	7	4	1	11	2	0	0	0	0	0	0	1		
Supt.	13	15	15	13	12	1	2	4	5	9	2	2	0	2	1	0	8	3	7	0	6	0	0	0	0	0	0	0	0	0	

## PERU TEACHERS PLACEMENT BUREAU—1941

Report on the number of calls for teachers received for 1941 (to Sept. 4)

Table No. 2: Shows the number of times each subject was called for to be taught either alone or in combination with one, two, three, or more other subjects. Also shows the number of times each high school subject was mentioned in all calls received for the years 1935, 1936, 1937, 1938, 1939, 1940, and 1941.

SUBJECT	one only	two subj. or more	three	Total times each subject was mentioned during the following years:						
				1941	1940	1939	1938	1937	1936	1935
English	5	44	96	184	156	134	146	133	86	53
Music	19	62	12	187	116	119	201	189	96	70
Mathematics	4	18	32	141	85	87	93	84	49	37
Commerce	26	43	20	133	109	80	93	78	64	34
Boys Athletics	2	33	45	158	93	77	97	95	60	42
Home Economics	5	22	14	65	44	48	58	51	38	27
Sciences—All	3	25	18	123	69	56	71	46	45	31
Social Science	0	10	16	76	50	51	72	53	28	22
Latin	0	7	6	38	42	48	55	45	51	25
History	0	5	9	74	48	40	48	56	32	42
Dramatics*	0	0	0	36	30	26	32	30	15	24
Manual Arts	7	19	14	62	34	23	45	52	23	23
Prin. & Supt.	2	7	25	34	29	20	31	27	22	11
Biology	0	0	2	22	18	14	22	22	8	6
Physical Sci.	0	1	3	12	15	12	14	26	7	7
Normal Training	0	17	3	23	0	11	24	18	24	11
Girls Athletics*	0	0	0	11	25	10	23	9	14	6
General Science*				4	0	3	4	17	14	0
Art*				4	1	3	1	1	1	0
French*				5	0	3	0	6	2	1
Spanish*				4	4	2	3	3	2	1
Agriculture*	2			5	5	2	4	4	4	3
German*				1	2	1	1	1	1	2
Totals	93	317	366							

\*These subjects were never mentioned first and only in combination with other subjects.

Table No. 3: Total number of calls by departments over a period of six years.

DEPARTMENT	1941	Total calls received each year					
		1940	1939	1938	1937	1936	1935
Early Elementary (Dks. 1, 2)	67	53	47	50	63	45	26
Elementary, grades 3, 4, 5, 6	86	77	64	72	47	52	34
Junior High, Dept. and 7-8	87	53	38	54	56	49	35
Grades 9-10	12	2	5	10	10	4	3
High School Calls	656	471	373	438	390	233	193
Totals for each year	908	623	527	628	570	385	321

## BIBLIOGRAPHY

1. American vocational association. Committee on standards. Standards of attainment in industrial-arts teaching. (Final report of the committee, as presented at the Pittsburgh convention, \_\_\_ 1934) =Bloomington, Ill., Pantagraph printing and stationery co.,= 1934. 92 p.
2. Aviation education research project. Education for the air age; a preliminary statement for teachers and school administrators. New York, the Project, 525 West 120 Street, 1942. 23 p. Prepared by the staff under the auspices of the Civil aeronautics administration.
3. Baker, Emily V. Those who watch our ramparts. Educational administration and supervision, 25:513-22, October 1939.
4. Bawden, W. T. Preparation of teachers for general shop. Industrial education, 40:221-22, September 1938.
5. Bennett, Charles Alpheus. History of manual and industrial education, 1870 to 1917, Peoria, Illinois, The manual arts press [1937] 566 p.
6. Briggs, Eugene S. Demands for teachers prepared to guide and direct extra-class activities. School and society, 45:693-6, May 15, 1937.
7. Dean, Leonard F. Courses for teachers. School and society, 45:401-2, March 20, 1937.
8. Fryklund, Verne C. Industrial arts teacher education in the United States. Bloomington, McKnight and McKnight, 1941. 112 p.
9. Inman, James Henry. The training of Iowa high school teachers in relation to the subjects they teach; a study of 1048 graduates of eleven colleges. Iowa City, Ia., The University, [1928] 66 p. (Iowa University. University of Iowa studies in education, v. IV, no. 9)

10. Kirby, Thomas J. Subject combinations in high school teachers' programs. School review, 34:494-505, September 1926.
11. Koos, Leonard V. The questionnaire in education. New York, The Macmillan company, 1924. 177 p.
12. Lafferty, H. M. Problems to be considered by teachers-in-training in selecting fields of specialization. Educational administration and supervision, 25:641-52, December 1939.
13. Leib, B. W. Preparing comprehensive general-shop teachers in a teachers' college. Industrial education magazine, 41:165-70, September 1939.
14. Meyer, E. D. Follow-up study of industrial arts graduates. Industrial arts and vocational education, 30:11-12, January 1941.
15. Newkirk, L. V. and Stoddard, G. D. The general shop. Peoria, Ill., The manual arts press, 1929. 190 p.
16. Pawelek, S. J. Some aspects of industrial-arts teacher preparation. Industrial arts and vocational education, 31:147-9, April 1942.
17. Proffitt, M. M. The general shop. Washington, Govt. print. off., 1929. 27 p. (U. S. Office of education, Bulletin, 1929, no. 30.)
18. Proffitt, M. M. Industrial arts an essential in the curriculum of American schools. Industrial education, 40:231-34, November 1938.
19. Proffitt, M. M. Trends in industrial arts. Washington, U. S. Govt. print. off., 1940. 20 p. (U. S. Office of education. Pamphlet no. 93).
20. Ridgeway, C. W. A comparative study of the training and teaching combinations of Kansas high school teachers. -Emporia, Kansas, - 1931. 31 p. (Kansas state teachers college, Emporia. Studies in education, no. 5.)
21. Snidow, Harold J. Changes in industrial arts methods of teaching in the United States since 1900. Master's special report, 1941. Colorado state college. 64 p. ms.

22. Talley, Claire B. A survey of the three-year high schools in west central Illinois. Master's thesis, 1938. Colorado state college. 88 p. ms.
23. Whitney, Harry H. Survey of industrial arts curricula in state teachers colleges accredited by the north central association. Master's thesis, 1933. Colorado state college. 83 p. ms.
24. Woellner, Robert C. and Wood, M. Aurilla. Requirements for certification of teachers and administrators for elementary schools, secondary schools, and junior colleges, [6th,] 1941-42, edition. Chicago, University of Chicago press, [1941.] [92] p.
25. Works, George A. Preparation of secondary school teachers; the problem in colleges of liberal arts. North central association quarterly, 15:241-2, January 1941.

LIBRARY  
COLORADO STATE COLLEGE OF A. & M. A  
FORT COLLINS, COLORADO