THE STATUS OF INDUSTRIAL ARTS IN NEW MEXICO SINCE 1941

THE STATUS OF INDUSTRIAL ARTS IN NEW MEXICO SINCE 1941

By

LELAND F. HOWERTON

Bachelor of Science

Southwest Texas State Teachers College

San Marcos, Texas

1953

Submitted to the Faculty of the Graduate School of
the Oklahoma State University of Agriculture
and Applied Sciences
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
1959

THE STATUS OF INDUSTRIAL ARTS IN NEW MEXICO SINCE 1941

LELAND F. HOWERTON

MASTER OF SCIENCE

1959

Report Approved:

C. R. Hill
Report Advisor and Head,
Department of Industrial Arts Education

L. H. Bengtson
Associate Professor,
Department of Industrial Arts Education

Dean of the Graduate School

ACKNOWLEDGMENT

To Mr. C. L. Hill, Head, Department of Industrial Arts Education, Oklahoma State University, I wish to take this opportunity to express my sincere appreciation for his assistance and guidance in making this report possible. Without his aid and advice this report could not have been concluded.

L.F.H.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

CHAPTER I

AN INTRODUCTORY STATEMENT

The subject of this study was chosen to show the readers the vast growth and development of industrial arts in the education system of the state of New Mexico. It is hoped that the material will be presented in such a manner that it will give the reader a comparison with a previous thesis written by Mr. G. B. Strunk, entitled, "The History and Status of Industrial Arts in New Mexico Since Statehood to 1941".

Purpose of Study. The major purpose of this study is to show the growth and development of industrial arts in New Mexico from 1941 to 1959. The writer hopes that the final results of this study will indicate the definite and distinct progress which the state of New Mexico has made in the past twenty years. This study will also bring a previous research up-to-date and will form a basis for comparisons.

Limitation of Study. The major portion of this study is based on questionnaires returned by the industrial arts teachers in the state of New Mexico. A thorough and complete conclusion cannot be made due to the fact that less

than fifty percent of the questionnaires were returned by those teachers. The writer would like to present an evaluation of this information and in such manner that it will show by comparison the expansion of the industrial arts program since the last study was conducted.

Research Techniques Used. The information obtained for this study was through a questionnaire (Page 58 of Appendix), library research, and personnal letters to Mrs. LaMar W. Lamb, Director, Division of Certification, State Board of Education, Santa Fe, New Mexico and Mr. W. R. Forkner, Secretary-Treasurer, New Mexico Industrial Arts Association, Hobbs, New Mexico.

Scope of Study. It is anticipated that from the results of the questionnaire the reader will be provided with data pertaining to: (a) Organization and administration of the New Mexico Industrial Arts Association, (b) Teacher certification, (c) Professional preparation, (d) Curriculum, (e) Shops and equipment, and (f) historical data.

Definitions of Terms. The following definitions are given so that the reader may keep in mind the aims and views of the writer and have a better understanding of the material presented. To clarify the meaning of the following vocabulary for the reader, it has been necessary to extract the following terms from bibliographical references.

> Manual Training. That phase of industrial training originated to emphasize the importance of making good workmen as well as educated intellects. (3, page 361)
>
> Industrial Arts. Industrial arts, as a school subject, may be defined as a study of the machines, tools, and processes by means of which the forces of nature are utilized and the raw materials of nature are changed by man to make them more valuable and pleasing. It leads to an understanding of the native qualities of raw materials and of the natural forces together with a knowledge of the methods and practices of utilizing and changing these materials and forces. It is also concerned with the social and economic problems incident to these changes. (14, page 1)
>
> Industrial Education. A generic term including all educational activities concerned with modern industry, its raw materials, products, machines, personnel, and problems. It, therefore, includes both industrial arts, the general education forerunner of our introduction to vocational industrial education and the latter also. (3, page 7)

With this brief introduction to the problem it will be of interest to the reader to acquaint himself with those factors which have brought about the growth of industrial arts in New Mexico. In the following chapters a more detailed observation will be made of all phases of this report. Chapter II will be divided into two parts; (a) Teaching certificates for industrial arts teachers in New Mexico public school systems, and (b) a brief resume of the organization, development, and growth of the New Mexico Industrial Arts Association. In Chapter III will be presented the results of the questionnaire giving teacher qualifications, the shop and equipment, curriculum and historical data, etc. Chapter IV will state conclusions and recommendations for further study.

CHAPTER II

TEACHER CERTIFICATION AND THE NEW MEXICO INDUSTRIAL ARTS ASSOCIATION

With the advent of World War II, in 1941 the character of industrial education in New Mexico was changed somewhat by the emphasis on defense and war production training. Industrial arts woodworking classes were discontinued in some secondary schools in favor of machine shops and automotive instruction. Emergency training programs were established in twelve centers to offer instruction in the defense and war production training program.

The training programs that were formed in New Mexico during World War II have influenced industrial education in the state since 1941. Many schools took advantage of the opportunity to secure school shop equipment from war surplus supplies.

With the preceding statements in mind and the fact that the professional teachers of New Mexico have organized and that the Certification requirements have been strengthened, it may be easily seen why there has been a definite development of industrial arts.

More shall be written regarding the improvement of Certification and the professional growth of the teachers.

This information will be presented in the following paragraphs.

Part A

Teacher Certification

The state of New Mexico requires that every teacher must hold a New Mexico teaching certificate if they serve as either a regular or substitute teacher on a full or part time basis in the New Mexico public schools. These certificates are issued for special fields of specialization such as; Industrial Arts, Art, Music, Vocational Trade and Industrial Education, and Vocational Home Economics.

General Requirements. Any teacher who applies for a teacher's certificate in New Mexico is required by law to be 18 years old, to furnish proof of United States citizenship (except for foreign teachers on exchange basis), and to provide the State Department of Education with a complete application signed by a representative of the school where the applicant received a major part of his training. These applications include information as to mental and physical health, moral character, and certification that applicant has met the requirements of an approved program of teacher preparation. (15, page 8, 9)

Provisional Secondary Certificate. To secure a Five Year Provisional Secondary Certificate under the new regulations (effective July 1, 1956) all prospective teachers

applying for positions in New Mexico public school systems must have a Bachelor's Degree from an accredited college or university and a recommendation from the Dean of the College of Education where the degree was received. (15, page 21)

The requirements for securing a Provisional Secondary certificate are as follows: (1) General education must include forty-eight semester hours in any four of these six fields; Humanities, Social Science, Biological and/or Physical Sciences, Commucative Arts, Fine and Practical Arts, and Health, Physical Education and Recreation. A minimum of six semester hours is required for each field. (2) Six semester hours of secondary student teaching along with Child Growth and Development, Areas Relating to Guidance, Techniques, and Orientation are required to make up twenty-four semester hours of Professional Education. (15, page 22)

Industrial Arts Certificates. There are two plans under which an applicant may meet the requirements for a certificate endorsed for the teaching of industrial arts.

Plan I. A standard certificate endorsed for the teaching of industrial arts will be issued at either the elementary or secondary level with the same framework as that required for other certificates under the new regulations.

Plan II. A special certificate endorsed for the teaching of industrial arts, Grades 1 - 12, will be issued

provided the applicant has a composite major total of thirty-six semester hours in industrial arts and a minor of fifteen semester hours in another teaching area or a total of fifty-one semester hours in the area of industrial arts. Applicants for the Special Industrial Arts Certificate under Plan II must meet the following requirements:

1. General Education - 48 semester hours. Same as required for other certificates.
2. Professional Education - 24 semester hours. Same as required for other certification, except that the applicant must have student teaching and methods courses on both the elementary and secondary level.
3. Specialization - 36 semester hours in shop or drawing courses.

> Renewal of Industrial Arts Certificates. The Five Year Industrial Arts Certificate or the Special Industrial Arts Certificate may be renewed for five years at a time, provided the holder earns eight semester hours of graduate or appropriate credit during the life of the certificate. Such credit must be recommended to the Director of Certification by the employing superintendent. If the applicant is unemployed at the time the renewal credits are earned, request for course approval must be submitted to the Director of Certification, State Department of Education, P. O. Box 999, Sante Fe, New Mexico. Unapproved credits will not be accepted on a renewal. (15, page 40)

From the information received by the writer it appears that Plan II is much superior to Plan I in that it definitely states that a certified teacher must have a minimum number of semester credit hours in his field of specialization.

Part A

New Mexico Industrial Arts Association

The New Mexico Industrial Arts Association was organized in 1947 with a membership of thirty-five industrial arts teachers.

The major purposes of organizing the association were; (1) dissemination and enterchanging of ideas to aid industrial arts teachers, and (2) creation of an understanding by the general public of the importance of industrial arts in education.

Annual meetings are held the last week of October in Albuquerque. The meeting is held in two general sessions, usually on Thursday afternoon and Friday morning. Officers for the year of 1958 and 1959 are as follows:

Wade O. Fredrickson	Hobbs	President
Worth Long	Albuquerque	Vice-President
W. R. Forkner	Hobbs	Sec.-Treas.

The first several years' activities were concerned with organizational procedures. Leaders in the field of Industrial Arts were invited to speak at annual meetings to interest teachers in up-grading the industrial arts departments of the state.

Membership in the organization is available to all industrial arts teachers in the state; including elementary, secondary and college teachers. The association is affiliated with the New Mexico Education Association and the American Industrial Arts Association.

The constitution was patterned after industrial arts constitutions from surrounding states. The constitution being accepted early in the 1950's. The present project for the New Mexico Industrial Arts Association is to compile a study guide of curricula for as many of the state schools offering industrial arts as possible. The study guides are nearly completed and will be ready for distribution at the annual meeting in October, 1959. The study guides will cover such areas as drafting, metals, woods, crafts, electricity, carpentry, graphic arts, and auto mechanics.

In a period of only twelve years the membership in the New Mexico Industrial Arts Association has increased from thirty-five members to one hundred twenty-five.

The preceding paragraphs present a fairly clear presentation of the three events that have contributed to the growth of industrial arts in New Mexico. The first was, perhaps, the events that transpired during and following World War II, the Teacher Certification program and the professional growth of the teachers. The next chapter will present further proof of this statement.

The following chapter will present the results of the questionnaire giving teacher qualifications, the shop and equipment, and curriculum.

CHAPTER III

A REPORT OF INQUIRY INTO THE STATUS OF INDUSTRIAL ARTS IN NEW MEXICO SCHOOLS

In this chapter the teacher qualifications, tenure, salaries, experience, and colleges attended are considered. The shop and equipment, size of building in feet and ratio, location, direction facing, and type of floor will be shown and discussed. Extra-curricular activities the industrial teacher carries out are sponsoring of adult and other clubs, classroom sponsor, etc. The above listed subjects are discussed in detail and are shown by tables, in the order that they appear.

Part A

The Industrial Arts Teacher

Industrial arts teachers in New Mexico have a wonderful opportunity to offer a diversified program within the state. In recent years industry has been moving into the state along with the vast oil development, which creates a great demand for industrial arts students.

Number of Industrial Arts Teachers in New Mexico. There are one hundred and twenty-five industrial arts teachers in New Mexico who belong to the New Mexico Industrial

Arts Association, (names, school and addresses are given in Appendix C). This is over ninety percent of the Industrial Arts teachers in the state.

In 1941 there were only forty industrial arts teachers in the state of New Mexico. Within a period of less than twenty years the number of industrial arts teachers being employed by the state has increased over three times.

Qualification of the Teacher. The following paragraphs will be answers received through the survey of questionnaires returned to the writer. The following topics appearing on the questionnaire will be discussed and illustrated with tables: (1) salaries of industrial arts teachers, (2) college graduates, (3) colleges graduated from, (4) number of hours in major field, (5) attitudes of industrial arts teacher toward self-improvement, and (6) tenure.

Salary of Industrial Arts Teachers in New Mexico. New Mexico does not have a fixed salary throughout the state for teachers. Each school system determines the teacher's salary by the amount of funds received from the state, from taxes, grants, natural resources, etc.

In most school systems within the state of New Mexico a teacher with the baccalaureate degree and no experience will receive $4200 salary plus $250 if head of the family. Some school systems count military service as teaching experience, an additional one hundred dollars being paid for each years experience. A Masters Degree pays an additional two hundred fifty dollars.

Table I will show the salaries of industrial arts teachers in New Mexico, by intervals of pay, medium, and number of teachers receiving pay within that interval.

TABLE I

SALARY OF INDUSTRIAL ARTS TEACHERS IN NEW MEXICO

INTERVALS	MEDIUM	NUMBER OF TEACHERS
8200	8200	1
7900	7900	1
7200	7200	1
6900 - 7100	7000	2
6700 - 6900	6800	3
6500 - 6700	6600	3
6000 - 6500	6250	6
5500 - 6000	5750	5
5000 - 5500	5250	10
4500 - 5000	4750	6
4000 - 4500	4250	8
No Answer		5
	TOTAL:	51

Salaries for industrial arts teachers in New Mexico range from $4,000 to $8,200 a year. The average pay is $6,359 per year for an industrial arts teacher.

In comparison with other states, New Mexico ranks high in teacher pay scale. The pay scale in New Mexico runs approximately one thousand dollars more than Oklahoma per industrial arts teacher.

Table II, College Graduates, shows the number of industrial arts teachers in New Mexico who possess a baccalaureate degree, and also an advanced degree.

The survey revealed that one hundred percent of the industrial arts teachers in New Mexico have received either

TABLE II

COLLEGE GRADUATE

TEACHER NUMBER	COLLEGE GRADUATE	ADVANCE DEGREE	:	TEACHER NUMBER	COLLEGE GRADUATE	ADVANCE DEGREE
1	Yes	Yes	:	27	Yes	Yes
2	Yes	No	:	28	Yes	No
3	Yes	Yes	:	29	Yes	No
4	Yes	No	:	30	Yes	No
5	Yes	No	:	31	Yes	No
6	Yes	Yes	:	32	Yes	Yes
7	Yes	Yes	:	33	Yes	Yes
8	Yes	Yes	:	34	Yes	No
9	Yes	Yes	:	35	Yes	No
10	Yes	Yes	:	36	Yes	Yes
11	Yes	Yes	:	37	Yes	Yes
12	Yes	No	:	38	Yes	Yes
13	Yes	Yes	:	39	Yes	Yes
14	Yes	No	:	40	Yes	No
15	Yes	Yes	:	41	Yes	Yes
16	Yes	No	:	42	Yes	Yes
17	Yes	No	:	43	Yes	No
18	Yes	No	:	44	Yes	Yes
19	Yes	No	:	45	Yes	No
20	Yes	Yes	:	46	Yes	Yes
21	Yes	No	:	47	Yes	No
22	Yes	Yes	:	48	Yes	Yes
23	Yes	No	:	49	Yes	No
24	Yes	Yes	:	50	Yes	Yes
25	Yes	Yes	:	51	Yes	Yes
26	Yes	Yes	:	TOTAL	51	29

a Bachelor of Science or Bachelor of Arts degree. Of the fifty-one questionnaires surveyed, twenty-nine of them had advanced degrees. This shows the industrial arts teachers of New Mexico are definitely improving themselves through advance schooling.

Graduated From What College. New Mexico has four colleges training industrial arts teachers; New Mexico University, Eastern New Mexico University, New Mexico Western College, and Highlands University. The type of preparation

done by the future teacher greatly affects curriculum. Some colleges and universities are much better equipped than others; with better equipment, instructors, etc. A much more diversified curriculum may be offered students preparing to teach.

TABLE III

GRADUATE FROM WHAT COLLEGE

TEACHER NUMBER	NAME OF COLLEGE	LOCATION BY STATE
1	Highlands University	New Mexico
2	University of New Mexico	New Mexico
3	University of Michigan	Michigan
4	Kansas State College	Kansas
5	East Central Oklahoma	Oklahoma
6	University of New Mexico	New Mexico
7	Oklahoma State University	Oklahoma
8	Nebraska State Teacher College	Nebraska
9	Highlands University	New Mexico
10	Bradley University	Illinois
11	Central State College	Oklahoma
12	West Texas State College	Texas
13	Highlands University	New Mexico
14	University of New Mexico	New Mexico
15	Highlands University	New Mexico
16	Highlands University	New Mexico
17	Highlands University	New Mexico
18	Eastern New Mexico University	New Mexico
19	Southeastern State	Oklahoma
20	Highlands University	New Mexico
21	East Central State	Oklahoma
22	Southwestern State College	Oklahoma
23	University of New Mexico	New Mexico
24	Pennsylvania State University	Pennsylvania
25	Oklahoma State University	Oklahoma
26	Platteville State Teachers	Wisconsin
27	North Texas State College	Texas
28	North Texas State College	Texas
29	North Texas State College	Texas
30	Adams State College	Colorado
31	Oklahoma State University	Oklahoma
32	Stout State	Wisconsin
33	North Texas State College	Texas
34	University of New Mexico	New Mexico
35	University of New Mexico	New Mexico

TABLE III (Continued)

TEACHER NUMBER	NAME OF SCHOOL	LOCATION BY STATE
36	Gallovdet	Wash., D. C.
37	New Mexico Western	New Mexico
38	Eastern New Mexico University	New Mexico
39	East Central State	Oklahoma
40	University of Illinois	Illinois
41	Eastern New Mexico University	New Mexico
42	Eastern New Mexico University	New Mexico
43	Westmar College	Iowa
44	Eastern New Mexico University	New Mexico
45	Iowa Wesleyan College	Iowa
46	North Texas State College	Texas
47	University of New Mexico	New Mexico
48	Northern Illinois State	Illinois
49	Central State College	Oklahoma
50	New Mexico Western College	New Mexico
51	Emporia State	Kansas

Twenty-one teachers or forty-one per cent of the teachers answering the questionnaire are graduates of New Mexico colleges or universities. Ten are graduates of Oklahoma colleges, six are graduates of Texas colleges and three are graduates of Illinois colleges. Kansas, Iowa and Wisconsin are represented by two graduates each while Nebraska, Michigan, Pennsylvania, Colorado, and Washington, D. C. are represented by one graduate.

Number of Hours in Major Field. Table IV shows the major field of the teacher and number of semester hours each has in his major field.

Forty-two of the fifty-one questionnaires received listed industrial arts as the major field, while other major fields were as follows: secondary education, two; school administration, one; business administration, one;

TABLE IV

NUMBER OF HOURS IN MAJOR FIELD

TEACHER NUMBER	MAJOR	NUMBER OF SEMESTER HOURS
1	Secondary Education	65
2	Industrial Arts	74
3	Industrial Arts	No Answer
4	Industrial Arts	41
5	Industrial Arts	No Answer
6	School Administration	57
7	Industrial Arts	24
8	Industrial Arts	28
9	Industrial Arts	No Answer
10	Industrial Education	No Answer
11	Industrial Arts Education	36
12	Industrial Arts	50
13	Industrial Arts	36
14	Industrial Arts Education	60
15	Industrial Arts	47
16	Industrial Arts	No Answer
17	Industrial Arts	29
18	Industrial Arts	52
19	Education	59
20	Industrial Arts	24
21	Industrial Arts	35
22	Industrial Arts	36
23	Industrial Arts Education	51
24	Industrial Arts	76
25	Industrial Arts	55
26	Industrial Arts	No Answer
27	Industrial Arts	75
28	Industrial Arts	60
29	Secondary School Administration	6
30	Industrial Arts	38
31	Industrial Arts	54
32	Industrial Education	68
33	Business Administration	84
34	Industrial Arts Education	61
35	Industrial Arts	45
36	Industrial Arts & Voc. Education	103
37	Industrial Arts	62
38	Industrial Arts	64
39	Administration & Supervision	40
40	Physical Education	43
41	Industrial Arts	36
42	Industrial Arts	57
43	Industrial Arts	36
44	Industrial Arts	40
45	Fine Arts	45

TABLE IV (Continued)

TEACHER NUMBER	MAJOR	NUMBER OF SEMESTER HOURS
46	Industrial Arts	48
47	Industrial Engineering	60
48	Industrial Education	40
49	Industrial Arts	28
50	Industrial Arts	28
51	Industrial Arts	27

administration and supervision, one; physical education, one; fine arts, one; secondary school administration, one; and industrial engineering, one.

With the field of study in industrial arts being so broad, (twenty to twenty-five different areas) a student teacher should plan several hours in the subjects he is preparing for. The number of semester hours averaged in the major field from the questionnaire received was fifty-three.

Attitudes of Industrial Arts Teachers Toward Self-Improvement. There are a number of ways an industrial arts teacher may improve himself. One way is by attending summer school at regular intervals, others by working in industry during summer vacation, conferences, etc.

Table V shows the attitudes of the industrial arts teachers toward attending summer school during summer vacation.

The industrial arts teachers' attitudes toward attending summer school every summer is one yes, two did not answer. Attending summer school every other summer, six answered yes, one answered possibly, two did not answer, and the other

TABLE V

ATTITUDES OF INDUSTRIAL ARTS TEACHERS
TOWARD SELF-IMPROVEMENT

TEACHER NUMBER	EVERY SUMMER	EVERY OTHER SUMMER	EVERY THIRD SUMMER
1	No	Yes	Yes
2	No	No	Yes
3	No	No	Possibly
4	Yes	-	-
5	No	No	Possibly
6	No	No	Yes
7	No	Yes	-
8	No	No	Possibly
9	No	No	Yes
10	No	No	Yes
11	No	No	Possibly
12	-	-	-
13	No	No	Yes
14	No	No	Yes
15	No	No	Yes
16	No	No	Yes
17	No	No	No
18	No	Yes	No
19	No	No	Yes
20	No	No	Yes
21	No	Yes	-
22	No	No	No
23	No	No	Yes
24	No	Possibly	Yes
25	No	No	No
26	No	No	No
27	No	No	Possibly
28	No	No	Possibly
29	No	No	Yes
30	No	No	No
31	-	-	-
32	No	Yes	No
33	No	No	Yes
34	No	No	Yes
35	No	No	No
36	No	No	No
37	No	No	No
38	No	No	Yes
39	No	No	Possibly
40	No	No	No
41	No	No	No
42	No	No	No
43	No	Yes	Yes

TABLE V (Continued)

TEACHER NUMBER	EVERY SUMMER	EVERY OTHER SUMMER	EVERY THIRD SUMMER
44	No	No	No
45	No	No	Yes
46	No	No	No
47	No	No	No
48	No	No	No
49	No	No	No
50	No	No	Yes
51	No	No	Yes

forty-two answered no. Attitudes of the industrial arts teachers toward attending summer school every third summer is; twenty-one yes, eighteen no, seven possibly and five did not answer.

Tenure. Table VI shows the average tenure of the New Mexico industrial arts teacher.

TABLE VI

TENURE

TEACHER NUMBER	YEARS IN PRESENT POSITION	TEACHING EXPERIENCE	COACH	PRIN.	SUPT.
1	8	30			
2	2	2			
3	5	16			
4	2	2			
5	30	32			
6	4	9			
7	3	3			
8	15	32			X
9	12	12			
10	11	11			
11	12	12			
12	12	40			
13	10	10		X	
14	1	2			
15	12	12		X	

TABLE VI (Continued)

TEACHER NUMBER	YEARS IN PRESENT POSITION	TEACHING EXPERIENCE	COACH	PRIN.	SUPT.
16	3	3			
17	3	4			
18	1	1			
19	2	5			
20	6	11			
21	1	1	X		
22	9	9			
23	5	5			
24	10	11			
25	12	15			
26	13	30			
27	6	6			
28	4	4			
29	1	1			
30	4	8			
31	1	1			
32	11	17			
33	3	4			
34	4	13			
35	5	7			
36	14	14			
37	16	22			
38	3	3			
39	2	10			
40	11	24			
41	4	5			
42	8	9			
43	2	6			
44	7	10			
45	8	8			
46	5	7			
47	5	6			
48	10	12			
49	17	22			
50	6	8			
51	21	29			

The average years in present positions is 7.45 years per teacher. The average teaching experience for the industrial arts teacher is 10.8 years. All industrial arts teachers are full time with the exception of four; one coach, two principals, and one superintendent.

Library. In order for an industrial arts teacher to teach effectively, he must be as studious as the student himself. If he does not keep current with all new ideas, good or bad, it is very easy to fall into a rut and teach out-dated methods and procedures.

TABLE VII

LIBRARY

TEACHER NUMBER	NUMBER OF BOOKS IN SCHOOL LIBRARY	NUMBER OF BOOKS IN PERSONAL LIBRARY
1	60	200
2	111	592
3	None	20
4	20	None
5	36	None
6	16	39
7	10	15
8	35	None
9	53	53
10	12	25
11	20	None
12	20	None
13	50	100
14	30	50
15	10	30
16	60	40
17	40	25
18	None	15
19	500	40
20	None	None
21	35	None
22	15	12
23	96	30
24	325	94
25	250	30
26	Unknown	50
27	None	None
28	None	15
29	150	50
30	30	20
31	50	50
32	600	450
33	14	30
34	50	130

TABLE VII (Continued)

TEACHER NUMBER	NUMBER OF BOOKS IN SCHOOL LIBRARY	NUMBER OF BOOKS IN PERSONAL LIBRARY
35	20	None
36	75	100
37	None	None
38	12	None
39	None	None
40	40	None
41	20	None
42	Unknown	250
43	None	20
44	20	None
45	None	20
46	Unknown	20
47	300	50
48	Unknown	150
49	175	305
50	100	200
51	80	None

Table VII reveals that the average number of industrial books in the school library is seventy volumes. The average number of industrial arts volumes found in personal libraries is sixty-five.

Professional Magazines. Another method for the industrial arts teacher to keep current is by reading professional magazines. Some of the most popular magazines are; Industrial Arts Teacher, School Shop, Industrial Arts and Vocational Education, and Professional Builder.

Table VIII reveals that each industrial arts teacher subscribes to an average of three professional magazines per industrial arts teacher in New Mexico. Three industrial arts teachers indicated that they did not subscribe to any professional magazines.

TABLE VIII

PROFESSIONAL MAGAZINES

TEACHER NUMBER	PROFESSIONAL MAGAZINES	TEACHER NUMBER	PROFESSIONAL MAGAZINES
1	8	27	2
2	8	28	2
3	2	29	1
4	5	30	5
5	1	31	3
6	1	32	3
7	2	33	5
8	2	34	0
9	2	35	3
10	2	36	5
11	6	37	1
12	0	38	5
13	1	39	4
14	1	40	4
15	1	41	1
16	2	42	5
17	2	43	4
18	2	44	2
19	3	45	2
20	3	46	3
21	0	47	3
22	3	48	2
23	4	49	5
24	4	50	4
25	5	51	3
26	3		

Vacations. Table IX shows how industrial arts teachers in New Mexico spend their vacations and how many inspection trips were made to industries.

The study of fifty-one industrial arts teachers shows that six attend school every summer while four teachers did not respond to the question. The remainder of the teachers work or travel. An average of 2.5 inspection trips for each teacher are made. Fourteen teachers indicated that they had made no inspection trips.

TABLE IX

SPENDING VACATION

TEACHER NUMBER	HOW VACATIONS ARE SPENT	INSPECTION TRIPS
1	Building house	3
2	Working	5
3	Scientific lab	1
4	School	1
5	U. S. Forest Service	1
6	Painting	2
7	Carpentry	1
8	Teaching	2
9	Working at home	0
10	Working	0
11	School	2
12	Resting	0
13	Working	3
14	School	1
15	School	5
16	--	0
17	Working	2
18	Working	1
19	--	5
20	Traveling	2
21	Working	3
22	Working	3
23	Working	3
24	Work and travel	1
25	Building furniture	15
26	Travel	7
27	--	-
28	Oil field and school	2
29	School	13
30	Travel and construction work	2
31	Shop work	2
32	Building a home	2
33	Working	12
34	Maintenance (School)	7
35	Working	0
36	School	0
37	Travel and fishing	0
38	Traveling and working	1
39	--	6
40	Working	0
41	Building houses	1
42	School production work	8
43	Working	0
44	Working for the school	0
45	Construction work	0

TABLE IX (Continued)

TEACHER NUMBER	HOW VACATIONS ARE SPENT	INSPECTION TRIPS
46	Cabinet Making	0
47	School	4
48	Teaching	0
49	Fishing	5
50	Working	2
51	Cabinet making and finishing	1

Teachers Visiting School Shops and Using Check Cards. Table X shows the results of answers to the question, "Does the industrial arts teacher like to visit other shops, why and does he use a check card?" One needs to know what he is going to look for when visiting another shop. This can best be done by use of a simple check card.

TABLE X

TEACHERS VISITING SCHOOL SHOPS AND USING CHECK CARDS

TEACHER NUMBER	VISIT SCHOOL SHOPS	WHY	CHECK CARDS
1	Yes	To see different approaches	Yes
2	Yes	To get new ideas	No
3	Yes	To get new ideas	No
4	Yes	Equipment set-up & course contents	No
5	Yes	New ideas	No
6	Yes	Gather new methods	No
7	Yes	Study layout & methods	Yes
8	Yes	To get new ideas	No
9	Yes	Observation	No
10	Yes	To get new ideas	No
11	Yes	Acquaintance, projects & shop layout	Seldom
12	No	--	--
13	Yes	Discuss I.A. Problems, and projects	No

TABLE X (Continued)

TEACHER NUMBER	VISIT SCHOOL SHOPS	WHY	CHECK CARDS
14	Yes	To get new ideas	No
15	Yes	Exch. ideas & shop practice	Yes
16	Yes	To get new ideas	No
17	Yes	Further knowledge	Yes
18	Yes	New ideas	No
19	Yes	Spread ideas	Seldom
20	Yes	General information	No
21	Yes	Compare notes	Yes
22	Yes	To get new ideas	No
23	Yes	To observe other methods of teaching	Yes
24	Yes	To obtain new ideas	No
25	Yes	To make comparison	No
26	Yes	For new ideas	No
27	Yes	Compare teaching methods	No
28	Yes	New teaching ideas & projects	No
29	Yes	For new ideas	Yes
30	Yes	For techniques	Yes
31	Yes	For new ideas	No
32	Yes	For new ideas teaching & methods	No
33	Yes	To acquaint myself with their procedure	Yes
34	Yes	For new ideas	Yes
35	Yes	For new ideas	Seldom
36	Yes	For new ideas	Yes
37	Yes	Information	Yes
38	Yes	Exchange and better acquain-- tance	No
39	Yes	For new ideas	Yes
40	Yes	For new ideas	Seldom
41	Yes	New ideas & methods	No
42	Yes	For new ideas	No
43	Yes	Information	Yes
44	Yes	See shop operation	No
45	Yes	Information	Seldom
46	Yes	To view conditions & problems	Yes
47	Yes	For new ideas	Yes
48	Yes	Evaluation	Yes
49	Yes	For new ideas	Yes
50	Yes	For new ideas	No
51	Yes	For new ideas	No

All but one indicated he likes to visit other school shops. The outstanding reasons for visiting were; to get

new ideas, and to acquaint themselves with other industrial arts programs.

Part B

The Shop and Its Equipment

The physical make-up of an industrial arts shop and equipment must include hand tools, power tools, tool room, individual lockers, types of doors, square feet in shop floor plan, type of building construction and many other features combined to make up a satisfactory place for the industrial arts teacher to teach a diversified program. Each part of the shop will be discussed and considered, with tables showing the responses to the fifty-one questionnaires received from industrial arts teachers in New Mexico.

Separate Shop Buildings. Table XI shows the number of schools in the state of New Mexico that maintain a separate shop building.

Fifty-eight per cent of the schools maintain a separate industrial arts building. The remaining forty-two per cent are in the area of the main building.

The main factors to be considered in planning a separate building are:

1. Located near the main building. The separate building should be located close to the main building, with only enough space separating them to provide good lighting, ventilation, and elimination of noise.

2. Building to fit contour of the grounds. In many cases it is advantageous to allow

TABLE XI

SEPARATE SHOP BUILDING

TEACHER NUMBER	SEPARATE SHOP BUILDING	TEACHER NUMBER	SEPARATE SHOP BUILDING
1	No	27	Yes
2	No	28	No
3	No	29	Yes
4	Yes	30	No
5	Yes	31	Yes
6	No	32	Yes
7	No	33	Yes
8	No	34	No
9	No	35	Yes
10	No	36	Yes
11	No	37	No
12	Yes	38	Yes
13	Yes	39	Yes
14	No	40	Yes
15	No	41	Yes
16	No	42	Yes
17	No	43	No
18	Yes	44	Yes
19	Yes	45	No
20	Yes	46	Yes
21	Yes	47	No
22	Yes	48	Yes
23	No	49	Yes
24	Yes	50	Yes
25	Yes	51	No
26	Yes		

the separate shop building to conform to the contour of the ground on which it is built, for reasons of economy in construction, to gain floor to ceiling space, and to allow for convenience in handling heavy materials and perhaps production work.

3. Architectural design. It is desirable to have the separate shop building of the same architectural design as the main building. This is well if the building can be designed to fully incorporate the features most desirable in a shop building. It is not in the least desirable, however, to conform to the architectural pattern of the main building if it requires elimination of the requisites of a good shop building. With careful

> thought and design, types of architecture can be mixed to include desired features without causing too much conflict in architectural design. (14, page 63)

Size of the Shop Building. Table XII shows the height, width, length, and ratio of width to length.

TABLE XII

SIZE OF SHOP BUILDINGS IN NEW MEXICO HIGH SCHOOLS

TEACHER NUMBER	HEIGHT	WIDTH	LENGTH	RATIO
1	12	38	80	1:2.1
2	15	60	129	1:2.1
3	15	--	--	--
4	20	37	120	1:3.2
5	9	28	90	1:3.2
6	10	23	54	1:2.3
7	12	30	50	1:1.6
8	10	--	--	--
9	10	--	--	--
10	10	—	--	--
11	16	52	72	1:1.3
12	12	50	120	1:2.4
13	12	40	75	1:1.8
14	8	--	--	--
15	10	--	--	--
16	10	36	50	1:1.3
17	12	20	80	1:4
18	12	20	60	1:3
19	14	45	70	1:1.6
20	12	60	120	1:2
21	18	35	125	1:3.5
22	8	20	70	1:3.5
23	16	36	88	1:2.4
24	12	100	120	1:1.2
25	14	50	73	1:1.4
26	18	35	70	1:2
27	14	36	77	1:2.1
28	20	--	---	--
29	13	35	60	1:1.7
30	9	30	80	1:1.6
31	-	75	100	1:1.3
32	14	50	90	1:1.8
33	10	30	70	1:2.3
34	12	45	65	1:1.4

TABLE XII (Continued)

TEACHER NUMBER	HEIGHT	WIDTH	LENGTH	RATIO
35	9	28	62	1:2.2
36	12	38	100	1:2.6
37	8	--	--	--
38	10	40	60	1:1.5
39	10	50	80	1:1.6
40	20	--	--	--
41	10	26	72	1:2.7
42	--	--	--	--
43	10	32	52	1:1.6
44	12	45	87	1:1.9
45	10	25	75	1:1.3
46	14	52	80	1:1.5
47	22	40	52	1:1.3
48	14	40	135	1:3.3
49	14	50	99	1:1.9
50	14	60	75	1:1.2
51	12	--	--	--

Width to length ratio of 1:1 1/2 or 1:2. These ratios to be recommended, and it is believed that when using them, arrangement of shops and equipment will be more satisfactory. Much space is lost in square shops and lighting is difficult. (14, page 64)

Location of Shop. Table XIII shows the location of the school shops. They may be located on the first floor or basement.

TABLE XIII

LOCATION OF SCHOOL SHOPS IN NEW MEXICO HIGH SCHOOLS

TEACHER NUMBER	FIRST FLOOR	BASEMENT
1	X	
2	X	
3	X	
4	No Reply	
5	No Reply	
6	X	

TABLE XIII (Continued)

TEACHER NUMBER	FIRST FLOOR	BASEMENT
7	X	
8		X
9	X	
10	X	
11	No Reply	
12	No Reply	
13	X	
14		X
15	X	
16		X
17	X	
18	No Reply	
19	X	
20	No Reply	
21	No Reply	
22	No Reply	
23	X	
24	No Reply	
25	X	
26	X	
27	No Reply	
28	X	
29	No Reply	
30		X
31	X	
32	X	
33	No Reply	
34	X	
35	No Reply	
36	No Reply	
37		X
38	X	
39	No Reply	
40	X	
41	No Reply	
42	No Reply	
43	No Reply	
44	No Reply	
45	X	
46	X	
47	X	
48	No Reply	
49	No Reply	
50	X	
51	X	

Forty-two per cent of the respondents did not answer this question in the questionnaire. Forty-nine per cent of the respondents reported their shops were located on the first floor. The other eight per cent of the respondents reported their shops were in the basement. No one reported having shops located on the second floor.

Direction the Shop Faces. Table XIV shows the direction the shop faces.

TABLE XIV

DIRECTION THE SHOP FACES

TEACHER NUMBER	NORTH	EAST	SOUTH	WEST
1	X			
2			X	
3			X	
4			X	
5				X
6			X	
7		X		
8			X	
9		X		
10			X	
11			X	
12	X			
13			X	
14		X		
15			X	
16			X	
17				X
18				X
19			X	
20		X		
21		X		
22	X			
23			X	
24	X			
25			X	
26		X		
27		X		

TABLE XIV (Continued)

TEACHER NUMBER	NORTH	EAST	SOUTH	WEST
28		X		
29		X		
30		X		
31	X			
32			X	
33		X		
34	X			
35	X			
36		X		
37				X
38	X			
39				X
40	X			
41		X		
42		X		
43	X			
44			X	
45	X			
46			X	
47		X		
48			X	
49				X
50	X			
51	No Reply			

One respondent failed to answer the question. Twelve of these shops face north, sixteen face east, seventeen face south, and six face west.

Natural Lighting. Table XV shows the number of windows in each respondents shop.

It is considered good planning to have at least twenty-five per cent of the floor space, located on at least two sides of the shop illuminated by natural light. Windows should be located approximately forty-two inches from the floor and six inches from the ceiling.

TABLE XV

NUMBER OF WINDOWS IN SHOP

TEACHER NUMBER	NUMBER OF WINDOWS IN SHOP
1	12
2	24
3	15
4	35
5	18
6	14
7	6
8	11
9	10
10	11
11	22
12	6
13	10
14	3
15	6
16	8
17	10
18	12
19	35
20	ALL OUTSIDE WALLS
21	8
22	10
23	40
24	10
25	ALL NORTH AND SOUTH WALLS
26	WINDOWS IN NORTH AND SOUTH ENDS
27	10
28	4
29	9
30	10
31	20
32	8
33	10
34	14
35	500 SQUARE FEET
36	20
37	10
38	8
39	NO ANSWER
40	NO ANSWER
41	8
42	NO ANSWER
43	6
44	27
45	15

TABLE XV (Continued)

TEACHER NUMBER		NUMBER OF WINDOWS IN SHOP
46	TWO SIDES	
47		9
48	ONE COMPLETE WALL	
49		33
50	COMPLETE NORTH WALL	
51	TWO COMPLETE SIDES	

Tool and Lecture Rooms. Table XVI shows the number of shops maintaining a separate tool and lecture room.

TABLE XVI

TOOL AND LECTURE ROOMS

TEACHER NUMBER	TOOL ROOMS	LECTURE ROOMS	TEACHER NUMBER	TOOL ROOMS	LECTURE ROOMS
1	No	Yes	27	No	Yes
2	Yes	Yes	28	Yes	Yes
3	No	Yes	29	Yes	No
4	Yes	Yes	30	No	No
5	Yes	Yes	31	Yes	Yes
6	No	No	32	Yes	Yes
7	No	No	33	No	No
8	Yes	Yes	34	Yes	No
9	Yes	Yes	35	Yes	Yes
10	No	Yes	36	No	Yes
11	Yes	Yes	37	Yes	No
12	No	Yes	38	Yes	Yes
13	Yes	Yes	39	Yes	Yes
14	No	No	40	No	No
15	No	No	41	No	Yes
16	No	Yes	42	No Reply	Yes
17	Yes	No	43	Yes	No
18	No	Yes	44	Yes	Yes
19	Yes	Yes	45	No	Yes
20	Yes	No	46	No	Yes
21	Yes	Yes	47	Yes	No
22	Yes	Yes	48	No	Yes
23	Yes	No	49	Yes	Yes
24	Yes	Yes	50	Yes	Yes
	No	Yes	51	No	No
26	No	Yes			

One of the respondents did not reply to the question. Of the fifty-one questionnaires returned twenty-eight or fifty-five per cent have special tool rooms. The remaining forty-five per cent do not have special tool rooms, but some did state they use wall tool panels.

Sixty-nine per cent of the respondents reported they have a separate lecture room. The other thirty-one per cent reported no lecture room or area.

Lecture and demonstration room or area.

1. Room. The room, as in the case of the planning room, should be located for easy access from the main working area, and should be enclosed by glassed partitions for supervision.

    a. Equipped for showing motion pictures. Since educational films are very effective in teaching Industrial Arts, provision for showing them in the lecture room should be made. Windows may be provided with dark curtains, and a roll--down type of screen that can be left in the lecture room.

    b. Platform for chairs. The Industrial Arts lecture and demonstration room should have the students' chairs placed on platforms with each succeeding row immediately in front. Some school shops have a mirror behind and above the demonstrator so that the student may have the same view of the work as the person performing the demonstration.

2. Areas in shop. If space does not permit a separate lecture and demonstration room, a suitable area in the shop should be designated and equipped for this purpose.

    a. Location. The lecture and demonstration area should be located in the cleanest part of the shop area, and arranged in such a way that other work going on in the shop will not distract

the attention of students watching the demonstration. If possible, the demonstration and lecture area should be located so that curtains or sliding doors may divide the area from the main part of the shop and darken it for showing educational films.

b. As in the case of the separate room, the chairs in the demonstration area should be placed on raised platforms as outlined previously. (14, pages 68, 69)

Types of Floors. Table XVII shows the types of floor in fifty-one of the New Mexico school shops.

TABLE XVII

TYPES OF FLOORS

TEACHER NUMBER	WOOD	CONCRETE	:	TEACHER NUMBER	WOOD	CONCRETE
1	X		:	27		X
2		X	:	28		X
3		X	:	29		X
4		X	:	30		X
5	X		:	31	(TILE)	
6		X	:	32		X
7		X	:	33	X	
8		X	:	34	X	
9	X		:	35		X
10		X	:	36		X
11	X	X	:	37	X	
12	X	X	:	38		X
13		X	:	39		X
14		X	:	40		X
15		X	:	41		X
16		X	:	42		X
17		X	:	43		X
18		X	:	44	X	
19		X	:	45	X	
20		X	:	46		X
21		X	:	47		X
22	X	X	:	48		X
23		X	:	49		X
24		X	:	50		X
25		X	:	51		X
26		X	:			

Eleven of the respondents answered the questionnaire as having wood floors in their shops. Thirty-nine industrial arts teachers stated that they had concrete floors in their shops and one stated that his shop had a tile floor.

Wood floors are satisfactory in light shops, such as planning, lecture room, library, etc. However, in the heavy shops concrete has proven to be the most satisfactory type of flooring. The foundry should have a partial concrete and dirt floor.

TABLE XVIII

SHOPS CONTAINING LOCKERS

TEACHER NUMBER	PRIVATE STUDENT LOCKERS	TEACHER NUMBER	PRIVATE STUDENT LOCKERS
1	No	27	Yes
2	Yes	28	No
3	No	29	No
4	No	30	Yes
5	Yes	31	Yes
6	No	32	Yes
7	No	33	No
8	No	34	No
9	No	35	No
10	No	36	No
11	Yes	37	Yes
12	No	38	Yes
13	Yes	39	No
14	No	40	No
15	No	41	No
16	No	42	Yes
17	No	43	No
18	No	44	Yes
19	Yes	45	No
20	No	46	No
21	No	47	No
22	No	48	Yes
23	No	49	Yes
24	Yes	50	Yes
25	No	51	No
26	Yes		

Sixty-five per cent of the respondents indicated that they have individual lockers in the shop where they teach. Thirty-five per cent of the respondents answered that they did not have individual lockers in the shops.

Opening of Doors. Table XIX shows the direction the doors open.

TABLE XIX

HOW DOORS OPEN

TEACHER NUMBER	INSIDE	OUTSIDE	TEACHER NUMBER	INSIDE	OUTSIDE
1	X	X	27		X
2		X	28		X
3		X	29	X	
4		X	30	X	
5		X	31		X
6		X	32	X	
7		X	33		X
8		X	34		X
9	X		35		X
10	X		36	X	
11		X	37	X	
12		X	38		X
13	X	X	39		X
14	X		40		X
15		X	41	X	
16	X		42		X
17		X	43	X	X
18	X		44		X
19		X	45	X	X
20		X	46		X
21		X	47		X
22		X	48		X
23		X	49		X
24		X	50		X
25		X	51		X
26		X			

All doors should open to the outside for fire protection, or have safety releases on them. Table XIX shows that twenty-nine per cent of the shops studied in New Mexico have

doors opening toward the inside, the other seventy-one per cent open toward the outside.

Windows in Partition of Walls. Table XX shows the number of the fifty-one shops studied in New Mexico that have windows in partitions of walls.

TABLE XX

WINDOWS IN PARTITION OF WALLS

TEACHER NUMBER	WINDOWS IN PARTITION OF WALLS	TEACHER NUMBER	WINDOWS IN PARTITION OF WALLS
1	Yes	27	No Reply
2	Yes	28	No Reply
3	Yes	29	No Reply
4	Yes	30	No
5	Yes	31	Yes
6	No	32	No Reply
7	No Reply	33	No
8	No	34	No Reply
9	No Reply	35	Yes
10	Yes	36	No
11	Yes	37	Yes
12	Yes	38	Yes
13	No	39	No Reply
14	No	40	No
15	Yes	41	No
16	No	42	No Reply
17	No Reply	43	Yes
18	No	44	Yes
19	No Reply	45	No
20	Yes	46	Yes
21	No Reply	47	No Reply
22	Yes	48	Yes
23	Yes	49	Yes
24	Yes	50	Yes
25	Yes	51	No
26	Yes		

Twenty-five of the shops being studied have windows in partition of walls. Thirteen shops do not have windows and thirteen teachers did not reply to this question.

Teachers Offices. Table XXI shows the number of industrial arts teachers being studied that have an office.

TABLE XXI

TEACHERS OFFICES

TEACHER NUMBER	OFFICE	TEACHER NUMBER	OFFICE
1	Yes	27	No
2	Yes	28	No
3	Yes	29	No
4	Yes	30	No
5	Yes	31	Yes
6	Yes	32	Yes
7	Yes	33	No
8	No	34	Yes
9	Yes	35	No
10	Yes	36	Yes
11	No	37	No
12	Yes	38	Yes
13	No	39	Yes
14	No	40	No
15	No	41	No
16	No	42	No
17	No	43	No
18	No	44	Yes
19	Yes	45	No
20	Yes	46	Yes
21	Yes	47	No
22	Yes	48	Yes
23	No	49	Yes
24	Yes	50	Yes
25	Yes	51	Yes
26	No		

Fifty-five per cent of the industrial shops being studied have offices for the teacher. The other forty-five per cent of the school shops being studied had no offices for the teacher.

Office Space

1. Located in shop area. The teacher's office should be located in a separate room, but

if limited space prohibits this, it should be placed in a clean area of the shop.

a. In this case, it is wise to place the desk on a platform about 8 to 10 inches above the regular floor. This will allow the teacher, when required to be at his desk, to obtain a better view of the shop and its activities.

2. Separate room. The most satisfactory arrangement for the shop office is to have it in a separate room adjoining the shop. Files and records may be kept clean and orderly. Noise will be greatly eliminated and interviews and conversation may prove more satisfactory in the separate office.

a. It is essential that the office be equipped with windows so that the teacher may exercise proper supervision over the shop while he is required to be in his office.

b. The shop office or office area should contain a desk and chair, at least one extra chair, filing cabinets, book shelves, cabinets, and any other furniture and equipment needed to most efficiently operate and supervise the shop and its records. (14, page 71)

Value of Electrical Machines. Table XXII shows the value of electrical machines in the fifty-one industrial arts shops being studied in New Mexico.

TABLE XXII

VALUE OF ELECTRICAL MACHINES

TEACHER NUMBER	VALUE OF ELECTRICAL EQUIPMENT
1	$10,000.00
2	No Reply
3	No Reply
4	No Reply

TABLE XXII (Continued)

TEACHER NUMBER	VALUE OF ELECTRICAL EQUIPMENT
5	No Reply
6	4,000.00
7	500.00
8	800.00
9	2,760.00
10	No Reply
11	15,000.00
12	No Reply
13	5,000.00
14	1,000.00
15	3,000.00
16	No Reply
17	1,300.00
18	900.00
19	2,500.00
20	No Reply
21	No Reply
22	No Reply
23	1,758.00
24	9,800.00
25	No Reply
26	13,000.00
27	2,000.00
28	3,000.00
29	No Reply
30	2,900.00
31	No Reply
32	125,000.00
33	600.00
34	4,000.00
35	No Reply
36	40,000.00
37	4,000.00
38	5,000.00
39	10,000.00
40	No Reply
41	3,000.00
42	No Reply
43	2,400.00
44	4,000.00
45	No Reply
46	5,000.00
47	4,500.00
48	8,000.00
49	8,100.00
50	12,500.00
51	3,000.00

Seventeen of the industrial arts teachers did not take time to evaluate the amount of equipment in their shops.

Part C

Extra-curricular Activities Sponsored by The Industrial Arts Teacher

Industrial arts teachers are frequently called upon to conduct extra-curricular activities in smaller schools. However, school systems being studied in New Mexico have not overburdened the shop teacher with such activities.

In recent years the adults have become interested in such programs as adult classes in various fields of industrial arts. This is a wonderful opportunity for the industrial arts teacher to sell the public on the necessity of industrial arts being taught in the public school system of New Mexico. If the adult is interested they will see that the younger generation becomes interested in such a program as industrial arts. Adult classes are one of the best means of publicity for the industrial arts program in a school system.

Table XXIII will answer the following questions on the questionnaire, (1) Do you sponsor an industrial arts club? (2) Do you sponsor a home workshop for boys? (3) If you do not give full time to industrial arts, what other subjects do you teach? (4) Do you have a homeroom to keep? (5) Do you have a class to sponsor?

Only four of the schools being studied have an industrial arts club program. One school has an adult program

TABLE XXIII

EXTRA-CURRICULAR ACTIVITIES SPONSORED BY THE INDUSTRIAL ARTS TEACHER

TEACHER NUMBER	I.A. CLUBS	HOME WORKSHOP FOR BOYS	OTHER SUBJECTS TAUGHT	HOME ROOM	CLASS SPONSOR
1	No	No	None	No	Yes
2	No	Yes	None	Yes	No
3	No	No	None	Yes	No
4	No	No	Drivers Train.	No	No
5	No	No	Coach	Yes	Yes
6	No	No	None	Yes	Yes
7	No	No	None	Yes	No
8	No	No	None	No	No
9	No	No	None	No	Yes
10	No	No	None	No	Yes
11	No	No	Math	No	No
12	No	No	Principal	No	No
13	No	No	Art	Yes	Yes
14	No	No	None	Yes	No
15	No	No	None	No	Yes
16	Yes	No	None	Yes	Yes
17	No	No	None	Yes	Yes
18	No	No	Coach	Yes	Yes
19	No	No	Social Studies	No	No
20	No	No	None	Yes	Yes
21	Yes	Yes	None	No	Yes
22	No	No	None	Yes	Yes
23	No	No	None	No	No
24	No	Adults	None	No	Yes
25	No	No	None	Yes	Yes
26	No	No	None	Yes	Yes
27	No	Yes	None	Yes	Yes
28	No	No	Voc. Auto Shop	Yes	Yes
29	No	No	None	No	No
30	No	No	None	Yes	No
31	No	No	Math	Yes	No
32	Yes	No	None	No	No
33	No	No	None	Yes	Yes
34	No	Yes	Social Studies	No	No
35	No	No	None	Yes	No
36	No	No	None	Yes	No
37	No	No	None	Yes	No
38	Yes	No	None	No	Yes
39	No	No	None	No	No
40	No	No	Coach	No	No
41	No	No	None	No	Yes
42	No	No	None	Yes	Yes
43	No	No	None	No	No

TABLE XXIII (Continued)

TEACHER NUMBER	I.A. CLUBS	HOME WORKSHOP FOR BOYS	OTHER SUBJECTS TAUGHT	HOME ROOM	CLASS SPONSOR
44	No	No	None	Yes	No
45	No	No	None	Yes	No
46	No	No	None	No	No
47	No	No	None	Yes	No
48	No	No	None	No	No
49	No	Yes	None	Yes	Yes
50	No	No	None	No	Yes
51	No	No	None	No	Yes

and five schools have a home workshop for boys. Other subjects taught by industrial arts teachers who responded to the questionnaire are: drivers education, one; social studies, two; coaching, three; mathematics, one; principal, one; vocational automotive shop, one; and all others teach industrial arts full time. Twenty-six of the questionnaires stated that the industrial arts teachers have a homeroom to keep. Twenty-four of the industrial arts teachers being studied are class sponsors.

Chapter III is a study of fifty-one industrial arts teachers in New Mexico, their salaries, qualifications, tenure, colleges attended, major fields, teacher attitudes toward self-improvement, etc. Part B contains the physical make-up of the shop and equipment, size and location of building in feet and ratio, location of building, direction the building is facing, type of floor in building, natural lighting, etc. Part C deals with extra-curricular activities sponsored by the industrial arts teacher.

Chapter IV will discuss the written findings and conclusions of the survey conducted on the status of Industrial Arts in New Mexico since 1941.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

The industrial arts program has progressed a great deal since it was first introduced into the public school systems. It was first known as manual training, due to the absense of machines; the training was hand operated tools. As new types of industry developed there came about a new term, that of "industrial arts", which serves as an exploratory program, and is the connecting link between industry and the school.

Conclusion. The following conclusions are based on data presented in the study and the information obtained throughout the entire investigation.

Since the close of World War II, there has been a trend on the part of the non-vocational teachers of New Mexico to express their interest in up-grading the quality of the industrial arts program of the state. However, accompanying the expanded interest in industrial arts there has been a slowly widening cleavage from trade and industrial education personnel.

With four institutions of higher learning in New Mexico maintaining undergraduate industrial arts teacher-training

departments there appears to be some duplication of effort and facilities. It would probably be more efficient to operate fewer, but larger departments, even in light of future increased demands for trained industrial arts instructors.

Comparisons. The following comparisons are based on data collected from Mr. G. B. Strunk's thesis in 1941 and from the same questionnaire in 1959. It is the writer's desire to show the reader a comparison of industrial arts and the growth and development in a period of less than twenty years. These can best be shown by teachers' salaries, tenure of teachers, number of industrial arts teachers, colleges graduated from, number of college graduates and the number of teachers interested in visiting other schools. Other interesting data collected from this survey will show a comparison of the number of separate shop buildings, and tool and lecture rooms.

Teacher Salary: Teachers salaries in 1941 ranged from $1,000 to $2,400, average salary $1,597, in the twenty-five schools studied in New Mexico. Salaries of industrial arts teachers in 1959 ranged from $4,250 to $8,200 with the average salary being $6,359. The sharp increases are partially due to the raising of economical standards of the United States, and to keeping the best qualified personnel in the teaching profession.

Tenure of Teachers. The average years in present position of the industrial arts teacher in New Mexico in 1941, of the twenty-five questionnaires returned was 5.4 years, and in 1959 the average of the fifty-one questionnaires returned, was 7.45 years.

Teaching experience in 1941 averaged 10.4 years and in 1959 the average was 10.8 years. Only .4 of a year increase is shown in teaching experience between 1941 and 1959. However, the reader must keep in mind that two wars have been fought within this period. Many industrial arts teachers were either called upon for military service, or to work in defense plants and many of the older teachers retired.

Number of Industrial Arts Teachers: Industrial arts teachers in New Mexico numbered forty in 1941. In 1959 there were one hundred twenty-five industrial arts teachers in New Mexico who belonged to the New Mexico Industrial Arts Association. This is approximately 90 per cent of the industrial arts teachers in the state. The number of industrial arts teachers being employed in the state has increased over four times, within a period of less than twenty years.

Colleges Graduated From. In 1941 only three of the industrial arts teachers in the state of New Mexico received their degrees from institutions within the state, while six received their degrees from Oklahoma, four from Texas, five from Colorado, and the other seven from other states. In 1959, twenty-one of the fifty-one answering the questionnaire received degrees from colleges or universities in New Mexico.

Other colleges or universities represented were: Oklahoma, ten; Texas, six; and Illinois, three. Kansas, Iowa and Wisconsin are represented by two each while Nebraska, Michigan, Pennsylvania, Colorado, and Washington, D. C., are represented by one graduate.

College Graduates. In 1941 only twenty-two out of the twenty-five industrial arts teachers studied possessed degrees. The survey of 1959 shows that all fifty-one of the teachers studied possess at least a B.S. or B.A. degree and twenty-nine of these have advanced degrees. This shows the attitude of the industrial arts teacher in New Mexico toward self-improvement. The teachers realize that with more education he can offer a richer program and at the same time be rewarded with higher pay.

Teachers Interest in Visiting Other Schools. In 1941 one hundred per cent of the twenty-five industrial arts teachers in New Mexico studied indicated they liked to visit other school shops. Eighty per cent of these teachers did not use check cards, while the other twenty per cent used check cards. The main reasons for visiting other school shops were for new ideas and information.

In 1959, all but one of the fifty-one industrial arts teachers in New Mexico being surveyed indicated they liked to visit other school shops. The outstanding reasons for visiting were; to get new ideas, and to acquaint themselves with other industrial arts programs.

Separate Shop Buildings. In 1941, New Mexico school systems maintained thirty-two percent of the twenty-five shops studied in separate buildings; the other sixty-eight percent did not maintain a separate shop building from the main building. In 1959 fifty-eight percent of the fifty-one questionnaires received indicated a separate shop building is maintained. The remaining forty-two percent are in an area of the main building.

Tool and Lecture Rooms. Sixty percent of the twenty-five questionnaires studied in 1941 indicated they had a special tool room, while the other forty percent did not have special tool rooms. Fifty-five percent of the fifty-one shops studied in 1959 had special tool rooms, while the remaining forty-five percent did not have them.

In 1941 sixty percent of the shops studied did not have separate lecture rooms and thirty-nine percent indicated that they had separate lecture rooms. One per cent of the shops studied did not furnish this information. In 1959, sixty-nine percent of the respondents reported they have separate lecture rooms and thirty-one percent reported no lecture rooms or areas.

Recommendations. After a study of the status of industrial arts in New Mexico since 1941, conducted over a period of several months, the writer of this report has found that the recommendations given here seem to be indicated for the improvement of the industrial arts program in the state of

New Mexico. The writer offers these recommendations with respect to those conducting the industrial arts programs of New Mexico.

More Diversified Program. More units should be offered in order to meet the interest and needs for the student of today and industry of tomorrow.

Adult Program. The school shops should be open to adult programs, and the adults should be encouraged to take part in such programs. A program of this nature should be held at least two evenings a week and adult industrial arts clubs should be organized. Too much emphasis cannot be placed on such a program.

Self-Improvement. The writer feels that attitudes of self-improvement should be developed by the teachers so that teacher and pupil may benefit from such action.

State Supervisor. A state supervisor should be appointed to work directly under the state superintendent of schools for the industrial arts education program.

Shop Planning. When the construction of a new shop is being planned the shop teacher should be consulted as to size, specifications, types of equipment, materials, etc. to be used.

Teachers' Salaries. Teachers' salaries are far too low compared to other professions requiring such high standards

of education. The teaching profession is the most underpaid of any; if the youth of today are not educated to take over the ever changing industry of tomorrow the primary cause is lack of early education and training. One reason the best qualified personnel are not in the teaching profession today is because industry can pay them much more money.

Further, the writer feels that studies similar to this report should be undertaken in all states from which a composite report of the extent and growth of Industrial Arts in the United States may be made.

APPENDIX

A SELECTED BIBLIOGRAPHY

1. Bawden, William T., Leaders in Industrial Education, Bruce Publishing Company, Milwaukee, 1950, 196 pages.

2. Bawden, William T., and others, Industrial Arts in Modern Education, The Manual Arts Press, Peoria, Ill., 167 pages.

3. Bennett, Charles A., History of Manual and Industrial Education up to 1870, The Manual Arts Press, Peoria, Ill., 1926, 461 pages.

4. Ericson, Emanuel E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Ill., 1946, 384 pages.

5. Feirer, John Louis, Research in Industrial Arts Education, Western Michigan College Print Shop, 1947, 73 pages.

6. Friesse, John F., Course Making in Industrial Arts, The Manual Arts Press, Peoria, Ill., 1946, 297 pages.

7. Koos, Leonard B., The Questionnaire in Education, The Macmillan Co., New York, 1928, 178 pages.

8. Newkirk, Louis Vest, and Johnson, William H., The Industrial Arts Program, New York, Macmillan Co., 1948, 357 pages.

9. Selvidge, R. W., and Fryklund, Verne C., Principles of Trade and Industrial Teaching, The Manual Arts Press, Peoria, Ill., 1930, 419 pages.

10. Struck, F. Theodore, Creative Teaching, Industrial Arts and Vocational Industrial Education, John Wiley and Sons, New York, 1938, 623 pages.

11. Struck, F. Theodore, Foundations of Industrial Education, John Wiley and Sons, New York, 1930, 492 pages.

12. Wilber, Gordon Owen, Industrial Arts in General Education, 2d ed., Scranton, International Textbook Co., 1954, 401 pages.

13. Willmott, John Nelsen, High School Boys Electing Industrial Arts, New York, Teachers College, Columbia University, 1941, 71 pages.

Bulletin

14. Oklahoma State Department of Education, Industrial Arts in Oklahoma, Bulletin No. 105, 1951, 129 pages.

OKLAHOMA STATE UNIVERSITY

College of Education

Stillwater

School of Industrial Arts Education

L. F. Howerton
211 S. Duncan St.
Stillwater, Okla.
March 2, 1959

Dear Industrial Arts Teacher:

As a student of Industrial Arts, may I ask your assistance in studying and reporting on this subject, "The Status of Industrial Arts in New Mexico Since 1941", which is the title of my Master's Degree report. A previous thesis was written by Mr. G. B. Strunk, entitled, "The History and Status of Industrial Arts in New Mexico Since Statehood to 1941."

Industrial Arts has had a tremendous growth since 1941 to the present time. This University feels a study and survey of this nature would be of great value to note the vast growth and development of Industrial Arts in New Mexico.

It is hoped that this study is important enough to merit your time and effort to fill out this questionnaire, and a prompt return in the stamped, self-addressed envelope which has been enclosed for your convenience.

I wish to take this opportunity to thank you in advance for your cooperation and prompt response.

Very sincerely yours,

L. F. Howerton
Graduate Student

C. L. Hill, Acting Head
Industrial Arts Education
Oklahoma State University

An Inquiry Concerning the Status of Industrial Arts in New Mexico

Conducted by Leland F. Howerton, graduate student of Industrial Arts, Oklahoma State University, Stillwater, Oklahoma.

DIRECTIONS: Please answer the following questions to the best of your ability. This material will be used in my report entitled, "The Status of Industrial Arts in New Mexico Since 1941".

Leland F. Howerton

QUESTIONNAIRE

The Status of Industrial Arts in New Mexico Since 1941

Name of respondent _____

Address _____

_____

Position _____

_____

I. Your Qualifications:

1. Are you a college graduate? _____
2. What College? _____
3. Where is it located? _____
4. Do you have a Master's Degree? _____
5. If not, are you working on one? _____
6. What is your major? _____
7. How many undergraduate semester hours (2 semester hours is equal to three term hours) have you earned in your major subject? _____

8. What is your minor? _____
9. How many semester hours have you earned in it? ___
10. Do you have other majors or minors? _____
11. If so, list here. _____
12. Do you believe it is desirable for the industrial arts teacher to go to school every summer? _____
13. Every other summer? _____
14. Every third summer? _____
15. Even if you had your master's degree completed, would you attend summer school? _____
16. Did you attend summer school last summer? _____
17. Where? _____
18. Are you going to attend some summer school in 1959? _____.
19. Where? _____
20. Do you like to visit other teachers' shops? _____
21. Why do you visit them? _____
22. Do you use a checking card to note your observations? _____
23. How many industries did you visit last year? _____
24. How do you spend your summer vacation? _____
25. How many years of teaching experience have you had? _____
26. How long have you been in your present position?__
27. What is your annual salary(Optional)? _____
28. What professional magazines do you take? (List them in the order of importance to you) _____

_____

29. Do you have a professional library? _____ How many volumes? _____

30. Estimate the cost of it. _____

II. The Shop and Equipment

1. Do you have a separate shop building? _____
2. The width of building is _____
3. Length is _____
4. If the shop is located in the main building, is it on the first floor, second floor, or in the basement? (Underline)
5. The height of ceiling is _____
6. Number of windows in shop? _____
7. The shop faces South, North, East, or West. (Underline)
8. Does the shop have a tool room? _____
9. Lecture room or space? _____
10. Floor is made of wood, concrete. (Underline)
11. Does each student have a separate locker? _____
12. How do your doors open, inside or outside? (Underline)
13. Do you have a shop library? _____
14. How many industrial arts books are there in the school library? _____
15. If you have more than one room to supervise do you have windows in partition of walls? _____
16. Do you have an office? _____

Please submit the following information concerning the machines used by boys for educational purposes in your shop.

Name of Machines	Make	No. of Machines	Size of H.P. Rating	Are machines equipped with individual motors
WOOD LATHE				
MACHINE LATHE				
CIRCULAR SAW				
BAND SAW				
JOINTER				
DRILL PRESS				
JIG SAW				
SURFACER				
MORTISER				
TOOL GRINDER				
ROUTER				
SHAPER				
PAINT SPRAYER				
CYLINDER PRESS				
JOB PRESS				
LINOTYPE				
MONOTYPE				
METAL SAW				
MAT CASTER				
PAPER CUTTER				
FINISHING				
ARC-WELDING				
OXY-ACETYLENE WELDING				

Total value of equipment $_____ What new equipment is needed? _____

_____

Which of the above machines do you consider less valuable to your department? _____

Please fill in this form which will give information about your daily teaching schedule.

Period	From	To	Course	No. of students
Example	10:30	11:15	Beginning Hand Woodworking	16
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

III. The Curriculum

1. Do you have courses of study for each course taught?

_____

2. Do you require textbooks be used in your classes?

_____

3. What textbooks do you use? List courses and textbooks.

_____

_____

_____

4. What per cent of your teaching is given to lecture and recitation and what per cent is given to shop practice? _____

IV. Historical Data

1. When was industrial arts first organized in your school? _____
2. Who was the first industrial arts teacher? _____
3. Was he a college graduate? _____
4. What college? _____
5. What subjects were offered the first year? _____

_____

_____

6. What was the instructor's annual salary the first year $ _____
7. How many students were enrolled in industrial arts the first year it was taught in your school? _____
8. How many are enrolled in industrial arts in your school now? _____
9. What were the objectives then? _____

_____

_____

_____

10. What are they now? _____

_____

_____

_____

11. Do you have more tools now than they had then?____

V. Extra-Curricular

1. Do you sponsor an industrial arts club? _____
2. Do you sponsor a home work shop for boys? _____
3. If a student wants to make a model airplane do you allow it to be done in class? _____
4. If you do not give your full time to industrial arts, what other subjects do you teach? _____
5. Do you have a home room to keep? _____
6. Do you have a class to sponsor? _____
7. Freshman, Sophomore, Junior or Senior Class? _____

Curriculum

Check the kinds of work your shops are equipped to teach. Fill in blanks with the number of boys in each.

Kind of work	No. of boys	Approximate age	Grade
Bench Woodwork			
Cabinet making			
Carpentry			
Furniture construction			
Pattern making			
Wood turning			
Wood carving			
Printing			
Bookbinding			
Operating linotype			
Mechanical drawing			
Auto mechanics			

Electricity _____

Sheet metal _____

Foundry _____

Machine shop _____

Leather craft _____

Brick laying _____

Concrete _____

Shoe repair _____

Forge _____

General repair work _____

Industrial field trips _____

Arc-welding _____

Oxy-acetylene welding _____

Wood finishing _____

Metal finishing _____

Total No. Boys in shop classes _____

Do you think industrial arts teachers are going to the extreme in stressing too much handwork? _____

Too much machine work? _____

Which of the two divisions do you think is the more important? _____

Why? _____

_____

_____

_____

_____

Teachers of Industrial Arts in New Mexico
Who Returned Questionnaire

Name	Kind of School	City	Address
Baldwin, Carl	High School	Alamogordo	319 12th
Berckes, E.W.	High School	Roswell	
Bettina, Al A.	University	Portales	
Brown, J. D.	High School	Eunice	
Buckley, Joe	Jr. High	Tucumcari	
Carter, Noah	Jr. High	Hobbs	
Carpenter, Jack		Roswell	416 S. Pine
Coleman, John	High School	Carlsbad	
Dame, Everett	High School	Corona	
Fisher, Joseph	Jr. High	Roswell	
Forkner, W. R.	High School	Hobbs	416 E. Permian Dr.
Fowler, Kyle	Jr. High	Hobbs	300 E. Mesa Dr.
Fredrick, Lawrence	College	Silver City	2901 Mann Dr.
Fredrickson, Wade O.	High School	Hobbs	1206 N. Llano Dr.
French, W. P., Jr.	High School	Silver City	1207 Mississippi
Gallagher, Budd C.	High School	Raton	
Gallagos, Clemente	High School	Penasco	
Garner, Jim L.	High School	Albuquerque	324 Wellesley SE
Gilliland, Spencer	High School	Alamogordo	1801 Hawaii A.
Henderson, Bob	High School	Loving	Box 185
Hein, W. R.	College	Silver City	1400 N. Louisiana
High, Very	Jr. High	Roswell	110 W. Country Club Rd.
Hipwood, Stan	High School	Los Alamos	1432 41st
Hood, Lloyd	High School	Ft. Sumner	
Irish, Joe	High School	Carlsbad	
Janes, George	Jr. High	Alamogordo	1711 Hawaii
Jones, Ben	High School	Las Vegas	
Kephart, Frank	Jr. High	Albuquerque	1008 Calif. NE
Leigon, Barney	High School	Carlsbad	
Long, Worth	Jr. High	Albuquerque	
Maes, Charles	NMMSS	El Rito	
Martin, John	Jr. High	Albuquerque	
McCoy, Paul A.	Elementary	Los Alamos	
Meairs, Clayton	High School	Roswell	
Miller, Earnest	High School	Jal	
Miller, Robert		Albuquerque	Menaul School
Morrow, Richard	High School	Encino	
Perry, Vennon	Carlsbad	Carlsbad	Rt.1 Box 241
Pierce, Robert	High School	Silver City	315 A. St.

Name	Kind of School	City	Address
Quintana, Robert	High School	Albuquerque	
Santsteven, Pete	High School	Wagonmound	
Semler, A. G.	High School	Cimmarron	
Shepherd, John	Jr. High	Sante Fe	
Milligan, Don W.	High School	Albuquerque	2638 Candeleria NW
Smith, Ray	High School	Madgalena	
Smith, Tom	High School	Clovis	
Terauds, Hugo		Santa Fe	137 E. Alameda
Valverde, Sigfredo	Jr. High	Albuquerque	
Weathersby, Keith		Santa Fe	504 San Clemente
Wood, Lynn		Aztec	810 McCoy
Wheeler, Alfred	High School	Hobbs	1319 Breckon Dr.
Wilkinson, Donald	S. for the Deaf	Santa Fe	

VITA

Leland F. Howerton

Candidate for the Degree of

Master of Science

Report: THE STATUS OF INDUSTRIAL ARTS IN NEW MEXICO SINCE 1941

Major Field: Industrial Arts Education

Biographical:

Personal Data: Born November 19, 1920, Agra, Oklahoma

Education: Undergraduate study, McPherson College, McPherson, Kansas, 1939-40; Baylor University, Waco, Texas, 1950; Southwest Texas State Teachers College, San Marcos, Texas, 1951-1953.

Experiences: Eighteen and one-half years in the United States Air Force from January, 1941, until the present time having one and one-half years to complete for twenty year retirement. During my Air Force career many vast experiences have been encountered, traveling in Australia, New Guinea, Phillippine Islands and many other Pacific islands from 1942 until 1945; in Greenland for one year, May, 1955, until May, 1956. Worked as airplane mechanic, aerial engineer, helicopter mechanic and for the past five years as Production Control Planner.

Organizations: Member of Epsilon Pi Tau, Iota Lambda Sigma, Red Red Rose fraternities, American Industrial Arts Association, Oklahoma Industrial Arts Association, and Student Industrial Arts Association.

Date of Final Examination: July, 1959.

REPORT TITLE: THE STATUS OF INDUSTRIAL ARTS IN NEW MEXICO SINCE 1941

AUTHOR: LELAND F. HOWERTON

REPORT ADVISOR: C. L. HILL, Head of Department of Industrial Arts Education

The content and form have been checked and approved by the author and report advisor. Changes or corrections in the report are not made by the graduate school office or by any committee. The copies are sent to the bindery just as they are approved by the author and faculty advisor.

TYPIST: Eileen Meyerdirk