

A SURVEY OF INDUSTRIAL ARTS DRAFTING PROGRAMS  
IN OKLAHOMA PUBLIC HIGH SCHOOLS  
DURING 1966-1967

By

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## CHAPTER I

### INTRODUCTION

Industrial arts in the public schools of Oklahoma began about the year 1904. At that time the program was referred to as manual training. One of the first areas of instruction in industrial arts to be taught in Oklahoma schools was drafting. At that time the course objectives and course content were determined by each individual instructor.<sup>1</sup>

In 1927 the American Vocational Association formed a committee to produce a bulletin. This committee has produced several printed reports, all aimed at increasing effectiveness in the teaching of industrial arts by providing sound objectives and practical suggestions for the content of industrial arts courses.<sup>2</sup> In 1943 the Oklahoma Industrial Arts Association was organized. The association has made available organized course objectives and a recommended format for Oklahoma industrial arts instructors to follow.<sup>3</sup> The Industrial Arts Associations exist only in an advisory capacity and have no authoritative control over what is being presented in the classroom. The individual in-

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<sup>1</sup>Oklahoma State Department of Education, Industrial Arts in Oklahoma (Oklahoma City, 1951), p. 15.

<sup>2</sup>American Vocational Association, A Guide to Improving Instruction in Industrial Arts (Washington D.C., 1953), p. 100.

<sup>3</sup>Oklahoma State Department of Education, Industrial Arts in Oklahoma (Oklahoma City, 1951), p. 27.

structor has been the determinant of course objectives and content.

The present status of Oklahoma's high school drafting programs needs to be known so that recommendations of new and changing conditions can be made and teacher training programs can be improved. This study, "A Survey of Industrial Arts Drafting Programs in Oklahoma Public High Schools During 1966-1967," will help to identify prevailing conditions, practices, and deficiencies in the Oklahoma industrial arts drafting program. This study should prove helpful and be inducive to further development and progress in this particular field. Comparison of the accumulated data with the reports of studies in other states should provide some constructive information about the growth and development of the industrial arts drafting program in Oklahoma public high schools. It should also help to identify its strengths, weaknesses, and problem areas.

#### Need for the Study

The need for this study is to reveal existing conditions and current practices of industrial arts drafting programs in Oklahoma. A study of this type is needed so that programs may be improved, trends may be identified, and weaknesses may be detected. This study will help interested drafting instructors to improve individual programs. It can also be used as a guide for organizing new programs. Studies of this type should be made periodically in order that those concerned may have a definite idea of the status of the present program.

#### Statement of the Problem

The intent of this study is to determine the existing status of the industrial arts drafting program in Oklahoma public high schools. Spe-

cific questions to be answered are: (1) what is the educational background of the industrial arts drafting instructor, (2) what industrial experience does the instructor have, (3) what is being taught, (4) what classroom facilities are available, (5) what methods of presentation are being used, and (6) what is the average size of the industrial arts class?

### Theoretical Assumptions

It will be assumed that industrial arts drafting instructors returning the questionnaires are a representative sample of all Oklahoma industrial arts drafting instructors. It will also be assumed that the respondent will answer the questionnaire as truthfully and honestly as possible.

### Definitions of Selected Terms

A common understanding of certain terms must be reached to avoid the possibility of misunderstanding. A few of the terms to be mentioned quite frequently in this study are defined as follows:

Manual Training. Any form of constructive work that serves to develop the powers of the pupil through spontaneous and intelligent self-activity. The power of observation is developed through exacting demands upon the senses, the reason by constant necessity for thought before action, and the will by the formation of habits of patience and careful application.<sup>4</sup>

Industrial Arts. Instructional shop work of a non-vocational type which provides general educational experiences centered around the industrial and technical aspects of life today offers orientation in the areas of appreciation, production,

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<sup>4</sup>Frank M. Leavitt, Examples of Industrial Education (Boston, 1912), p. 15.

consumption, and recreation through actual experiences with materials and goods. It also serves as exploratory experiences which are helpful in the choice of a vocation.<sup>5</sup>

Industrial Arts Drafting. The high school course develops a background applicable to most fields industrial in nature; creates a basic understanding of industrial dependence upon the drawing medium for communications; and develops latent abilities for creativeness and originality of design. The basic course includes instruction in orthographic projections, lettering, pictorial drawing, sections, auxiliary views, and architectural drawings.<sup>6</sup>

Drafting Room Facilities. The classroom facilities referred to in this study consist of drafting machines, a reproduction printer, a light table, electric erasers, an overhead projector, a movie projector, and several drafting tables.

Mechanical Drawing. A drawing is accomplished by correct manipulation of drawing instruments so that correct habits may be formed and maintained. Technically, the term includes principles of drawing, orthographic projection, assembly drawing, working drawings, engineering drawing, pictorial and reproduction of drawings.<sup>7</sup>

#### Previous Research

Several studies have been done regarding various phases of industrial arts in Oklahoma and other states. Following is a brief outline of a few of these similar studies:

Lemuel W. Apala.<sup>8</sup> Apala made a study of industrial arts courses offered in small high schools in Oklahoma. Two of his findings were that out of 295 schools, mechanical drawing

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<sup>5</sup>Oklahoma Curriculum Improvement Commission, A Guide to Improvement of Industrial Arts in Oklahoma (Oklahoma City, 1965), p. 2.

<sup>6</sup>Ibid., p. 12.

<sup>7</sup>Frederick E. Giesecke, Alva Mitchell, and Henry C. Spencer, "Technical Drawing" (New York, 1958), p. 12.

<sup>8</sup>Lemuel W. Apala, "A Study of the Course Offerings in a Small High School in Oklahoma with Special Emphasis on Industrial Arts" (unpub. Masters thesis, Oklahoma State University, 1949), p. 52.

was offered by 55 schools and freehand drawing by only 12.

R. W. Thornton.<sup>9</sup> Thornton surveyed the scope of industrial arts in the secondary schools of Texas during 1960. His findings were divided into the academic and professional training of the teachers, factors affecting teacher efficiency, curriculum, and facilities for instruction.

Fred J. Hill.<sup>10</sup> Hill made a survey of teaching mechanical drawing in the State of Kansas during the school year 1959-1960. This study was developed to show the methods being used to teach mechanical drawing in Kansas. Hill also sought to reveal the areas of needed improvement. The specific questions answered concern the size of drawing classes, drafting materials available for student use, and subject area offered.

A conference report on industrial arts by the United States Office of Education was reviewed for the purpose of determining what objectives should be emphasized in industrial arts.<sup>11</sup> A similar investigation by the Oklahoma State Department of Education was reviewed for Oklahoma industrial arts drafting objectives and suggested courses of study.<sup>12</sup>

#### Procedures

The needed information for this study as determined from the problem was a descriptive analysis of the industrial arts drafting programs in Oklahoma public high schools during the school year 1966-1967. This

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<sup>9</sup>R. W. Thornton, "Survey of Industrial Arts in the Secondary Schools of Texas" (unpub. report, Oklahoma State University, 1960), pp. 46-80.

<sup>10</sup>Fred J. Hill, "A Survey of Teaching Mechanical Drawing" (unpub. report, Oklahoma State University, 1960), pp. 34-45.

<sup>11</sup>United States Department of Health, Education, and Welfare, Improving Industrial Arts Teaching (Washington, 1962), pp. 11-22.

<sup>12</sup>Oklahoma Curriculum Improvement Commission, A Guide to Improvement of Industrial Arts in Oklahoma (Oklahoma City, 1965), p. 2.

information was obtained by the normative survey method. A questionnaire was prepared and sent to the industrial arts drafting instructors. The data for Chapter III was then transferred from the questionnaire and tabulated into table form for visual observation.

In writing Chapter II, the historical method of research was used. A listing of the sources used in this Chapter may be found in the bibliography section of the thesis.

#### Delimitation of the Study

This study will treat only industrial arts drafting on the high school level. Junior high and elementary schools will not be included. The study will be confined to only Oklahoma high schools that were listed as offering industrial arts drafting during 1966-1967. This may not be an accurate list because of unexpected curriculum changes. The questionnaire method of obtaining data for this study will be a limiting factor because of differing intellectual abilities of the individual drafting instructors. The prejudices of the respondents completing the questionnaire will also provide a certain amount of biased information.

## CHAPTER II

### HISTORY OF INDUSTRIAL EDUCATION

The development of industrial arts drafting runs parallel to the development of industrial education. It is, therefore, necessary to develop an understanding of the evolution of industrial education. To be specific in covering this development would be impractical, so a brief overview of the subject area will be made.

#### Early History of Industrial Education

Most trade education in the ancient nations was conducted in a father-son relationship. It was with the advent of apprenticeship that distinctive patterns of teaching industrial process arose.

The Greeks. The glory of Greece was built upon a self-sufficient system of slave industry and agriculture. Production of Greek sustenance was largely the job of the slave or near-slave population, and, therefore, was for the most part considered menial. The citizens of militaristic Sparta were forbidden to exercise any mechanical trade. The burden of production in Sparta fell upon the Perioeci, a group of the "dwellers about" who were in a sense slaves once removed. They were free men, but they were second class citizens in that they had no political rights. The Perioeci tilled the land, worked the quarries, mined the iron, and made all of the products required by Sparta. The

craftsmanship of the Perioeci was a family affair.<sup>1</sup>

The rise of Athens, like that of Sparta, was accomplished by an increase in the practice of trades as required by the growing city. The industrial workers, although free people, were generally of the second class. The free workers organized clubs representative of different occupations: stonemasonry, marble cutting, woodworking, pottery making, etc. The educational training of these workers was by way of personal relationship between master and pupil, craftsman and apprentice. The many theorists of that time scorned the trades and could not think of education as having any connection with manual activities. Despite this judgment, the work of the artisan is the best evidence of Greek achievement.<sup>2</sup>

The Romans. "The grandeur that was Rome," like "the glory that was Greece," produced little evidence to indicate that either industry or artisanship was ever held in very high official esteem. And yet the great public works, aqueducts, buildings, and roads required a high level of craftsmanship for construction.

Throughout a long history the craftsmen and artisans of Rome were composed of a mixture of slaves and freemen. They acquired skill in the only way possible--through family apprenticeship.<sup>3</sup>

The Middle Ages. The so-called Middle Ages account for approximately 1,000 years of history between ancient and modern times. Chris-

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<sup>1</sup>Will Durant, The Life of Greece (New York, 1939), p. 81.

<sup>2</sup>Ibid., p. 329.

<sup>3</sup>Melvin L. Barlow, History of Industrial Education in the United States (Peoria, Illinois, 1967), p. 17.

tianity had triumphed over the pagan Mediterranean world by 313 A.D. The last obstacle to the development of the Christian Church had been removed. The first monasteries appeared shortly thereafter. In the monks' work we also find a thin thread of industrial education.

Elements of apprenticeship were part of the formal training of the monks. This helped to establish manual labor in an honorable and preferred position. At least seven hours of manual labor were required of the monks each day. Agriculture and some phase of the trades composed a large part of the manual labor requirement, and, by the very nature of the work, involved an apprenticeship type of learning. This learning and manual labor were built into the foundations of Christianity and were the preservation of learning. Unfortunately, education existed primarily for the Church; the masses remained illiterate.<sup>4</sup>

The later Middle Ages were marked by the development of a merchant class and a class of skilled artisans. With the development of trade, the merchant guilds were formed. The guilds of the Middle Ages are thought of as the forerunners of the modern labor unions.<sup>5</sup>

The Renaissance and the Reformation. The Renaissance, a period of about 250 years, began in the fourteenth century. Education was still not for the masses, but with the development of printing, knowledge was more easily acquired. The guilds required the masters to teach reading and writing to apprentices. Religion acted as a catalyst in speeding up the process of social change. By the sixteenth century educational

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<sup>4</sup>Ibid., pp. 18-19.

<sup>5</sup>F. Theodore Struck, Foundations of Industrial Education (New York, 1930), p. 5.

reformers were supplementing new views to education.<sup>6</sup>

Educational Reform. Educational reforms of the sixteenth and seventeenth centuries provided for industrial education in theory, and in some instances actually included industrial-related instruction in programs of formal education. Rousseau's Emile was destined to become a carpenter--not just an ordinary carpenter, but a craftsman of high distinction who was educated in other areas.<sup>7</sup> Mulcaster's Merchant Taylor's School placed emphasis upon drawing as an element of instruction.<sup>8</sup>

Inspired by the teachings of Rousseau, Johann Heinrich Pestalozzi, a Swiss educator, established a school on his farm in 1774. Pestalozzi evolved a system of educational theory and practice from which industrial education borrowed heavily during its formative years. The concept that impression results from expression was a fundamental principle of Pestalozzi's, and it became the basis of learning in his school where the child was allowed to learn by doing.<sup>9</sup> Pestalozzi rejected pure word knowledge, which had been the basis of education, and turned to the pathways of nature and natural environments as the appropriate setting for learning.<sup>10</sup>

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<sup>6</sup>Barlow, History of Industrial Education in the United States (Peoria, Illinois, 1967), pp. 19-21.

<sup>7</sup>Ibid., p. 21.

<sup>8</sup>Ibid.

<sup>9</sup>Herman Krusi, Pestalozzi: His Life, Work, and Influence (Cincinnati, 1875), pp. 152, 188, 168.

<sup>10</sup>Ibid., p. 188.

Pestalozzi came to advocate industrial training because it was fundamental to the future economic dependence of the poor children who could find a means of subsistence through the practice of several different kinds of crafts. Adequate training for agriculture, for domestic management, and for industry were included. Pestalozzi felt that vocational training, which failed to provide an equal cultivation of the head and the heart, would only degrade the individual and reduce his status to one trained only for making a living.<sup>11</sup>

The influence of Pestalozzi quickly spread throughout the world. One of his followers, Francis Joseph Neff, opened several schools in the United States between the years 1806-1828 using the methods of Pestalozzi as a guide; these schools failed to develop. Pestalozzian methods were later developed in normal schools throughout the United States with great success. Joseph Neff greatly influenced the manual labor movement in the United States.

#### Industrial Education in the United States

The awakening of educational consciousness in the United States occurred about 1820. By 1870 the American people had accepted the concept of universal public education. The educational issue was that a system of education for all men was needed, and that the curriculum did not satisfy the needs of the working class.

The manual training move was in the beginning. Drawing had become popular in classes conducted by the mechanic institutes throughout the country. Drawing as a part of education for all boys found many

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<sup>11</sup>Barlow, History of Industrial Education in the United States (Peoria, Illinois, 1967), p. 22.

supporters because of its everyday uses on the farm, at home, and in the world of industry. John Hart (1868) emphasized the value of drawing saying,

A workman who is ready and expert with his pencil, who has learned to put his own ideas, or those of another, readily on paper, is worth fifty per cent more than his fellows who do not have this skill.<sup>12</sup>

The Morrill Act of 1862 helped to establish agricultural and mechanical colleges by allotting land to several states. This helped to clarify the image of industrial education, but only contributed to the industrial education movement on the college level.

The leaders of the manual training movement in the United States were influenced by new ideas from Russian and Scandinavian countries. These ideas helped to form the beginning of manual and trade education.

The Sloyd Movement. Otto Salomon's work at Naas, a private school in Sweden, did more for sloyd than any other known work.<sup>13</sup> The sloyd system as advocated by Salomon was that manual labor in a pre-vocational sense should be taught as part of general education. The seven principles considered most important as set forth by Salomon's "Sloyd as a Means of Education" (1884) are:<sup>14</sup>

1. The concentration on one form of sloyd.
2. The making of useful articles and not articles of luxury, nor parts of articles, e.g., joints.

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<sup>12</sup>Ibid., p. 32.

<sup>13</sup>Otto Salomon, The Theory of Educational Sloyd (Boston, 1906), p. 8.

<sup>14</sup>Ibid., p. 10.

3. The teaching based on educational principles, and the work methodically arranged.
4. The instruction to be given by a trained teacher, not by an artisan.
5. Voluntary and individual teaching.
6. Positions to be chosen suitable for physical development.
7. Drawing and sloyd to be continued.

Sloyd was regarded not as apprenticeship training, but as pre-apprenticeship training. The articles were to be made starting with the simple and progressing to the more complex, using models as a guide.

The Russian System. In 1868 Victor Della-Vos introduced into the Imperial Technical School at Moscow a method of manual instruction that has been called the Russian system of manual training to differentiate it from sloyd or the Swedish system of manual training. This system was essentially a laboratory method of teaching, the method being quite similar to teaching other laboratory work involving a given set of exercises. These exercises were arranged in what was considered to be a logical order for teaching purposes. Little was known about Victor Della-Vos in America until the year 1876 when the Imperial Technical School sent to the Centennial Exposition at Philadelphia an exhibit of exercises of wood and iron.<sup>15</sup>

Educational Reform. Some of the prominent leaders for industrial education during the late years of the nineteenth century were Calvin M. Woodward, William T. Harris, E. E. White, and John D. Runkle. These

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<sup>15</sup>Struck, Foundations of Industrial Education (New York, 1930), p. 27.

men were instrumental in the development of the manual training movement, and by open discussion and defending their positions helped to gain much support for the movement.<sup>16</sup>

From the standpoint of industrial education in the public schools, the two principal products of the crucible were: (1) development of a strong and expanded manual training program, and (2) the emergence of trade education. Private trade schools set the pace in contributing to the development of an educated labor force. Corporation schools formed industrial education programs appropriate for their use.

Another important factor in the promotion of vocational education in the public secondary schools was the work of the National Society for the Promotion of Industrial Education. The work of the Society was instrumental in the passage of the Smith-Hughes Act (vocational education act of 1917). Passage of the Smith-Hughes Act was the beginning of several educational acts, and was the result of laborious effort by many individuals, professional organizations, and education departments. These acts have done much for the promotion and development of industrial education in the United States. A brief summary of some of the more important acts as they apply to industrial education will help to explain the current development of industrial education.

#### SMITH-HUGHES ACT

(Public Law 347, 64th Congress)<sup>17</sup>

The Smith-Hughes Act provided a continuing appropriation for voca-

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<sup>16</sup>Barlow, History of Industrial Education in the United States (Peoria, Illinois, 1967), pp. 34-41.

<sup>17</sup>Roy W. Roberts, Vocational and Practical Arts Education (New York, 1965), pp. 131-132.

tional education in agriculture, in trades and industry, and in home-making, and for teacher training in each of these fields. Funds were appropriated for the administration of the program on the national level. The funds appropriated for the teaching of agriculture and of trades and industry increased annually from the fiscal year ending June 30, 1918, to the fiscal year ending June 30, 1926, at which time the appropriation reached the maximum of \$3,000,000 annually for each of the two services, and this amount has been appropriated annually thereafter. The states, under the provisions of the law, were permitted to use an amount not to exceed twenty per cent of the appropriation for trade and industrial education for salaries of teachers of home economics. The continuing appropriations for teacher training reached its maximum in 1921, at which time an annual appropriation of \$1,000,000 was provided. A total of \$200,000 annually was appropriated for the federal administration, and sufficient additional funds were appropriated to insure that each state received a minimum of \$10,000 each for the teaching of agriculture, of trade and industry, and of teacher training.

The federal funds were appropriated as a reimbursement for the salaries of teachers, supervisors, and directors of agricultural subjects, and the funds so appropriated were allotted to each state in the proportion that its rural population bore to the rural population of the United States. The funds appropriated as a reimbursement for the salaries of teachers of trade and industrial and of home economics subjects were allocated to each state in the proportion that its urban population bore to the urban population of the United States. The law required that for each dollar of federal money expended, the state or

local community or both must expend an equal amount.

The Smith-Hughes Act provided for a Federal Board for Vocational Education and a state board of not less than three members for each state. Each state was required to prepare a state plan for vocational education and to agree: (1) that the federally aided program of vocational education would be under public supervision and control, (2) that the controlling purpose would be to fit for useful employment, (3) that the vocational education would be of less than college grade and designed to meet the needs of persons over 14 years of age who had entered upon or who were preparing to enter the occupation for which they were receiving training, and (4) that the state or local community or both would provide the necessary plant and equipment.

Students in agriculture education were required to engage in a supervised practice program for a minimum of six months each year. Certain specifications with reference to length of term, use of funds for part-time classes, and age of evening school students were made in the use of funds for trades and industry and for home economics education. The specifications for the use of teacher training funds limited the amount of funds for any one service and provided standards for the use of these funds. The act also provided for the custody of the federal funds and directed the Federal Board for Vocational Education to engage in the necessary studies and investigations to insure an efficient and productive program.

In summary, the Smith-Hughes Act owes its very existence to two astute parliamentarians, Senator Hoke Smith and Dudley Hughes of Georgia. The act was in the legislative mill for almost three years before it was finally passed and signed into law. Senator Hoke's delaying tactics

and sureness of acceptance in all quarters helped in no small way. Congressman Hughes' bad health helped in the delaying tactics. When the bill cleared both houses of Congress, there were 137 differences which caused further delays until differences were resolved. The Senate receded on 104 and the House on 33.

The Smith-Hughes Act that came from the joint conference passed the Senate in July, 1916. It was not included in the House calendar and Congress adjourned in September without the House acting upon it.

When the second session of the Congress convened, President Wilson urged passage of the act by the House not merely for military reasons, but for industrial reasons as World War I clouds were upon the horizon. The act was rushed through the House in February, 1917. It was signed into law by President Wilson February 23, 1917; it went into effect in 1918. The states were quick to accept it, and each of the 48 states had accepted the provisions of the National Vocational Education Act and set up state boards. There were five subsequent acts before the Smith-Hughes Act was passed.

The Smith-Hughes Act is the most specific and exacting of all these enactments in its requirements upon the states in its use of federal money. The act has met its greatest test--the test of time, and it still stands as strong as it was on February 23, 1917.

#### GEORGE-BARDEN ACT

(Public Law 586, 79th Congress)<sup>18</sup>

Public Law 586 amended the George-Deen Act of 1936 which was designed to provide for the further development of vocational education

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<sup>18</sup>Ibid., p. 136.

in the several states and territories. In the 1947 revision of the Statement of Policies, Bulletin No. 1, the United States Office of Education says

The chief characteristic of the George-Barden Act as contrasted with previous vocational education legislation is flexibility. Some of the specific limitations on the use of funds were omitted from this act and provisions were included to allow for new phases of work.<sup>19</sup>

It might well have been added that certain activities which previously developed under administrative approval were given legislative status under this act, for example, supervision of the activities of the Future Farmers of America and the New Farmers of America by teachers of agriculture and the providing of training programs for apprentices.

The most important aspects in which the George-Barden Act differs from the Smith-Hughes and George-Deen Acts are:

1. The George-Barden Act provides one appropriation for each of the four service fields and no separate appropriation for teacher training. This same procedure was followed in the case of distributive education in the George-Deen Act. A state makes its own determination of the proportion of the allotment in a given field to be used for teacher training.
2. Federal funds under the George-Barden Act may be used for maintenance of administration and supervision. Under the George-Deen Act federal funds could not be used for administration and only for salaries and expenses in supervision. The Smith-Hughes Act allows for salaries of supervisors of agriculture only.

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<sup>19</sup>United States Office of Education, Statement of Policies, Bulletin No. 1 (Washington, 1947).

3. Under the George-Barden Act federal funds may be used for purchase or rent of equipment and supplies for vocational instruction. Section XVII of the Smith-Hughes Act concludes with the sentence

No portion of any monies appropriated under this act for the benefit of the states shall be applied directly or indirectly to the purchase, erection, preservation, or repair of any building (or buildings) or equipment.<sup>20</sup>

4. The George-Barden Act in Section VII and the George-Deen Act in Section VI provide that

The appropriations made under authority of this act shall be subject to the same conditions and limitations as the appropriations made to carry out the Smith-Hughes Act; except that . . . ,<sup>21</sup>

and here four exceptions almost identical in the two acts follow. The George-Barden Act adds a fifth exception, namely

Pre-employment schools and classes organized for persons over eighteen years of age or who have left the full-time school may be operated for less than nine months per year and less than thirty hours per week and without the requirement that a minimum of fifty per cent of the time must be given to shop work on a useful or productive basis.<sup>22</sup>

Section XI of the Smith-Hughes Act says that

Such schools or classes giving instruction to persons who have not entered upon employment shall require that at least half of the time of such instruction be given to practical work of a useful or productive basis, such instruction to

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<sup>20</sup>Roberts, Vocational and Practical Arts Education (New York, 1965), pp. 131-132.

<sup>21</sup>Ibid., p. 136.

<sup>22</sup>Ibid.

extend over not less than nine months per year  
and not less than thirty hours per week.<sup>23</sup>

In summary, the George-Barden Act made no specific allocation of funds for teacher training or for vocational guidance, but each state board for vocational education was permitted to use such amounts for these purposes as it deemed necessary. The George-Barden Act authorized the use of federal funds for some items not specifically authorized in previous acts. Among these were funds for the salary and expenses of state directors of vocational education, for salaries and travel expenses of vocational counselors, for training and work experience training programs for out-of-school youths, for supervision of Future Farmer and New Farmer activities, and for the purchase or rental of equipment and supplies for vocational instruction. The act provided that after June 30, 1951, not more than ten per cent of these funds could be used for the purpose or acquisition of equipment. The act provided for more flexibility in the use of funds for administration, and in general, the use of funds was subject to the conditions and limitations included in the previous vocational education laws.<sup>24</sup>

#### THE MANPOWER DEVELOPMENT AND TRAINING ACT

OF 1962 AS AMENDED IN 1963, 1965

(Public Law 87-415, 87th Congress)<sup>25</sup>

The purpose of this act was to require the Federal Government to appraise the manpower requirements and resources of the nation, and to

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<sup>23</sup>Ibid., pp. 131-132.

<sup>24</sup>Ibid., p. 136.

<sup>25</sup>Roberts, Vocational and Practical Arts Education (New York, 1965), pp. 330-333.

develop and apply the information and methods needed to deal with the problems of unemployment resulting from automation and technological changes and other types of persistent unemployment.

The Secretary of Labor shall, through evaluation, the collection of information, and research:

1. Determine the effects of technological changes on manpower, and establish ways of detecting the effects in advance.
2. Study employment practices which affect worker mobility.
3. Appraise the nation's efforts to meet manpower needs and recommend adjustments.
4. Promote, encourage, or conduct programs of information on manpower needs.
5. Arrange for research into ways that promise to fulfill the objectives of the act.
6. Develop, compile, and publish information and skill requirements, job opportunities, and national, state, and local labor trends.

He shall also seek the advice of consultants with respect to the standards governing the adequacy and design of proposals, the ability of applicants and the priority of projects in meeting the objectives of this act.

The Secretary of Labor shall assist interested agencies in setting up job development programs that will serve to expand employment.

The Secretary of Labor shall, during a period ending June 30, 1967, set up a number of pilot projects designed to show the effectiveness in reducing unemployment, and to increase the mobility of involuntarily unemployed workers by providing assistance through grants or loans to meet relocation expenses. These individuals must also secure full-time employment in the community in which they live and have proven offers for the chosen job. These loans and grants are subject to the following terms:

1. There is reasonable assurance of repayment of the loan.
2. The amount of the loan is adequate to assure achievement of its purpose.

3. The credit is not otherwise available on reasonable terms.
4. The loan bears interest at a rate not less than (a) the average market yield on outstanding treasury obligations of comparable maturity, plus (b) such additional charges, if any, toward covering other costs of the program as consistent with its purposes.
5. The loan is repayable in ten years.

The maximum appropriation for the purpose of carrying out this section may not exceed \$5,000,000.

The Secretary shall also develop placement projects through the public employment office.<sup>26</sup>

The Operation of the MDTA. The local community or labor market is the focus of the MDTA program. The procedure for project approval requires the preparation of a training proposal. This proposal includes the following items: (1) survey of skills required, (2) referral of persons for training, (3) planning and development of the training program, (4) conduct of the program, and (5) placement and follow-up of those persons who have completed training. The development of the proposal is a joint undertaking of the representatives of the state department of employment-security and state division of vocational education.

When the state division of vocational education receives the results of the labor market survey showing a need for training, the division determines whether or not appropriate facilities are available and what additional facilities are needed to conduct the training program. The vocational division then prepares a detailed analysis of the training project to include: (1) course content of the curriculum, (2) lo-

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<sup>26</sup>Ibid.

cation and description of the facilities to be used, (3) analysis of available instructional staff, (4) description of existing equipment and needs for additional equipment, and (5) statement of cost of program.

Each application for a training program is evaluated by representatives of state and federal agencies responsible for the training. An important factor considered in this evaluation is that of placement. Selection and referral for training will not be made unless there is some evidence to indicate that the trainee may secure employment, either in the area in which he resides or outside the area, in the occupation for which he is trained.

Federal funds for both training costs and support of trainees are apportioned to the states under a formula based on the following factors: (1) the proportion which the labor force of a state bears to the total labor force of the United States, (2) the proportion which the unemployed in a state during the preceding calendar year bears to the total number of unemployed in the United States in that year, (3) the lack of appropriate full-time employment in a state, (4) the proportion which the insured unemployed within a state bear to the total number of insured employed within the state, and (5) the average weekly unemployment compensation benefits paid by the state.

A total of 1,191 training projects for 64,740 trainees were approved between July 1, 1963, and January 31, 1964. The projects were located in communities in 51 states and territories. By the end of 1963 a total of 40,683 persons were enrolled in training and had completed a training course. The estimated cost per trainee for the projects approved was \$679.00, and the average training allowance was

about \$35.00 per week. The average duration of training was 31 weeks per trainee.<sup>27</sup>

### VOCATIONAL EDUCATION ACT OF 1963

(Public Law 88-210, 88th Congress)<sup>28</sup>

#### Purpose

The purpose of this act is to provide high quality and realistic vocational education to persons of all ages in all communities--to those in high schools, those who have dropped out of school, those with jobs who need retraining, and the unemployed persons with academic, socio-economic, or other handicaps.

Appropriations for the fiscal year 1965 were \$118.5 million, and for 1966, \$177.5 million.

#### Use of Funds

1. Ninety per cent of the funds are allotted to the states according to a formula based on each state's population and per-capita income.
2. Ten per cent of the funds are allotted to the Commissioner of Education for project grants to be distributed to State Boards of Education, or with their approval, directly to local educational agencies.

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<sup>27</sup>Ibid.

<sup>28</sup>U.S., Congress, Vocational Education Act of 1963, Public Law 88-210, 88th Congress.

3. Three per cent of a state's allocation must go toward ancillary services and activities.
4. One-third of the state's allocation must go toward construction of area-vocational-education school facilities or for vocational education of persons not in school. (After 1968 one-fourth of a state's money must go for this purpose).
5. The remainder of a state's allotment must be used for vocational education for high school students, for persons already in the labor force who need retraining, and for persons with socio-economic, academic, or other handicaps which prevent them from succeeding in the regular vocational educational programs.

#### Matching Requirement

Federal funds are to be matched dollar for dollar by the state and/or local schools. Funds not matched will be reallocated to other states.

#### Administration

State plans must have a state advisory council to consult with the State Board of Vocational Education in carrying out the state plan. USOE regulations require that the State Board work closely with the State Employment Service and that each state's plan must consider the needs of all groups in all communities in the state. Vocational education must be made readily available to all persons as soon as possible. A state's allotment under the old laws relating to vocational education may now be transferred in any amount from one program to another

wherever the need is greatest.

#### Allowable Expenditures for Equipment

State funds may be spent for acquisition, maintenance, and repair of instructional equipment supplies, and teaching aids. Equipment is defined as:

1. An article which retains its shape and appearance with reasonable care over at least one year.
2. An article which requires repair rather than entire replacement.<sup>29</sup>

Instructional equipment, supplies, and teaching aids mean any material including reference materials and textbooks used by authorized personnel in instruction or by the students in learning. In construction of area vocational education facilities, funds may be spent for initial equipment which includes all necessary building fixtures, furnishings, and instructional equipment. Funds may also be used for replacing obsolete or worn out equipment. These facilities must be adequate in supply and quality to meet standards approved by the state board of vocational education, and must enable the trainees to meet the occupational objective for which the education is intended.

#### Residential Schools and Work Study Programs

This law also authorizes Congress to appropriate funds for the establishment of residential schools and work study programs. Funds will be granted by the Commissioner of Education for the construction, equipment, and operation of schools for youths between the ages of

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<sup>29</sup>Ibid.

fifteen and twenty-one who will need full-time vocational study on a residential basis. These schools are primarily for large urban areas with a large number of dropout students. Funds will also be granted to states for students who need money to continue or commence vocational schooling. Full-time vocational education students between the ages of fifteen and twenty-one who need earnings to continue or commence training and who are capable of maintaining good standing in the vocational educational program while employed under the work study program are eligible for entrance into a work study program. Students will be allowed fifteen hours of work per week for a maximum total of \$60.00 per week or a maximum total of \$500.00 per school year. The students must be employed by the local educational agency or some other reputable agency or institution.

A SUMMARY OF THE ECONOMIC OPPORTUNITY ACT

OF 1964

(Public Law 88-452, 88th Congress)<sup>30</sup>

The Economic Opportunity Act of 1964 establishes an Office of Economic Opportunity in the Executive Office of the President. The OEO is headed by a director who has a planning and coordinating staff responsible for coordinating the poverty-related programs of all government agencies. Within the OEO, separate staffs operate a Job Corps, a program for Volunteers in Service to America (VISTA), a Community Action Program, and special programs for migrant workers. In addition, the

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<sup>30</sup>U.S., Congress, A Summary of the Economic Opportunity Act of 1964, Public Law 88-452, 88th Congress.

OEO distributes funds to existing agencies to operate other programs authorized under the bill; work-training programs administered through the Labor Department; work study programs and adult basic education through HEW; special rural anti-poverty programs through the Agricultural Department; small business loans through the Small Business Administration; and community work and training projects for welfare recipients through HEW.

Following is a summary of the programs authorized under the Economic Opportunity Act of 1964:<sup>31</sup>

Title I - Youth Programs: \$412,500,000

1. Establish a Job Corps to provide education, work experience, and vocational training in conservation camps and residential training centers; would enroll 40,000 young men and women ages 16-21 this year-- 100,000 next year. Administered by the Office of Economic Opportunity. Total cost--\$190,000,000.
2. Establish a Work Training Program under which the director of OEO enters into agreements with state and local governments or nonprofit organizations to pay part of the cost of full- or part-time employment to enable 200,000 young men and women, 16-21, to continue or resume their education or to increase their employability. Administered by the Labor Department. Total cost--\$150,000,000.
3. Establish a Work Study Program under which the director of OEO enters into agreements with institutions of higher learning to pay part of the costs of part-time employment to permit 140,000 students from low-income families to enter upon or continue higher education. Administered by the Department of Health, Education, and Welfare. Total cost--\$72,500,000.

Title II - Community Action Program: \$340,000,000

1. Authorize the director of OEO to pay up to 90 per cent of the costs of anti-poverty programs planned

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<sup>31</sup>Ibid.

and carried out at the community level. Programs will be administered by the communities and will coordinate poverty-related programs of various federal agencies. Total cost--\$315,000,000.

2. Authorize the director to make grants to states to provide basic education and literacy training to adults. Administered by the Department of Health, Education, and Welfare. Total cost--\$25,000,000.
3. Authorize the director to establish and operate a clearing house to facilitate arrangements between foster parents willing to provide financial support for needy children under the guidance of a local agency. Only administrative funds are required.

Title III - Programs to Combat Poverty in Rural Areas:  
\$35,000,000

1. Authorize loans up to \$2,500 to very low-income rural families for farm operations and nonagricultural income-producing enterprises, and loans to low-income family cooperatives. Administered by the Department of Agriculture.
2. Authorize assistance to establish and operate housing, sanitation, education, and child day-care programs for migrant farm workers and their families. Total cost--not more than \$15,000,000, financed from other titles.
3. Authorize the Secretary of Agriculture to indemnify farmers whose milk has been polluted by pesticides recommended by USDA. No specific funds are authorized.

Title IV - Employment and Investment Incentives

Authorize loans and guaranties to small businesses of up to \$25,000 on more liberal terms than the regular loan provisions of the Small Business Administration. Administered by the Small Business Administration. Would use SBA's regular spending authority.

Title V - Work Experience Program: \$150,000,000

Authorize the director of OEO to transfer funds to HEW to pay costs of experimental, pilot, or demonstration projects designed to stimulate the adoption in the states of programs of providing constructive work experience or training for unemployed fathers and needy persons.

Title VI - Administration and Coordination: \$10,000,000

Establish the Office of Economic Opportunity and specifies its functions. Authorize the director of OEO to recruit and train an estimated 5,000 VISTA volunteers to serve in specified mental health, migrant, Indian, and other federal programs including the Job Corps, as well as in state and community anti-poverty programs.

Title VII - Treatment of Public Assistance

This is a policy declaration that an individual's opportunity to participate in programs under this act shall neither jeopardize, nor be jeopardized by, receipt of public assistance.

#### ELEMENTARY AND SECONDARY EDUCATION ACT

OF 1965

(Public Law 89-10, 89th Congress)<sup>32</sup>

The purpose of the Elementary and Secondary Education Act of 1965 is to improve educational quality and educational opportunities in the nation's elementary and secondary schools. In order to achieve this purpose, the act authorizes a number of programs especially concerned with breaking the relationship which exists between poverty and low educational achievement.

Title I of the act will provide federal financial assistance to school districts which serve a large number of children from low-income families. These funds are not marked for use in specific programs; rather, the recipient school agencies will use the funds in carrying out any of a broad range of locally-planned projects and activities designed to meet the special needs of educationally deprived children.

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<sup>32</sup>U.S., Congress, Elementary and Secondary Education Act of 1965, Public Law 89-10, 89th Congress.

Programs which might be undertaken with assistance under this title include those involving in-service training for teachers; increasing the number of teachers to reduce class size; purchasing supplementary teaching materials; instituting special classes for handicapped, disturbed, or maladjusted children; providing remedial reading classes, dropout prevention techniques, cultural activities, pupil health services, and many others.

Appropriations of \$1,060,000,000 have been authorized for Title I programs for this fiscal year. The formula for allocation of appropriated sums is based on the two factors of (1) one-half the average per pupil educational expenditure in a state, and (2) the number of school age children in the school districts of a state who come from families with an annual income of less than \$2,000. The latter factor also includes children from families whose income is more than \$2,000 only because they receive welfare payments under the program of public assistance to families with dependent children.

Title I of the Elementary and Secondary Act also extends for two years the non-permanent provisions of Public Law 874, under which local school agencies in federally impacted areas receive grants for school operation and maintenance.

Title II of this act authorized a five year program of grants to state educational agencies for use in purchasing textbooks, library resources, and other printed and published materials for the state's elementary and secondary schools. It also authorized the appropriation of \$100,000,000 for 1966. Assistance is to be allotted among the states on the basis of elementary and secondary school enrollment in each state.

Title III complements Title I by authorizing federal funds to assist local school agencies in establishing supplementary educational centers and services for improving the quality and availability of educational and cultural opportunities for all Americans. As in Title I, there is no strict roster of programs for which Title III funds may be used. Planning will be at the local level. Programs must make use of the services of persons representing a broad range of the cultural and educational resources of the local area. Colleges and universities, museums and libraries, state and local school agencies, and individuals versed in the various arts and sciences will be able to contribute to the planning and execution of Title III programs. Programs may be carried out in the regular schools or as pilot projects in special centers.

Title III authorized appropriations of \$100,000,000 for 1966. One-half of the appropriated sums was to be distributed among the states on the basis of relative school age population; one-half on the basis of relative total population.

Title IV of Public Law 89-10 amends the Cooperative Research Act of 1954 to increase the amount of federal assistance under that act for educational research purposes. Title IV also authorizes the use of funds for the construction and operation of a number of national and regional laboratories for educational research and training. In these facilities, teams of scholars, researchers, teachers, and school administrators will work together to develop, test, and disseminate new and improved educational techniques and materials. Title IV authorizes appropriations of \$100,000,000 over a period of five fiscal years beginning in fiscal 1966.

The fifth and last substantive Title of this act authorizes federal grants to the several state educational agencies to assist them in insulating and fulfilling the educational needs of the states. Basic grants may be used by a state agency for such programs as educational planning on a statewide basis, improving the collection and use of educational statistics and data, and strengthening teacher training. Special grants are also available to allow a state department of education to undertake a project designed to solve a problem common to several or all of the states. A program of personnel exchange between a state agency and the United States Office of Education is also authorized. Title V appropriations of \$25,000,000 were authorized for 1966, the first of the five-year program.

#### Evolution of Industrial Arts

The history of industrial arts has been a record of adjustment to socio-economic conditions in an educational environment. Despite the obstacles that from time to time have threatened its right to inclusion in the school curriculum, industrial arts has managed to grow.

The history of the development of industrial arts in the public schools of the United States began in Baltimore in 1884 with the establishment of the first manual training high school to be supported at public expense. At that time industrial arts was referred to as manual training or manual arts. By 1910 the term "industrial arts" had gained substantial support, but the evolution from manual training was a long slow process.<sup>33</sup>

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<sup>33</sup>Oklahoma State Department of Education, Industrial Arts in Oklahoma (Oklahoma City, 1951), p. 17.

Before the advent of the Smith-Hughes Act in 1917, industrial education was similar to a vocational training program which reflected the interest and needs of the local communities. With the new vocational education program of the Smith-Hughes Act, industrial education was divided into two categories: that of industrial arts, and vocational education. This meant that industrial arts could place more emphasis on general education. However, many industrial arts instructors were trying to change the programs to one of a vocational nature in order to receive federal funds. With the increased demand for a skilled labor force during World War I, many school shops were changed into training programs to fill this need.<sup>34</sup>

Immediately following the war, industrial arts assumed the responsibility of providing general education and vocational guidance. One of the problems facing industrial arts educators at that time was the never-ending struggle with terms and concepts. The leaders in the field of industrial education were trying to define the principles and rationalizations of the programs. With the formation of the American Vocational Association in 1926 and the American Industrial Arts Association in 1939, the objectives of industrial arts were defined and published.<sup>35</sup>

The Depression and World War II. The depression brought many changes to the United States. Education and industrial arts were changing as did the values and philosophy of the instructors. The importance of industrial arts as a solution to the problem of excess leisure time

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<sup>34</sup>Barlow, History of Industrial Education in the United States (Peoria, Illinois, 1967), pp. 241-242.

<sup>35</sup>Oklahoma State Department of Education, Industrial Arts in Oklahoma (Oklahoma City, 1951), p. 19-24.

was well known prior to the depression. Schools were urged to broaden their activity with the view that leisure, normal or forced, provided opportunities for industrial arts to make additional contributions to the general welfare.

Educators in the field looked with favor upon progressive tendencies in industrial arts, but not to the extent of abandoning the subject matter. Nevertheless, the progressive education movement did affect industrial arts. Some of the significant practices or trends were as follows:<sup>36</sup>

1. More emphasis upon pupil development and emergent outcomes as evidenced in the objectives which stress attitudes, appreciations, and habits with less emphasis upon manual skill.
2. A change of emphasis from vocational and pre-vocational education to general education as the aim of industrial arts.
3. An increased emphasis upon practical projects in place of abstract exercises and formal models.
4. A greater emphasis upon flexibility, variety, and enrichment of content as evidenced by the growth of the general shop, the use of suggestive plans rather than rigid courses of study, and the increasing number of shop subjects or activities.
5. Less teacher dictation and more pupil initiative and freedom in the selection of projects and in the choice of materials and methods of carrying the learning units to completion.
6. An increased number of instructional devices to care for individual differences and to broaden the experiences of the pupils. Such devices include excursions, movies, instruction sheets, shop manuals, and shop reference books.

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<sup>36</sup>C. H. Christopherson, "Significant Progressive Education Tendencies in the Industrial Arts," American Vocational Association Journal and News Bulletin, XV, No. 2 (May, 1940), p. 109.

7. An increased tendency to correlate shop courses to integrate the pupil's experiences.
8. The use of improved tests and scales for diagnosing building, and evaluating in the learning process.

The shortage of skilled manpower for World War II did not change the industrial arts programs as did that of World War I. The shortage of instructors was of a greater essence. The noticeable changes were the type of projects being constructed and the increase in the enrollment of girls.<sup>37</sup>

Space Age Developments. Following the war the increasing demand of a changing and technological society required that instructional programs be evaluated and improved. Industrial arts, keeping with the theme of general education, has sought to improve its standards of instruction. Curriculum committees and professional organizations have encouraged instructors to improve programs and develop a philosophy of sound objectives.

The existence of industrial arts has been challenged throughout its history. The one thing that has prevented its extinction has been its continuing insistence of being an essential part of a well rounded educational program. The importance of industrial arts in an automated technological society can best be summarized by the five objectives given in the January-February, 1967, issue of "The Journal of Industrial Arts Education."<sup>38</sup>

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<sup>37</sup>C. H. Silvius, "Intensive Training to Provide Industrial Arts Teachers During the War," Industrial Arts and Vocational Education, XXXI, No. 8 (October, 1942), pp. 321-322.

<sup>38</sup>Shriver L. Coover, "Three Variations on the Convention Theme," The Journal of Industrial Arts Education, XXVI, No. 3 (January-February, 1967), pp. 48-52.

1. To develop literacy in a technological civilization in such a society and be able to communicate in the language of industry, technology, and science. Hence, one must be able to read drawings and make sketches as first steps in understanding our society. This ability to read and sketch drawings is related to things of a technical nature much as reading and writing are associated with learning history or mathematics.
2. To develop an insight and understanding of industry and its place in our society.
3. To discover and develop student talents.
4. To develop problem solving abilities related to a variety of tools, materials, processes, and products.
5. To develop skill in the safe use of tools and machines.

## CHAPTER III

### REPORT OF THE SURVEY

As stated in a previous chapter, the principal aim of this study is to reveal the existing conditions and current practices of industrial arts drafting programs in Oklahoma public high schools. The purpose of this chapter is to present the results of this investigation in logical sequence and in detail. Through this presentation, it is hoped the writer has accomplished the purpose of the study, and made available to those interested a gathering of data pertaining to industrial arts drafting.

#### Sources of Data

The needed information for this study as determined from the problem was a descriptive analysis of the industrial arts drafting programs in Oklahoma public high schools during the school year 1966-1967. To obtain this type of information a survey was needed. Because of insufficient time needed to personally contact every drafting instructor, a questionnaire was used.

Selection of the Population. The population consisted of Oklahoma industrial arts public high school drafting instructors. The mailing list was determined from the annual directory of industrial arts for the school year 1966-1967.

Construction of the Questionnaire. To identify existing conditions of the high school industrial arts drafting programs, the questionnaire method of obtaining data was used. The questionnaire was formulated to elicit quantitative information. The questions were concise and designed to obtain the statistics required for a survey. As a means of testing the validity of the questionnaire, copies of it were presented to the class members of Industrial Arts Education 563 for discussion and criticism. The questionnaire was then revised to include the recommendations of the test class. A copy of the questionnaire and the letter of transmittal are in the appendix.

Administration of the Questionnaire. The questionnaire, a letter of transmittal, and a return envelope were sent to 200 industrial arts drafting instructors in Oklahoma public high schools. The questionnaire was returned by 123 instructors, giving a response of 61.5 per cent.

Validity of the Data. The validity of the data acquired by the survey is dependent upon several things: the validity of the questionnaire technique itself; the validity of the specific questionnaire used; and the validity of the responses.

The first of these--the questionnaire technique itself--generally is accepted as of sufficient validity for the purpose of this type of study. In the case of this writer, the physical and economic barriers of time, distance, and expense made a personal survey of the problem impossible (although it is the writer's belief that this would have been the ideal method). Therefore, the questionnaire technique was employed.

The second of these--the validity of the questionnaire used--is

limited by two diametrically opposed sets of factors. One, the questionnaire should not be too detailed, too long, or too difficult to answer, if there is to be a truly representative percentage of response. Two, the questionnaire should be objective, valid, comprehensive, and reliable, if the responses are to be of value.

The third and last of these--the validity of the respondents--becomes a matter of accepting upon good faith the responses received. The problems of interpretation, of human nature, of individual differences, and many other unpredictable factors must be considered by those using the data.

#### Survey Data

The data from the questionnaires are divided into six major areas. These areas are: (1) instructor's background, (2) drafting room facilities, (3) methods of presentation, (4) title of drafting courses offered, (5) subject area taught, and (6) size of drafting classes.

The data are reported for the most part in tabular form. The responses to the questionnaire are listed as to frequency of occurrence, and percentages are determined for each area of response. The questions pertaining to each table are listed at the bottom of the table.

Instructor's Background. This area pertains to question numbers one and two of the questionnaire. The responses to question one as shown in Table I indicate that all instructors teaching industrial arts drafting in Oklahoma public high schools have Bachelor's Degrees with 46.5 per cent having Master's Degrees. This table also reveals that 43.9 per cent of the instructors have some type of industrial experience, but only 15.7 per cent have experience in the area of drafting.

TABLE I  
INSTRUCTOR'S BACKGROUND

Background	Frequency	Per Cent of Total Number
Bachelor's Degree	116	100.0%
Master's Degree	53	46.5%
Industrial Experience	51	43.9%
Experience in Drafting	8	15.7%

Question 1. Degrees held: B.S. \_\_\_\_\_ M.S. \_\_\_\_\_ Other \_\_\_\_\_

Table II indicates that 47.0 per cent of those instructors who have had industrial experience of some sort, have had less than five years of experience. As indicated in Tables I and II, it would appear that industrial arts drafting instructors in Oklahoma public high schools have good education backgrounds, but they are deficient in the number of years of industrial experience in the area of industrial arts drafting.

Drafting Room Facilities. The importance of proper facilities in a drafting program cannot be over emphasized. The most advanced instructor may be limited by the lack of drafting room facilities. Proper facilities are also a limiting factor in the progress of the students. Question three sought to reveal the status of the drafting room facilities in Oklahoma public high schools. As indicated in Table III, of the instructors responding only 74.1 per cent have drafting tables. This implies that 25.9 per cent must improvise some other means.

The table also reveals that only 21.6 per cent have drafting machines and only 25.3 per cent have some type of reproduction printer. This would indicate that there is a need for improvement in the drafting

room facilities in Oklahoma public high schools.

TABLE II  
INDUSTRIAL EXPERIENCE

Years	Frequency	Per Cent
1- 4	24	47.0%
5- 9	13	25.5%
10-14	6	11.8%
15-19	5	9.9%
20-24	2	3.9%
25-30	1	1.9%

Question 2. Industrial experience: Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, number of years \_\_\_\_\_ What trade? \_\_\_\_\_

TABLE III  
DRAFTING ROOM FACILITIES

Facilities	Frequency	Percentage*
Drafting machines	25	21.6%
Reproduction printer	30	25.3%
Light table	12	10.3%
Electric eraser	9	7.7%
Overhead projector		
1. Permanent	29	25.0%
2. Part time	67	57.7%
3. Not available	20	17.2%
Movie projector	95	81.9%
Drafting tables	86	74.1%

\*Percent of 116 responses

Question 3. Drafting room facilities. (Listed in preceding table)

Methods of Presentation. The importance of adequate facilities has already been mentioned. But even with proper facilities the instructor must use the correct methods of presentation and at the appropriate time. Question seven sought to show the current methods being used. Table IV shows the frequency of methods used and the percentage of each compared to the total response. Table IV indicates that lecture and demonstration are the predominant methods used. Questioning and discussion were also rated high.

In Table III it was indicated that 74.1 per cent of the instructors have access to an overhead projector, but Table IV reveals that transparencies were used in only 8.9 per cent of lesson presentations. This would indicate that there should be more emphasis on the use of transparencies to teach drafting.

Table IV also indicated that field trips are seldom used as a method of presentation. Field trips were indicated by only 0.6 per cent of the total methods.

Title of Drafting Courses. The current practice in courses of study has been to name the first course in drafting as Drafting I and the second course as Drafting II. Table V indicates that this is not true in Oklahoma public high schools since 36.2 per cent of the courses taught are referred to by the conventional title of Mechanical Drawing I. It also indicates that architectural, technical, and machine drafting are seldom taught as individual courses. By adding Mechanical Drawing I and Drafting I together it appears that 58.2 per cent of the drafting classes in Oklahoma public high schools are only beginning courses.

TABLE IV  
METHODS OF PRESENTATION

Methods	Frequency	Of Total Percentage
Lecture	109	20.1%
Demonstration	108	19.9%
Questioning and discussion	101	18.7%
Films (sound)	52	9.7%
Transparencies	48	8.9%
Charts	50	9.2%
Models	70	12.9%
Field trips	3	0.6%
Total	541	100.0%

Question 7. Methods of presentation. (Listed in preceding table)

TABLE V  
TITLE OF DRAFTING COURSE

Title	Frequency	Per Cent
Drafting I	46	21.9%
Drafting II	27	12.8%
Architectural	20	9.5%
Design	3	1.4%
Mechanical Drawing I	76	36.2%
Mechanical Drawing II	32	15.2%
Mechanical Drawing III	2	1.0%
Technical	2	1.0%
Machine	2	1.0%

Question 8. Title of drafting courses offered.

Subject Area Taught. This area of the survey sought to reveal the subject areas most frequently taught in drafting classes in Oklahoma public high schools. The responses to question nine of the questionnaire have been tabulated into Table VI as to frequency of response, and a percentage of the total areas taught has been determined for each area.

The eight areas with the highest percentage are: (1) lettering - 6.7 per cent, (2) dimensioning - 6.5 per cent, (3) orthographic projection - 6.2 per cent, (4) working drawings - 6.1 per cent, (5) isometric projection - 6.0 per cent, (6) sections - 5.9 per cent, (7) auxiliary views - 5.8 per cent, and (8) geometric construction - 5.5 per cent. The subject area least taught was aerospace with 0.2 per cent.

TABLE VI  
SUBJECT AREAS TAUGHT

Subject Area	Frequency	Per Cent
Freehand sketching	83	4.8%
Lettering	116	6.7%
Geometric construction	94	5.5%
Orthographic projection	107	6.2%
Dimensioning	112	6.5%
Auxiliary views	100	5.8%
Sections	102	5.9%
Surface developments	61	3.5%
Cams	33	1.9%
Gears	39	2.2%
Architecture	84	4.8%

TABLE VI (Continued)

Subject Area	Frequency	Per Cent
Map drafting	21	1.2%
Electrical and electronic	15	0.9%
Aerospace	3	0.2%
Isometric	103	6.0%
Dimetric	15	0.9%
Trimetric	13	0.8%
Oblique	91	5.3%
Perspective	76	4.4%
Welding drawings	18	1.0%
Inking	65	3.8%
Screws and bolts	76	4.4%
Other fasteners	47	2.7%
Working drawings	105	6.1%
Detail drawings	85	4.9%
Blue print reading	61	3.5%
Total	1,725	100.0%

Question 9. Subject areas taught in drafting.

Size of Drafting Classes. The size of the class is important to both the instructor and the students. As shown in Table VII, it appears that Oklahoma high schools have a well balanced drafting class average with 17.3 per cent of the classes having an average number of 14-15 students per class. An average of 20-21 students per class was checked by 15.5 per cent of the instructors. By adding the responses of those

indicating the class average from 14-21, this appears to represent 46.5 per cent of the total responses.

TABLE VII  
SIZE OF INDUSTRIAL ARTS DRAFTING CLASSES

Average Number of Pupils Per Class	Frequency	Percentage
4- 5	1	0.9%
6- 7	1	0.9%
8- 9	1	0.9%
10-11	10	9.0%
12-13	11	10.0%
14-15	19	17.3%
16-17	9	8.2%
18-19	6	5.5%
20-21	17	15.5%
22-23	8	7.3%
24-25	11	10.0%
26-27	4	3.6%
28-29	4	3.6%
30-31	6	5.5%
32-36	2	1.8%
Total	110	100.0%

Question 5. Average number of drafting students in your classes

Data in Table VIII. The responses to question four indicate that 82.7 per cent of the drafting programs in Oklahoma public high schools

are a one-instructor program. One school indicated having four industrial arts drafting instructors in its program.

TABLE VIII

NUMBER OF INSTRUCTORS PER SCHOOL TEACHING  
INDUSTRIAL ARTS DRAFTING IN OKLAHOMA  
PUBLIC HIGH SCHOOLS

Instructor Per School	Frequency	Percentage
1	96	82.7%
2	16	13.8%
3	3	2.6%
4	1	0.9%

Question 4. Number of industrial arts drafting instructors in your school \_\_\_\_\_

Data in Table IX. The responses to question six are tabulated in Table IX. Of the responses, 49.1 per cent indicate a fee charge with an average charge of \$2.57 per student. Several instructors commented that this charge was for materials used by the students.

TABLE IX

## FEE CHARGE

	Frequency	Per Cent	Amount
Yes	56	49.1%	Total Amount \$144.05
No	60	50.9%	Average Amount \$ 2.57 (Per Student)
Total	116	100.0%	

Question 6. Is there a fee charge for the course? Yes \_\_\_\_\_  
No \_\_\_\_\_ If yes, how much? \_\_\_\_\_

This chapter has presented, for the most part in tabular form, the data acquired by the survey of 116 public high schools in Oklahoma. The data have been presented in entirety with supplemental information for the purpose of clarification. The following chapter presents the conclusions of the survey together with a brief summary.

## CHAPTER IV

### SUMMARY

The intent of this study was to reveal existing conditions and current practices of industrial arts drafting programs in Oklahoma public high schools. Mailed to the various industrial arts drafting instructors throughout the state were 200 questionnaires. Returned were 116 usable questionnaires. The survey was divided into six basic areas for tabulation purposes, each area having a specific question to be answered.

The first area sought to determine the type of educational background of the instructors. The results of the survey indicated that approximately 47 per cent of those instructors teaching industrial arts drafting have a master's degree. This area also showed that 44 per cent of the instructors have some type of industrial experience.

The second area concerned drafting room facilities. It was disclosed that approximately 25 per cent of the industrial arts drafting programs in Oklahoma are being conducted using a substitute for drafting tables. It was also noted that approximately 22 per cent of those responding have available for instruction at least one drafting machine.

The third area has indicated a need for improvement in methods of presenting instructional material. Approximately 91 per cent of the lessons are presented without the aid of transparencies.

The fourth area indicated that 58.2 per cent of the industrial arts drafting classes in Oklahoma are beginning courses in drafting. Also, architectural, technical, and machine drafting are not taught as individual courses but as a part of basic Drafting I or II.

The subject areas receiving the highest responses were lettering, dimensioning, orthographic projections, working drawings, isometric projection, sections, auxiliary views, and geometric construction. This reflects the high percentage of beginning courses. The survey also revealed that 83 per cent of the courses are a one-instructor program.

In the sixth area an average class size of 14-15 students was reported as representing 17.3 per cent of all the classes. Of the classes, 47 per cent range from 14-21 students per class. A fee charge for the classes was indicated by 49 per cent of the responding instructors. The average amount was \$2.57 per student.

#### CONCLUSION

From the facts obtained, and insofar as the respondents are representative of the whole, the following conclusions may be drawn:

The basic objective of an industrial arts high school drafting course, as described by the Oklahoma Curriculum Improvement Commission,<sup>1</sup>

is to develop a background applicable to most industrial fields. It should develop an understanding of industrial dependence upon the drawing medium for communication, and develop latent abilities for creativeness and originality in design. The course should include instruction in orthographic projection, lettering, pictorial drawing,

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<sup>1</sup>Oklahoma Curriculum Improvement Commission, A Guide to Improvement of Industrial Arts in Oklahoma Schools (Oklahoma City, Oklahoma State Department of Education, 1965), p. 12.

sections, auxiliary views, and architectural drawing. The depth to which these goals are to be pursued in a beginning course will depend upon time allotment.

When these objectives are compared to the responses of the questionnaire, it appears that the drafting programs are including the basic areas suggested by the Curriculum Improvement Commission.

In view of the evidence presented, the data indicate that there are both over-developed and under-developed industrial arts drafting programs in the state, and there is an imbalance within these programs. It can be concluded that there should be a curriculum guide made available to the instructors so that the development of a balanced and standardized program could be obtained throughout the state industrial arts drafting programs. A means of obtaining a stronger drafting program and improved instruction could be by an increased participation of industrial arts drafting instructors in professional organizations.

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APPENDIX A

## INDUSTRIAL EDUCATION INSTRUCTORS TO WHOM THE QUESTIONNAIRE WAS MAILED

<u>City</u>	<u>Instructor</u>
Bearden	Mr. Garland Pennington
Bethany	Mr. James Lunsford
Binger	Mr. Robert Birdwell
Bixby	Mr. Leon Hicks
Blackwell	Mr. Robert Moore
Blanchard	Mr. Ward Postman
Boswell	Mr. Ray Latham
Bowlegs	Mr. Edward Adams
Boynton	Mr. Ronnie Ellis
Boyd, Frederick	Mr. John Williams
Braman	Mr. Loren Meritt
Braggs	Mr. William Willis
Bristow	Mr. Darrell Stiles
Broken Arrow, Union	Mr. James Johnson
Burlington	Mr. Donald Talley
Caddo	Mr. Deion Bleer
Canton	Mr. Marvin Daugherty
Cashion	Mr. David Yadon
Cement	Mr. Cleatus Fitzgerald
Cherokee	Mr. Jim Fanning
Chilocco (Indian School)	Mr. Calvin Cowen
Choctaw	Mr. James Smith
Choctaw, Dunjee	Mr. Alexander Jones
Claremore	Mr. Harland Jones
Claremore, OMA	Mr. Howard Shirk
Cleo Springs	Mr. Jimmy Burt
Cleveland	Mr. Charles Heusel
Clinton	Mr. Buel Garner
Colcord	Mr. O. E. Holderby, Jr.
Collinsville	Mr. Robert West
Comanche	Mr. Onus Baxter
Commerce	Mr. Dick Currey
Cordell	Mr. Orville Long
Crescent	Mr. Duane Shores
Cromwell	Mr. Alvin Minor
Cushing	Mr. Richard Cobb
Cyril	Mr. Wendell Whitman
Davis	Mr. Bob Tollett
Drittwood, Byron	Mr. Henry Martin
Drumwright	Mr. Lloyd Ernst
Drumwright, Olive	Mr. Joseph Ritchey
Durant	Mr. A. G. Tomme
Edmond	Mr. Lee George
Elk City, Merritt	Mr. Hubert Weil
Elmore City	Mr. Jim Coffey
El Reno	Mr. Terry Nichols
Enid High School	Mr. Delbert King and Mr. Tommy Niles
Erick	Mr. Donovan Bowers

<u>City</u>	<u>Instructor</u>
Fanshawe	Mr. Billy Shipman
Ft. Cobb	Mr. Jerry Acox
Ft. Sill Indian	Mr. James Simms
Fox	Mr. Louis Kimmel
Frederick	Mr. J. D. Norton
Garber	Mr. Ivan Holder
Geary	Mr. Allen Long
Gerty	Mr. Lester Robinson
Grove	Mr. Edward Grimmett
Guthrie	Mr. Earl Deter
Harrah	Mr. Joe Richards
Hartshorne	Mr. John Samuels
Haywood	Mr. Oscar Spinks
Healdton	Mr. Kenneth Fancher
Helena	Mr. Douglass Foltz
Hennessey	Mr. Robert Dowell
Hinton	Mr. Buddy Kennedy
Hobart	Mr. Wallace Krewell and Mr. Walter Turvaville
Idabel	Mr. F. D. Armstrong
Jones	Mr. Don Chase
Kellyville	Mr. Ted Cummings
Keyes	Mr. Merlin Freed
Kiefer	Mr. W. H. Woolf
Kingston	Mr. Joe Reid
Konawa	Mr. James Robertson
Konawa, Vamoosa	Mr. Orville Long
Kremlin	Mr. Dwayne Janzen
Lawton	Mr. Jeff Swindle
Lawton, Eisenhower	Mr. Don Salmen and Mr. Carrel Bowman
Lindsay	Mr. Perry Ross
Lindsay, Hughes	Mr. Eugene Smith
Mangum	Mr. Wilbur Winters
Mannsville	Mr. Eddie Tedder
Maysville	Mr. Jack Dillingham
McAlester	Mr. Frank Sittel
McCurtain	Mr. Brooks Shaw
Medford	Mr. Arlie Goforth
Meeker	Mr. Jack Butler
Meno (Okla. Bible Academy)	Mr. Merlyn Ratzlaff
Midwest City	Mr. Duwane Miller
MWC, Carl Albert	Mr. Frank Lucas
MWC, Del City	Mr. C. D. Foster
Moore	Mr. Robert Phelps
Morris	Mr. Ronnie Smith
Mountain View	Mr. Rolin Hill
Mulhall	Mr. Don Colwell
Muskogee	Mr. Willard Perry
Navajo, Altus	Mr. A. M. Armstrong
Newkirk	Mr. Andrew Loughridge
New Lima	Mr. John Tahsuda

<u>City</u>	<u>Instructor</u>
Norman	Mr. Starlin Powell
Nowata	Mr. Kenneth Guthrie
Ochelata	Mr. J. L. Parker
Oilton	Mr. Jim Lewis
Okeene	Mr. Donald Wahl
Okemah	Mr. Jackie Spears
Okemah, Bearden	Mr. Garland Pennington
Oklahoma City, Central	Mr. H. C. Brooks
OKC, Classen	Mr. Chester Reeves
OKC, Crooked Oaks	Mr. Murl Ergenbright
OKC, Douglass	Mr. Walter Seward
OKC, Grant	Mr. Bob Steele
OKC, Harding	Mr. Bruce Nutt
OKC, Marshall	Mr. James McNally
OKC, Northeast	Mr. Thomas Fowler
OKC, Southeast	Mr. Marvin Shields
OKC, Starr Spencer	Mr. Harold Wood
Okmulgee	Mr. Harold Spoon
Oktaha	Mr. Charles Sparks
Olustee	Mr. Marland Mason
Orlando	Mr. Maitland Goodman
Owasso	Mr. Frank Muskrat
Panama	Mr. Delbert Kirk
Fauls Valley	Mr. Dale Hayhurst
Pawnee	Mr. Ralph Teague
Perkins	Mr. Cecil Acuff
Perry	Mr. A. L. Ebersole
Pittsburg	Mr. Basil Warner
Pond Creek	Mr. Lloyd Gilbert
Purcell	Mr. Allen Moore
Putnam City	Mr. Cecil Cannon
Quinton	Mr. George Foreman
Ramona	Mr. James Grovenburg
Rush Springs	Mr. Bobby Patterson
Sallisaw, Central	Mr. Robert Spears
Sasakwa	Mr. James Musgrove
Savanna	Mr. Art Badgett
Seminole	Mr. Ronald Sheppard
Seminole, Strother	Mr. William Carter
Sharon	Mr. Albert Richmond
Shattuck	Mr. John Bell
Shawnee, St. Gregory	Mr. Raymond Ware
Shidler	Mr. Jack Gilbreath
Skiatook	Mr. Jim Wills
Snyder	Mr. DeWayne Tipton
Spiro	Mr. Eugene Butler
Stillwater, Sr.	Mr. Jim Sloan
Stratford	Mr. Howard Johnson
Sulphur	Mr. Foy Stout
Tahlequah, Sequoyah Indian	Mr. Jim Justice
Tishomingo	Mr. Bill Francis
Tonkawa	Mr. Dale Simpson

<u>City</u>	<u>Instructor</u>
Tulsa, Central	Mr. G. E. Brewer
Tulsa, East Central	Mr. Donald Randolph
Tulsa, Edison High School	Mr. James Patton and Mr. I. D. Powell
Tulsa, Hale	Mr. Ray Duncan and Mr. Clifford Shea
Tulsa, McLain	Mr. Rudolph Lack
Tulsa, Memorial	Mr. Ron Amos
Tulsa, Rogers	Mr. Clyde Glover and Mr. Charles Loper
Tushka	Mr. Jerry Hall
Valliant	Mr. Frank Loar
Watonga	Mr. Ural Stevenson
Waurika	Mr. Raymond Donica
Weleetka	Mr. Harvey Dean
Wellston	Mr. Freeman Patterson
Wewoka	Mr. Boyce Harrison
Whitesboro	Mr. Paul Gwaltney
Wilson	Mr. L. A. Robertson
Woodward	Mr. Jasper Overton
Wright City	Mr. Paul Storey
Wynnewood	Mr. Zorns Berry
Yukon	Mr. Merlyn Randolph

APPENDIX B

**OKLAHOMA STATE UNIVERSITY • STILLWATER**

Department of Industrial Arts Education  
Industrial Education Building Room 104

74074

**TO:** Industrial Arts Teachers  
State of Oklahoma

**FROM:** James L. Sharpton, Graduate Student  
Industrial Arts Education

A curriculum study committee of the Oklahoma Council of Industrial Arts Teacher Educators is currently making a study of the various curriculum offerings in Industrial Arts in Oklahoma public secondary schools. The purpose of this study is to improve instruction in the various areas. It is desirable to know the present status of the Industrial Arts Drafting programs in the secondary schools of Oklahoma so that existing conditions and practices can be made available to the committee.

I am making a survey to collect the necessary information for the purpose of writing a Master's Degree thesis entitled, "A Survey of Industrial Arts Drafting Programs in Oklahoma Public High Schools During 1966-67." I am attempting to contact all Industrial Arts Drafting instructors in the Oklahoma public secondary schools so that a detailed description can be made.

The enclosed questionnaire is designed to secure this information in the most direct manner possible. I have attempted to keep the questionnaire brief and objective to conserve your time in answering the questions.

Your cooperation will be greatly appreciated in completing the questionnaire and returning it in the enclosed, self-addressed and stamped envelope.

Approved By:

L. H. Bengtson, Chairman  
Industrial Arts Education

A SURVEY OF INDUSTRIAL ARTS DRAFTING PROGRAMS IN  
OKLAHOMA PUBLIC HIGH SCHOOLS DURING 1966-1967

James L. Sharpton, Graduate Student  
Department of Industrial Arts Education  
Oklahoma State University  
Spring 1967

Directions: Please check the correct answer on each of the following questions.

\_\_\_\_\_  
Name \_\_\_\_\_

School \_\_\_\_\_ City \_\_\_\_\_

1. Degrees held: B.S. \_\_\_\_\_ M.S. \_\_\_\_\_ Other \_\_\_\_\_

2. Industrial experience:

Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, number of years \_\_\_\_\_ What trade? \_\_\_\_\_  
\_\_\_\_\_

3. Drafting room facilities:

a. Drafting machine. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_ Number \_\_\_\_\_

b. Reproduction printer(s) . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

c. Light table . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

d. Electric erasers. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

e. Overhead projector. . . . .

Permanent \_\_\_\_\_

Part time \_\_\_\_\_

Not available \_\_\_\_\_

f. Movie projector . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

g. Drafting tables . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_ Number \_\_\_\_\_

h. Other \_\_\_\_\_  
 \_\_\_\_\_

4. Number of industrial arts drafting instructors in your school \_\_\_\_\_

5. Average Number of drafting students in your classes \_\_\_\_\_

6. Is there a fee charge for the course? Yes \_\_\_\_\_ No \_\_\_\_\_ How Much?  
 \_\_\_\_\_

7. Methods of presentation:

		<u>Percentage of Time</u>
a. Lecture . . . . .	Yes _____ No _____	_____
b. Demonstration . . . . .	Yes _____ No _____	_____
c. Questioning and discussion. . . . .	Yes _____ No _____	_____
d. Films (sound) . . . . .	Yes _____ No _____	_____
e. Transparencies. . . . .	Yes _____ No _____	_____
f. Charts. . . . .	Yes _____ No _____	_____
g. Models. . . . .	Yes _____ No _____	_____
h. Other _____		_____

8. Title of drafting courses offered:

	<u>Grade Level</u>	<u>Plates Required</u>
a. Drafting I. . . . .	_____	_____
b. Drafting II . . . . .	_____	_____
c. Architectural . . . . .	_____	_____
d. Design. . . . .	_____	_____
e. Mechanical Drawing I. . . . .	_____	_____
f. Mechanical Drawing II . . . . .	_____	_____
g. Other _____		_____

## 9. Subject areas taught in drafting:

- a. Freehand sketching. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- b. Lettering . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- c. Geometric construction. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- d. Orthographic projection . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- e. Dimensioning. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- f. Auxiliary views . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- g. Sections. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- h. Surface developments. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- i. Cams. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- j. Gears . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- k. Architecture. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- l. Map drafting. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- m. Electrical and electronic . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- n. Aerospace . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- o. Esometric . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- p. Dimetric. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- q. Trimetric . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- r. Oblique . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- s. Perspective . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
1. One-point . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
2. Two-point . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
3. Three-point . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- t. Welding drawings. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- u. Inking. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- v. Screws and bolts. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- w. Other fasteners . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_
- x. Working drawings. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

y. Detail drawings. . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

z. Blue print reading . . . . . Yes \_\_\_\_\_ No \_\_\_\_\_

1. Other areas \_\_\_\_\_

\_\_\_\_\_

VITA

James Leroy Sharpton

Candidate for the Degree of

Master of Science

Thesis: A SURVEY OF INDUSTRIAL ARTS DRAFTING PROGRAMS IN OKLAHOMA PUBLIC HIGH SCHOOLS DURING 1966-1967

Major Field: Industrial Arts Education

Biographical:

Personal Data: Born in Glencoe, Oklahoma, May 28, 1941, the son of James A. and Cora M. Sharpton.

Education: Attended grade school in Stillwater, Oklahoma; graduated from Stillwater High School in 1959; received the Bachelor of Science degree from Oklahoma State University with an A major in Industrial Arts Education in May, 1967; completed requirements for the Master of Science degree at Oklahoma State University in July, 1967.

Professional Organizations: Iota Lambda Sigma, Phi Delta Kappa, Red Red Rose.