8-1-1939

A Survey of Inductrial Arts in the Accredited High Schools of North Dakota

Charles Adam Montague

A SURVEY OF INDUSTRIAL ARTS IN THE ACCREDITED HIGH SCHOOLS OF NORTH DAKOTA

- -

A Thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

by

Charles Adam Montague

- -

In Partial Fulfillment of the Requirements

for the Degree of

Master of Science in Education

August, 1939

This thesis, offered by Charles Adam Montague as a partial fulfillment of the requirements for the degree of Master of Science in Education at the University of North Dakota, is hereby approved by the committee under whom the work has been done.

Erich Selke
Chairman

E. T. Towne

W. Hill

J. C. Breitwieser
Director of the Graduate Division

ACKNOWLEDGEMENTS

In the preparation of this thesis the writer is deeply indebted to Dr. Erich Selke for the assistance and guidance which he so generously gave in the writing of the manuscript. Appreciation is also expressed to A. W. Gill, who approved this survey and freely gave of his time and ability. The writer is also indebted to the members of the State Department of Public Instruction of North Dakota for giving access to the state records, the superintendents of schools and the teachers of industrial arts of the high schools surveyed for returning the questionnaire.

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES

List of Figures

CHAPTER 1

INTRODUCTION

The history and development of industrial education has been a process of many centuries. Yet, today we are in one of the greatest periods of change that has taken place in our educational system.

During the past few years, industrial arts education and its relative value in the school curriculum has been a topic of considerable discussion. The teachers in this field have little doubt as to the comparative benefits that may be derived from such education in the public schools. The critics of education today demand that it must be made practical and must relate well to the experiences of actual life.

Industrial arts has developed from a maze of related subjects to its present status so that it has become a part of the general educational program which better equips young people with the versatility necessary to adjust themselves to everyday living. Maris M. Proffitt, chairman of a committee appointed by the United States Commissioner of Education to study industrial arts, states:

> "Activities, such as industrial arts presents, provide opportunities for self-expression in natural kinds of media as opposed to the kinds used in instruction in abstract subjects. Industrial arts activities provide most excellent educational experiences for preserving and

developing the artistic and natural sides of the child's nature." [1]

Vocational education equips the student with the fundamentals of a vocation to be carried out as a life work. This type of education has been advancing in our educational system in order to equip students with better natural facilities for earning a living.

> "Vocational education is a very inclusive term and, viewed broadly, may corner all those experiences whereby an individual learns to carry on successfully any useful occupation. In a narrower sense, vocational education may be defined as a series of controlled and organized experiences arranged to prepare a person for socially useful employment. All education may be considered vocational in the sense that it should prepare for satisfactory living. It is customary, however, to distinguish between general education and vocational education." [2]

> "It is desirable to understand the relationship and points of departure of industrial arts education and vocational industrial education. Industrial arts education is a part of general education intended to contribute to all-around development of the individual, as distinguished from vocational education which is specialization in a definite field of work. In other words, industrial arts does not aim to make efficient producers, and could not even if time allowed." [3]

Today most of our leading educators agree that

---

1. Proffitt, Maris M., Industrial Arts Its Interpretation in American Schools, Bulletin 1937, No. 34, Washington, D. C.: United States Department of Interior, 1938, p. 6.
2. Russell, John Dale, and Associates, Vocational Education, United States Government Printing Office, Washington, D.C., 1938, p. 13.
3. Struck, F. T., Foundations of Industrial Education, John Wiley and Sons, 1930, p. 37.

industrial arts education and vocational education are closely interrelated and should be accepted as such for a clearer and better understanding of general education. We should not attempt to designate the point at which industrial arts education ends and vocational education begins.

> "There are two complementary phases of kinds of industrial education, the general or industrial arts phase and the strictly vocational or training phase. These should be thought of, not as mutually exclusive and different offerings, but as closely allied and interdependent parts of a complete service. Students, teachers, equipments, and moneys in these two phases need administrative attention in the direction of welding and fusing. The early federal-aid practices tended to hold them apart which, I think, was well advised in the beginning. For the years ahead a closer union of the two seems not only a wiser course but a plan in process of realization. Ultimately we shall have more state and federal aid for this work in support of well founded programs, without regard to their constituent elements. The criteria for aid will be goodness of concept, worthiness of effort, and effectiveness of placement and adjustment result. It will be a matter of service rendered to existing, needy groups. There will be lateral and vertical integration." 4

> "Let us not be too much concerned about where industrial arts shall end and trade training shall begin. The day of their strict demarcation has happily gone.
>
> "It is all industrial education, and who shall say just what a boy or a man may need in the years ahead? The future requires improvement in both of these fields, but it makes a still stronger demand that we recognize their interdependence. It is overlapping, interweaving, dovetailing, and blendwelding that will insure success. As long as versatility helps in placement, as long as promotion means change of work,

---

4 Smith, Homer J., "Aims and Types of Industrial Education", Industrial Arts and Vocational Education Magazine, Vol. 28, February, 1939, p.45.

the industrial-arts courses are justified and will remain. The problem is one of improvement. The challenge is clear as the future is certain." [5]

---

5 Smith, Homer J., "Challenge of the Future", Industrial Arts and Vocational Education Magazine, Vol. 22, April, 1933, p. 159.

Purpose of This Study

The author of this study proposes to discover to what extent industrial arts education is offered in the classified accredited high schools of North Dakota; the growth and decrease of industrial arts, pupil-teacher ratio in the courses offered, such industrial subjects as are in the program, facilities and equipment for teaching, apprenticeship methods, visual instruction, educational qualifications and teaching combinations of teachers, and other minor phases of industrial arts pertaining to this study.

Source of Data

The information and data presented in this study were obtained from three major sources: from the Department of Public Instruction including the Administrative Manual for North Dakota High Schools, the North Dakota Educational Directory, certificates held by teachers, and the Annual Report of the High School Inspector; a questionnaire sent to the schools offering industrial arts courses; and reference material obtained at the University of North Dakota library.

The purpose of the Department of Public Instruction in issuing the Administrative Manual is to cooperate with the local school authorities in guiding the development of their

high schools. To that end, many suggestions and recommendations, in addition to the required standards for accredited schools, are given. The standards are minimum requirements. Recommendations and suggestions are made toward the further development of the school along the lines of the most modern conception of secondary education.[6] This Manual gives the requirements for classification of first, second, and third class high schools of North Dakota which are pertinent to this study.

The North Dakota Educational Directory[7] gives a list of accredited high schools, the number enrolled in high school, and the number of teachers in high school, all of which information is used in this study.

The Annual Report of the High School Inspector[8] gives compiled information on industrial arts subjects taught, their enrollment, per cent of boys enrolled, and the valuation of shop equipment, which is included in this study. The High School Annual Reports are sent to the High School Inspector by the administrators of the accredited schools. These reports

---

6 Administrative Manual for North Dakota High Schools, Department of Public Instruction, Bismarck, North Dakota, 1938.

7 Thompson, Arthur E., North Dakota Educational Directory - 1938-1939, Department of Public Instruction, Bismarck, North Dakota, 1938.

8 The Annual Report of the High School Inspector, Department of Public Instruction, Bismarck, North Dakota, 1920, 1925, 1930, unpublished 1935.

include the names of the instructors, their degrees, their years of experience, their annual salaries, the college from which they were graduated, their teaching combinations, and the total enrollments in their classes.[9]

The department of certification files include records of industrial arts instructors, including such information as the degrees held, the dates of graduation from college, and major and minor fields of preparation.

The questionnaire was sent to the superintendents or the principals of all four-year accredited high schools listed on the annual report blanks for 1938-1939 as offering industrial arts. This method was used to collect data which was not available from other listed sources.[10]

The reference material obtained from the University of North Dakota library included books, bulletins, magazines, North Dakota statutes, theses and other materials.

Terminology

The term, industrial arts, has been used by educators to cover many courses and activities of industrial education.

---

9 Appendix, A

10 Appendix, B

In recent years, attempts have been made to straighten out the use of this term.

A committee composed of Elroy Bollinger of the University of North Dakota, John Fintz and Frank Moore of Cleveland, Dr. William H. Stone and Dr. William E. Warner of Ohio State University, prepared for the meeting of the Western Arts Association which was held in Columbus, Ohio, May 1933, the following list of definitions:

Industrial-Arts Education

Addition of the word, Education, to the term Industrial Arts is used when referring to a field or program of such work: for example, Policies in Industrial Arts Education refers to a book dealing with the preparation of Industrial-Arts teachers; Supervision of Industrial-Arts Education refers to a person employed to supervise Industrial Arts in a city or state program.

Practical Arts

Practical Arts Education is a form of general or non-vocational education which aids or enriches every-day life principally through purposeful activity. Practical Arts includes the various subclasses of (major) Industrial Arts, Household Arts, Commercial Arts, Agriculture Arts (minor), Graphic Arts, Musical Arts, Physical Arts, Plastic Arts, representing the various major or minor areas of both individual and social economic life. Frequently Fine Arts is classed as a separate practical arts, although really "fineness" is a characteristic or quality of all the arts, practical and liberal. The term Practical Arts is best used as an omnibus term for administrative purposes instead of a name of an object.

Technical Education

Technical education is a special form of education on secondary school and college levels offered for the purpose of preparing persons in the arts and sciences, the underlying practices in some trades and professions, and to help qualify them

to engage in a trade or some branch of productive industry. This type of education prepares quite specifically for the work in the engineering occupations and minor executive positions in industry.

Vocational Education

Vocational Education is a form of practical education the chief purpose of which is to prepare persons fourteen years of age and older for gainful or wage-earning employment; specifically economic rather than generally social. Its minor purposes, however, are of social character, including civic, moral, ethical, and health.

Industrial Arts

Industrial Arts is one of the Practical Arts, a form of general or nonvocational education, which provides learners with experiences, understandings, and appreciations of materials, tools, processes, products, and of the vocational conditions, and requirements incident generally to the manufacturing and mechanical industries. The term Industrial Arts is generally displacing the historical but narrower term, Manual Training; and in common usage it has substantially the same significance as the term Manual Arts; although Industrial Arts emphasizes in addition the all-round arts of industry rather than just manipulative or Manual aspects of artistic construction implied in the term Manual Arts. [11]

Many other terms in this study should be clarified. A supervisor as referred to is the head of the school system. Full time instructors are men teaching only in the industrial arts field. Part-time instructors are men teaching in the industrial arts field who also have other instructional or supervisory work. Pupil-teacher ratio refers to the enrollment in courses taught by industrial arts instructors.

---

11 Warner, William E., Bollinger, Elroy W., Hitchinson, Herbert H., and Others, "The Terminlogical Investigation of Professional and Scientific Terms from the Literature of Vocational and Practical Arts Education", Western Arts Association Supplement, 1933, p. 44.

Apprenticeship method concerns industrial art students working part time at a vocation. Program is the industrial arts course offered by representative schools. Fees are monies paid by students to help defray the expenses of the course. Visual instruction refers to the use of silent and sound projectors in presenting additional materials in industrial arts courses. Per cent of time is the time spent by part-time instructors in teaching industrial arts as compared to the time they spend in teaching other courses. Extra-curricular activities are the activities conducted by both classes of industrial arts instructors in addition to their actual teaching.

CHAPTER II

GROWTH AND DECLINE OF INDUSTRIAL ARTS IN THE ACCREDITED HIGH SCHOOLS OF NORTH DAKOTA

Industrial arts, under the term of manual training, was required by law enacted by the legislature of 1911, to be offered as one of the requirements for accrediting in the four year state, high, graded, and consolidated schools.[1] This accounts for the large number of accredited high schools offering industrial arts courses in 1919-1920.

The requirements for manual training in the accredited high schools as set forth in the High School Manual of 1920,[2] were as follows:

1. There shall be sufficient room space for manual training.

2. In first and second class high schools, teachers of manual training, who do not teach academic subjects in high school, and who do not hold the bachelor's or equivalent degree from an institution of recognized standards or the first grade professional certificates, granted under the provisions of section 252 of the school laws of 1911, shall hold special certificates to teach these subjects, granted under the provision of section 253 of the school laws of 1911.

---

1 Manual of the State High School Board of North Dakota, Published by the High School Board, August, 1911, p. 10.

2 Manual of the High School Board, 1919.

3. Two units of manual training are offered by the high school. No pupil shall be eligible for the second credit in manual training without taking at least one-half credit in mechanical drawing.

4. The recommended program of studies for high schools as set up by the State Board of Education in 1919, included manual training 1 and 11 as constants for the school.

The growth of accredited schools was steady up to 1918, 1919, and 1920, the accrediting remaining stationary with an enrollment of 144, which was achieved in 1918.[3] This stationary period, no doubt was caused by the after affects of the world war.

INCREASE OF FOUR YEAR ACCREDITED HIGH SCHOOLS

Table 1 shows the growth in number of first, second and third class accredited high schools. The school years selected for this study are representative of the general growth of accredited high schools from 1920 through 1939.

---

[3] Thirteenth Annual Report of the Inspector of High Schools, Published by the Department of Education, Bismarck, North Dakota, 1920, p.18.

TABLE I

GROWTH OF ACCREDITED SCHOOLS

NUMBER OF HIGH SCHOOLS				
Year	First Class	Second Class	Third Class	Total
1920	76	28	40	144
1925	90	39	33	162
1930	100	52	39	191
1935	103	48	55	206
1939	116	44	54	214

The data in Table 1 indicates the growth in numbers. From the school year 1920, through the school year 1939, there was an increase from 144 to 214 accredited schools; this was an increase of 70 accredited high schools, or a 48.6 per cent increase. The greatest rate of increase was from 1920 through 1930, an increase of 32.6 per cent. An increase of only 5.6 per cent has been made from 1935 through 1939. This can be readily accounted for as there are fewer schools left for accrediting. Also the economic conditions of the past few years have affected progress in school accrediting. The second class accredited schools had the greatest rate of accrediting from 1920 through 1930, with an increase of 85.7 per cent. The third class schools had the smaller rate from 1920 through 1925, a decrease of 17.5 per cent. The general

tendency has been for more schools to attain higher accrediting recognition, promoted by the state department of education and the requirements for college entrance.[4]

Industrial Arts in the Accredited High Schools

The offering of industrial arts in the accredited high schools has declined since 1920, as shown in Table II. This has resulted from state legislation. After 1922, manual training was required to be taught only once in the high school life of a pupil.[5] This fact explains some of the decrease in enrollment. The state legislature of 1929 enacted a law which does not require accredited high schools to offer industrial arts in their curriculum.[6] This resulted in a decline of industrial arts from 1930 through 1935.

The thirty-second Annual High School Inspector's Report for 1939 is not available at the time of this study, which may result in a slight variation as the material is taken from the Annual Reports of the accredited high schools.

---

4 Administrative Manual, 1938, pp. 42-43.

5 Manual of the State High Schools, 1923, p. 10

6 "Manual Training and Domestic Science", General Laws of the State of North Dakota, 1929, Chap. 206, p. 285.

TABLE II

ACCREDITED HIGH SCHOOLS OFFERING INDUSTRIAL ARTS

School Year Ending	1920	1925	1930	1935	1939
Accredited High Schools	144	162	191	206	214
Industrial Arts Offered	98	49	39	27	36
Per Cent of Decrease of Industrial Arts in Accredited Schools	0.0	50.0	60.2	72.5	63.3

The data in Table II indicates the drop of industrial arts in the accredited high schools. The greater decrease, due only to legislation, is from 1920 through 1935, where 71 schools discontinued the course, a decrease of 72.5 per cent. A good growth is shown from 1935 through 1939, an increase of nine schools or a 33.3 per cent gain. In 1920 there were ninety-eight accredited schools or 68 per cent offering industrial arts and in 1939 only thirty-six schools, or a 16.8 per cent, offered it in some form.

Instructors Surveyed in Industrial Arts

Table III indicates the number of the industrial arts teachers in the schools surveyed in this study. The information compiled is for all instructors having complete available records. The instructors in the Dickinson, Minot, and Valley City College High Schools were not included in this study since they also instruct college classes.

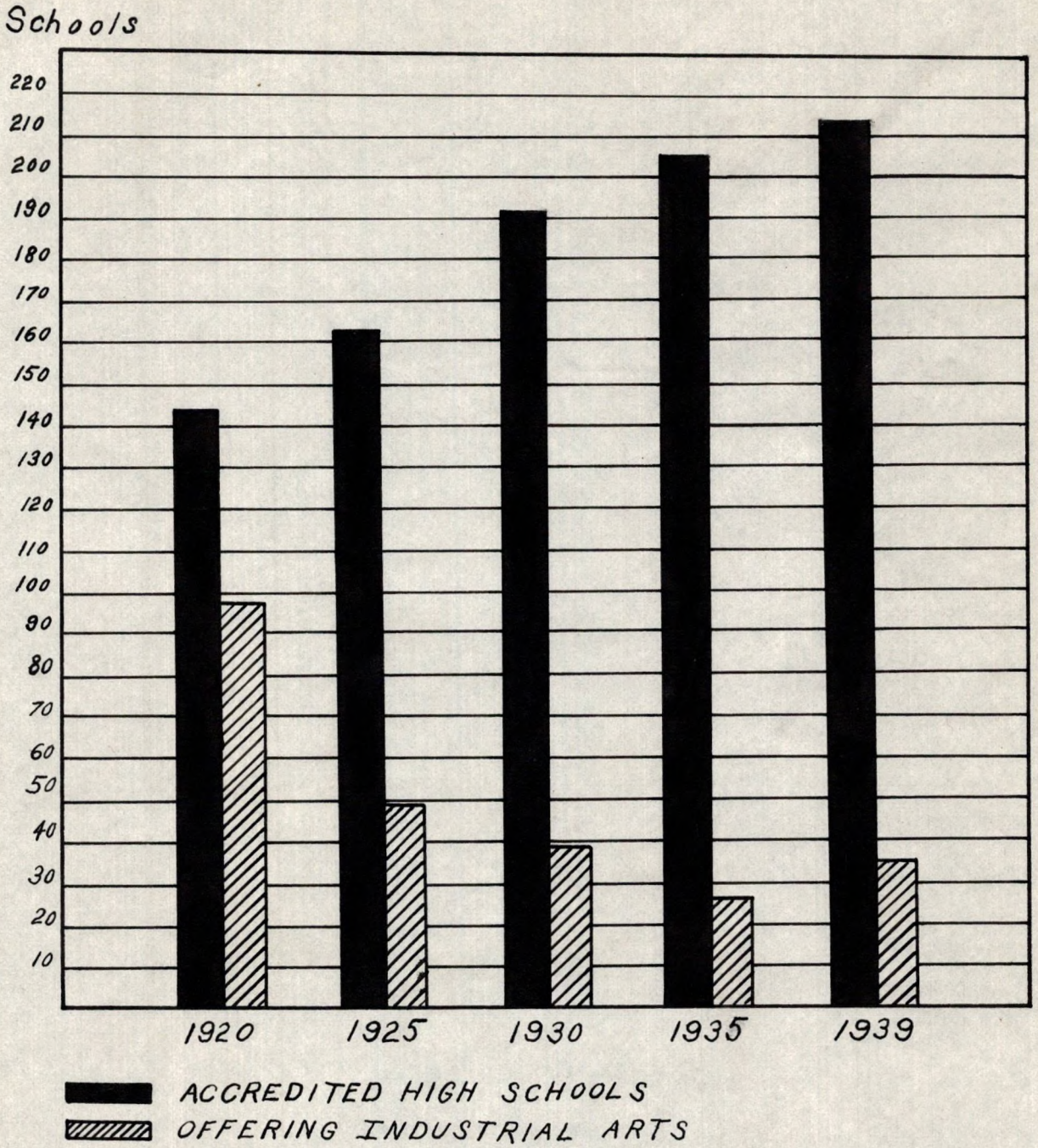


FIG. 1 - ACCREDITED HIGH SCHOOLS AND ACCREDITED HIGH SCHOOLS OFFERING INDUSTRIAL ARTS

TABLE III

INSTRUCTORS SURVEYED IN INDUSTRIAL ARTS

	School Years				
	1920	1925	1930	1935	1939
Total No. Industrial Arts Teachers	91	37	31	21	43
Teaching Only Industrial Arts	12	9	8	7	9
Teaching Industrial Arts and Other Subjects	42	7	7	8	22
Principals Teaching Industrial Arts	4	6	10	2	3
Superintendents Teaching Industrial Arts	33	15	6	4	9

The decrease in the number of industrial arts teachers has paralleled the decline in industrial arts courses offered in the accredited high schools. The general decrease from 1920 through 1935 was 76.9 per cent, whereas the schools offering industrial arts courses decreased 72.5 per cent.

An increase was made in the number of instructors from 1935 through 1939, an estimated increase of 104.5 per cent. The number of instructors employed from 1935 through 1939 was greater than the growth of accredited high schools over the same period.

There is shown a gradual decrease in full time instructors through the years 1920 to 1935, but from 1935 through 1939 an increase of approximately 28.5 per cent is shown. This is accounted for by the larger schools employing

more full time instructors. The number of full time instructors shows less change than any other group.

There were more instructors with other teaching combinations than full time instructors in 1920, there being forty-two part time instructors (not administrators) as compared with twelve full time instructors. There has been a greater percentage of decrease from 1920 through 1939 in the number of part-time instructors than in the full-time instructors or in the number of principals teaching industrial arts. There is greater growth in number of part-time instructors in 1935 through 1939 than in other groups. This is as it should be, because practically all of the growth has been in the schools which offer from one to three shop subjects.

The study shows that principals teaching in the industrial arts field have never, at any period, been in great numbers. They represent only 8.3 per cent of the instructors in 1939. Their small number is the result of other teachers or the superintendents having qualifications to teach in this field.

In 1920 there were thirty-three superintendents, representing 36.2 per cent of the industrial arts instructors. In 1939 there were nine superintendents, 22 per cent, teaching this subject as well as carrying their administrative duties. Because of economic conditions, in some cases, they have had to go into this field to keep the courses in the schools.

The first class schools show a total of thirty-five instructors of the forty-three studied, second class show six, and the third class, two. The trend has been toward the larger schools to retain industrial arts over this period because of an enriched curriculum.

The Salaries of Industrial Arts Instructors

Salaries for two of the teachers for 1938-1939 were not available for this study.

TABLE IV

AVERAGE SALARIES OF INDUSTRIAL ARTS INSTRUCTORS

	Through the School Years				
	1920	1925	1930	1935	1939
Industrial Arts Teachers Surveyed	91	37	31	21	41
All Instructors	$ 1483	1668	1732.50	1300	1384
Full-Time Industrial Arts Instructors	1539	1795	1981	1469	1646
Part-Time Instructors	1254	1240	1503	1094	1169
Principals with Industrial Arts	1456	1661	1539	1090	900
Superintendents with Industrial Arts	1760	1868	1989	1520	1760

The average salary for all instructors in 1920 was $1483, gradually raising to $1732.50 in 1930. Since 1930 it has taken a great drop until the average salary in 1939 was $1384. The lowest average was from 1930 through 1935. This is parallel with the drop in salaries of South Dakota in-

dustrial arts teachers.[7] The 1939 average shows a slight raise over 1935.

The highest full time instructors salary in 1939 was $1930 and the lowest $1400. The economic conditions throughout the United States have not been good for several year, and this, added to drouth conditions in North Dakota, has resulted in a decrease of salaries in all fields of teaching.

Returns on the Questionnaire

The questionnaire was sent to the superintendents or principals of the thirty-six schools used in this study. Thirty returns were received. The schools used have been divided into four groups, according to the enrollment in the high schools in 1938-1939,[8] in order to give better comparison. Group I includes schools with a high school enrollment up to sixty-nine inclusive; group II includes seventy to one hundred forty-nine students; group III includes one hundred fifty to two hundred ninety-nine students; and group IV includes schools with three hundred and over in high school.

---

[7] Ackert, Hugh P., The Status of Industrial Arts in the High Schools of South Dakota, Unpublished Master's Thesis, University of North Dakota, Chap. 2, p. 16.

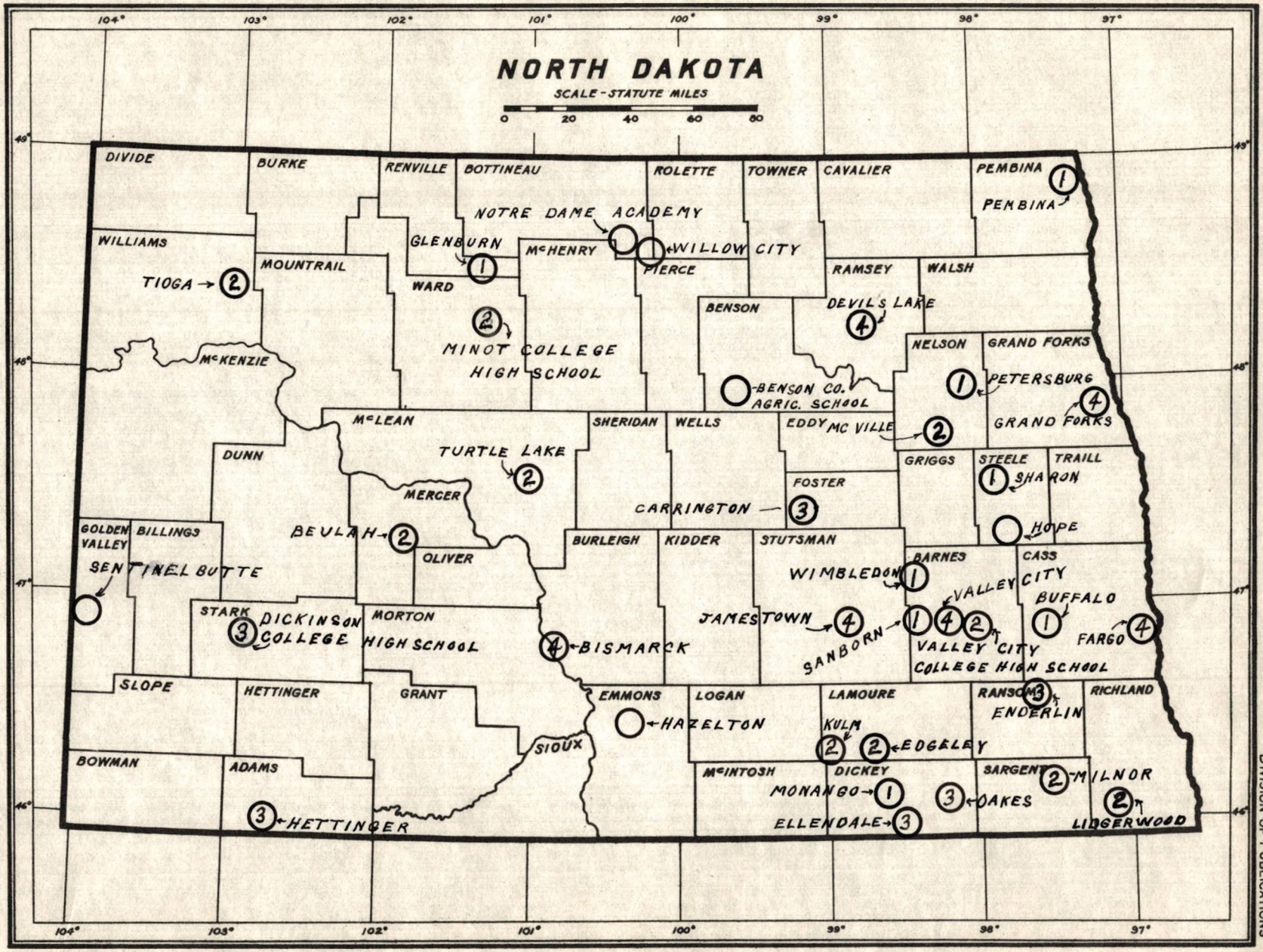
[8] Educational Directory, 1938-1939, pp. 6 - 14.

TABLE V

NUMBER OF QUESTIONNAIRES SENT AND RETURNED

Group	High School Enrollment	Questionnaires Sent	Returned	Percentage Returned
I	0 - 69	12	8	66.6
II	70 - 149	11	10	90.9
III	150 - 299	7	6	85.7
IV	300 - over	6	6	100.0
Totals		36	30	83.3

The questionnaire was sent to the thirty-six schools which, according to the annual reports, offer industrial arts. Those offering shop as a part of vocational agriculture were not considered. Group I, schools of the smallest enrollment, returned 66.6 per cent. The larger schools had a better return, with group IV showing 100.0 per cent return. This can be expected, as they have better facilities and take a keen interest in research problems. The total return was 83.3 per cent.



○ SCHOOL NOT RETURNING QUESTIONNAIRE.

④ NUMBER DENOTES GROUP SCHOOL IS IN AND RETURNED QUESTIONNAIRE. SEE TABLE V FOR SCHOOL GROUPING.

FIG. 2 - GEOGRAPHICAL DISTRIBUTION OF SCHOOLS ON RETURN OF QUESTIONNAIRE

AHOEN & CO. BALTO.

U. S. DEPARTMENT OF AGRICULTURE
DIVISION OF PUBLICATIONS

CHAPTER III

INDUSTRIAL ARTS COURSES AND THE PUPIL-TEACHER RATIO

The industrial arts subjects which appear in the high school curriculum with the most frequency is the next topic which should be considered in this study. In connection with this is the pupil-teacher ratio of the classes.

The material was taken from the high school annual reports for 1938-1939 and was supplemented with information obtained from the questionnaire. The state reports do not require certain information that is pertinent to this study.

Table VI shows that more schools offer mechanical drawing I, as a unit course, than any other subject. It is offered in 63.9 per cent of the schools. General shop is offered in 58.3 per cent of the schools, and is rapidly replacing subjects which were formerly taught as single units, such as metal work, and electricity. Woodwork one is offered in 55.5 per cent of the schools. Other industrial arts subjects show less frequency as being offered in the schools.

TABLE VI

FREQUENCY OF INDUSTRIAL ARTS SUBJECTS

Subject	Schools Surveyed	Frequency Reported	Per Cent of Schools Offering
Mechanical Drawing 1		23	63.9
Mechanical Drawing 11		11	30.5
Woodwork 1		20	55.5
Woorwork 11		11	30.5
General Shop		21	58.3
Electricity		2	5.5
Metal Work		3	8.3
Printing		5	13.8
Farm Shop*		1	2.8

* Not offered as partial requirement for vocational agriculture.

Mechanical drawing and woodwork have had a prominent place in school curriculums as shop unit shop courses since 1911. General shop has had considerable growth. In 1930 there were eight schools teaching the course with an enrollment in general shop of one hundred seventy-four,[1] and in 1935 there were twelve schools with an enrollment of three hundred twenty-seven.[2] It appeared earlier under the title of Home Mechanics.

---

[1] Twenty-Third Annual High School Inspector's Report, 1930, p.46

[2] Twenty-Eighth Annual High School Inspector's Report, Unpublished, 1935. Table X.

In 1939 it is found in twenty-one schools with an enrollment in general shop of seven hundred ten pupils.[3] Printing has increased from two[4] schools offering it in 1925 to five schools offering it in 1939. Electricity, metal work, and farm shop are offered in few schools.

Grades in Which Industrial Arts is Taught

Table VII shows the frequency with which industrial arts is taught in the grades of the thirty-six schools in 1938-1939.

TABLE VII

GRADES IN WHICH INDUSTRIAL ARTS IS TAUGHT

Grades	Frequency Reported	Per Cent of Thirty-Six Schools
Seven and Eight	14	38.8
Nine	29	80.5
Ten	28	77.7
Eleven	23	63.8
Twelve	20	55.5

The ninth grade is indicated as having more shop courses taught than any other grade, with a frequency of twenty-nine, or 80.5 per cent. The tenth grade's frequency is twenty-eight, 77.7 per cent. The seventh and eighth

---

Table IX, p. 27.

3

[4] Eighteenth Annual High School Inspector's Report, 1925, p.32.

grades had fourteen schools offering them industrial arts. Some of the schools offer it only to the seventh or the eighth, and other schools offer it to both grades. This is the smallest frequency shown. From the data, it is plainly seen that the ninth and tenth grades have the most industrial arts work. Over half of the schools offer it to the eleventh and twelfth grades. Two schools reported courses offered in the sixth grades.

Grades in Which Industrial Arts is Elective or Compulsory

To determine the grades in which industrial arts is an elective, or compulsory course, these questions were asked in the questionnaire:

1. In which grade is shop work compulsory?
2. In which grades is shop work elective?
3. Do you limit the course to certain grades?

There were twenty-nine answers received in the thirty questionnaires returned. This should give sufficient information. Some of the schools offer shop only to the seventh or eighth grade, not to both, which accounts for the difference in frequency. Four schools limit it to the ninth-tenth grades. Table VIII gives the compiled data on these questions.

TABLE VIII

FREQUENCY IN WHICH SHOP IS ELECTIVE, COMPULSORY, LIMITED

Grade	Elective	Compulsory	Limited to Grade
Seven	2	7	0
Eight	2	9	0
Nine	23	2	2
Ten	24	0	0
Eleven	19	0	0
Twelve	20	0	1

Industrial arts courses are elective for ninth and tenth grades, with more than three-fourths the schools reporting. In more than one-half of the schools, it is an elective in the eleventh and twelfth grades. It is an elective for the seventh and eighth grades in two schools, although in most cases it is required. Two schools limit it to the ninth grade and one school to the twelfth grade. Two schools reported courses in the sixth grade, with one as an elective and the other as a required course. The table shows that the courses are offered more frequently to high school pupils than to grade pupils. The trend in school curriculum is to offer industrial arts as a required subject for the seventh and eighth grades and as an elective in the high school.

The Enrollment in Industrial Arts Courses

The enrollment in the courses was taken from the annual high school reports for 1938-1939. This was to de-

termine how the courses rank as to enrollment in the thirty-six schools, from the ninth grade through the twelfth.

TABLE IX

TOTAL ENROLLMENT IN INDUSTRIAL ARTS COURSES

Subject	Groups I	II	III	IV	Total Enrollment	Percent Subject of Enrollment
Mechanical Drawing I	70	80	61	187	398	19.9
Mechanical Drawing II	0	44	12	90	146	7.3
Woodwork I	48	70	73	184	375	18.7
Woodwork II	33	21	7	79	140	7.0
General Shop**	33*	55	222	400	710	35.4
Electricity	0	31	0	0	31	1.5
Metal Work	0	14	0	40	54	2.7
Printing	0	32	0	104	136	6.8
Farm Shop	0	12	0	0	12	0.6
Totals	184	359	375	1084	2002	99.9

* One school did not report enrollment
** Fourteen schools offer the course in the seventh and eighth grades.

The total enrollment in the industrial arts courses for the thirty-six schools was 2002 pupils. General shop enrolled the largest number of pupils with a total of 710. It also ranked first in Group III and IV. Mechanical drawing I had 398 pupils enrolled or 19.9 per cent of the total. It ranked first in Groups I and II. Woodwork I had a large enrollment in all four groups, yet was not first in any group. Mechanical drawing II and Woodwork II had nearly

the same number of pupils. Printing was offered in the larger schools with an enrollment of 136, or 6.8 per cent of the total. Electricity and metal work ranked low in enrollment. This is due to many of the schools offering work of that type in general shop. Farm shop was offered by one school.

The enrollment indicates that general shop appeals to the average boy. It gives him an exploratory course of varied subject matter and an insight into the industries. Leading educators have agreed that general shop is replacing many of the other industrial arts subjects.

The Pupil-Teacher Ratio in Industrial Arts Classes

It is recommended that the pupil-teacher ratio should not be more than twenty-five to one. It is considered a violation of this standard if the pupil-teacher ratio in any school exceeds thirty to one, except in larger schools where thirty-five to one shall be considered a maximum. [6]

The pupil-teacher ratio was determined for each of the four groups, by dividing the number of five one-hour classes, or six forty-five minute periods, into the number of students for each group.

---

[6] Administrative Manual, 1938, p. 26.

TABLE X

PUPIL-TEACHER RATIO IN INDUSTRIAL ARTS CLASSES

Group	Teachers	Classes	Total Enrollment	Ratio
I	12	20	184	10
II	11	20	359	18
III	7	14	375	27
IV	13*	44	1084	25
All	43	98	2002	20

* Three instructors' complete record not available.

The pupil-teacher ratio of all groups is within the limits set by the State Department of Public Instruction. Group I, representing the small schools, has a ratio of ten to one and is well below the standard set at twenty-five to one. Group II has a higher ratio of eighteen to one. Group III indicates that it has the largest of all four groups with a ratio of twenty-seven to one. Group IV, large schools, fall within the recommendations of the state department, as set for the small schools. The two larger groups, III and IV, attempt to follow recommendations rather closely, whereas groups I and II fall below the suggested ratio. This is possibly true because the school enrollment is small for the teachers employed.

Per Cent of Boys Taking Industrial Arts

The data in Table XI indicates that industrial arts is an important course of study in the high school life of a boy. The thirty-six schools studied have 3,720 boys enrolled in high school. There are 2,002 boys taking industrial arts in some form. This is 53.8 per cent of all boys enrolled in high school.

TABLE XI

PER CENT OF BOYS ENROLLED IN INDUSTRIAL ARTS

Group	Total Number of Boys Enrolled	Boys Enrolled in Industrial Arts	Per cent
I	341	184	53.9
II	570	359	62.9
III	639	375	58.6
IV	2170	1084	49.9
Total	3720	2002	53.8

Group II has the largest per cent of all the boys enrolled in high school taking industrial arts, which is 62.9 per cent. Group IV has the smallest per cent of its boys enrolled in industrial arts work. The larger schools have a greater variety of subjects to offer in their curriculums which results in a smaller per cent enrolling in industrial arts. The small schools arelimited in facil-

ities and equipment which results in small number of subjects that can be offered. The tendency here is for more of the boys to take industrial arts work.

The Industrial Arts Curriculum

The industrial arts curriculum has been a topic of discussion among the educators in this country for many years. The sentiment is for less titles to be listed in the various curriculums of school systems. In the study made by Tryon, Smith, and Rood, of seventy-eight large high school systems from various states, it was found that twenty different subjects were offered in the junior high school curriculums and fifty-six subjects were offered in the senior high schools. Many of these courses over-lapped in duplication of work. Their recommendations were for schools to have the industrial arts work grouped under three or four headings, which would benefit transfer pupils, students' entrance into college, and the employers of high school graduates. [7]

The subjects taught in the high school curriculum of North Dakota are listed in order, as they appear in the frequency Table V.

---

[7] Tryon, R. M., Smith, H. L., and Rood, A. F., "The Program of Studies in Seventy-Eight Junior High School Centers", School Review, Vol. 25, February, 1927, pp. 96 - 107.

Subject	Frequency
Mechanical Drawing I	23
General Shop	21
Woodwork I	20
Woodwork II	11
Mechanical Drawing II	11
Printing	5
Metal Work	3
Electricity	2
Farm Shop*	1

*This is in a school not offering vocational agriculture.

The Department of Public Instruction in 1938 issued a course of study for industrial arts in North Dakota high schools.[8] The course of study is in the right direction, but some of the courses seem to lack a relationship or unity to each other. Also, the courses as outlined bear little relationship to some of the industrial arts courses firmly established in the various high school curriculums. General shop and mechanical drawing are outlined with more detail given to general shop. These two subjects rank highest in the industrial arts curriculum and should require detailed explanation in the presentation of the course. Woodwork is treated as an elementary course in general shop. This study finds that it is offered in twenty of the thirty-six schools as a unit subject. That alone demands an outlined course with methods of presentation. Printing was reported as being taught in five of the high schools, yet the course of

---

[8] Course of Study for North Dakota High Schools - Industrial Arts, Issued by the Department of Public Instruction, Bismarck, North Dakota, 1938.

study does not mention it or give any outline of material to be offered. Concrete and electricity are treated as unit subjects, with only two schools offering electricity, and no schools were found that offer concrete as a unit course. These subjects are included in general shop courses in nearly all the schools studied.

A complete revision of the course of study with consideration being given to industrial arts courses as they are set up at the present time in the school curriculum would be advisable. It should be built around the courses having the greatest frequency in our school systems. Other courses not appearing in the high school curriculums should be encouraged by the course of study.

CHAPTER IV

EDUCATIONAL QUALIFICATIONS AND TEACHING COMBINATIONS of INDUSTRIAL ARTS INSTRUCTORS

In his discussion of "Sources and Training of Industrial Arts Teachers", Emanual E. Ericson states:

> "From the very beginning of organized mechanical activities in schools, the question of the sources of teachers and their background has been an important one. Opinion has been divided as to the relative importance of practical experienee, pedagogical training, liberal-arts education, and other qualifications, in the making of an efficient instructor in the school shop. Where it has been granted that an instructor of this special type of work should possess all of these phases of preparation as a background, the question of which is of most importance has remained a debated one.
>
> In general, it might be said that throughout the history and development of shopwork as a public school subject, from the time when Salomon announced his "theory of educational Sloyd" and established a teacher-training institution until the present, teachers in this field of education have come from three main sources: (1) the normal schools and other teacher training institutions; (2) the engineering colleges and other technical schools without teacher training; and (3) the rank and file of tradesmen and mechanics.
>
> Each of these types of teacher is possessed, generally speaking, of certain definite characteristics. Each type has brought into the work valuable contributions toward the establishment and development of industrial education in its varied aspects, as we know it today. Each, on the other hand, has lacked certain desirable abilities and characteristics possessed, perhaps, by one of the others." [1]

---

[1] Ericson, Emanual E., "Sources and Training of Industrial-Arts Teachers", Teaching Problems in Industrial Arts, Manual Arts Press, 1930. Chap. 22, pp. 407 - 408.

In our North Dakota schools we find teachers from all three of the groups just previously mentioned instructing shop courses. The teacher-training source supplies our school systems with a large proportion of its teachers.

The certification of teachers for industrial arts, as has been previously stated in the requirements, is a two year special certificate. The holder of a first grade professional certificate, under North Dakota school law, is allowed to teach industrial arts, without any special training in the field.

In a survey carried out by V. C. Dougherty in 1934, he found that thirteen of the forty-eight states, require a two year special certificate to be held by instructors in the industrial arts field not having a first grade professional certificate. This is twenty-seven per cent of all the states. North Dakota is in this group. The greater number of states, twenty-one, require a four year first grade certificate to be held.[2]

Qualifications of Industrial Arts Instructors

The qualifications of the industrial arts teachers are taken from the individual annual reports of the schools offering the course in the school year 1938-1939 and from

---

[2] Dougherty, V. C., "Certification of Teachers", Industrial Arts and Vocational Education Magazine, Vol. 23, October, 1934, p. 309.

the department of certification.

The qualifications of forty teachers are included in this survey and their training is shown in Table XII. Three of the teachers' records were not complete enough to use in this chapter study, and so will be omitted. The qualifications of the three college high school instructors will also be omitted as previously stated. Their qualifying standards are set above those required for high school teaching.

TABLE XII

EDUCATIONAL TRAINING OF INDUSTRIAL ARTS TEACHERS

Group	Master's Degree	Bachelor Degree	Three Year Special	Two Year Special	Apprentice and Trades	Total
I	0	12	0	0	0	12
II	3	5	1	0	0	9
III	2	4	0	0	0	6
IV	0	9	2	1	1	13
Total	5	30	3	1	1	40

Five of the forty instructors have master's degrees. This represents 12.5 per cent of the total number, forty, in the thirty-six schools. Three-fourths of the instructors hold bachelor's degrees. There are three teachers using three year special certificates, one teacher holding a two year special, and one instructor having had apprentice and trades experience. There are 87.5 per cent of the industrial

arts teachers, in theschools surveyed, holding degrees. In his study of fifty-seven Minnesota teachers, in 1933, G. O. Pfeifer found that 57.9 per cent of the instructors of industrial arts held degrees of some form.[3]

The large number of degrees shown in the first three groups are those of part time instructors who have had no major or minor work in industrial arts, but who are required to hold a first grade professional certificate.

Full and Part Time Instructors

The qualifications of the forty teachers shown in Table XII are for thirty-one part time instructors and nine full time instructors. The part time instructors represent 77.5 per cent of the instructors in the thirty-six schools. The full time instructors have a percentage of 22.5. Only the larger schools have full time instructors. This is reasonable, as they have the facilities and enrollment to require full time service.

A survey of twenty-five states made by Anderson and Eliassen, in 1932, found that sixty-one per cent of all the industrial arts teachers teach the subject exclusively. In Washington, ninety-seven per cent of the industrial arts instructors taught their field exclusively, while in Kansas

---

[3] Pfeifer, G. O., Duties of Industrial Arts Instructors in Minnesota Other Than Shop Instruction, Unpublished Master's Thesis, University of North Dakota, 1933, p. 37.

only eight per cent of the total taught industrial arts alone. The states having the highest percentage of industrial arts instructors teaching other subjects in combination with industrial arts were Kansas with ninety-two per cent, North Dakota with eighty per cent, Ohio with sixty-two per cent, Minnesota with forty-six per cent, and Indiana with thirty-eight per cent.[4]

Compared with the investigation made by Anderson and Eliassen, the results of this study show that North Dakota has a greater percentage of full time instructors in the thirty-six schools than Kansas, and now has two and one-half per cent less part time instructors than it had in 1932.

TABLE XIII

QUALIFICATION OF PART AND FULL TIME INSTRUCTORS

Degree or Diploma	All Instructors	Full Time Instructors	Part Time Instructors	Percent of Total
Master's Degree	5	0	5	12.5
Bachelor's Degree	30	5	25	75.0
Three Year	3	2	1	7.5
Two Year	1	1	0	2.5
Apprentice and Trades	1	1	0	2.5
Total Instructors	40	9	31	100.0
Per cent of part and full time instructors		22.5	77.5	

[4] Anderson, Earl W., and Eliassen, Reuben H., "High School Teachers of Industrial Arts", Industrial Arts Magazine, Vol. 21, February, 1932, p. 215.

The master's degrees are held by five superintendents teaching industrial arts work and academic subjects, and they represent 12.5 per cent of the total instructors.

Five of the full time instructors hold bachelor degrees. One of these five has four years of college work but no degree; yet his work is equivalent to a first grade professional certificate. They represent 12.5 per cent of the total instructors and 55.5 per cent of the full time instructors. Seventeen of the part time instructors hold bachelor degrees; this is 68.0 per cent of the part time instructors. There are eight superintendents and principals, as part time instructors, that have bachelor degrees. They represent 32.0 per cent of the part time instructors.

The three year special certificate is held by two full time instructors and one part time instructor. One full time instructor is teaching with a two year special certificate.

There is one full time instructor teaching with no college training. This instructor has had four years of apprentice work and ten years of trades experience.

Major and Minor Work in Industrial Arts

Table XIV indicates the major, minor, special and trade training in this field of work. The largest percent has not had sufficient training. This has already been explained. The majors and special certificates fall

in larger schools, as they require training in the field. Many of the large schools adhere to the North Central ruling, which encourages higher requirements to be upheld.[5]

TABLE XIV

MAJOR AND MINOR WORK IN INDUSTRIAL ARTS

	Frequency	Per cent of Instructors
Major	15	37.5
Minor	3	7.5
Special Certificates	4	10.0
Trade Training in Field	1	2.5
Not Sufficient Training in Field	17	42.5

Fifteen teachers have major work in the industrial arts field; this is 37.5 per cent of all the instructors. Seventeen instructors, or 42.5 per cent, are teaching without any major or minor work or special certificate. They teach by meeting the requirements with a first grade professional certificate. Four instructors teach with special certificates and without a degree. One instructor has had trade experience.

A survey of the qualifications of one hundred twenty-five teachers of industrial arts in South Dakota, by

---

5 The North Central Association Quarterly, Published by The North Central Association of Colleges and Secondary Schools, Vol. XIII, July, 1938, p. 104.

Hugh P. Ackert, shows that 49.6 per cent of the teachers had a major in industrial arts. It was also found that 17.6 per cent had no training in this field.[6] In comparison with South Dakota teachers, there are fewer North Dakota teachers with industrial arts majors. In comparison with South Dakota, North Dakota has more than twice the percentage of instructors without adequate industrial arts preparation.

The Teaching Experience of Instructors

Information on the teaching experience for thirty-eight of the forty instructors of industrial arts in 1938-1939 was available.

TABLE XV

TEACHING EXPERIENCE OF INDUSTRIAL ARTS INSTRUCTORS

Years Experience	Teaching Industrial Arts Only	Teaching Industrial Arts and Combinations	Total Instructors	Percent of Total
0 - 1	0	3	3	7.9
2 - 5	1	4	5	13.2
6 -10	0	13	13	34.2
11 -15	2	2	4	10.5
16 -20	2	1	3	7.9
21 -over	4	6	10	26.3
Total	9	29	38	100.0

[6] Ackert, Hugh P., op. cit., p. 37.

TABLE XVI

TEACHING EXPERIENCE IN PRESENT POSITION

Years Experience	Teaching Industrial Arts Only	Teaching Industrial Arts and Combinations	Total Instructors	Percent of Total
0 - 1	0	11	11	28.9
2 - 5	3	11	14	36.9
6 -10	0	3	3	7.9
11 -15	1	2	3	7.9
16 -20	3	1	4	10.5
21 - over	2	1	3	7.9
Total	9	29	38	100.0

The statistics in Table XV indicate that the greatest percentage of teachers with experience, that is, twenty-one years or over, are full-time instructors. The largest number of part-time instructors have from six to ten years of experience.

Table XVI indicates that the full-time instructors have a greater tenure than part-time instructors, remaining in their full-time positions over a long period of years. Tenure for the part-time instructors in the industrial arts field is from one to five years.

Subject Combinations Taught with Industrial Arts

The subject combinations as they appear with industrial arts are in Table XVII. This data is for thirty-eight instructors in 1938-1939.

TABLE XVII

SUBJECT COMBINATIONS WITH INDUSTRIAL ARTS

Subject	Frequency	Percentage of Total Teaching Industrial Arts
Science	14	36.8
Mathematics	13	34.2
Social Science	9	23.6
Full Time Industrial Arts	9	23.6
Commerce	4	10.5
Physical Education	4	10.5
Foreign Language	3	7.9
History	2	5.2
English	1	2.6
Athletics	1	2.6
Seventh and Eighth Grades	1	2.6

The frequency shown in Table XVII indicates that science and mathematics are taught more times in combination with industrial arts than any other subject. Science is taught in fourteen instances and mathematics in thirteen. English, as a high school subject, appeared once in combination with industrial arts.

The duties of full time instructors were not combination teaching assignments. They will be taken up as extra-curricular activities in the next discussion.

Table XVIII shows frequency of teaching combinations of nine full time instructors and twenty-nine part-time instructors.

TABLE XVIII

FREQUENCY OF COMBINATIONS TAUGHT BY INDUSTRIAL ARTS INSTRUCTORS

Instructors	Industrial Arts and One Subject	Industrial Arts and Two Subjects	Industrial Arts and Three Subjects
Full Time Industrial Arts Instructor	0	0	0
Part-Time Industrial Arts Instructors	6	8	3
Principals	0	3	0
Superintendents	5	3	1
Total	11	14	4

The combination of two subjects with industrial arts is taught in fourteen instances by instructors with other subject combinations. This is the greatest frequency of the three combinations. One subject and industrial arts has a frequency of eleven. Only four frequencies appeared with the combination of three subjects and industrial arts.

The part-time instructors and principals had the greatest frequency of two subjects and industrial arts. The superintendents who teach industrial arts, in most cases teach one other subject beside carrying out the supervisory duties of their positions.

Per Cent of Instructors Time in Industrial Arts

The full-time instructors' Class work in industrial arts ranges from four one-hour class periodsto six one-hour class periods. The average one-hour class periods for all nine full-time instructors was found to be 4.8 hours each school day.

The part-time teacher was found to spend 34 per cent of his actual teaching time in industrial arts class work. The principals spend 35.3 per cent of their classroom time in industrial arts work. The superintendents instructing were found to spend 42.4 per cent of their classroom teaching in industrial arts. It is indicated that superintendents, outside of their regular supervisory work, spend a larger per cent of their teaching time in industrial arts than in teaching any other one subject.

Extra-Curricula Activities of the Industrial Arts Instructors

In the discussion of extra-curricula activities the Administrative Manual states:

> "Extra-curricular activities have proved of value sufficient to warrant their inclusion in any well balanced high school program. They are among those forces which are considered to be the most practical in high school education in training by doing. Often some extra-curricular activity has been found to be the most worthwhile activity in the pupil's school life and frequently has been the dominating force in the guidance of the pupil's after school life. The larger school systems have had greater opportunity to provide an extensive extra-curricular program than have the smaller school systems. The latter have been handicapped by lack of properly trained sponsors, inadequate finances and time." [7]

---

[7] Administrative Manual, 1938, p. 37.

In order to find out the extra-curricular activities and duties of the industrial arts instructors a second questionnaire was sent out to thirty-three of the thirty-six schools previously surveyed. Twenty of the schools responded by return of the questionnaire.[8] This is a 60.6 per cent return of the thirty-three schools. Several different activities were listed on the questionnaire; any others were asked to be shown. There were seventeen different activities listed by the twenty schools. They appear in Table XIX. The activity having the greatest frequency is placed first; the rest follow in order.

TABLE XIX

EXTRA-CURRICULAR ACTIVITIES OF INSTRUCTORS

Activity	Frequency Listed	Per cent of Twenty Schools
Basketball Coach	9	45.0
Boy Scout Work	7	35.0
Football Coach	6	30.0
Staging and Lighting	6	30.0
Track Coach	5	25.0
Repair Work	3	15.0
Dramatics	2	10.0
Newspaper	2	10.0
Selling Tickets	2	10.0
Basketball Coach	1	5.0
Tennis Coach	1	5.0
Glee Club Director	1	5.0
Band Director	1	5.0
Orchestra Leader	1	5.0
Policing Games	1	5.0
Supply Department	1	5.0
Operating Score Board	1	5.0

[8] See Appendix, C.

The compiled list of activities show the varied duties that the instructors carry out besides their regular class work. No discussion will be made of these activities. Many different opinions have been given as to the activity outside the school, its worth in the school, and the contribution that it may have in aiding the pupil in his social life.

The Schools the Industrial Arts Instructors Attended

It was possible to obtain information about forty-one instructors as to the schools from which their training had been received. Twenty-nine of this number received their training in North Dakota institutions of higher learning. This represents 68.3 per cent. Table XX shows the institutions attended.

TABLE XX

SCHOOLS THE INDUSTRIAL ARTS INSTRUCTORS ATTENDED

School	Instructors	Per cent of Instructors
University of North Dakota	11	26.8
North Dakota Agricultural College	3	7.3
Dickinson State Teachers College	1	2.4
Ellendale Normal and Industrial College	8	19.5
Minot State Teachers College	2	4.9
Valley City State Teachers College	3	7.3
Schools Outside of North Dakota	13	31.7
Total	41	99.9

CHAPTER V

FACILITIES AND EQUIPMENT IN THE HIGH SCHOOL SHOPS

The statistics for this chapter were obtained from the questionnaire letter[1] sent to the superintendents and principals of the thirty-six schools offering industrial arts courses. The only information on this topic to be found in the annual reports of the high schools to the high school inspector is the valuation of the shop departments. This was also asked on the questionnaire, but the estimates of valuation differed from the valuation of the state reports to such an extent on the questionnaire, that the writer used the state report records for the valuation of shop equipment. The information will be presented in the order asked on the questionnaire. The facilities and equipment will be discussed in the five groups to which the schools have been classed, as this gives a more accurate comparison.

WOODWORK ACCOMMODATION FOR PUPILS

The question was asked, "How many students are you equipped to handle in your shop woodworking courses?" This question was asked to find out the size of the shops of the various schools.

---

[1] See Appendix B.

TABLE XXI

WOODWORK ACCOMMODATION FOR PUPILS

Group	Students	Number of Shops Reported	Percentage
I	0 - 10	3	13.6
II	11 - 15	4	18.2
III	16 - 20	9	40.0
IV	21 - 25	4	18.2
V	26 - over	2	9.1
Total		22	100.0

In the thirty questionnaires received, the question was answered by twenty-two schools. This represents 73.3 per cent of the schools returning the questionnaire. Nine schools, or 40.9 per cent of the twenty-two schools, have shop accommodations for sixteen to twenty students. Three of the schools have accommodations for ten students or less. Two schools have accommodations for twenty-six students or over. The smallest accommodation reported was six students; the largest was thirty. The average accommodation of all shops was seventeen pupils.

General Shop Accommodation for Pupils

The question was asked, "How many students are you equipped to handle in your general shop?" There were nineteen answers to this question. Eleven schools did not offer the course or failed to answer the question.

TABLE XXII

GENERAL SHOP ACCOMMODATION FOR PUPILS

Group	Students	Number of School Shops Reported	Percentage
I	0 - 10	1	5.3
II	11 - 15	5	26.3
III	16 - 20	4	21.0
IV	21 - 25	7	36.8
V	26 - over	2	10.5
Total		19	99.9

Seven, or 36.8 per cent of the nineteen schools, have a pupil accommodation from twenty-one to twenty-five. Only one school has a shop with fewer pupil accommodation than eleven pupils. Two schools have the accommodations for more than twenty-five pupils. The smallest shop reported was for nine students; the largest was for forty pupils. The average accommodation of the nineteen shops reported is for twenty-one pupils.

Mechanical Drawing Accommodation for Pupils

A similar question was asked concerning the accommodations for mechanical drawing, as was stated in the two previous discussions. Fifteen, or fifty per cent of the schools answered the question. No doubt, many of the smaller schools hold mechanical drawing in rooms used for

other school subjects, and so failed to report.

TABLE XXIII

MECHANICAL DRAWING ACCOMMODATION FOR PUPILS

Group	Students	Number of Drafting Rooms Reported	Percentage
I	0 - 10	I	6.6
II	11 -15	4	26.7
III	16 -20	1	6.6
IV	21 -25	6	40.0
V	26 - over	3	20.0
Total		15	99.9

Six, or forty per cent, have drafting room accommotion for twenty-one to twenty-six pupils. Four schools have rooms equipped to accommodate eleven to sixteen pupils. One school reported in group I, and also one in group III. Three schoolshad drafting rooms for twenty-six or more students. One school reported accommodation for six pupils. This was the smallest. Two schools reported thirty, which was the largest. The accommodation of the average drafting room for all groups is twenty-five pupils.

Printing Accommodation for Pupils

There are five high schools with printing facilities. These are Bismarck, Fargo, Grand Forks, Minot College High School, and Valley City College High School. The average

accommodation of the five printing departments is thirteen students. The smallest is for three students, and two have accommodations for twenty pupils.

Metal Shop Accommodation for Pupils

Three schools reported facilities for metal shop instruction as a unit course. The smallest shop was for four students and the largest was for twenty-four. Metal shop, in most of the schools surveyed, is included in the work of the general shop course.

Farm Shop Accommodation for Pupils

Three schools reported farm shop facilities. Two of the shops were not in operation. The other school had accommodation for twelve pupils and also had a farm class of twelve pupils.

A list of the vocational agriculture schools offering farm shop work during the school year of 1938-1939, is placed in the appendix.[2] These schools are not discussed in this study. It may be of some value for comparison work or other statistics. The list was obtained from the director of high school vocational agriculture work, Ernest L. DeAlton, of the North Dakota Agricultural College, Fargo, North Dakota.

---

[2] Appendix, D.

Location of Shops and Drafting Rooms

The location of shops and drafting rooms in the high schools was asked for in the questionnaire.[3] Table XXIV shows the location of rooms in the thirty schools answering the questionnaire. Two schools did not give the location of either shop or drafting room.

TABLE XXIV

LOCATION OF SHOPS AND DRAFTING ROOMS

	Number Reported	Above Basement	Per Cent Above	In Basement	Per Cent in Basement
Shops	28	7	25.0	21	75.0
Drafting Rooms	20	7	35.0	13	65.0

The data indicates that there are more shops in the schools than drafting rooms. Twenty-eight shops were reported, with 75.0 per cent located in the basement and 25.0 per cent above the basement floor. Twenty locations of drafting rooms were given, with 65.0 per cent in the basement and 35.0 per cent above the basement floor. In comparison with South Dakota,[4] they are about the same in location of shops, but they have 6.5 per cent more of their drafting rooms located above the basement. It is possibly desirable for the shops

---

[3] See Appendix, B.
[4] Ackert, Hugh P., op. cit., p. 31.

to be located in the basement, for many reasons. The drafting rooms, generally, have better lighting, if located above the ground floor. The trend in new building construction is to give better lighting facilities. All shops and drafting rooms should have good natural or artificial lighting and ventilation systems.

Valuation of Shop Equipment

The valuation of thirty-four of the thirty-six school shops was listed on the individual annual reports of each school for 1938-1939. The valuations will be grouped to give a better comparison.

TABLE XXV

VALUATION OF SHOP EQUIPMENT

Group	Valuation	Number	Percentage
I	Under $ 199	3	8.8
II	$ 200 - 499	10	29.4
III	500 - 999	9	26.5
IV	1000 - 1999	5	14.7
V	2000 - 2999	1	2.9
VI	3000 - over	6	17.6
Total		34	99.9

Table XXV shows the valuation, in six groups, of 94.4 per cent of the thirty-six schools. The lowest valuation was $120.00 and the highest reported was $18,000. Two schools offering mechanical drawing did not report shop valuations.

Student Fees for Shop Operation

The schools were asked to indicate the means by which their shops obtain money to operate. Only half of the schools responded, therefore it may be assumed that those not answering charged no fee. Only an estimate can be given of the cost of shop operation. About half of the schools replying charge a semester fee of fifty cents per pupil. The other half charge no fee. Practically all of the schools require students to pay for materials used. The cost of shop operation ranged from $1387.20 in a large school, to $25 in a small school, for the school year. All of the schools' estimates of operation costs were between these amounts.

Power Equipment in Shops

The high schools were asked to list the power equipment available in their shops. Five of the thirty schools returning questionnaires have no power equipment. This means that their shop work is carried on with hand tools. The complete number of machines were not given in many instances, so no attempt will be made to give an estimate. Table XXVI gives the frequency and names of the sixteen different machines as reported.

One school reported the renting of machinery at various period during the year.

TABLE XXVI

Power Equipment in Shops

Machine	Frequency	Per Cent of Twenty-five Schools
Circular Saw	16	64.0
Jig Saw	15	60.0
Grinder	15	60.0
Wood Lathe	14	56.0
Sander	10	40.0
Drill Press	9	36.0
Band Saw	8	32.0
Jointer	7	28.0
Shaper	4	16.0
Saw Filer	3	12.0
Mortiser	3	12.0
Planer (Wood)	2	8.0
Machine Lathe	1	4.0
Power Hack Saw	1	4.0
Buffer	1	4.0
Forge	1	4.0

The data indicates that machines used for woodworking purposes have a greater frequency in the schools than those for metal work. In a survey made in 1929 Stanley Mythaler found that six different power machines was used in the shops.[5] The present survey finds that there are sixteen different types of machines used in twenty-five schools. This indicates the increase in the use of machinery by the various industrial arts shops.

---

[5] Mythaler, Stanley L., Industrial Arts Teaching in North Dakota Classified High Schools, With Particular Reference to Woodwork and Mechanical Drawing in the Ninth Grade, Unpublished Master's Thesis, University of North Dakota, 1929, p. 17.

Visual Instruction in Industrial Arts

The question was asked, "Do you use silent or sound films for visual instruction?" The writer wished to determine how many schools have available equipment for this form of instruction. Seven schools answered the question. Three schools use both silent and sound films as an aid for instruction. Two schools use silent films, and two schools use sound films. These seven schools represent 23.3 per cent of the thirty schools returning the questionnaire.

Many industries have fine educational films for use in school departments. Schools having available projectors should take advantage of the opportunity for visual instruction by this means.

Apprentice Training

The writer wished to find to what extent apprentice training was carried out in the shop courses of the thirty-six schools. The question was asked, "Do any of your students work as apprentices in trades?" Two schools, Bismarck and Tioga, have a few students in this system of part time education. This is generally carried out as vocational education, and not as a part of industrial arts. The writer believes a great work could be accomplished by the cooperation of industrial arts work and industry, to give the student actual opportunity to gain first hand knowledge of the industries and the materials they consume or produce.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Industrial arts has declined in the accredited high schools of North Dakota. This was due to legislation which gradually removed the industrial arts courses from the constant subjects recommended for high schools. Also economic and financial conditions have required schools to reduce their budgets and this has had great effect on the decline of industrial arts. However a slight growth was made in the past few years by industrial arts in the accredited high schools because educators realize these types of courses are necessary for a complete general education for the boy.

Mechanical drawing, general shop, and woodwork are the subjects which appear most frequently in the high school curriculums. They also have the largest enrollments of the industrial arts subjects being offered. General shop was found to have the largest enrollment of all subjects in this field. Printing has made progress only in the larger high schools.

The pupil-teacher ratio was found to remain within the recommendations of the state department of public instruction. The smaller schools were found to be considerably below the recommended ratio as expected while the larger schools remain near the recommended ratio set forth in the

Administrative Manual.

The subjects, science and mathematics, were found to be taught most frequently in combination with industrial arts by part-time instructors. Mathematics is the more logical subject of the two as a combination because it does not require a laboratory period and fits nicely into a combination with industrial arts. Science and industrial arts, both laboratory subjects, require too much time to be devoted to each to make an efficient combination.

A large number of the industrial arts instructors have not had sufficient training in this specialized field as shown by their major or minor preparation. No doubt most of the instructors teaching industrial arts have had a course or two of this specialized work but it would seem that the state should demand a specified number of hours of credit in the field of industrial arts as qualification for a certificate.

There is a variation of facilities and equipment inthe shops of the high schools. This leads to a restriction in the industrial arts courses that may be offered in schools which lack these facilities.

The removal of mechanical drawing rooms from the basement has made slow progress. The tendency of new school planning has been to move the mechanical drawing room out of the basement and locate it so that better lighting conditions are available.

The location of shops in the basement has many advantages. Noise produced by activities in the shop is reduced to a minimum and other classrooms of the school are not disturbed.

Little has been done by industrial arts departments to acquaint pupils with actual working conditions of industry through pupil placement in trades and business as a part of an industrial arts program. More could be done in this field to familiarize pupils with industrial activities.

Recommendations

The requirements for teachers of industrial arts courses should include special training in this field of education. At least a minor should be required in industrial arts work for a teacher in this field. The schools, which are members of the North Central Association of Secondary Accredited High Schools, are required to employ industrial arts teachers who have had not less than thirteen semester hours of industrial arts training. This would make an excellent requirement for all instructors of industrial arts in the high schools of North Dakota.

Definite Standards should be required for courses in industrial arts in North Dakota. Courses offered throughout the state would then be uniform and this would strengthen the field of industrial arts. This would give school systems an impetus to guide their courses with an attitude of procuring, for the pupil, the greatest benefit of industrial arts training

in the general educational program and would enhance industrial arts in the curriculum of schools throughout the state.

The course of study for industrial arts should be revised so that there is more coherence between the courses in the study and also with the curriculum of the high schools offering the course. Subjects not found in the high school curriculums should be encouraged by this course of study if growth and steady development of this field is to be accomplished in the schools.

Schools within set enrollments should be required to have equipment suitable for their needs in industrial arts shops. Too many schools attempt to give this specialized training without adequate equipment and this tends to lower the efficiency of the departments to such an extent that industrial arts training will not provide the pupil with the necessary aims to complete a well rounded general education.

The lighting and ventilating systems of rooms located in the basement and used for shops and drafting should be rigidly checked. The tendency is for lighting conditions and ventilation to be neglected unless inspection is carried out once a year. The physical health of all pupils should be the prime requisite of school administrators.

Safety conditions of shops and power machinery should be required. An inspection of safety devises and fire hazards should be made once a year. This would reduce injuries and give greater security to the pupils and instructors.

Extra-curricular duties of shop instructors should be relatively light, which will give more time to the instructor for shop purposes. Industrial arts is a laboratory course and activities which require a great amount of time should not be assigned to industrial arts people. The tendency has been to regard industrial courses as subjects requiring a small amount of preparation and leaving more time for the instructor to carry out duties other than in his field. This attitude by administrators has resulted in overloading the shop instructor with extra burdens which greatly retards the quality of work and progress of shop courses.

Industrial arts courses should be correlated more with business and trades in order to give the pupil a wider experience for general educational knowledge, and also to acquaint the public with industrial arts. The exploratory activities should represent a sufficient number of worthwhile industrial experiences and occupational information in studies to give the pupil a broad and well developed capacity for experiences in general industrial activities of the future.

BIBLIOGRAPHY

BOOKS

Bennett, Charles A., History of Manual and Industrial Education 1870 to 1917, Peoria, Illinois: The Manual Arts Press, 1937.

Erickson, Emanual E., "Sources and Training of Industrial-Arts Teachers", Teaching Problems in Industrial Arts, Peoria, Illinois: Manual Arts Press, 1930, Chap. 22, pp. 407-408.

"Manual Training and Domestic Science", General Laws of the State of North Dakota, 1929, Chap. 206, p. 285.

Struck, F. Theodore, Creative Teaching, New York: John Wiley and Sons, Inc., 1938.

Struck, F. Theodore, Foundations of Industrial Education, New York: John Wiley and Sons, Inc., 1930, p. 37.

BULLETINS

Administrative Manual for North Dakota High Schools, Bismarck, North Dakota: Department of Public Instruction, 1938.

Course of Study for North Dakota High Schools - Industrial Arts, Bismarck, North Dakota: Department of Public Instruction, 1938.

Eighteenth Annual Report of the Inspector of High Schools, Bismarck, North Dakota: State Department of Public Instruction, 1925.

Manual of the State High School Board of North Dakota, Bismarck, North Dakota: State High School Board, August, 1911, p. 10.

Manual of the State High School Board of North Dakota, Bismarck, North Dakota: State High School Board, 1919.

Proffitt, Maris M., Industrial Arts Its Interpretation in American Schools, Bulletin 1937, No. 34, Washington D. C.: United States Department of Interior, 1938, p. 6.

Russell, John Dale, and Associates, Vocational Education, Washington, D. C.: United States Government Printing Office, 1938, p. 13.

State of North Dakota High School Manual, Bismarck, North Dakota: Department of Public Instruction, 1923.

The North Central Association Quarterly, Ann Harbor, Michigan: The North Central Association of Colleges and Secondary Schools, Vol. XIII, July, 1938, p. 104.

Thirteenth Annual Report of the Inspector of High Schools, Bismarck, North Dakota: State Department of Education, 1920.

Thompson, Arthur E., North Dakota Educational Directory - 1938-1939, Bismarck, North Dakota: State Department of Public Instruction, 1938.

Twenty-Eighth Annual Report of the Director of Secondary Education, Bismarck, North Dakota: State Department of Public Instruction, Unpublished, 1935.

Twenty-Third Annual Report of the Director of Secondary Education, Bismarck, North Dakota: State Department of Public Instruction, 1930.

Warner, William E., Bollinger, Elroy W., Hitchinson, Herbert H., and Others, "The Terminological Investigation of Professional and Scientific Terms from the Literature of Vocational and Practical Arts Education", Western Arts Association Supplement, 1933, p. 44.

MAGAZINES

Anderson, Earl W., and Eliassen, Reuben H., "High School Teachers of Industrial Arts", Industrial Arts Magazine, Vol. 21, February, 1932, p. 215.

Dougherty, V. C., "Certification of Teachers", Industrial Arts and Vocational Education Magazine", Vol. 23, October, 1934, p. 309.

Smith, Homer J., "Aims and Types of Industrial Education", Industrial Arts and Vocational Education Magazine, Vol, 28, February, 1939, p. 45.

Smith, Homer J., "The Challenge of the Future", Industrial Arts and Vocational Education Magazine, Vol. 22, April, 1933, p. 159.

Tryon, R. M., Smith, H. L., and Rood, A. F., "The Program of Studies in Seventy-Eight Junior High School Centers", School Review, Vol. 25, February, 1927, pp. 96-107.

THESES

Ackert, Hugh P., The Status of Industrial Arts in the High Schools of South Dakota, Unpublished Master's Thesis, University of North Dakota, Chap. 2, p.16.

Lenz, William O., A Survey of the Vocational Educational Opportunities of North Dakota, Unpublished Master's Thesis, University of North Dakota, 1938.

Mythaler, Stanley L ., Industrial Arts Teaching in North Dakota Classified High Schools, With Particular Reference to Woodwork and Mechanical Drawing in the Ninth Grade, Unpublished Master's Thesis, University of North Dakota, 1929, p. 17.

Pfeifer, G. O., Duties of Industrial Arts Instructors in Minnesota Other Than Shop Instruction, Unpublished Master's Thesis, University of North Dakota, 1933, p. 37.

To be filed with the Director of Secondary Education by March first. Use typewriter if possible.

STATE OF NORTH DAKOTA

Department of Public Instruction
Bismarck, N. Dak.

Date submitted_____

ANNUAL REPORT OF ACCREDITED SCHOOL

_____class school

_____School located at_____

1. Enrollment (February first)
Elementary School.

Grades	Boys	Girls	Total
1.			
2.			
3.			
4.			
5.			
6.			
7. If in elementary organization			
8. If in elementary organization			
Total			
Average Daily Attendance			
% of Attendance			

Senior high school

Grades	Boys	Girls	Total
7. If in high school organization			
8. If in high school organization			
9.			
10.			
11.			
12.			
Specials			
Total			
Average Daily Attendance			
% of Attendance			

Non-resident high school enrollment.

Boys	Girls	Total

No. of Senior High School classes having:

1- 5 students_____ 21-25 students_____

6-10 students_____ 26-30 students_____

11-15 students_____ 31-35 students_____

16-20 students_____ over 35 students_____

Standard I. The School Plant and Sanitation

2. Does the school conform to the requirements indicated in Standard I? _____

If not, what are the exceptions? _____

3. What is the total amount of insurance carried on all school buildings? _____

Standard II. Libraries

4. Are the library facilities adequate to the needs of instruction? _____

5. Location of library, Check:

(_____) In separate room. (_____) In assembly room.

6. Seating capacity _____

7. No. of hours open per day _____

8. Number of volumes in high school library, exclusive of texts _____

9. Total number of non-fiction books purchased last year_____

10. Total amount spent for high school library last year.

$_____

11. Amount spent per high school pupil last year for library.

$_____

12. Number of volumes in elementary and junior high school libraries _____

13. Total amount spent for elementary and junior high school libraries last year. $_____

14. Amount spent per elementary and junior high school pupil for library last year. $_____

15. Are the libraries catalogued?_____

16. How many semester hours of library training has librarian?

_____

STANDARD VIII

Separate Sheets are furnished for larger schools

NAME OF TEACHER	Salary	Years teaching before this year	Years employed in this school before this year	Periods per week of teaching in H. S.	Number of grade classes instructed per day	Sum of the numbers in the various classes	Preparation Years			Degrees held	Name of school—graduated	N. Dak. Certificate held: 1P, 2P, SP	Number of Certificate	FIELDS IN WHICH TEACHER NOW HAS CLASSES Designate fields thus: E=English M=Mathematics F=Foreign Languages Sc=Social Studies S=Science C=Commercial Subjects I.A.=Industrial Arts H.E.=Home Economics 1, 8=Grades
							In normal school	In college	In graduate study					
Supt.														
Senior High School Principal														
Junior High School (if any)														
Elementary School														

42. Number of high school teachers teaching daily:

a. Less than 141 pupils_____. b. 141-150 pupils _____. c. 151-160 pupils_____.

d. More than 160 pupils_____.

Standard X. Pupil Load.

43. Number of pupils carrying for credit aside from physical education and music:

a. Less than four units_____. b. Four units_____.

c. More than four but less than five units_____.

d. Five units_____. e. More than 5 units_____.

Graduates

44. Graduates continuing education:

	Boys	Girls	Total
a. Total graduates last year			
b. Attending colleges & universities			
c. Attend'g normal schools or teachers colleges			
d. Attending other schools			
e. Total continuing school			

f. Per cent of last year's graduates continuing their education_____.

Physical Education

45. Is there a school gymnasium? _____

46. a. Are elementary and junior school pupils given professional physical examinations? _____

b. Senior high school pupils? _____

c. At what regular intervals are pupils examined?_____

_____

Note: To be professional the service must be performed by medical doctors or registered nurses.

47. a. In the physical education program is the attempt made to correct defects? _____

b. Is the recreational value stressed? _____

c. Is the inspirational value stressed? _____

d. Is the preventive value stressed? _____

Finance

Note: If possible, give information as of February 1, otherwise indicate date of information.

48. Latest taxable valuation of district $_____

Note: The taxable valuation is fifty per cent of the assessed valuation. If you do not have the taxable valuation of your district at hand, the accurate information may be obtained from your county auditor. Give accurate amount, not an estimate.

49. Total bonded indebtedness of district $_____

50. Give the total amount of floating indebtedness (outstanding certificates of indebtedness and warrants, excluding bonds).

$_____

51. Give the total amount of money in the sinking fund.

$_____

52. Give the total amount of money in the building fund.

$_____

53. Give the cash balance on hand. $_____

Note: Do not include sinking or building funds.

54. Give the mill levy for general or current expenses (exclude interest and sinking levies) as set at last annual meeting of board and additional voted levies (if any)_____mills.

Note: Please be accurate.

55. Give the mill levies for interest, sinking and building funds.

_____mills.

Note: May be obtained from county auditor.

56. Give the amount that can be raised by district by 18 mill levy. $_____.

57. Give the total amount spent by district last school year except for interest, sinking and building funds. $_____

58. Give the total amount received from Equalization Fund last year $_____

59. What was the annual per capita cost of senior high school instruction during the past year? $_____

Note: Total high school costs should be considered as teachers' salaries for the portion of their time devoted to high school; proportionate administrative costs; janitors' salaries and fuel. These are to be determined on the basis of the floor area devoted to high school. Insurance premiums should be spread over the years that the insurance is in force. Extensive repairs should also be spread over a period of years. Base per capita cost on enrollment. A minimum of twenty days attendance is to be considered enrollment. (Per capita cost is an important item and should be figured accurately. Do not give estimates.)

Jamestown, N. Dak.
April 14, 1939

Dear Sir:

Your school is one of the few in North Dakota offering industrial arts courses. Will you be so kind as to give me the following data regarding your shops?

1-Underline the grades in which you offer shop work:
six; seven; eight; nine; ten; eleven; twelve.

2-Underline the grades in which shop work is compulsory:
six; seven; eight; nine; ten; eleven; twelve.

3-Underline the grades in which shop work is elective:
six; seven; eight; nine; ten; eleven; twelve.

4. Do you limit shop work to certain grades: Underline:
six; seven; eight; nine; ten; eleven; twelve.

5. How many students are you equipped to handle at one time in your shop courses? Place number in blank space.

Woodworking _____ Print Shop _____
General Shop _____ Metal Shop _____
Mechanical Drawing _____ Farm Shop _____

6. Give total enrollment in each of the following courses for this school year:

Woodworking _____ Print Shop _____
General Shop _____ Metal Shop _____
Mechanical Drawing _____ Farm Shop _____
Trades and Ind. _____ Other Courses _____

7. Check the pieces of power equipment your shop contains in addition to your hand tools:

Circle Saw _____ Sander _____ Mortiser _____
Band Saw _____ Planer _____ Other Machines _____
Jig Saw _____ Jointer _____ _____
Wood Lathe _____ Saw Filer _____ _____
Machine Lathe _____ Shaper _____ _____
Drill Press _____ Grinder _____ _____

8. Give valuation of shop equipment; from inventory: _____

9. Is your shop on the basement floor? _____ Above? _____

10. Is your drawing room on the basement floor? _____ Above? _____

11. Do any of your shop students work as apprentices in trades? _____
If so, what trades? _____ _____ _____ _____

12. Do you use films for visual instruction? _____ Sound Films? _____
Silent films? _____

I shall appreciate your taking time to furnish me with this information at your very earliest convenience and thank you in advance.

Very truly yours,

Head of the Industrial Arts Department.
Charles A. Montague

Jamestown, North Dakota
May 22, 1939

Dear Sir:

The information you so kindly gave in a previous questionaire has required my asking for material on a few more items.

Daily shop program:

8:00 - 9:00	_____	1:00 - 2:00	_____
9:00 - 10:00	_____	2:00 - 3:00	_____
10:00 - 11:00	_____	3:00 - 4:00	_____
11:00 - 12:00	_____		

Shop instructors extra-curricular activities. Please check after activity.

Football _____	Band _____	Others not listed:
Basketball ____	Staging & lighting ____	_____
Track _____	Orchestra _____	_____
Baseball _____	Debate _____	_____
Tumbling _____	Dramatics _____	_____
Glee Club _____	Newspaper _____	_____

Give an estimate of your shop expenditure in 1938-39: $_____

Is your shop run by semester fee? _____ If so, how much is charged of each pupil per semester? _____

Thanking you for any information you have given me, I remain.

Very truly yours,

Charles A. Montague
Head of Industrial Arts Dept.

Appendix D

LIST OF SCHOOLS OFFERING VOCATIONAL AGRICULTURE IN 1938-1939

Beach
Bisbee
Bottineau
Cavalier
Cooperstown
Crosby
Devils Lake
Egeland
Fingal
Grafton
Hannaford
Hunter
Hettinger
Kenmare
Lakota
LaMoure
Larimore
Maddock
Mandan
Mayville
Mohall
Mott
New England
New Salem
Northwood
Park River
Plaza
Ray
Rolette
Rolla
Rugby
Sherwood
Stanley
Starkweather
Towner
Velva
Williston
Wishek

Appendix E

SCHOOLS TEACHING INDUSTRIAL ARTS AND SURVEYED IN THIS STUDY

Class	School	High School Enrollment	Questionnaire Returned	
			First	Second
	GROUP I 0 - 69			
2	Buffalo	58	X	X
1	Glenburn	52	X	
1	Hope	59		
3	Monango	66	X	
2	Notre Dame Academy (Willow City)	44		
1	Pembina	53	X	X
3	Petersburg	65	X	
1	Sanborn	54	X	
1	Sentinel Butte	46		
2	Sharon	59	X	X
1	Willow City	62		X
2	Wimbledon	51	X	
	GROUP II 70 - 149			
2	Beulah	105	X	X
1	Edgeley	139	X	X
2	Hazelton	92		
1	Kulm	122	X	X
1	Lidgerwood	124	X	X
1	McVille	97	X	
1	Milnor	93	X	X
1	Minot College High School	140	X	Not sent
1	Tioga	103	X	X
1	Turtle Lake	122	X	X
1	Valley City College High School	111	X	Not sent
	GROUP III 150 - 299			
1	Benson County Agricultural, Maddock	155		

1	Carrington	199	X	X
1	Dickinson College High School	159	X	Not sent
1	Ellendale	160	X	X
1	Enderlin	180	X	X
1	Hettinger	190	X	
1	Oakes	228	X	

GROUP IV
300 - over

1	Bismarck	707	X	X
1	Devils Lake	471	X	X
1	Fargo	1406	X	X
1	Grand Forks	1241	X	X
1	Jamestown	607	X	X
1	Valley City	380	X	X

Appendix F

LIST OF SCHOOLS NOW OFFERING INDUSTRIAL ARTS AND OVER THE PERIOD OF THIS STUDY

Class	School	1920	1925	1930	1935	1939
1	Beulah					X
1	Bismarck	X	X	X	X	X
2	Buffalo	X				X
1	Carrington	X				X
1	Devils Lake	X				X
1	Dickinson College High School				X	X
1	Edgeley	X	X	X	X	X
1	Ellendale	X	X*	X*	X*	X
1	Enderlin					X
1	Fargo	X	X	X	X	X
1	Glenburn					X
1	Grand Forks	X	X	X	X	X
2	Hazelton					X
1	Hettinger	X				X
1	Hope		X			X
1	Jamestown	X	X	X	X	X
1	Kulm	X				X
1	Lidgerwood	X			X	X
1	McVille					X
1	Maddock -Benson County Agricultural School				X	X
1	Milnor				X	X
1	Minot College High School			X	X	X
3	Monango					X
2	Notre Dame Academy-Willow City					X
1	Oakes	X	X		X	X
1	Pembina	X		X	X	X
3	Petersburg	X			X	X
1	Sanborn	X		X	X	X
1	Sentinel Butte	X		X	X	X
2	Sharon	X	X			X
1	Tioga			X	X	X
1	Turtle Lake			X		X
1	Valley City	X	X	X	X	X

Class	School	1920	1925	1930	1935	1939
1	Valley City College High School				X	X
2	Wimbledon		X		X	X
2	Willow City	X				X
		20	11	13	20	36

* Ellendale High School work given at Ellendale Normal and Industrial College.