

NEED FOR A CURRICULUM GUIDE FOR INDUSTRIAL  
ARTS DRAFTING IN THE STATE  
OF OKLAHOMA

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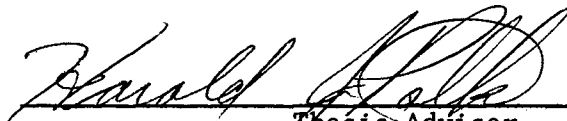
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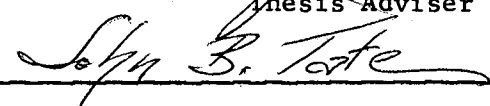
Submitted to the Faculty of the Graduate College  
of the Oklahoma State University  
in partial fulfillment of the requirements  
for the Degree of  
MASTER OF SCIENCE  
May, 1972

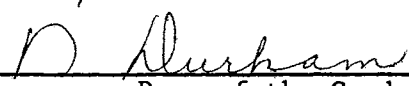
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OF OKLAHOMA

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## ACKNOWLEDGEMENTS

My special appreciation goes to Dr. Harold J. Polk, Thesis Adviser and Head, Industrial Arts Education, for his help and valuable suggestions during the course of the investigation and particularly for his criticism and assistance to the study.

Appreciation is also extended to all those instructors and industries who took the time to complete and return the questionnaires.

I wish to express my appreciation to my wife, Sarah Jane, for her understanding, and for her help in preparing this thesis.

Appreciation is also extended to my typist, Ann Smith.

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## CHAPTER I

### INTRODUCTION

Within the past ten years, drafting has rapidly become one of the most important professions of our society. While the demand for engineers has decreased markedly, the demand for technicians and skilled artisans has increased appreciably. For example, Oklahoma State Employment Service figures show that during the year beginning in August 1970 through July 1971, they filled 11,894 positions in the technical fields and only 225 positions in the engineering fields.<sup>1</sup>

To keep up with the ever increasing need of these technicians and skilled artisans, the government is spending millions of dollars each year for the development of Area Vocational-Technical schools throughout Oklahoma and other states in the nation. These area schools were developed to provide proper instruction for the needed skills in the industrial world.

Among these skills is drafting. According to one source:

Employment opportunities for draftsmen are expected to be favorable through the 1970's. Prospects will be best for those having post-high school drafting training. Well qualified high school graduates who have had only high school drafting, however, also will be in demand for some types of jobs. ...Employment of draftsmen is expected

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<sup>1</sup>This information was obtained through a personal phone call to the Oklahoma State Employment Service, Oklahoma City.

to rise rapidly as a result of the increasing complex design problems of modern products and processes.<sup>2</sup>

Since some high school graduates who have had only high school drafting are in demand for some types of jobs, industrial arts drafting students should have an understanding of industrial needs in the field of drafting. The importance of industrial arts drafting cannot be overemphasized in our high schools today, since drawing is the language of industry and industry is the core of our economy.

#### Statement of the Problem

In order to provide the high school with the necessary knowledge of industrial drafting, the present curriculum must be restructured to permit students to understand the current and future needs of industry. In order to develop a consistent understanding of these needs, a state-wide curriculum guide is needed in the teaching of industrial arts drafting. It is not the author's intent to develop a curriculum guide, but only to reveal the need for one.

#### Purpose of the Study

The purpose of this study is to ascertain the extent to which public high school industrial arts drafting programs in the state of Oklahoma, through course content offerings, are providing knowledge consistent with industry's demands in the field of drafting. A study of this type is needed in order to show that present industrial arts drafting programs are in need of a state-wide curriculum guide for

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<sup>2</sup>"Drafting," prepared by Division of Research, Planning and Evaluation, Oklahoma State Department of Vocational and Technical Education, (Stillwater), p. 5.

industrial arts drafting in Oklahoma.

### Importance of the Study

It is hoped that this study will provide a basis upon which to develop a state-wide curriculum guide for industrial arts drafting in Oklahoma. Without a study of this type, it would be impossible to ascertain what the demands of industry are, and whether or not a consistent understanding of these demands is being taught in industrial arts drafting courses at the high school level. If it can be proven by a study such as this one, that most high school industrial arts drafting programs are not providing students with an understanding of the demands of industry, something must be done to correct the deficiencies in the present programs. The correction of such deficiencies might best be done by means of a curriculum guide.

### Hypothesis

Based on information found in a review of the literature (see Chapter II) concerning the status of industrial arts drafting in the state of Oklahoma during the school year 1966-1967, the general hypothesis for this study is that high school industrial arts drafting courses are not providing students with an understanding of the demands of industry in the field of drafting.

More specifically, this study will answer the following questions:

1. Are adequate drafting room facilities which are needed to give the students an understanding of industry, available in Oklahoma's public high schools?
2. Are up-to-date methods of presentation being used by high



school instructors in their industrial arts drafting classes?

3. Is there a variety of industrial arts drafting courses from which the student may choose to enroll?

4. What subject areas are being taught in public high school industrial arts drafting courses?

#### Definition of Terms

The following definitions have been compiled to explain the use of certain words as they pertain to this study. Credit has been given for definitions compiled by persons other than the author of this study.

1. 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, consumption, and recreation through actual experiences with materials and goods. It also serves as an exploratory experience which is helpful in the choice of a vocation.<sup>3</sup>
2. 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>4</sup>
3. 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

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<sup>3</sup> Oklahoma Curriculum Improvement Commission, A Guide to Improvement of Industrial Arts in Oklahoma (Oklahoma City, 1965), p. 2.

<sup>4</sup> Ibid., p. 12.

projection, assembly drawings, working drawings, engineering drawing, pictorial drawing, and reproduction of drawings.<sup>5</sup>

#### Limitations of the Study

This study will be limited to only those Oklahoma high schools which were listed as offering Industrial Arts Drafting during 1970-1971. Junior high schools will not be included. Since unexpected curriculum changes are bound to occur, the list may not be completely accurate.

The questionnaire method of research will be a limiting factor in this study. Everyone has a tendency to be prejudiced and somewhat biased in his answer when completing a questionnaire.

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<sup>5</sup>James L. Sharpton, "A survey of Industrial Arts Drafting programs in Oklahoma Public High Schools During 1966-1967," (unpublished Master's thesis, Oklahoma State University, 1967), p. 4.

## CHAPTER II

### REVIEW OF THE LITERATURE

The literature concerned with evaluating the current status of industrial arts drafting in Oklahoma public high schools is not as abundant as it could be. It would seem as though we are not placing enough emphasis on the evaluation of our curriculum at the secondary level of education. However, the author has found several studies that have been done which point out useful methods, procedures, and tools which may be used in the present study. These studies are included in this review of the literature.

Included also in the review of the literature is a discussion of two research studies which were relevant to the present study. One, relatively recent, differed in purpose from this study but was used to back up its hypothesis. The second was more recent and very similar to the present study except that it was concerned with a different industrial field, that of electronics technology. It proved very useful to the present author in deciding upon the research procedure to be used in this study.

It has been pointed out in many studies that there is a definite need for draftsmen of all types in every area of the United States. Studies also show that some draftsmen receive no more training than that which they receive in their high school drafting courses. For example, it was pointed out in one study that "It is recognized that

instruction and training in the fields of Drafting and/or Design can be given in various degrees and levels of accomplishment ... ranging from senior high school to a baccalaureate degree."<sup>1</sup> This should be kept in mind when developing a curriculum for high school industrial arts drafting.

According to the same source, "A curriculum for 'Junior Draftsmen' should contain not only basic but advanced drawing courses in one or more specialized fields. It should have a complete foundation in the theory and technique of drafting and a highly developed manual skill in the use of instruments and the ability to do outstanding free-hand lettering and sketching in the field of specialization."<sup>2</sup>

It is understood that drawing courses involve not only drawing board practice in a formal class but also lecture, discussion, and individual guidance from an instructor. Also, outside assignments are usually a part of the drawing course.

Fred J. Hill, with a survey of teaching mechanical drawing in the state of Kansas during the school year 1959-60, discovered that many objectives spoken of earlier in this chapter were not being met in the Kansas high schools. For instance, as Hill stated, "Only about thirty per cent of the drafting instructors teach freehand sketching."<sup>3</sup>

Perhaps more studies concerned with surveying and evaluating our current curriculum in industrial arts drafting would assist educators

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<sup>1</sup>American Institute for Design and Drafting, A Program of Curricula Evaluation and Certification Procedure (Published ERIC Document, ID 023 837, 1971), p. 5.

<sup>2</sup>Ibid., p. 7.

<sup>3</sup>Fred J. Hill, "A Survey of Teaching Mechanical Drawing," (unpublished Master's report, Oklahoma State University, 1960), p. 42.

in up-dating present programs.

One study, a Master's thesis by James L. Sharpton, was done to reveal existing conditions and current practices of industrial arts drafting programs in Oklahoma public high schools during the school year 1966-67.<sup>4</sup> In this study a questionnaire was developed and sent to the industrial arts drafting instructors of 200 public high schools in Oklahoma. The results showed that approximately 22 per cent of those responding had available for instruction at least one drafting machine. But, if classes were very large, not everyone had the opportunity to use the drafting machine.

Another area indicating a need of improvement was that of instructional presentation. Approximately 91 per cent of the lessons were presented without the aid of transparencies.

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

It was found that the drafting programs were including the basic areas suggested by the Curriculum Improvement Commission, but that many of the programs in the state were under-developed and some were over-developed.

Although Sharpton's study is somewhat different from the present study, it backs up the hypothesis of the present study, that high school industrial arts drafting programs are not providing students

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<sup>4</sup>James L. Sharpton, "A Survey of Industrial Arts Drafting Programs in Oklahoma Public High Schools During the Year 1966-1967," (unpublished Master's thesis, Oklahoma State University, 1967).

with an understanding of the demands of industry in the field of drafting.

Of all the material reviewed which could be used in the present study, a research study from a report in an industrial arts journal proved to be the most helpful to the present author in determining what method of research to use. This study, by Richard J. Vasek, was conducted in electronics technology.<sup>5</sup>

In Vasek's study, names and addresses of electronics instructors were obtained through state supervisors of technical education. Names of firms employing electronic technicians were obtained through State Employment Security offices and through state industrial directories.

Questionnaires were sent to schools for the purpose of discovering what was being taught in the schools. At the same time a similar questionnaire was sent to various industries, to attempt to discover what was required in electronics technology.

Vasek found that schools were not meeting needs of industry as they should be. According to Vasek:

...a closer working relationship between guidance, industrial, and educational personnel is recommended. More emphasis should be placed upon the development and diversified approach to technical training.<sup>6</sup>

The present author will use Vasek's approach to this study in attempting to prove the hypothesis.

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<sup>5</sup>Richard J. Vasek, "Electronics Technology: Content Taught Versus Needed Content," Industrial Arts and Vocational Education, LVII (June, 1968), 42-45.

<sup>6</sup>Ibid., p. 45.

## CHAPTER III

### METHOD OF RESEARCH

The principal aim of this study is to ascertain the extent to which high school industrial arts drafting programs, through course content, are providing knowledge consistent with industry's needs in the field of drafting.

The needed information for this study as determined from the problem is a descriptive analysis of the demands of industry in the field of drafting, together with an analysis of the industrial arts drafting programs in Oklahoma public high schools. Both sides are necessary in order to ascertain whether or not the high schools are developing a consistent understanding of industry's needs.

Due to the nature of this study, it was decided that a questionnaire would be the best means of collecting the data. A questionnaire which could be used in the present study with minor revisions was found in a study in a Master's thesis.<sup>1</sup> A discussion of the study containing the questionnaire is included in the Review of the Literature.

Names and addresses of public high school industrial arts drafting instructors have been compiled in the annual Oklahoma Industrial

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<sup>1</sup>James L. Sharpton, "A Survey of Industrial Arts Drafting Programs in Oklahoma Public High Schools During 1966-1967," (unpublished Master's thesis, Oklahoma State University, 1967), Appendix B.

Education Directory 1970-71. The mailing list was determined from this annual directory. All teachers listed as teaching industrial arts drafting were sent a questionnaire and a letter of instruction.

Names of firms employing draftsmen were obtained through State Employment Security offices and through state industrial directories. A questionnaire and letter of instruction similar to those sent to the high school instructors were mailed to several of these firms, in order to discover the current demands of industry in the field of drafting.

The data from each of the questionnaires has been tabulated and the content taught by the high schools has been compared to the content needed by industry. From the tabulated results the researcher has tested his hypothesis and drawn conclusions.



## CHAPTER IV

### REPORT OF THE SURVEY

It has been stated in a previous chapter, that the principal aim of this study is to ascertain the extent to which high school industrial arts drafting programs, through course content, are providing knowledge consistent with industry's needs in the field of drafting. It is the purpose of this chapter to present the results of the investigation in logical sequence and in detail. It is hoped that through this presentation, the writer has accomplished the purpose of the study, and made available to those interested a collection of data which represents the co-operative efforts of 142 industrial arts drafting instructors in the Oklahoma public high schools and 35 industries throughout the state.

#### Sources of Data

As stated in the previous chapter, the questionnaire method was employed to acquire the data for this study.

In composing the questionnaire, the writer endeavored to satisfy as many of the accepted requirements as possible. The primary purposes of the questionnaires were (1) to acquire an accurate picture of the existing status of industrial arts drafting in Oklahoma public high schools, and (2) to determine the needs of industry in the field of drafting. By doing this, the writer is able, through comparison,

to determine whether Oklahoma public high school industrial arts drafting courses are providing their students with an understanding of the needs of industry in the field of drafting.

Administration of the Questionnaires. A questionnaire, a letter of instruction, and a self addressed, stamped, return envelope were sent to 182 industrial arts drafting instructors in Oklahoma public high schools. The questionnaires were returned by 142 instructors, giving a response of 78.02 percent. A similar questionnaire, a letter of instruction, and a self addressed, stamped, return envelope were sent to 42 industries throughout the state of Oklahoma. These questionnaires were returned by 35 of the industries, giving a response of 83.33 percent. (Copies of the questionnaire and the letters of instruction are in the appendix. Also included in the appendix is a copy of the follow-up card which was mailed to those high school instructors who had not responded within ten days of the first mailing of the questionnaire, and a copy of the letter which was sent five days after the post card was mailed. Included also, is a similar letter sent to those industries who did not respond within ten days of the mailing of the first questionnaire.)

#### Survey Data

The data from the questionnaires are divided into four major areas. These areas are: (1) drafting room facilities, (2) methods of presentation, (3) subject areas taught in drafting, and (4) degree of understanding of the needs of industry provided by the high school industrial arts drafting courses.

The data are reported for the most part in tabular form. The

responses to the questionnaires are listed as to frequency of occurrence, and percentages are determined for each area of response.

Drafting Room Facilities. The importance of proper facilities in a drafting program cannot be over emphasized. The most advanced instructor may be limited by a lack of drafting room facilities. Proper facilities are also a limiting factor in the progress of the students. Question one sought to reveal the status of the drafting room facilities available in Oklahoma public high schools, and contrast this with those facilities of which industry feels their beginning draftsmen should have a working knowledge. As can be seen in Table I, of the instructors responding, only 23.9 percent have drafting machines available for their students. At the same time, 48.6 percent of the industries responding felt it very important that their beginning draftsmen have a working knowledge of the drafting machine. Another 31.4 percent of the industries felt it important that their beginning draftsmen have a working knowledge of the drafting machine, leaving only 20 percent who felt it was of little significance. Of these 20 percent, several pointed out that their draftsmen learn the use of the drafting machine in training programs after they are hired.

Table I also reveals that a working knowledge of the reproduction printer is considered very important by 28.6 percent of industry, considered important by 37.1 percent and of little significance by 34.3 percent. This seems to indicate that many of the students are lacking in a working knowledge of the reproduction printer since only 23.2 percent of the schools have them available. Also, as seen in the table, only 9.2 percent of the public high schools have available to their students a light table, and 75.2 percent of all high school

TABLE I  
DRAFTING ROOM FACILITIES

Facilities	Educational Availability		Importance as Seen by Industry <sup>2</sup>		
	Freq.	Per Cent <sup>1</sup>	Very Important	Important	Of Little Significance
Drafting machines	34	23.9%	48.6%	31.4%	20.0%
Reproduction printer	33	23.2%	28.6%	37.1%	34.3%
Light table	13	9.2%	17.1%	28.6%	54.3%
Drafting table	103	75.2%	68.6%	20.0%	11.4%

<sup>1</sup>Per Cent of 142 responses

<sup>2</sup>Per Cent of 35 responses

drafting courses have drafting tables available to their students. This implies that 24.8 percent must improvise by some other means. Many of the respondents indicated that they are using cafeteria tables, or wood shop work benches.

This data would indicate that there is a need for improvement in the drafting room facilities in the Oklahoma public high schools.

Methods of Presentation. The importance of adequate facilities has already been mentioned. However, without the proper methods of presentation at the appropriate time, the facilities mean little. Question two sought to show the current methods being used by the instructors, and what methods industry feels are most important in the teaching of drafting. Table II shows the frequency of methods used and the percentage of each compared to the total response. Table II

also shows industry's opinion as to the emphasis on certain methods of presentation. The table indicates that lecture and demonstration are the predominant methods used. Questioning and discussion were also rated fairly high. Upon examination of the table it can be seen that industry would seem to feel that demonstration should be the most often used method. 60.0 percent felt it should be used often, while 40.0 percent felt it should be used occasionally. Not one industry felt it should be seldom used.

TABLE II  
METHODS OF PRESENTATION

Methods	Freq.	Of Total Percentage <sup>1</sup>	Opinion of Industry on Frequency of Use of Method <sup>2</sup>		
			Often	Occasionally	Seldom
Lecture	138	20.6%	31.4%	57.2%	11.4%
Demonstration	137	20.4%	60.0%	40.0%	0.0%
Questioning and Discussion	126	18.8%	54.3%	40.0%	5.7%
Films (sound)	40	6.0%	5.7%	57.2%	37.1%
Transparencies	55	8.2%	17.1%	68.6%	14.3%
Charts	50	7.5%	8.6%	77.1%	14.3%
Models	92	13.7%	37.1%	57.2%	5.7%
Field trips	<u>32</u>	<u>4.8%</u>	17.1%	71.5%	11.4%
Total	670	100.0%			

<sup>1</sup>Percentage of total presentations made

<sup>2</sup>Per Cent of 35 respondents

Industry also places more importance upon questioning and discussion than do the high school instructors. The high schools indicated that questioning and discussion is used 18.8 percent of the time as a method of presentation. This is the third most used method. Industry indicated that it should be second to demonstration. The third most important method of presentation as indicated by industry is the use of models. As seen in the table, models are the fourth most used methods of presentation in the high schools, being used 13.7 percent of the time.

Perhaps the greatest difference in opinion is the lecture method of presentation. While it is the most often used by instructors in the high schools, being used 20.6 percent of the time, industry rates it as the fourth most important method of presentation. 31.4 percent of the industries responding felt it should be used often, 57.2 percent felt it should be used occasionally and 11.4 percent felt it should be seldom used.

Table II also indicates that field trips are used only 4.8 percent of the time in high schools. This is the least used method of presentation by the high schools, yet 17.1 percent of industry felt it should be used often, 71.5 percent felt it should be used occasionally and 11.4 percent felt it should be seldom used.

Transparencies are used in only 8.2 percent of the presentations, while 17.1 percent of the industries felt they should be used often, 68.6 percent felt they should be used occasionally and 14.3 percent felt they should be seldom used. This would indicate that there should be more emphasis placed on the use of transparencies to teach drafting.

Subject Areas Taught. This area of the survey sought to reveal:

(1) the subject areas most frequently taught in the Oklahoma public high school industrial arts drafting courses, and to what extent they are being taught, and (2) the subject areas which industry feels are required knowledge, preferred knowledge, or unnecessary knowledge for their beginning draftsmen and junior draftsmen. The responses to this part of the questionnaires have been compiled in Table III, which compares content taught in the Oklahoma public high school industrial arts drafting courses to the content needed by industry.

The instructors to whom the questionnaire was mailed were asked to mark the instrument as it pertained to their program according to the following criteria:

1. Taught in Depth--Instructional items which the instructor covers thoroughly.
2. Discussed Briefly--Information which the instructor covers briefly but does not consider extremely important.
3. Not Taught--Instructional units that the instructor mentions only as interest items, are of little significance or are so specialized that there is no room for them in the drafting curriculum.

The industries to whom the similar questionnaire was mailed were asked to mark the check list as it pertained to their beginning draftsmen's educational needs according to the following criteria:

1. Required Knowledge--Instructional units of which their draftsmen must have a working knowledge in order to perform their duties.
2. Preferred Knowledge--Information not absolutely essential but with which their draftsmen should be familiar.

TABLE III  
CONTENT TAUGHT VERSUS NEEDED CONTENT

Subject Area	Educational Emphasis			Industrial Emphasis		
	Taught in Depth	Discussed Briefly	Not Taught	Required Knowledge	Preferred Knowledge	Unnecessary Knowledge
Freehand Sketching	28.2%	61.3%	10.5%	34.3%	51.4%	14.3%
Lettering	75.4%	23.2%	1.4%	74.3%	25.7%	0.0%
Geometric Construction	56.3%	34.5%	9.2%	51.4%	45.7%	2.9%
Orthographic projection	89.4%	7.0%	3.6%	60.0%	31.4%	8.6%
Dimensioning	92.9%	5.7%	1.4%	85.7%	14.3%	0.0%
Auxiliary views	60.6%	30.2%	9.2%	74.3%	14.3%	11.4%
Sections	61.3%	28.9%	9.8%	85.7%	11.4%	2.9%
Surface developments	26.1%	40.1%	33.8%	25.7%	45.7%	28.6%
Cams	8.5%	33.8%	57.7%	5.7%	37.1%	57.2%
Gears	8.5%	34.5%	57.0%	5.7%	40.0%	54.3%
Architecture	53.5%	28.9%	17.6%	2.9%	45.7%	51.4%
Map drafting	7.7%	26.8%	65.5%	25.7%	31.4%	42.9%
Electrical and electronic	5.7%	18.3%	76.0%	25.7%	54.3%	20.0%
Aerospace	2.1%	7.7%	90.2%	5.7%	20.0%	74.3%
Isometric	76.0%	17.0%	7.0%	42.9%	45.7%	11.4%
Dimetric	1.4%	16.2%	82.4%	5.7%	42.9%	51.4%
Trimetric	0.7%	14.8%	84.5%	5.7%	40.0%	54.3%



TABLE III (Continued)

Subject Area	Educational Emphasis			Industrial Emphasis		
	Taught in Depth	Discussed Briefly	Not Taught	Required Knowledge	Preferred Knowledge	Unnecessary Knowledge
Oblique Perspective	40.1%	30.2%	29.7%	14.3%	45.7%	40.0%
One-point	25.3%	47.9%	26.8%	14.3%	37.1%	48.6%
Two-point	25.3%	38.7%	36.0%	5.7%	48.6%	45.7%
Three-point	9.2%	27.5%	63.3%	5.7%	34.3%	60.0%
Welding drawings	2.8%	22.5%	74.7%	42.9%	40.0%	17.1%
Inking	21.1%	37.3%	41.6%	37.1%	34.3%	28.6%
Screws and bolts	33.8%	43.0%	23.2%	40.0%	34.3%	25.7%
Other fasteners	9.8%	34.5%	55.7%	31.5%	37.1%	31.4%
Working drawings	76.0%	18.3%	5.7%	68.5%	28.6%	2.9%
Detail drawings	52.8%	31.0%	16.2%	68.5%	28.6%	2.9%
Blue print reading	18.3%	45.1%	36.6%	77.1%	22.9%	0.0%

3. Unnecessary Knowledge--Instructional units or items which have little or no significance to the responsibilities of their draftsmen.

The information in Table III is given in percentage of respondents answering as they did. For example, freehand sketching was taught in depth by 28.2 percent of the respondents, discussed briefly by 61.3 percent of the respondents and not taught by 10.5 percent of the respondents. While 34.3 percent of the respondents from industry indicated that freehand sketching was required knowledge for their beginning draftsmen, 51.4 percent indicated that it was preferred knowledge, and 14.3 percent felt that it was unnecessary knowledge.

Upon examination of Table III it can be seen that the six areas which are being taught in depth most frequently are: (1) dimensioning, (2) orthographic projection, (3) working drawings, (4) isometric projection, (5) lettering, and (6) sections, respectively. The six areas which are listed most frequently as required by industry are: (1) dimensioning, (2) sections, (3) blueprint reading (4) lettering, (5) working drawings and detail drawings, and (6) orthographic projection, respectively. The subject area least taught by high school industrial arts drafting courses and also least required by Oklahoma industries was aerospace drafting.

Degree of Understanding of the Needs of Industry. This area of the survey sought to reveal the extent to which industrial arts drafting instructors felt their drafting programs were providing their students with an understanding of the needs of industry in the field of drafting. Also a similar question on the questionnaire sent to industry sought to reveal the extent to which industry feels that

industrial arts drafting programs are providing their students with an understanding of the needs of industry in the field of drafting.

Table IV shows that 4.2 percent of the instructors felt that their industrial arts drafting programs were more than sufficiently providing their students with an understanding of the needs of industry in the field of drafting, 62.7 percent felt they were sufficiently providing their students with an understanding of the needs of industry, and 33.1 percent felt that their programs were insufficient. Of the industries responding, 54.3 percent felt that Oklahoma public high schools are sufficiently providing their students with an understanding of the needs of industry in the field of drafting. The remaining 45.7 percent felt that the public schools are insufficiently providing their students with an understanding of industry's needs.

TABLE IV

DEGREE OF UNDERSTANDING OF NEEDS OF INDUSTRY PROVIDED BY  
HIGH SCHOOL INDUSTRIAL ARTS DRAFTING COURSES

	As Seen by Instructors	As Seen by Industry
More than sufficiently	4.2%	----
Sufficiently	62.7%	54.3%
Insufficiently	33.1%	45.7%
Total	100.0%	100.0%

Title of Drafting Courses. This area of the questionnaire sought to reveal the courses which are being offered in the Oklahoma public high school industrial arts drafting programs, and to reveal the importance of these courses as seen by industry. However, due to the fact that course content cannot be determined by the title of a drafting course, the data on the questionnaire sent to industry could not be considered reliable.

Table V, however, does include the data received from the high school instructors. The table shows what drafting courses are being offered in Oklahoma public high school industrial arts programs. By adding Mechanical Drawing I and Drafting I together, it appears that 57.7 percent of the drafting classes offered are beginning courses.

TABLE V  
TITLE OF DRAFTING COURSE

Title	Frequency	Per Cent
Drafting I	76	27.7%
Drafting II	45	16.4%
Architectural	32	11.7%
Design	3	1.1%
Mechanical Drawing I	82	30.0%
Mechanical Drawing II	<u>36</u>	<u>13.1%</u>
Total	274	100.0%

Design courses are the least prevalent courses offered. Only three design courses are offered in all of the Oklahoma public high school industrial arts programs responding, for a percentage of 1.1 percent.

This chapter has presented, for the most part in tabular form, the data acquired by the survey of 142 public high school industrial arts drafting programs and 35 Oklahoma industries.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The intent of this study was to ascertain the extent to which high school industrial arts drafting programs in the state of Oklahoma, through course content offerings, are providing knowledge consistent with industry's demands in the field of drafting. Questionnaires were mailed to 182 industrial arts drafting instructors throughout the state, with 142 usable questionnaires returned. Also, 42 similar questionnaires were mailed to various industries throughout the state, with 35 usable questionnaires being returned. The survey was divided into five basic areas for tabulation purposes, each having a specific question to be answered.

The first area sought to reveal the status of the drafting room facilities available in Oklahoma public high schools, and to contrast this with those facilities with which industry felt their beginning draftsmen should have a working knowledge. It was disclosed that approximately 25 percent of the industrial arts drafting programs in Oklahoma are being conducted using a substitute for drafting tables. It was also noted that approximately 24 percent of those responding have available for instruction at least one drafting machine. Industry felt that both of these facilities are extremely important items of which their beginning draftsmen should have a working knowledge.

The second area indicated a need for improvement in the methods

of presentation of instructional material. Transparencies are used only 8.2 percent of the time, indicating that approximately 92 percent of the lessons are presented without the aid of transparencies. Field trips are seldom used as a method of presentation, being used only 4.8 percent of the time.

The third area, which dealt with subject area taught, shows that the six areas which are being taught in depth most frequently are: dimensioning, orthographic projection, working drawings, isometric projection, lettering, and sectional views, respectively. The six areas which were listed most frequently as required by industry were: dimensioning, sections, blueprint reading, lettering, working and detail drawings, and orthographic projections, respectively.

Area four indicated that the drafting instructors rated their programs higher than industry rated them when asked how well they felt the programs were providing the students with an understanding of the needs of industry in the field of drafting.

The fifth area indicated that 57.7 percent of the industrial arts drafting classes in Oklahoma public high schools are beginning courses in drafting. Also, design courses make up only 1.1 percent of all industrial arts drafting courses in Oklahoma public high schools.

### Conclusions

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,

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, sections, auxiliary views, and architectural drawing. The depth to which these goals are to be pursued in a beginning course will depend on time allotment.<sup>1</sup>

When these objectives are compared to the responses on the questionnaires from the high school industrial arts drafting programs, it can be seen that many of the programs are falling short of the objectives.

#### Recommendations

In view of the evidence presented, the data indicate that there are many under-developed industrial arts drafting programs in the state of Oklahoma, and a few over-developed programs. The author therefore makes the following recommendations:

1. That a curriculum guide be made available to the instructors so that the development of a standardized program can be obtained throughout the state.
2. That school systems provide their industrial arts drafting instructors with the proper facilities for an adequate drafting program.
3. That the instructors evaluate their own programs periodically, and update them according to industry's needs.
4. That a study of this type be done periodically for the betterment of industrial arts drafting programs.

---

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



## A SELECTED BIBLIOGRAPHY

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APPENDIX A

## INDUSTRIAL EDUCATION INSTRUCTORS TO WHOM THE QUESTIONNAIRE WAS MAILED

<u>City</u>	<u>Instructor</u>
Ada, Byng	Mr. Robert Allen
Ada, Latta	Mr. Charles Bigham
Afton	Mr. Hugh Sapp
Aline	Mr. Melvin Ricks
Allen	Mr. Jim Allred
Alva	Mr. Joe Heaton
Anadarko	Mr. Steven Winn
Ardmore	Mr. C. E. Jacobson
Atoka	Mr. W. J. Bowman
Bartlesville, College	Mr. R. L. Quinton
Bartlesville, Sooner	Mr. Gary Randall
Beaver	Mr. Eddie Trew
Bennington	Mr. Gibson Beal
Bethany	Mr. Vester Holman
Bixby	Mr. Leon Hicks
Blackwell	Mr. Charles Hetrick
Blanchard	Mr. Jerald McDonald
Blue	Mr. Bob Roundtree
Boley	Mr. Wilbur Stevenson
Boswell	Mr. Ray Latham
Boynton	Mr. John Schaublin
Braman	Mr. Keith Gilbert
Bristow	Mr. Kenneth Guthrie
Burlington	Mr. Willis Colson
Burns Flat	Mr. Robert Birdwell
Cache	Mr. Alvin Richey
Caddo	Mr. J. V. Edwards
Calvin	Mr. Thomas Whitaker
Cameron	Mr. John Fox
Canton	Mr. John Petree
Cashion	Mr. David Yadon
Cement	Mr. Coy D. Tugman
Cherokee	Mr. Jim Fanning
Chilocco	Mr. Calvin Cowen
Choctaw	Mr. Kenneth Leach
Cleveland	Mr. Milton F. Vaughn
Coalgate	Mr. Ronal Collins
Colbert	Mr. Carl Dillinger
Colcord	Mr. O. E. Holderby Jr.
Comanche	Mr. Onus Baxter
Commerce	Mr. Dick Currey
Cordell	Mr. Orville Long
Crescent	Mr. Duane Shores
Cromwell	Mr. D. D. Wilson
Cushing	Mr. Gary Pickett
Custer	Mr. Kenneth Dickerson
Cyril	Mr. Wendell Whitman
Davis	Mr. Bob Tollett
Depew	Mr. Ray O. Bond
Dewey	Mr. Charles Hankins

<u>City</u>	<u>Instructor</u>
Dibble	Mr. Robert E. Warford
Drumright	Mr. Lloyd Ernst
Durant	Mr. A. G. Tomme
Earlsboro	Mr. Frank Bryant
Edmond	Mr. Ronald Joe Straw
Elk City	Mr. Hubert Weil
Elmore City	Mr. Don Blankenship
El Reno	Mr. Terry Nichols
Enid	Mr. Tommy Niles
Erick	Mr. Rollin Hill
Ft. Sill	Mr. James Simms
Fox	Mr. Louis Kimmel
Frederick	Mr. J. D. Norton
Gage	Mr. Wayne L. Mackey
Garber	Mr. Irvine Holder
Geary	Mr. Allen Long
Granite	Mr. J. R. Nicholson
Grove	Mr. Edward Grimmett
Guthrie	Mr. Earl Deter
Harrah	Mr. Joe Richards
Hartshorne	Mr. Leon Burke
Healdton	Mr. Tom Worsham
Hennessey	Mr. Robert Dowell
Hinton	Mr. Buddy Kennedy
Hobart	Mr. Walter Turvaville
Hominy	Mr. David Butler
Hooker	Mr. Nick Miles
Jenks	Mr. J. D. Newland
Jones	Mr. Don Chase
Kelleyville	Mr. Ted Cummings
Keyes	Mr. Jack Shafer
Kingston	Mr. Boyce Harrison
Konawa	Mr. James Robertson
Kremlin	Mr. Dwayne Janzen
Laverne	Mr. Ronald Duncan
Lawton, Lawton High	Mr. Jeff Swindle
Lawton, Eisenhower	Mr. Garrel Bowman
Lindsay	Mr. Joseph Ritchey
Madill	Mr. Rex R. Rowe
Mangum	Mr. Garland Roper
Maud	Mr. Glen Rhodes
Maysville	Mr. Odie Lawrence
McAlister	Mr. Frank Sittel
McCurtain	Mr. Brooks Shaw
Medford	Mr. Paul Krehny
Meeker	Mr. Jack Pryor
Dell City	Mr. C. D. Foster
Moore	Mr. Robert Phelps
Morris	Mr. Richard Teel
Mounds	Mr. S. D. Carrol
Mountain View	Mr. James O. Poole
Muskogee	Mr. Willard Perry

<u>City</u>	<u>Instructor</u>
Mustang	Mr. Roger Eells
Navajo	Mr. A. M. Armstrong
Newkirk	Mr. Andrew Loughridge
New Lima	Mr. John Tahsuda
Nobel	Mr. Ronnie Rippy
Norman	Mr. Starlin Powell
Nowata	Mr. Paul Statham
Oilton	Mr. Lem Lewis
Okarche	Mr. Burton Ferrell
Okeene	Mr. James Jones
Okemah	Mr. Jackie Spears
Oklahoma City, Classen	Mr. Chester Reeves
OKC, Douglass	Mr. Don Burns
OKC, Dunjee	Mr. Willie Case
OKC, John Marshall	Mr. Steve Casida
OKC, Northwest Classen	Mr. Fred Holloway
OKC, Southeast	Mr. Marvin Shields
OKC, Starr Spencer	Mr. Harold Wood
Okmulgee	Mr. John Busey
Oktaha	Mr. Dale Lynn
Olustee	Mr. Jim Dollar
Panama	Mr. Tommie Lewis
Pauls Valley	Mr. Dale Hayhurst
Pawnee	Mr. Ralphe Teague
Perkins	Mr. Jack Meyers
Perry	Mr. A. L. Ebersole
Pittsburg	Mr. Basil Warner
Pocola	Mr. Chester Brannon
Pond Creek	Mr. Lloyd Gilbert
Porter	Mr. Robert Spears
Purcell	Mr. Charles Lowe
Putnam	Mr. Cecil Cannon
Rush Springs	Mr. Fred C. Aaron
Sapulpa	Mr. Ted Johnson
Sasakwa	Mr. James Musgrove
Seminole, Seminole High	Mr. Alan Ledbetter
Seminole, Pleasant Grove	Mr. Daniel Taylor
Seminole, Strother	Mr. William Carter
Sentinel	Mr. Eugene Parker
Sharon	Mr. Albert Richmond
Shattuck	Mr. L. R. Holley
Shawnee	Mr. Raymond Ware
Shidler	Mr. Dwight Milliken
Skiatook	Mr. Robert Hunt
Spiro	Mr. Eugene Butler
Spencer, Dunjee	Mr. Willie Case
Sperry	Mr. Alfred Rust
Sterling	Mr. Roy Jennings
Stilwell	Mr. Johnny Mays
Stratford	Mr. Howard M. Briggs
Sulphur	Mr. Foy Stout
Tahlequah	Mr. Jim Justice

<u>City</u>	<u>Instructor</u>
Talala	Mr. Johnnie Riddle
Tecumseh	Mr. Darryll Wilsie
Tishomingo	Mr. Bill Francis
Tondawa	Mr. Dale Simpson
Tulsa, Central	Mr. G. E. Brewer
Tulsa, East Central	Mr. Donald Randolph
Tulsa, Edison	Mr. James Womack
Tulsa, Hale	Mr. Ray Duncan
Tulsa, Memorial	Mr. P. J. Pallissard
Tulsa, Rogers	Mr. Clyde Glover
Tulsa, Washington	Mr. Howard Thomas
Tulsa, Webster	Mr. Elmer Mabry
Tushka	Mr. Jerry Hall
Tyrone	Mr. Larry Cox
Valliant	Mr. Frank Loar
Vinita	Mr. William Anderson
Watonga	Mr. Elmer Class
Waurika	Mr. Wiley T. Burden
Wayne	Mr. Don Crull
Weleetka	Mr. Garland Pennington
Wewoka	Mr. Jim Lawson
Wilburton	Mr. Ronald Adams
Wilson	Mr. Bill Monroe
Wister	Mr. Buford Powers
Wright City	Mr. Paul Storey
Wynnewood	Mr. Tom McKay
Yarbrough	Mr. Frederick Boyd
Yukon	Mr. Merlyn Randolph

## INDUSTRIES TO WHOM THE QUESTIONNAIRE WAS MAILED

<u>Industry</u>	<u>City</u>
Oklahoma Department of Highways	Oklahoma City
OCAMA, Tinker Air Force Base	Midwest City
City of Oklahoma City	Oklahoma City
North American Rockwell Corp.	Tulsa
City of Bartlesville	Bartlesville
City of Midwest City	Midwest City
Department of Transportation F.A.A.	Oklahoma City
Oklahoma Natural Gas Company	Tulsa
Oklahoma Gas and Electric Company	Oklahoma City
Phillips Petroleum Company	Bartlesville
Cities Service Oil Company	Tulsa
Pan American Petroleum Corporation	Tulsa
Skelly Oil Company	Tulsa
Kerr-McGee Corporation	Oklahoma City
Continental Oil Company	Ponca City
Bartlesville Petroleum Research Center	Bartlesville
Avco Corporation Electronics Division	Tulsa
Capitol Steel and Iron Company	Oklahoma City
U. S. Army Corps of Engineers	Tulsa
City of Tulsa	Tulsa
Midwestern Instrument Company	Tulsa
Yuba Heat Company	Tulsa
Westinghouse Air Brake Co. Drilling Equip Div.	Enid
Braden Aermotor Corporation	Broken Arrow
Dover Corporation	Tulsa
Unit Parts Company	Oklahoma City
B. F. Goodrich Tire Company	Miami
Muskogee Iron Works, Engineering Department	Muskogee
McDonnell Douglass Corporation	Tulsa
Flint Steel Corporation	Tulsa
Continental Oil Company, Refining Department	Ponca City
Pittsburgh Plate Glass Company	Henryetta
North American Rockwell Corp. Aero Commander Div.	Bethany
Seismograph Service Corp., Raytheon Company	Tulsa
Oklahoma Aerotronics, Inc.	Hartshorne
United States Gypsum Company	Southard
Sylvania Electric Products, Inc.	Shawnee
John Roberts, Inc.	Norman
Western Electric Company	Oklahoma City
General Electric Company	Oklahoma City
Sperry Rand Corporation	Tulsa
National Tank Company	Tulsa

**APPENDIX B**





*Oklahoma State University*

INDUSTRIAL ARTS EDUCATION

STILLWATER, OKLAHOMA  
104 INDUSTRIAL BUILDING  
(405) 872-6211 EXT. 7261

Dear Fellow Teacher:

This survey is being made to ascertain the extent to which high school industrial arts drafting programs, through course content, are developing a consistent understanding of industry's needs in the field of drafting.

It is believed that the results of the study will show the need of a state-wide curriculum guide for industrial arts drafting in Oklahoma. By completing and returning this questionnaire, you will provide us with the necessary information for the study, which may result in the development of such a curriculum guide.

For purposes of comparison and evaluation, a similar questionnaire is being sent throughout the state to industries employing draftsmen.

Your promptness in completing and returning this questionnaire will be greatly appreciated. A self-addressed, stamped envelope is included for your convenience.

To insure complete anonymity, you are asked not to write your name or the name of your school on the questionnaire.

Yours truly,

Clyde R. Raffety

Approved by:

Dr. Harold J. Polk, Head  
Industrial Arts Education

NEED OF A CURRICULUM GUIDE FOR INDUSTRIAL  
ARTS DRAFTING IN THE STATE OF OKLAHOMA

Clyde R. Raffety, Graduate Student  
Department of Industrial Arts Education  
Oklahoma State University  
Spring 1972

Directions: Please check the appropriate answer on each of the following items.

1. Drafting room facilities available to your students:

				Percentage of time used
a. Drafting machines	Yes ___	No ___	Number ___	_____
b. Reproduction				
Printer(s)	Yes ___	No ___	Number ___	_____
c. Light table	Yes ___	No ___	Number ___	_____
d. Drafting tables	Yes ___	No ___	Number ___	_____
e. Other _____				_____

2. Your methods of presentation:

			Approximate percentage of time
a. Lecture	Yes ___	No ___	_____
b. Demonstration	Yes ___	No ___	_____
c. Questioning and discussions	Yes ___	No ___	_____
d. Films (sound)	Yes ___	No ___	_____

			Approximate percentage of time
e. Transparencies	Yes ___	No ___	_____
f. Charts	Yes ___	No ___	_____
g. Models	Yes ___	No ___	_____
h. Field trips	Yes ___	No ___	_____
i. Other _____			_____

3. Title of drafting courses offered in your school:

a. Drafting I	Yes ___	No ___
b. Drafting II	Yes ___	No ___
c. Architectural	Yes ___	No ___
d. Design	Yes ___	No ___
e. Mechanical Drawing I	Yes ___	No ___
f. Mechanical Drawing II	Yes ___	No ___
g. Other _____		

4. Subject areas taught in drafting:

Directions: On this part of the questionnaire you are asked to mark the blank which is most applicable to your program according to the following criteria.

1. Taught in Depth--Instructional items which you cover thoroughly.
2. Discussed Briefly--Information which you cover briefly but do not consider extremely important.
3. Not Taught--Instructional units that you mention only as interest items, are of little significance, or are so specialized that there is no room for them in your drafting curriculum.

	Taught in Depth	Discussed Briefly	Not Taught
a. Freehand sketching	_____	_____	_____
b. Lettering	_____	_____	_____

	Taught in Depth	Discussed Briefly	Not Taught
c. Geometric construction	_____	_____	_____
d. Orthographic projection	_____	_____	_____
e. Dimensioning	_____	_____	_____
f. Auxiliary views	_____	_____	_____
g. Sections	_____	_____	_____
h. Surface developments	_____	_____	_____
i. Cams	_____	_____	_____
j. Gears	_____	_____	_____
k. Architecture	_____	_____	_____
l. Map drafting	_____	_____	_____
m. Electrical and electronic	_____	_____	_____
n. Aerospace	_____	_____	_____
o. Isometric	_____	_____	_____
p. Dimetric	_____	_____	_____
q. Trimetric	_____	_____	_____
r. Olique	_____	_____	_____
s. Perspective	_____	_____	_____
1. One-point	_____	_____	_____
2. Two-point	_____	_____	_____
3. Three-point	_____	_____	_____
t. Welding drawings	_____	_____	_____
u. Inking	_____	_____	_____
v. Screws and bolts	_____	_____	_____
w. Other fasteners	_____	_____	_____
x. Working drawings	_____	_____	_____

	Taught in Depth	Discussed Briefly	Not Taught
y. Detail drawings	_____	_____	_____
z. Blue print reading	_____	_____	_____
1. Other _____	_____	_____	_____

5. How well do you feel that your program is providing your students with an understanding of the needs of industry in the field of drafting?

More than sufficiently \_\_\_\_\_ Sufficiently \_\_\_\_\_ Insufficiently \_\_\_\_\_



*Oklahoma State University*

INDUSTRIAL ARTS EDUCATION

STILLWATER, OKLAHOMA  
104 INDUSTRIAL BUILDING  
(405) 372-0211 EXT. 7261

Dear Sir:

This survey is being made to ascertain the extent to which high school industrial arts drafting programs, through course content, are developing a consistent understanding of industry's need in the field of drafting.

It is believed that the results of the study will show the need of a state-wide curriculum guide for industrial arts drafting in Oklahoma. By completing and returning this questionnaire, you will provide us with the necessary information for the study, which may result in the development of such a curriculum guide.

For the purpose of comparison and evaluation, a similar questionnaire is being sent to all high school industrial arts drafting instructors throughout the state.

Your promptness in completing and returning the questionnaire will be greatly appreciated. A self-addressed, stamped envelope is included for your convenience. You are not required to identify yourself or your firm.

Yours truly,

*Clyde R. Rafferty*  
Clyde R. Rafferty

Approved by:

*Harold J. Polk*  
Dr. Harold J. Polk, Head  
Industrial Arts Education

NEED OF A CURRICULUM GUIDE FOR INDUSTRIAL  
ARTS DRAFTING IN THE STATE OF OKLAHOMA

Clyde R. Raffety, Graduate Student  
Department of Industrial Arts Education  
Oklahoma State University  
Spring 1972

Directions: Please check the appropriate answer on each of the following items.

- 
1. How important do you feel a working knowledge of the following equipment is to your draftsmen and/or junior draftsmen?

	Very Important	Important	Of Little Significance
a. Drafting machine	_____	_____	_____
b. Reproduction printer	_____	_____	_____
c. Light table	_____	_____	_____
d. Drafting table	_____	_____	_____
e. Other equipment not mentioned which you consider important _____			

2. How frequently do you feel the following methods of presentation should be used in teaching drafting?

	Often	Occasionally	Seldom
a. Lecture	_____	_____	_____
b. Demonstration	_____	_____	_____
c. Questioning and discussion	_____	_____	_____
d. Films(sound)	_____	_____	_____
e. Transparencies	_____	_____	_____

	Often	Occasionally	Seldom
f. Charts	_____	_____	_____
g. Models	_____	_____	_____
h. Field trips	_____	_____	_____
i. Other _____	_____	_____	_____

3. When screening an applicant for the position of junior draftsman and/or draftsman, how important do you feel the following high school courses are?

	Very Important	Important	Of Little Significance
a. Drafting I	_____	_____	_____
b. Drafting II	_____	_____	_____
c. Architecture	_____	_____	_____
d. Design	_____	_____	_____
e. Mechanical Drawing I	_____	_____	_____
f. Mechanical Drawing II	_____	_____	_____
g. Other _____	_____	_____	_____

4. On this part of the questionnaire you are asked to mark the blank which best describes the educational needs of your draftsmen according to the following criteria.

1. Required Knowledge - Instructional units of which your draftsmen must have a working knowledge in order to perform their duties.
2. Preferred Knowledge - Information not absolutely essential but with which your draftsmen should be familiar.
3. Unnecessary Knowledge - Instructional units or items which have little or no significance to the job responsibilities of your draftsmen.

	Required Knowledge	Preferred Knowledge	Unnecessary Knowledge
a. Freehand sketching	_____	_____	_____
b. Lettering	_____	_____	_____
c. Geometric construction	_____	_____	_____



	Required Knowledge	Preferred Knowledge	Unnecessary Knowledge
d. Orthographic projection	_____	_____	_____
e. Dimensioning	_____	_____	_____
f. Auxiliary views	_____	_____	_____
g. Sections	_____	_____	_____
h. Surface development	_____	_____	_____
i. Cams	_____	_____	_____
j. Gears	_____	_____	_____
k. Architecture	_____	_____	_____
l. Map drafting	_____	_____	_____
m. Electrical and electronic	_____	_____	_____
n. Aerospace	_____	_____	_____
o. Isometric	_____	_____	_____
p. Dimetric	_____	_____	_____
q. Trimetric	_____	_____	_____
r. Oblique	_____	_____	_____
s. Perspective	_____	_____	_____
1. One-point	_____	_____	_____
2. Two-point	_____	_____	_____
3. Three-point	_____	_____	_____
t. Welding drawings	_____	_____	_____
u. Inking	_____	_____	_____
v. Screws and bolts	_____	_____	_____
w. Other fasteners	_____	_____	_____
x. Working drawings	_____	_____	_____
y. Detail drawings	_____	_____	_____

	Required Knowledge	Preferred Knowledge	Unnecessary Knowledge
Z. Blueprint reading	_____	_____	_____
Other areas which should be taught	_____		

5. How well do you feel that Oklahoma public high school industrial arts drafting programs are providing their students with an understanding of the needs of industry in the field of drafting?

- a. More than sufficiently \_\_\_\_\_
- b. Sufficiently \_\_\_\_\_
- c. Insufficiently \_\_\_\_\_

**APPENDIX C**

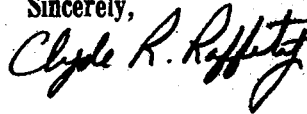
**Dear Fellow Teacher,**

**I am writing again to solicit your cooperation in conducting a study entitled "Need of a Curriculum Guide for Industrial Arts Drafting in the State of Oklahoma." I do need YOUR response.**

**If I have received no response within five days of postmark on this card I will assume that you have misplaced the questionnaire I sent earlier. In this case I will send another questionnaire and ask that you PLEASE return it promptly.**

**Your cooperation is greatly appreciated. Remember, I need YOUR response.**

Sincerely,



Follow-up post card which went out to those instructors who had not returned the questionnaire within ten days.



*Oklahoma State University*

INDUSTRIAL ARTS EDUCATION

STILLWATER, OKLAHOMA  
104 INDUSTRIAL BUILDING  
(405) 872-6311 EXT. 7261

March 6, 1972

Dear Fellow Teacher:

Again I am writing to solicit your cooperation in conducting a study entitled "Need for a Curriculum Guide for Industrial Arts Drafting in the State of Oklahoma." I do need your response and am enclosing another form in case you failed to receive or have misplaced the one I sent earlier.

It is important that all industrial arts drafting programs be represented in this study so that a detailed description can be made.

The response up to now has been good. However, 100 percent participation is needed to make the results more meaningful. Your reply will be kept confidential.

Would you please complete and return the questionnaire as soon as possible in the self-addressed, stamped envelope which I have enclosed. Thank you for your help.

Sincerely,

*Clyde R. Raffety*  
Clyde R. Raffety

Approved:

*Harold J. Folk*  
Harold J. Folk, Head  
Industrial Arts Education

Enc.



*Oklahoma State University*

INDUSTRIAL ARTS EDUCATION

STILLWATER, OKLAHOMA  
104 INDUSTRIAL BUILDING  
(405) 872-6211 EXT. 7261

March 15, 1972

Dear Sir:

I am writing again to solicit your cooperation in conducting a study entitled "Need of a Curriculum Guide for Industrial Arts Drafting in the State of Oklahoma." I do need your response.

A questionnaire concerning this study was sent to you earlier. The response up to now has been very good. However, 100 percent participation is needed to make the results more meaningful.

I would greatly appreciate it if you would please complete and return the questionnaire immediately, as we do need the data within the next week. Thank you for your cooperation.

Sincerely,

*Clyde R. Raffety*  
Clyde R. Raffety

pkc

VITA

Clyde Ray Raffety

Candidate for the Degree of

Master of Science

Thesis: NEED FOR A CURRICULUM GUIDE FOR INDUSTRIAL ARTS DRAFTING  
IN THE STATE OF OKLAHOMA

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Biographical:

Personal Data: Born in Seminole, Oklahoma, September 29, 1946,  
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