A STUDY OF ABILENE'S INDUSTRIAL ARTS CURRICULUM

by

GEORGE EUGENE CARLILE

B. S., Fort Hays Kansas State College, 1941

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1965

Approved by:

J. Harvey Littrell

Major Professor

TABLE OF CONTENTS

PAGE

LIST OF TABLES

INTRODUCTION

"Industrial arts, like all subjects in the school curriculum, should always be in transition."[1] Industrial arts offering must now provide for subject areas more nearly representative of the vast technology of our ever expanding industrial environment. The increasing complexity of our modern industrial society and the increasing amount of mechanization encountered in almost every phase of daily living make it essential that the industrial arts experiences be regarded as basic and fundamental for all youth.

The world in 1965 was a fast changing world as evidenced by the intercontinental missiles and space travels. The impact of these developments was felt by both the students and teachers. Since a large part of this change was of a technological nature, the industrial arts areas were affected. Teachers became aware that a change must come in the industrial arts department if the industrial arts area was to impart the necessary knowledge and training for the students to meet the industrial demands when their schooling terminated.

The industrial arts area is a broad area designed to meet the many and varied interests of the students. The Michigan State Department of Public Instruction expressed its philosophy concerning students and industrial arts curricula in the following quotation:

---

[1]Ohio State Department of Education, Industrial arts in Ohio School (Curriculum Guide. Columbus: Ohio State Department of Education, 1965), p. 2.

"Industrial arts courses must be broad enough in scope to attract the attention of the better student, the average, those with lesser ability, and the handicapped."[1]

The industrial arts curriculum if properly planned may create a firm foundation for whatever career that may be chosen by youth. All normal youth have the urge to manipulate, to create, to beautify, and to express through purposeful activity their ideas of how to meet felt needs.

Although industrial arts education has been an integral part of the educational program in the Abilene Junior and Senior High Schools, no attempts have been made to evaluate their industrial arts curricula for many years. The junior high school building is old and inadequate, but plans have been formulated and a new junior high school building will be built within the next five years (1965-1970). A new building will make possible an expanded industrial arts program. A new senior high industrial arts building will be constructed in 1965. The future plans make provision for a possible expanded industrial arts program and the addition of new instructors.

The growing enrollments in the Abilene junior and senior high schools have created a need for more classrooms and additional classes. With the building program in progress, 1965 was an ideal time to re-evaluate the Abilene industrial arts program.

---

[1] Michigan State Department of Public Instruction, Industrial Arts Programming for the High School (Bulletin No. 2148. Lansing: Michigan State Department of Public Instruction, 1965), p. 1.

With the advent of the space age, and the new jobs being created as a result, it is imperative for the schools to take inventory of their curriculum, to upgrade the old courses, and to add new courses. James B. Conant[1] said that all schools should have a diversified program for the development of marketable skills. The evaluation of the Abilene Industrial Arts Departments will make it possible to add some new courses and upgrade others.

STATEMENT OF THE PROBLEM

The purposes of this study were: (1) to review the curricula of the Abilene Junior and Senior High Schools' Industrial Arts Departments; (2) to determine the scope and sequence in order to discover areas of strength, weakness, and duplication; and (3) to propose changes in the curricula that would strengthen both the junior and the senior high schools' industrial arts programs.

DEFINITION OF INDUSTRIAL ARTS

Definitions of industrial arts are stated in various terms and expressions, but essentially they all have the same meaning. The definition agreed upon by the Abilene industrial arts teachers for use in this study was one used in a publication of the Kansas State Department of Public Instruction.

> Industrial arts is an area of learning activity that serves three basic purposes: 1. It is an integral part of general education by presenting a knowledge of industry;

---

[1]James B. Conant, The American High School Today, p. 51.

2. It offers a beginning of the specialized knowledge and skills needed by those who may choose some branch of industrial work as a vocation; 3. It offers one means of creative self-expression by encouraging students to change an envisioned idea into a tangible object. Such a program is psychologically sound, based as it is upon the investigative, manipulative, aesthetic and social impulses inherent in all people.[1]

METHODS OF PROCEDURE

There were three main procedures followed in making the study: (1) the thinking and educational point of view of Abilene's industrial arts teachers were obtained; (2) bulletins from five state departments of education were used; and (3) books and magazines dealing with industrial arts were studied.

In the 1964-1965 school year the Abilene school system employed four teachers in the industrial arts department. To bring their thinking and educational philosophy concerning industrial arts into focus, these teachers were all consulted by the author. Their ideas and recommendations concerning their departments and the industrial arts department as a whole were discussed and analyzed. With the rapidly expanding industrial environment and vast new technology, the challenge to the industrial arts areas seemed to be to revalue, examine, and expand, or fall behind. The industrial arts bulletins from five state departments of education, California, Iowa, Kansas, Ohio, and Michigan, were received, studied, and reviewed for help in

---

[1] Adel F. Throckmorton, A Curriculum Guide for the Secondary Schools of Kansas, Kansas State Superintendent of Public Instruction, (Topeka: Kansas Printing Office, 1960), p. 2.

comparing Abilene's program with others and to help lend support to recommendations found in this report.

Issues from 1958 to the present of the Industrial Arts and Vocational Education magazine and the School Shop magazine were studied and used as guides for recommendations for the study. A number of books written by recognized men in the industrial arts field were studied and reviewed. The recommendations of the authorities, the instructors' qualifications and training, Abilene's building limitations, the present curricula, the needs of the student and community were all basis for the author's recommendations in the report. The procedures were grouped in three general categories:

1. To outline the present scope and sequence of junior and senior high industrial arts departments in Abilene.
2. To determine from suggestions an improved industrial arts program.
3. To make suggestions for changes in the scope and sequence of the Abilene industrial arts departments.

BACKGROUND INFORMATION

Abilene, Kansas, a city of 8,000 people is located approximately 150 miles west of the eastern border and 70 miles south of the northern border of Kansas. The city is primarily dependent on agriculture for its income. There are a number of small businesses, but no one business dominates the economy. Unfortunately a majority of Abilene's graduates find employment elsewhere.

The Abilene junior high school and the senior high school are housed in separate buildings. Each has its own principal and staff of teachers. The junior high school in 1964-1965 had an enrollment of approximately 325 students and consisted of seventh and eighth grades. There were fifteen teachers, including one industrial arts teacher.

The high school is a fully accredited four year school having 32 teachers, including three industrial arts teachers, and approximately 565 students.

REVIEW OF LITERATURE

A study of various periodicals and books disclosed a great variety of programs in use or being recommended as sound and workable by many known authorities in the industrial arts field. Some things that seemed worthwhile, but apparently have not been put into practice across the nation and have not been used in Abilene, were found in Conant's Report.

> The Conant study also advocated that in all required subjects and in those elected by the students with a wide range of abilities students should be grouped according to ability, subject by subject. The author and his staff feel that three groups would be sufficient, one for the more able learning a subject (in the case of industrial arts, perhaps the potential technician or engineer), one for the middle group (the potential skilled tradesman), and one for the slow learners who need special attention (the potential semi-skilled or unskilled worker.)
>
> Because skilled trades and technical fields of employment require average or better abilities, he recommends that the vocational-industrial program enroll considerable

numbers of the average or better students. In order to do this, Conant feels that both school administrators and guidance counselors should have an appreciation of the real significance of these areas of employment. He states further that if the vocational-industrial programs (and it was assumed that he includes the advanced industrial arts courses) are to be successful, they must be protected by every school administration from becoming dumping grounds. Inasmuch as the average I. Q. among various skilled trades range from approximately 90 to 115, it is logical that we accept only those students with this same potential for preparation to enter these fields of employment.[1]

Industrial Arts Areas

The Industrial Arts and Vocational Education magazine, with its editorials and up-to-date articles on new methods, new materials, procedures, and the changing demands of industry, is a great help in keeping industrial arts instructors up to date on the possible needs and demands to meet the new job requirements of industry. These magazine articles influence the instructor's choice of industrial arts courses offered and cause them to re-evaluate the industrial arts courses that are being offered, for change and up dating of materials. The Industrial Arts and Vocational Education magazine was one of the sources used in making this tudy.

To determine the areas of industrial arts recommended in Kansas and other states, a study of the bulletins of the state departments of education of California, Iowa, Kansas, Michigan, and Ohio were studied and a master list of industrial arts areas recommended for

---

[1] Robert E. Rudiger, "Industrial Education and the Conant Study," Industrial Arts and Vocational Education, 49:16, February, 1960.

junior and senior high school was compiled in Table I. In Table I seventeen broad areas of industrial arts were listed and compared to Abilene's industrial arts areas. From Table I, it can be determined that Abilene offered eight industrial arts areas recommended in the five bulletins.

TABLE I

Industrial art areas recommended by State Departments of Education and areas Abilene used.

Areas	STATES					
	California	Iowa	Kansas	Michigan	Ohio	Abilene
Craft	S	S	J-S	J-S	S	S
Drawing	J-S	J-S	J-S	J-S	J-S	J-S
Electrical	J-S	J-S	J-S	J-S	J-S	S
Energy and Power Metals	S	S	S	S	S	
Graphic Arts	J-S	J-S	J-S	J-S	J-S	S
Woods	J-S	J-S	J-S	S	J-S	J-S
Metal	J-S	J-S	S	S	S	
Auto Mechanics	S	S	S	S	S	S
Power Mechanics	S	J-S	S	J-S	S	S
Welding	S	S	S	S	S	S
Foundry	S	S	S	S	S	
New Materials and Products	S	S	S	S	J-S	
Home Mechanics	J-S	J	J-S	S	S	
Electricity and Radio	S	S	S	S	S	
Machine Shop	S	S	S	S	S	
Handicrafts	J-S	S	S	J-S	J-S	
Photography	S	S	S	S	S	
Total Areas	17	17	17	17	17	8

Note: The letter J indicates junior high and the letter S indicates senior high school.

Table 1 reveals that of the seventeen areas listed, six of the junior high areas were recommended by three or more state departments. Abilene offered only two of these areas in the junior high school.

The seventeen areas were all recommended for high school by the state departments. Abilene was teaching eight of the areas.

Cardinal Aims of Industrial Arts

Dudley[1] recommended six aims for industrial arts education that all industrial arts teachers would like to achieve.

> "In the belief that there are fundamental aspects representing a frame of reference within which industrial arts instructional program can be formulated, the following are offered as six cardinal aims for industrial arts education:
>
> 1. Planning
>
> To foster planning on the part of the student as a means of learning orderly procedures, methods of problem solving and techniques of formulating and transmitting ideas.
>
> 2. Ingenuity
>
> To encourage the ingenuity factor involved in the planning construction and evaluation of the product produced in the industrial arts shop.
>
> 3. Tool Manipulation
>
> To demonstrate and practice tool manipulation as a learning experience.

[1] Arthur J. Dudley, "Cardinal Aims of Industrial Arts," Industrial Arts and Vocational Education, 50:23, October, 1961.

4. Industrial Materials

   To promote the understanding and useage of industrial materials as potential consumers and producers.

5. Industrial Measurement

   To assure skill and understanding in the use of industrial measurement methods.

6. Perceptual Skill

   To involve perceptual skill and understanding related to the factual information and the practical experiences of the student.

Junior High School Goals and Programs

Ericson and Seefeld[1] gave the following ten desired goals for junior high school industrial arts.

1. Self discovery by the pupil of his own abilities and aptitudes, leading toward life interests.

2. Satisfying experience in self-expression through creative effort leading to material accomplishments.

3. Understanding of industry and methods of production, and of the influence of industrial products and services upon the pattern of modern social and economic life.

4. Appreciation of good design and good workmanship in their application to construction and to manufactured products.

5. Judgment and resourcefulness in selection, purchase, use, and care of industrial products and services both in the home and in occupational life.

---

[1] Emanuel E. Ericson, and Kermit Seefeld, Teaching the Industrial Arts. (Peoria, Charles A. Bennett Company, 1960), pp. 206-61.

6. Ability to use tools and materials leading to household maintenance, leisure time pursuits, and, in some degree, to basic occupational skills.

7. Ability to read and to make sketches and drawings used for illustrative and construction purposes, including the ability to read graphic and technical illustrations in books and magazines.

8. Developing of maturing habits, feeling of responsibility, and ability to plan and execute work alone and in cooperation with others.

9. Basic experience in the use of tools, machines, and materials of value in carrying on future educational and professional work on scientific and technological levels.

10. Development of safety habits and fundamental safety consciousness not only in the school but in the home and future occupational life.

John L. Feirer,[1] editor of Industrial Arts and Vocational Education magazine has this to say about junior high industrial arts:

> It is at this educational level that we expect all boys to be exposed to industrial arts. The ideal goal of industrial arts at the junior high school level is to help our youth to evaluate their own aptitudes, interests, and potentialities.

Pat H. Atteberry[2] of Western Washington State College Industrial Arts department would propose the following areas as a basic course: (1) graphic drawing, photography, printing, (2) metal processes, (3) electricity and electronics, (4) fabrication and construction with wood and ceramic materials, and (5) power machines.

---

[1] John L. Feirer, "Enriching Junior High School Industrial Arts," Industrial Arts and Vocational Education. 53:15, December, 1964.

[2] Pat H. Atteberry, "Industrial Arts in the Junior High School," School Shop, 24:17-18, December, 1964.

Plastics are changing the way of life in the world today and offer great opportunities in the industrial arts area.

Gerald L. Steele[1] outlined a rather complete program for a plastics curriculum in the September, 1964, IAVE magazine. The plastic industry was described as the fastest growing industry in the United States.

James Conant[2] in his recommendation for education in the junior high school, recommended that all girls should receive instruction in home economics.

It was the belief of the Abilene industrial arts instructors that adopting a program with great flexibility and encompassing more industrial arts areas that the Abilene Junior High industrial arts department would be strengthened and the students would derive more useful and inspirational experiences. This type of program would also give a broader basis for incoming high school students.

Senior High School Programs

The Kansas Superintendent of Public Instruction, Adel F. Throckmorton,[3] recommends the following areas be taught in Kansas high

---

[1]Gerald L. Steele, "Teaching Plastics," Industrial Arts and Vocational Education, 53:31, September, 1964.

[2]James B. Conant, Education in the Junior High School Years, (Princeton: Educational Testing Service, 1960), p. 16.

[3]Adel F. Throckmorton, A Curriculum Guide for the Secondary Schools of Kansas, Kansas State Superintendent of Public Instruction, (Topeka: Kansas Printing Office, 1960), p. 5.

schools' industrial arts departments: (1) General Shop, (2) Crafts, (3) Auto Mechanics, (4) Drafting, (5) Electricity and Radio, (6) Graphic Arts, (7) Machine Shop, and (8) Woodwork.

The Federal Vocational Education Act of 1963 and Aid to Education Act passed by the 1965 Congress put great stress on education in general, industrial, and vocational education. The industrial arts and vocational education areas seem to be drawn closer together by these acts of Congress. Conant[1] recognizes the close relationship between industrial arts and vocational education in the following statement:

> The line between the industrial arts program and the vocational shop program for boys is not an easy one to draw. One may say that the industrial arts program provides a survey of the different skilled trades envolving the use of tools and working materials as diverse as leather, wood, and metal.

Conant[2] further stated in his recommendations for the high school industrial arts program that five areas should be included, (1) machine shop, (2) woodwork shop, (3) auto mechanics, (4) electrical shop, and (5) mechanical drawing.

The Fairfax, Virginia, County schools,[3] offers the following areas of instruction in their high school industrial arts program: (1) carpentry and cabinetmaking, (2) air conditioning and refrigeration, (3) automotive shops, (4) drafting, and (5) electronics and

---

[1] James B. Conant, The American High School Today, p. 54

[2] Ibid., p. 125.

[3] Louis Godla, "Vocational Trade Training in Fairfax County, Virginia," Industrial Arts and Vocational Education, 54:3, March, 1965.

electrical shop. They have found these areas meet the demands of their students.

There are essentially four things each youth needs to get from his high school education. H. H. London,[1] Chairman of the Industrial Education Department of the University of Missouri, believed that industrial arts can make a great contribution to these purposes. The four things he believed youth need are:

1. To become oriented to the world of nature and man.
2. To find his place in a society becoming increasingly complex and interdependent.
3. To become established as a successful, self-supporting citizen and family member.
4. To acquire an understanding and appreciation of the family of nations and the necessity and means for peace among men of all countries, everywhere.

Six Essential Areas in Industrial Arts

John L. Feirer,[2] one of the outstanding Industrial Arts authors and educators, talking about looking into the future for the next ten years said that the curriculum must be enriched as the need and circumstances change, but there are six areas which should be the heart of the curriculum. The six areas were: (1) drawing, planning, and

---

[1] H. H. London, "The Professional Objectives of the I-A Teacher," School Shop, 21:1, September, 1961.

[2] John L. Feirer, "What Should Industrial Arts Be Like Ten Years From Now?" Industrial Arts and Vocational Education, 50:17, October, 1961.

design, (2) general woods, (3) general metals, (4) electricity--electronics, (5) power mechanics and transportation, and (6) graphic arts.

INDUSTRIAL ARTS EXPERIENCES

A comprehensive list of sixty industrial art experiences is found in Table 2. The list was compiled by Dr. E. E. Holt,[1] and lists all the important industrial arts experiences taught in the United States schools. From this list of sixty experiences, only twenty were offered in the Abilene industrial arts department. The starred experiences in Table 2 were offered in the Abilene industrial arts department in 1965.

PRESENT SCOPE AND SEQUENCE OF INDUSTRIAL ARTS IN ABILENE

Junior High School Program

The Abilene junior high school offered industrial arts only for eighth grade boys and all were required to enroll in the two areas of instruction, drawing and woodwork. Drawing was taught the first semester and the second semester after a brief introduction to some of the basic woodworking skills, the students were free to spend the remainder of the school term working on woodworking projects of their choice, some were sizeable projects.

---

[1] E. E. Holt, Organization and Administration for Industrial Arts Education, Superintendent of Public Instruction, Ohio State Department of Education, (Columbus: The F. J. Heer Printing Company, 1959), p. 11.

TABLE II

Industrial Arts Experiences Offered in the Schools of the United States

EXPERIENCES		
*Mechanical Drawing	*Hand Metal	Industrial Mechanics
Drawing and Planning	Ornamental Iron	Carpentry
Machine Drawing	Heat Treating	Bldg. Maintenance
Industrial Drafting	*Art Metal	Home Mechanics
*Architectural Drawing	*Electricity	Cement and Concrete
Blue-print Reading	House Wiring	Home Repair
Sheet Metal Drawing	Radio	Plumbing
Sign and Poster Work	*Hand Woodwork	*Arts and Crafts
Graphic Arts	*Machine Woodwork	Plastics
Printing	*Cabinet Making	*Leather
Blockprinting	*Wood Finishing	Model Making
Bookbinding	Wood Carving	Plastic Carving
Photography	Upholstery	Jewelry
*Silk Screen	Pattern Making	Kenne Cement
General Metal	Aeronautics	Basketry
Machine Shop	Junior Aviation	Beadcraft
*Sheet Metal	*Auto Mechanics	Braiding & Knotting
*Forging	*Engine Mechanics	Rope Work
Foundry	*Gen. Power Mechanics	*Ceramics
*Welding	*Farm Mechanics	Weaving

*Experiences marked with an asterisk were taught in Abilene in 1965.

High School Program

Woodwork. The ninth grade high school industrial arts course was a modified general shop course, requiring three periods of eight weeks each for mechanical drawing, wood lathe, and woodworking, with the remaining school year open for free choice projects. There were 60 boys enrolled in three ninth grade industrial art classes during 1964-65. Three advanced woodworking classes were open to tenth, eleventh, and twelfth grade boys with 60 boys enrolled. More students were enrolled in wood working than any other industrial arts course.

Table 3 lists activities, skills and processes that could be performed in the eighth, ninth, tenth, eleventh, and twelfth grades. The areas listed in Table 3 were recommended by the bulletins of the five state departments of education. Those taught in Abilene are indicated by an (x). From Table 3 it is possible to determine the overlapping areas in eighth and ninth grades and the activities, skills, and processes used in the remaining grades; also those areas that the Abilene industrial arts department did not include in the curricula can be determined.

The survey and discussions of the staff brought out the fact that all grades (8-12) were employing some of the activities, skills, and processes found in Table 3. In reality the advanced students were developing and using complex operations in the same field and on an advanced scale and far beyond the eighth and ninth grade levels. The woodworking skills were being utilized in many fields in Abilene,

though there were a number of areas listed that were not offered in the Abilene woodshop areas.

TABLE III

Recommended Woodworking Activities, Skills and Processes

Activities, Skills and Processes	GRADES 8	9	10-11-12
Planning	x	x	x
Cutting	x	x	x
Sharpening		x	x
Safety, general	x	x	x
Laying out			x
Holding devices		x	x
Boring and Drilling		x	x
Joinery		x	x
Assembling	x	x	x
Finishing			x
Care and Maintenance of Hand Tools		x	x
Upholstery			
Hardware application			x
Machine Tool operations			x
Safety - Hand tool	x	x	x
Safety - Power equipment		x	x
Gluing			x
Spray equipment			x
Brushing finish	x		x

Note: Grade 9, high school first year students, grades 10-11-12 were advanced students and no grade divisions were made.

Drawing. Cooner[1] said, "Drawing is an important communication subject for everyone in our industrial society." Since students cannot effectively work until they can read blueprints and follow instructions, drawing is an important area of industrial arts. Nearly everyone reads road maps, makes sketches and studies floor plans sooner or later. Graphs and charts showing business conditions and the weather appear daily in our newspapers and weekly in our magazines. It is said drawing was our first written language and it has certainly played an important part in man's progress.

The eighth and ninth grade each had drawing as a required course for only part of the school term. One full year of drawing was offered for tenth, eleventh, or twelfth grade students. There were no class divisions and girls could enroll. The drawing class was low in enrollment. The class had ten boys and one girl enrolled, indicating low interest in the course. Perhaps the low enrollment was the result of not guiding students into the drawing course when they were being advised about their class enrollments.

Table 4 lists a number of skills and activities used in the drawing and drafting course taken from the bulletins of the five state departments of education studied. Those skills the Abilene industrial art classes employed were indicated by grade and checked with an (x). Table 4 listed twenty-one skills and activities, of these twenty-one, nine were used in the Abilene drawing classes.

---

[1]Shriver L. Cooner, Industrial Arts Drawing and Blueprint Reading, (New York: McGraw-Hill Book Company, Inc., 1961), p. 5

TABLE IV

Recommended Drawing Skills and Activities for Grades 8 to 12

Activities and Skills	GRADES 8	9	10-11-12
Tool recognition		x	
General sketching			
Pictorial sketching			
Exploded views			
Schematic diagrams			
Orthographic sketching			
Drawing with instruments		x	x
Graphs and Maps			
Reproduction of drawings			
Pictorial drawings			
Orthographic drawings	x	x	x
Development and Layout			x
Floor plans			x
Inkings of drawings			x
Machine drawing			x
Architectual drawing			x
Sheet Metal drawing			
Electrical and Electronic drawing			
Woodwork drawing	x	x	
Aircraft drafting			
Tool design			

x - Taught in Abilene

General Shop. The general shop course, in its broad meaning, encompasses many possible fields. These fields were listed in Table 5. Since the course in the general shop area covers a very wide scope, most instructors will not have training in all the courses and the school may have facilities for only a few of the courses. The building facilities and the instructor's training will determine

the shop experiences offered. General shop is a popular industrial arts area in the small schools because one instructor can teach several experiences, all in the one general shop class.

Abilene, in 1964-65, offered only one general shop course and it was taught by two instructors. This class was open to any boy in the tenth, eleventh, and twelfth grade. Twenty-four boys were enrolled. For boys interested in several phases of industrial arts this course filled that need. Table 5 lists seventeen possible activities that could be taught in a general shop course; of these Abilene taught six.

TABLE V

Recommended Activities, Skills, and Processes Possible to be Taught in a General Shop Course

Activities, Skills, and Processes	Grades 10-11-12
Planning	
Electrical Fundamentals	x
Radio Fundamentals	
Machine Shop Planning	
Welding, oxyacetylene	x
Welding, Electric	x
Welding, Arc	x
Sheet Metal	x
Forging and Heat Treating	
Metal Casting	
Electric Circuits	
Small gas engines	x
Small electric motors	
Repairs	
Woodwork	
Mechanical Drawing	
Plastics	

x - Taught in Abilene

Auto Mechanics. In this highly mechanized age, when the progress of the nation depends on mobility, automobiles are a part of the American way of life. If the present trend in the United States, in 1965, of more people and more cars continues, it is logical that the maintenance problem of cars will grow in the same proportion.

Since mobility is a way of living in the United States, the youth are deeply interested in their chief means of mobility, the automobile. Many youth own a car and nearly all youth are driving as soon as they become of legal driving age.

Auto mechanics offers a solution to some of the needs of the boys of high school age. Auto mechanics is a course that gives instruction on car maintenance, car operation, and knowledge concerning cars in both general and specific areas.

The auto mechanics shop in Abilene was too small to meet the demands for the 1965 enrollment. Only seniors could enroll, and a maximum of 14 students to a class was allowed. Two classes were taught, thus only 28 boys could enroll. There were 36 senior boys seeking to enroll in 1965, but only 28 were accepted into the two classes. Tenth and eleventh grade boys have requested that an auto mechanics class be offered for them, indicating an interest trend in the auto mechanics field.

Table 6 gives a list of the activities, skills, and processes that were possible in an auto mechanics course. There were twelve activities listed in Table 6, ten of the activities were being taught

in Abilene. One instructor in Abilene voiced the opinion that a one year course gave very limited instruction concerning auto mechanics activities.

TABLE VI

Recommended Auto Mechanics Activities, Skills, and Processes

Activities, Skills, and Processes	Grades 9	10	11	12
Engines				x
Electrical				x
Chassis				x
Inspection service				x
Body and Upholstery				
Body and Fender				
Tools				x
Brakes				x
Carburetors				x
Overhaul				x
Tuneups				x
Transmissions				x

x - Taught in Abilene

Art. Some industrial arts topics are offered in the art area, which means there can be an overlapping of the two departments. As an example, silversmithing, plastics, and ceramics may be offered in the art or industrial arts departments in different schools. This was found to be true in the recommendation in the industrial arts literature received from the six State Departments of Education previously mentioned in this report. Since there was the close relationship

between the art and industrial arts area, the art study was made a part of the author's study.

The Abilene art classes of 1964-65 were open to both boys and girls, the classes were evenly divided as to numbers of boys and girls enrolled. Two beginning and two advanced art classes were offered, the courses being very general in nature; that is, a wide choice of activities was open to the student. The advanced classes included the same areas as the beginning class, only more difficult activity was expected of the student.

The art activities found in the bulletins issued by the State Departments of Education of the states the author studied, are listed in Table 7 and those offered in the Abilene art department are checked with an x.

TABLE VII

Recommended Art Activities, Skills, and Processes

Activities, Skills, and Processes	COURSES	
	Beginning	Advanced
Free hand drawing	x	x
Landscapes	x	x
Water color	x	x
Leather craft	x	x
Ceramics	x	x
Silversmithing		x
Stones and gems		
Clay	x	x
Metal		x
Silk screen		x
Photography		
Oils		x
Charcoal		
Commercial art		

x - Taught in Abilene

SUGGESTIONS FOR CHANGE IN THE SCOPE AND SEQUENCE OF THE ABILENE JUNIOR AND SENIOR HIGH SCHOOL INDUSTRIAL ARTS DEPARTMENTS

There are many courses that may be offered in the industrial art area. Which course each school may offer will depend upon several factors, such as, physical structures, size of city and school, training and ability of the teachers.

To determine suggested changes in the scope and sequence for Abilene's junior and senior high schools industrial arts departments, all areas of Abilene's industrial arts were reviewed, evaluated and needed improvements noted. As a result of this study the improvements and recommendations which follow are being made.

Recommendations for the Junior High School Program

A study of the Abilene junior high school industrial arts department revealed that only two phases of the industrial arts area were being taught. These were mechanical drawing and woodwork. During the last two or three years only eighth grade boys have been eligible for these classes; so it is obvious that the seventh grade boys have been neglected. Since many students receive industrial arts experiences only in the junior high, Kukula[1] brings out the fact if the student does not have this experience, then a considerable

[1]Stanley J. Kukula, "The Orientation Unit," Industrial Arts and Vocational Education, 54:24, January, 1965.

number of students will never have this opportunity as some never go to high school and those that do may not be able to schedule an industrial arts course. It was the unanimous opinion of the Abilene industrial arts instructors that the seventh grade boys should be included in the program.

It will be difficult to meet the needs of the industrial arts program in the junior high school until more facilities are added and an additional instructor is employed. A new building is being planned, but until it is forthcoming, there will not be much chance of offering industrial arts in seventh grade. However, it was possible to make an improvement in the present curriculum. The feeling of the Abilene industrial arts instructors was that the junior high school industrial arts department should be planned so that a number of exploratory courses would be offered so students could be exposed to a greater variety of experiences and thereby gain a fuller comprehension of the industrial arts program. This industrial arts experience in turn would give the student an opportunity to find the area in which he was most interested and for which he had the greatest aptitude.

The Abilene industrial arts instructors recommend that a broad and exploratory program be initiated for the Abilene Junior High School. Such a program would eliminate the woodwork and drawing overlapping in the eighth and ninth grade, mentioned previously in this report. It was recommended that these courses (1) mechanical drawing, (2) plastics, (3) woodwork, (4) electricity, (5) sheet metal, (6) crafts, and (7) home mechanics be considered as basic teaching

areas in grades seven and eight with consideration also of opening this program to the girls.

Recommendations for the High School Program

Within the next school year Abilene should have a new high school industrial arts building, if the 1964-65 administration plans can be completed. This will make it possible to expand the industrial arts areas and add another instructor. It is feasible then to project industrial arts plans into the future with a likely chance they will become a reality. Each industrial arts area was reviewed and recommendations were made for each individual area.

Industrial Art Students. It seems that the tendency is to have the curricula so arranged that college bound and the more gifted high school students, even the much interested, find it difficult to organize their class schedules so they can take classes in the industrial arts areas. This seems to be a criticism voiced by the industrial art teachers that the author has contacted.

The Abilene industrial arts teachers would like to see more promotion by the administration and the guidance and counseling people of gifted and the better students to take more industrial arts courses. It was the feeling of the Abilene industrial art teachers that to maintain a progressive type of future industrial art teachers, more able students need to be attracted to the industrial art areas.

To show this is also a national problem, in 1963 the Office of Education of the United States Department of Health, Education, and Welfare,[1] made a research study of this problem and came up with some startling facts. A few of them were: (1) industrial art courses add up to only 3 per cent of the credits earned in all high school subjects by all high school graduates; (2) in the upper 5 per cent ability level forty-eight per cent took no industrial arts, 12 per cent took more than one credit; and (3) most of the students come from the lower 75 per cent ability levels.

Mechanical Drawing. Drawing needs more promotion and encouragement from the people counseling the student when the students are enrolling. It was the considered opinion of the industrial arts personnel that at least one year of beginning drawing and one of advanced should be scheduled with more encouragement pointed toward girls taking this course.

Offering at least two classes would double the present opportunity to enroll in this course and with only eleven presently enrolled it seems rather obvious that there is need for expansion in this area.

Art. The art area is not considered an industrial art area by many people; however in some schools certain courses, such as plastics,

---

[1]John L. Feirer, "Fallacies, Fantasies, and Facts Concerning Industrial Arts Students," Industrial Arts and Vocational Education, 52:17, May, 1963.

may be taught either in the art or industrial art courses. The art area was reviewed and recommendations made.

The instructor was dividing his time between high school and grade school with the result his services included so many classes that neither school profited as they should have from the instruction. It was recommended that the art instructor be made a full time high school instructor, and that the somewhat general course that had been offered in art be revised and several specific courses be offered. Some of the courses suggested were: (1) ceramics, (2) plastics, (3) oil, water and charcoal painting, (4) leather, (5) metals, and (6) photography. Art with many courses offered would appeal to interests of more students than a limited general course.

General Shop. There was only one general shop course offered with two instructors for the class of twenty-four students in the 1964-65 school year. Industrial arts classes with eighteen to twenty-four students was considered a suitable class size for one teacher by the industrial arts authorities, so it seems that with proper scheduling the one class could be larger or two classes offered with an instructor for each class.

It seemed more logical to have at least two classes offered. This would give the students a better opportunity to schedule their classes. With two classes the course could be expanded to cover more areas in this field.

Four general areas were covered in the general shop course, (1) electric fundamentals, (2) welding, (3) sheet metal, (4) small gas engine. It was recommended that a course in small electric motors, home maintenance problems and plastics be included in the general shop course.

Woodwork. The woodworking classes spent most of the class time constructing projects, since the shop was small there was no area or classroom where students might sit and study related materials. With the new industrial arts building there will be a classroom, and it is recommended that a specific time be scheduled as part of the course, in each class, for teaching related materials to the woodworking course.

In addition to the woodworking classes it was recommended that consideration be given to adding upholstery, wood finishing, and carpentry to the woodworking area.

Auto Mechanics. Abilene has offered two auto mechanics classes, each a beginning class, for senior boys. With present interest in the auto mechanics field increasing, the area needs expanding, with more classes offered in related experiences, for example, body shop and automatic transmissions.

It is recommended that two mechanic laboratory classes of one hour each be offered to eleventh grade, two two-hour classes in auto mechanics for twelfth grade and a body shop class open to both eleventh and twelfth grade boys. This would give a well rounded auto mechanics offering to the Abilene industrial arts program.

If the recommendations that have been suggested in the study of the industrial arts program are accepted, then Abilene would have an improved industrial arts program to offer its students.

ACKNOWLEDGEMENTS

The writer would like to express his sincere appreciation to Dr. J. Harvey Littrell, Associate Professor of Education of Kansas State University, for his valuable assistance and guidance in the completion of this study.

The Abilene Industrial Arts Teachers have willingly responded and have made information available for this study. Their cooperation and interest have been of great importance in the completion of this report.

BIBLIOGRAPHY

Atteberry, Pat H. "Industrial Arts in the Junior High School," School Shop, 24:17-18, December, 1964.

Bartlett, Lynn M. Industrial Arts in the Junior High School. State Superintendent of Michigan. Lansing: Published by The Department of Public Instruction, 1964.

Berg, Edward. Mechanical Drawing. Milwaukee: The Bruce Publishing Company, 1962.

Conant, James B. Education in the Junior High School Years. Princeton: Educational Testing Service, 1960.

Conant, James B. The American High School Today. New York: McGraw-Hill Book Company, Inc., 1959.

Cooner, Shriver, L. Industrial Arts Drawing and Blueprint Reading. New York: McGraw-Hill Book Company, Inc., 1961.

Dudley, Arthur J. "Cardinal Aims of Industrial Arts," Industrial Arts and Vocational Education, 50:23, October, 1961.

Ericson, Emanuel E. and Kermit Seefeld. Teaching the Industrial Arts. Peoria: Chas. A. Bennett Co., Inc., 1960.

Feirer, John L. Advanced Woodwork and Furniture Making. Peoria: Chas. A. Bennett Co., Inc., 1960.

Feirer, John L. Drawing and Planning for Industrial Arts. Peoria: Chas. A. Bennett Co., Inc., 1956.

Feirer, John L. "Enriching Junior High School Industrial Arts," Industrial Arts and Vocational Education, 53:15, December, 1964.

Feirer, John L. "Fallacies, Fantasies, and Facts Concerning Industrial Art Students," Industrial Arts and Vocational Education, 52:17, May 1963.

Feirer, John L. and John R. Lindbeck. Industrial Arts Education. Washington, D. C.: The Center for Applied Research in Education, Inc., 1964.

Feirer, John L. Industrial Arts Woodworking. Peoria: Chas. A. Bennet Co., Inc., 1960.

Feirer, John L. "What Should Industrial Arts be Like Ten Years From Now?" Industrial Arts and Vocational Education, 50:17, October, 1961.

Frylund, Verne C. and Frank Ray Kepler. General Drafting. Bloomington: McKnight and McKnight Publishing Company, 1960.

Frylund, Verne C. and Armand J. LaBerge. General Shop Woodworking. Bloomington: McKnight and McKnight Publishing Company, 1963.

Godla, Louis, "Vocational Trade Training in Fairfax County, Virginia," Industrial Arts and Vocational Education, 54:3, March, 1965.

Groneman, Chris. H. and John L. Feirer. General Shop. New York: McGraw-Hill Book Company, Inc., 1954.

Holt, E. E. A Guide for Industrial Arts in Ohio Schools. State Superintendent of Public Instruction, Ohio State Department of Education. Columbus: State Department of Education, 1963.

Holt, E. E. Organization and Administration for Industrial Arts Education. Ohio State Board of Education, Department of Education. Columbus: The F. J. Heer Printing Company, 1959.

Johnston, Paul F. Industrial Arts for Secondary School. Iowa State Department of Public Instruction. Des Moines: Published by State of Iowa, 1948.

Kukula, Stanley J. "The Orientation Unit," Industrial Arts and Vocational Education, 54:24, January 1965.

London, H. H. "The Professional Objectives of the I-V Teacher," School Shop, 21:1, September, 1961.

Michigan State Department of Public Instruction. Industrial Arts Programing for the High School. Bulletin No. 2148. Lansing: 1965.

Newkirk, Louis V. General Shop for Everyone. Boston: D. C. Heath and Company, 1959.

Ohio Industrial Arts Association, Inc. Looking In on Ohio School Shops. Columbus: Ohio Industrial Arts Association, 1964.

Ohio State Department of Education. Industrial Arts in Ohio Schools. Curriculum Guide. Columbus: 1965.

Osburn, Burl N. Industrial Arts is For Human Beings. American Industrial Arts Association, Inc. National Education Association of the United States, Bulletin 2. Washington: 1963.

Risher, Charles G. "Suggested Content For Power Mechanics," Industrial Arts and Vocational Education, 49:20-21, December, 1960.

Rudiger, Robert E. "Industrial Education and the Conant Study," Industrial Arts and Vocational Education, 49:16, February, 1960

Ruley, M. J. "Facilities for Industrial Arts in Tulsa," Industrial Arts and Vocational Education, 49:41-42, March, 1960.

Simpson, Roy E. Suggested Courses of Instruction in Industrial Arts for Junior High School Level. California State Department of Education. Sacramento: California State Printing Office, 1953.

Simpson, Roy E. Suggested Courses of Instruction in Industrial Arts for the Senior High School Level. California State Department of Education. Sacramento: California State Printing Office, 1955.

Steele, Gerald L. "Teaching Plastics," Industrial Arts and Vocational Education, 53:31, September, 1964.

Throckmorton, Adel F. A Curriculum Guide for the Secondary Schools of Kansas. State Superintendent of Public Instruction. Topeka: Kansas State Printing Office, 1960.

Woodword, Robert L. Safety Instruction In Industrial Arts Education. California State Department of Education. Sacramento: California State Printing Office, 1955.

A STUDY OF ABILENE INDUSTRIAL ARTS CURRICULUM

by

GEORGE EUGENE CARLILE

B. S., Fort Hays Kansas State College, 1941

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1965

Approved by:

J. Harvey Littell

Major Professor

Industrial arts teachers recognize the increasing complexity of our modern industrial society and are aware that a change must come in industrial arts departments if students are to receive the necessary knowledge and training to meet the industrial demands when their schooling is terminated.

The major purposes of this study were:

1. To survey the Abilene Junior and Senior High School industrial arts departments for the purpose of initiating a reorganization of the department.
2. To upgrade both the junior and senior high school industrial arts departments.
3. To propose that the industrial arts department be expanded to cover new areas of work and provide a greater number of courses for student choice.
4. To create industrial art areas where girls might enroll.

The four Abilene industrial arts instructors were all consulted and their ideas and recommendations were made a part of this report. The State Departments of Education of Kansas, Ohio, Iowa, Michigan, and California, were all contacted and recommendations concerning their industrial arts programs were received, studied and reviewed for ideas and help in making the recommendations of this report.

Books of noted industrial arts educators were studied and The Industrial Arts and Vocational Education and School Shop magazines were used for references.

The following conclusions were reached as a result of these studies, counselings, and recommendations of the other three Abilene industrial arts instructors.

1. The Abilene Junior High industrial arts program should include the seventh grade and girls.
2. The junior high program should be changed to a more comprehensive program, characterized by breadth rather than depth of skill and understanding.
3. The junior and senior high schools need more industrial arts instructors.
4. The senior high industrial arts program needs expansion and revaluation of various areas.
5. More classes need to be offered in drawing.
6. Carpentry, woodfinishing and upholstery classes should be added to woodworking area.
7. The art instructor should be a full time high school instructor and offer some specific courses such as oil painting, plastic or ceramics.
8. Auto mechanics is a fast growing field that needs classes open to eleventh grade with more classes added in the area taught at present time. A body shop class should be one of the new classes.
9. Drop the one two-teacher class in general shop and replace with two one-teacher classes. Expand the experiences to include electric motors and home maintenance.