


AN ABSTRACT OF THE THESIS OF

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Title Content and Teaching Methods for Beginning Drawing
 in the Junior High Schools of Utah

Abstract approved -- --  -- --

The purpose of this study is to determine the current practice in beginning drawing at the junior high school level, in Utah and other states and in large city districts.

A letter was sent to the superintendents of public instruction of forty-three states and to the district superintendents of forty-five city districts with populations over 200,000. A request was made for courses of study provided for the instructors in beginning drawing at the junior high school level. Instructors in twenty-one junior high schools in Utah were interviewed to determine what they were teaching in beginning drawing.

In analyzing the courses of study designed for teaching beginning drawing as a separate unit in the industrial arts program, it was found that 86% recommended teaching orthographic projection using drawing tools. The interviews with the industrial arts teachers in the junior high schools of Utah revealed a similar practice. The Utah schools did not spend as much time teaching beginning drawing as the courses of study indicate is spent in other states and in the city districts. Approximately 60% of the courses of study provided for the teaching of free-hand sketching. The greater portion of the time allotted was for sketching objects in orthographic projection; however, 23% also taught some other form of pictorial sketching, such as isometric, perspective, and maps, charts and graphs.

Several directors of industrial arts wrote letters commenting on future plans for beginning drawing in their state or district. The information in these letters revealed two trends: (1) moving away from formalized drawing courses toward more free-hand sketching, with greater emphasis on understanding and interpreting drawings as they affect the every-day living of the pupil; and (2) moving away from teaching of drawing as a separate class for a given number of weeks, toward drawing as a part of the planning in the general shop program.

CONTENT AND TEACHING METHODS
FOR BEGINNING DRAWING
IN THE JUNIOR HIGH SCHOOLS
OF UTAH

by

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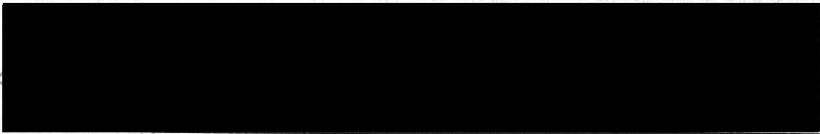
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CONTENT AND TEACHING METHODS FOR BEGINNING DRAWING IN THE JUNIOR HIGH SCHOOLS OF UTAH

CHAPTER I

INTRODUCTION

Drawing as a part of general education offers fundamental experiences necessary to round out the education and training of the average citizen.

Educational leaders, in the past as well as the present, have stressed that the fundamental part of the American educational system is to provide a functional education for the majority. Mechanical drawing instructors are well aware of this fundamental principle, and have been for many years, but tradition, coupled with the lack of suitable instruction materials, has kept them from conforming to it. The common needs of many groups of students must be considered; the prevocational, the college preparatory, the industrial arts student, the students who may drop out and go to work: all present a problem in making a course completely functional.

Drawings are no longer the secret communications of engineers and draftsmen. Instead, today they constitute an important part of the language of business and industry. In the business and industrial world nearly every employee is confronted with office layout, blueprints,

and organizational diagrams, many of which have little or no meaning for him.

Graphic expression has become an important part of the books, magazines, and newspapers universally available today. Yet it is surprising how many high school graduates are unable to take advantage of this time-saving aid to reading (23, p.336). The untrained reader ignores these graphs, charts, sectional drawings, and maps that would greatly aid understanding. The ability to express one's self graphically has long been recognized as important. Hundreds of years ago it was recognized that a "picture is worth ten thousand words."

Statement of the Problem

An interest in beginning drawing on the junior high school level was developed by the writer after having taught drawing for three years as an instructor of industrial arts in a Utah junior high school. The real need for this study became evident after serving as a member of the state committee for curriculum revision, for the industrial arts program on the junior high school level.

The problem was to determine what should be included in a beginning drawing course for the junior high school industrial arts student.

Purpose of the Study

The purpose of this study is to determine what is currently taught in beginning drawing at the junior high school level, in Utah and other states and in large city districts. It is hoped that the information made available may be of real value in re-evaluating the present Utah course of study.

The objectives that have guided this study are as follows:

1. To discover the present trends in the teaching of drawing
2. To determine what the teachers of beginning drawing are now teaching in Utah
3. To help establish criteria for re-evaluating the present course of study in beginning drawing in Utah

Definition of Terms

The following definitions are offered as an aid in interpreting the use of certain terms throughout this study, in order to help minimize misunderstanding.

Mechanical Drawing. A written language of all engineering and construction work, including all drawings made with

the aid of instruments and all freehand sketches made in the manner of these instrumental drawings.

Freehand sketching and drawing. That which is done by hand, without the use of drawing tools such as T-square, triangle and compass.

Isometric drawing. A pictorial form of mechanical drawing. The three views ordinarily employed in orthographic projection are combined into one view in isometric.

Oblique drawing. A form of pictorial drawing in which the front view is shown without distortion.

Perspective drawing. The representation of an object as it actually appears to the eye.

Drawing. In contrast to mechanical or engineering drawing, which refer to a definite kind of drawing, the term drawing refers to a much broader field. It is taught in the secondary schools as a part of general education to acquaint the pupil with the many kinds of drawings which the layman needs in his or her ordinary walks of life.

Course of study. "An official guide prepared for use by administrators, supervisors, and teachers of a particular school or school system as an aid to teaching in a given subject or area of study for a given grade. . . ." (14, p.394)

CHAPTER II

HISTORICAL BACKGROUND

There is no more definite knowledge of how drawing began than of how language started. The earliest existing record of man's attempt to draw can be found today on the walls of caves in Spain and Southern France. These drawings are mainly of animals: reindeer, bison, and wild horses. Most of these paintings are astonishingly vivid and lifelike. The reasons for their existence have been lost in the annals of time, but they do leave one with the feeling that graphic records have played an important role in the development of the civilization that exists today.

Drawing Through the Ages

Any study of the history of the accomplishments of mankind, especially in areas related to architecture, automatically leads back to the Nile valley of Egypt. History tells of the Egyptian's curiosity regarding the stars and constellations which resulted in the drawing of maps of their location in the sky.

Because nature favored the early building endeavors of the people of Egypt, there is preserved today one of the oldest records of man's accomplishments in drawing, building and designing, as evidenced by the great pyramids.

Some of the archaeologists have presented evidence that the great pyramids were very carefully planned and the building of them supervised. Petrie (19, p.208) mentioned Semnefer, the architect in the court of Khufu, and in speaking of the accuracy and care in building the great pyramids (19, p.214) states:

In the King's Chamber the masonry is very fine, both in its accuracy of fitting and in the squareness and equal height of all the blocks; but the builders were altogether wrong in their levels, and tilted the whole chamber over to one corner, so that their courses are $2\frac{1}{4}$ inches higher at the N.E. than at the S.W., a difference much greater than that in the whole base of the Pyramid. An error like this in putting together such a magnificent piece of work, is astonishing, As it would be difficult to suppose any architect allowing such errors of building, after so closely restricting the variations of masons' work, it strongly suggests that the granite had been prepared for the chamber long before it was built, and that the supervision was less strict as the work went on,

The architectural masterpieces of the early Greeks and Romans, such as the Parthenon, Coliseum, and the viaducts, present evidence that master designers had drawings of some kind available to them. Waffle (27, p.332) in commenting on this subject states:

Though there is a wealth of available information relative to the early structural accomplishments, there seems to be a missing link between the design and execution of the ancient works. At the present time, the construction of even simple buildings or

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machines is always preceded by designs executed in the form of mechanical drawings. Such a practice it seems, also must have been essential in ancient and medieval times, though we have very little evidence to that effect.

It was not until about the first century B.C. that there is any concrete evidence of drawing. Vitruvius, the Roman architect, wrote several books on architecture, in which references to plan and elevation drawings can be found.

From the time of the collapse of the Roman Empire until the Renaissance, there is little recorded in history regarding architectural drawing. It was not until the latter part of the fifteenth century that Leonardo da Vinci, thought of by many as a great painter but who was also a great engineer and designer, contributed his treatise on painting which included a section on perspective drawing. His theory of perspective drawing was sufficiently developed to merit use today of parts of it.

Orthographic projection, which is the basis for nearly all the drawing taught in schools today, came as the next development in 1795 by Gaspard Monge, a noted French mathematician.

Prior to that time machine drafting was unknown. The limited number of machines were of simple design and the builder was usually the planner. If drawings were

necessary, they were made as a pictorial sketch. With the invention of steam as a source of power, the drawings became more intricate and the simple sketch would no longer suffice. Waffle (27, p.332) says:

Not until the development of steam gave rise to the production of power, independent of wind and water, did drawing begin to grow and the expression of thought through lines assume the dignity of a language. But with the development of mechanisms, the inaccuracies due to the crude methods of pictorial representation led to confusion and increased expense in construction, thus necessitating the development of a graphic language.

Monge's projection method of drawing helped provide the type of drawing necessary to keep pace with this new era. Because these early draftsmen were taken from the field of architecture, the drawings during the following half century were very ornate.

Modern drafting took its place as an important part of the industrial world with the invention of blue printing. The ornate drawings were replaced by drawings of maximum simplicity, as industry became more specialized, in order to keep up with the rapid changes.

Drawing in the Schools

England. Although several early educators in England advocated the teaching of drawing in the schools, Richard Mulcaster, headmaster of the Merchants Taylor's School

from 1561 to 1586, was, according to Bennett (3, p.33) "the first to make drawing one of the fundamental studies of the school."

In an article written by Sir William Petty stating his ideas on education, he gives support to Mulcaster's point of view. Bennett (3, p.45) quotes from the article:

That in no case the art of drawing and designing be omitted, to what course of life soever those children are to be applied, since the use thereof for expressing the conception of the mind, seems (at least to us) to be little inferior to that of writing, and in many cases performeth what by words is impossible.

The first attempt on the part of any school to establish a department of drawing was made by Christ Hospital in 1692. The purpose behind this move was to teach drawing as a part of the writing class so as to save later trouble for the instructors in mathematics classes.

France. According to Bennett (3, p.284) France led the nations of Europe in the development of her schools for the instruction of drawing, and by 1865 the French schools had reached a high standard.

The following are some of the characteristics of the instruction in drawing in the French schools. Bennett (3, p.284):

- (1) Early emphasis on geometrical drawing, followed by

- (2) Projection drawing leading up to dimensioned sketches, at the same time giving special attention to training the memory for form and developing the constructive imagination.
- (3) Drawing to scale.
- (4) Machine drawing taught through the making of sections and details from assembly drawings and assembly drawings from detail drawings.
- (5) Designing parts of machines, applying knowledge of strength of materials.
- (6) Visiting factories to make dimensioned sketches of machines from which drawings were to be made.

The advantages of teaching drawing and design in the schools were recognized by the other nations of Europe as a result of the World's Fair in London in 1851. The manufactured products exhibited by the French manufacturers were far superior in design to the products submitted by the other nations. The need for making drawing and design a required subject in the schools was immediately recognized. The manufacturers of England and Germany soon made recommendations for the setting up of these schools to aid in the training of workers.

United States. Probably one of the first advocates for the teaching of drawing in the schools of the United States

was Benjamin Franklin. In 1749 he published his "Proposed Hints for an Academy." In the publication as quoted by Clarke (8, p.2):

Studies to be selected and adopted.--
As to their studies, it would be well if they could be taught everything that is useful and everything that is ornamental. But art is long and their time is short. It is therefore proposed that they learn those things that are likely to be most useful and most ornamental; regard being had to the several professions for which they are intended.

Writing, drawing, and arithmetic.--
[underlined words italics in original quotation.] All should be taught to write a fair hand, and swift, as that is useful to all. And with it may be learned something of drawing by imitation of prints and some of the first principles of perspective, arithmetic, accounts, and some of the first principles of geometry and astronomy.

The first real attempt to put drawing into schools was made by William Bentley Fowle in 1821. He introduced drawing based on geometry in the boys school at Boston, and linear drawing in its simplest application to geometrical figures especially was made a regular exercise. In 1827 Fowle published a book "The Hand and the Eye" translated mainly from the French book of M. Francoeur, with alterations and additions to make it suitable for school use.

Prior to 1860 certain subjects were required by law to be taught in the Massachusetts schools. In that

year drawing was added to this list of subjects. That seems to be the first legal authority to require the teaching of drawing in the public schools. This law came as the result of a joint action on the part of the city of Boston and the state of Massachusetts. Later, in 1870, another law was passed requiring that every city or town having more than 10,000 inhabitants should annually make provision for giving free instruction in industrial or mechanical drawing to persons over fifteen years of age, either in day or evening schools.

The importance of this experiment in Massachusetts to the drawing movement over the remainder of the nation is stated in the introductory remark of Clarke (8, p.IX):

One of the most striking and significant results of the experiment, begun in Boston in 1870, by the teaching of industrial drawing to the public school children of that city, has been the wide-spread interest awakened throughout the United States in the further development of the industrial training of children. No sooner was it shown that it was possible to give to the children in the public schools some elementary training of the hands and eyes, than a movement began in many places, to teach actual trades and handicrafts to the children while in school!

To clarify what he meant by the term drawing, Clarke (8, p. CI) further states:

I wish if possible, that it shall be distinctly understood that whenever in these pages "drawing" in the public schools is

spoken of, it is not "picture making" or "an accomplishment," which is meant; but it is the study of industrial drawing, undertaken with the direct purpose of so training the hand and the eye, that the pupil shall be better fitted to earn a livelihood by any of the forms of manual labor, than he or she could be without such training.

Clarke (8, p.337) in commenting on the claims of those who were urging that drawing be taught to all children states:

Drawing is a universal language, common to all people, essential to every form of manufacture, useful to every individual, always convenient, often indispensable. . . . The child who can draw readily and correctly, can be taught any kind of manual industry much more readily than the child who is ignorant of drawing.

By 1880 the drawing movement, which had begun in Massachusetts in 1870, was well established in nearly every section of the United States. One of the factors that stimulated the spread of this movement was the pamphlet on drawing, Circular No. 2, 1874, published by the United States Bureau of Education. This pamphlet contained information on the methods used in establishing the study of drawing in Massachusetts. In setting forth some of the reasons why it was desirable that drawing be taught in the public school, several paragraphs in the pamphlet were

quoted from Charles B. Stetson's book "Technical Education."

Among those quoted is the following (25, p.9):

Almost every thing that is well made now is made from a drawing. In the construction of buildings, ships, machinery, bridges, fortifications, nothing is done without drawings. It is not enough that there be draughtsmen to make the drawings: the workmen who are to construct the objects required should be able, without help, to interpret the drawings given for their guidance. This they cannot do without instruction that acquaints them with the principles on which the drawings are made and so trains the imagination as to enable it to form from the given lines a vivid mental picture of the object required. The workman who lacks this knowledge and this ability, as it is probable that nineteen-twentieths of American artisans now do, must work under the constant supervision of another, doing less and inferior work and receiving inferior wages. But it is also essential that the workman himself be able to make at least a rude working drawing whenever, as frequently happens, an emergency requires it.

Dr. C. M. Woodward realized the importance of drawing in the training of young men in order to fit them for the duties of life. So, with the establishing of the Manual Training School in Saint Louis in 1880, drawing was included as one of the five fundamental lines of study. As the manual training movement grew, drawing became one of the basic parts. Evolving from that movement, drawing has continued to be one of the basic courses required in the industrial arts program today.

CHAPTER III

THE STUDY

In order to determine what other states are recommending to their teachers of drawing, a letter was sent to the superintendents of public instruction of forty-three states. As large city districts have the personnel and finances available to construct courses of study, a letter was sent to district superintendents of forty-five city districts with populations over 200,000. A request was made for study guides or courses of study provided for the instructors in beginning drawing on the junior high school level.

With the cooperation of the Director of Trade and Industrial Education (at that time also State Supervisor of Industrial Arts for Utah), these letters (see Appendix A) went out on State Department of Public Instruction letterheads, over the Director's signature. This probably accounts in part for the high percentage of responses.

Replies were received from thirty-seven of the state departments of public instruction and thirty-nine of the city districts. The total of seventy-six responses represented eighty-six per cent of the number sent out. Table I shows a classification of these responses.

TABLE I
Classification of Replies

Item No.	Item classification	Number received	Percentage
1	No course of study	33	43.4
2	Course of study out of print or under revision	13	17.1
3	Named textbook in lieu of course of study	6	7.9
4	Course of study	<u>24</u>	<u>31.6</u>
	Total	76	100.0

Items 1, 2 and 3 were in the form of letters, several of which were from industrial arts directors of the states or the city districts in which they commented on the status of drawing in their particular state or district. Several of the responses in Item 4 of Table I were accompanied by letters commenting on the material sent or on future plans.

An interesting feature concerning these comments was that every one reflected a similar trend of thinking: moving away from formalized drawing courses toward more freehand sketching, with greater emphasis on understanding and interpreting drawings as they affect the every-day living of the pupil.

A director of industrial education in one of the large city districts commented as follows, regarding drawing in his particular district:

At the present time, mechanical drawing is offered starting with the 7A grade and may be elected from the 8th through the 12th grade. Junior-high-school-level drawing is much too formalized. . . .

. . . I personally think that in the early stages formalized drawing tends to dull the interest of the student because he is unable to understand the application of the things he is learning. I believe it would be better to present problems by means of simple sketching and blue-print reading. If shop periods could be lengthened more time could be devoted to planning the problem within the shop, therefore, increasing its effectiveness.

Another director of vocational and industrial-arts education of a large city district accompanied the course of study with a letter explaining what, in his opinion, is wrong with drawing at the junior high school level. Quoting from his letter:

We are not too well satisfied with this outline and I would like to see a new approach made to this very important subject. The industrial arts teachers in the junior high schools have been pressured by the drawing teachers in the senior high schools to emphasize acquisition of skills, and we find too many drawing courses filled with the drawing of abstract projects of little meaning to the pupil. These abstract projects can be developed in logical sequence of difficulty for principles of drawing but they lack motivation. It is true that

some drawing teachers do intersperse these drawings with projects more meaningful to the learner and do an excellent job. However, when the outline shows abstract drawing plates and leaves the selection of shop projects to the drawing teacher, there is a tendency to slip back to a drawing course of plate 1, plate 2, etc.

The comments made by the two directors quoted above cover the thoughts expressed in several of the other letters received. (See Appendix C).

There seemed to be another trend indicated in several of the letters, as well as in the courses of study, which is probably a natural consequence resulting from the first trend: moving away from the teaching of drawing as a separate class for a given 6, 12 or 18 weeks and working it in as a part of the general-shop program. This is expressed by the director of industrial education in a large city district:

We do not offer Drawing as such on a Junior High level, and confine our work to such sketches as needed for the Comprehensive General Shop. Even in our High School we are now thinking of formal drawing to begin no earlier than the 10th grade.

Another advocate of this trend, a director of practical arts in a city district, in his letter describing the practical arts program of that district, says:

We start our drawing in grades 7 and 8 where every boy is enrolled. This work is so-called freehand sketching but the boy

uses a straight edge and a pencil compass. He makes a simple working drawing for each project he makes in the practical-arts shop. This includes a bill of material and a cost estimate. There is very little emphasis on lettering but he learns the basic shape description and size description procedures.

What has brought about this change? Probably the realization that much of the content of the formalized drawing course meant very little and had no real value to the student at the junior high school level.

A survey was made by William P. Hale to determine what should be taught in the drawing classes in the schools by determining the types of drawings most frequently seen by the readers of newspapers, magazines and books. It was discovered that pictorial drawings and freehand sketches far exceeded any others in frequency of appearance, and together they made up a very high percentage of the types of drawings seen. Quoting Hale (15, p.232):

It is interesting to note that this study shows a race between free-hand sketches and pictorial drawings, both of which probably receive a small amount of attention in the average mechanical-drawing course.

As indicated in Table I, twenty-four courses of study were received from state departments and from city districts. These twenty-four courses of study varied from a simple outline of what the pupil should be able to do,

to a complete course consisting of all the plates to be drawn, with complete directions and information sheets on related information.

Seven of the twenty-four courses of study did not list drawing as a separate unit but included it as part of the planning and drawing of the general shop program.

In six of the letters received, the superintendents stated that certain textbooks were used in lieu of a course of study. As five of these textbooks were organized in a manner similar to a course of study, they are considered as such in this report.

The types of drawing mentioned in the courses of study for the beginning drawing level are shown in Table II and Table III.

TABLE II
Types of Mechanical Drawing Offered

Type of drawing	Number of times listed	Percentage
Orthographic	19	86.3
Lettering	15	68.1
Machine	6	27.2
Section views	5	22.7
Isometric	3	13.6
Sheet metal	3	13.6
Auxiliary views	3	13.6
Electrical	2	9.0
Architectural	2	9.0
Flat or two-dimensional	2	9.0
Perspective	1	4.5

TABLE III
Types of Sketching Offered

Type of sketching	Number of times listed	Percentage
Orthographic	13	59.0
Isometric	8	36.3
Maps, charts, graphs	5	22.7
Perspective	3	13.6
Oblique	1	4.5

Although there were several types of drawing listed as being taught, orthographic projection, in both the mechanical drawing and freehand sketching, was the predominant type. Nineteen, or 86%, taught orthographic projection using drawing instruments and thirteen, or 59%, taught orthographic projection by freehand sketching.

The courses of study were analyzed to determine which unit was recommended for teaching first, second and third. Table IV shows the results of this analysis.

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TABLE IV
Recommended Placement of Units

Unit	First	Second	Third	Fourth
How to measure	2			
Use of tools	9	6	1	
Lettering	4	7	7	2
Orthographic projection		5	11	1
Pictorial sketching	7	4		3

It will be noted that nine of the courses of study begin immediately by teaching the use of the drawing tools. In seven of the courses of study sketching was the first unit. It is interesting to observe that only two saw any need to teach the pupils how to read a ruler, or how to measure.

It has been the writer's experience that most pupils at the seventh grade level are not able to read a ruler and that more time could be spent profitably on that unit.

The general picture in Table IV indicates two patterns: (1) first, use of tools; second, lettering; third, orthographic projection; and (2) first, pictorial sketching; second, use of tools; third, lettering or orthographic projection.

Three of the courses of study suggested teaching sketching and lettering only, with no use whatsoever of mechanical drawing tools.

The courses of study were further examined to determine the grade level for beginning drawing. Table V gives these results.

TABLE V
Grade Level Recommended
for Teaching Beginning Drawing

Grade level	Number of times listed	Percentage
Seventh	13	59.1
Eighth	3	13.6
Ninth	2	9.1
Not indicated	4	18.2
Total	22	100.0

Grade seven was the level at which thirteen, or 59%, of the studies indicated for beginning drawing, while three placed it in the eighth grade and two in the ninth grade. Four of the studies did not indicate a grade placement for beginning drawing.

Closely related to the grade level is the amount of time devoted to the teaching of beginning drawing. See Table VI.

TABLE VI
Number of Weeks
Allotted to Beginning Drawing

Number of weeks	Number of times listed	Percentage
Nine	5	22.7
Eighteen (or semester)	10	45.5
Not indicated	<u>7</u>	<u>31.8</u>
Total	22	100.0

Seven of the courses of study did not indicate the number of weeks to be included in the course. The amount of material to be covered in these courses, however, would seem to necessitate a semester period.

There were six courses of study which mentioned the teaching of related information. The suggestions were given by way of topics that would fit into the course.

In order to make a comparison between the recommendations of the courses of study from the other states and the city districts, with the practices followed by

teachers in the junior high schools of Utah, a personal-contact survey was made of different areas of the state of Utah. The writer, using a questionnaire as a guide (see Appendix B), interviewed instructors in twenty-one schools, to determine what they were teaching in beginning drawing.

It was found that twenty of the twenty-one schools taught drawing as a separate unit in their industrial arts program. Table VII indicates the different grade levels where the various schools began teaching drawing.

TABLE VII
Grade Level Where Beginning Drawing
was Taught

Grade level	Number of schools	Percentage
Seventh	14	70
Eighth	5	25
Ninth	1	5
Total	20	100

The seventh grade was listed by fourteen, or 70%, of the schools. Although the state recommends the teaching of drawing in the seventh grade, some of the school districts are organized on a 7-3-2 plan, and the first industrial arts work is not offered until the eighth grade.

The length of the course in weeks had a wide variation, as Table VIII indicates.

TABLE VIII
Length of Drawing Unit in Weeks

Number of weeks	Number of schools	Percentage
2	1	5
3	2	10
4	7	35
5	4	20
6	4	20
8	1	5
18	<u>1</u>	<u>5</u>
Total	20	100

Each instructor arranged for drawing as a part of the total industrial-arts program, as he thought best. As a result, one school spent two weeks at drawing, while another used eighteen weeks. The greater number ranged between four and six weeks.

The length of the periods varied from a minimum of forty-five minutes to a maximum of sixty minutes. Table IX shows the time, frequency and percentage of the periods used.

TABLE IX
Length of Class Period

Number of minutes	Number of schools	Percentage
45	3	15
50	6	30
55	7	35
60	<u>4</u>	<u>20</u>
Total	20	100

A question was included in the questionnaire to determine how extensively common drawing tools, such as T-squares, triangles, compasses, architect scales, and rulers, were used in the beginning drawing classes.

Table X denotes the answers to this question.

TABLE X
Common Drawing Tools Used in Teaching
Beginning Drawing

Tools used	Number using	Number not using
T-square	18	2
Triangles	18	2
Compass	19	1
Architect scale	6	14
Ruler	18	2

In approximately 90% of the schools the pupils used T-squares, compasses, triangles and rulers, but in only six, or 30%, of the schools did the pupils use architect scales.

None of the schools had a separate room for the teaching of drawing. Sixteen of the schools had classrooms or demonstration areas, equipped with long tables or desks used as drawing tables. In five of the schools the pupils stood at the woodworking benches to do their drawing plates.

The types of mechanical drawing taught in the beginning classes are shown in Table XI.

TABLE XI
Types of Mechanical Drawing Taught

Type of drawing	Number of schools	Percentage
Orthographic	18	90
Isometric	12	60
Oblique	1	5

Here, as noted in the analysis of the courses of study, orthographic projection was stressed most. Eighteen of the schools, or 90%, taught orthographic projection. The purpose of this was to prepare the student to make working drawings of their shop projects. The two instructors who did not teach orthographic projection taught only sketching on this level.

Under the section on sketching, in the questionnaire, it was the intent to find out how extensively sketching was included in the beginning drawing unit, and some of the methods used in teaching sketching. In answering question

number one, "Do you teach freehand sketching as a part of your drawing unit?", 85% of the schools answered "yes."

Questions 2, 3 and 4 were included to discover whether special paper was used. See Table XII for this information.

TABLE XII
Types of Paper Used for Sketching

Type of paper	Number of schools	Percentage
Cross section	14	70
Isometric	10	50
Plain	9	45

Since pictorial drawings make up a large portion of the drawings we see in our daily living, question number five was included to discover the type of sketching taught most frequently. See Table XIII.

TABLE XIII

Types of Sketching Taught in Beginning Drawing

Type of sketching	Number of schools	Percentage
Orthographic	17	85
Isometric	16	80
Oblique	3	15
Perspective	3	15

Isometric sketching was included in the beginning drawing unit by sixteen, or 80%, of the schools. Oblique and perspective sketching were included in the drawing unit by only three, or 15%, of the schools. Orthographic sketching was taught by 85% of the schools contacted in Utah. This is much the same as the picture shown in other states and large city districts, as indicated in Table III.

In answering the question as to whether the instructors believed the training they had received, in drawing, at the teacher training institutions had been sufficient to enable them to teach beginning drawing effectively, eighteen, or 85%, indicated that they felt it was not sufficient.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary. The historical records of man's first attempts to draw are very meager. The pyramids of Egypt furnish an early example where architectural drawings were used as a guide in construction. As civilization progressed, the need for drawings became greater. With the development of machines and the resulting industrial revolution, the need for simple, less ornate and more accurate drawings became a necessity. The products resulting from this expansion of industry demanded a new type of drawing and design. Thus the pressure of the industrial world upon the schools was the main force which caused drawing to become a part of the curriculum of the early schools of Europe.

France led the rest of Europe in her schools for teaching drawing and design. After the World's Fair in 1851, England and Germany could see the need for drawing. In the United States several attempts were made to put drawing into the schools, at first with little success. With the realization by the New England manufacturers that their products were inferior in artistic design and beauty to those from France and England, steps were taken to place the teaching of drawing in the public schools. In 1870

Massachusetts passed a law requiring the teaching of drawing in all public schools and free evening schools for adults.

With the acceptance of the manual training movement by the secondary schools, drawing became one of the basic parts of manual training. Drawing, as a part of the industrial-arts program in the secondary schools today, has an important place in general education.

This study originated with the writer from a desire to discover what the beginning drawing unit should include in the way of content and teaching methods.

A letter was sent to forty-three state superintendents of public instruction, and to the superintendents of forty-five city districts with populations over 200,000, requesting copies of their courses of study or study guides for beginning drawing. Replies were received from seventy-six of the superintendents, or 86%. A personal-contact survey was made of twenty-one junior high school teachers over a wide area of the state of Utah, to determine what they were teaching in beginning drawing.

The seventy-six replies from the letter sent to the superintendents disclosed that thirty-three, or 43%, did not have a prescribed course of study for their instructors to follow; thirteen, or 17%, indicated that their course of

study was being revised. Twenty-four, or 31%, sent courses of study. Of the twenty-four courses of study, seven included drawing as a part of the general-shop program; the remaining seventeen taught beginning drawing as a separate unit in the seventh or eighth grade. The length of the unit varied from nine weeks to a semester or more.

Six of the directors of industrial arts in the states and the city districts wrote letters mentioning a textbook used in lieu of a course of study. Several directors of industrial arts wrote letters commenting on the status of drawing in their area and what, in their opinion, the beginning drawing course should include. These letters revealed a strong trend toward a less formal drawing course at the beginning level, with greater emphasis on free-hand sketching and interpretation of various kinds of drawings.

The study revealed that the schools of Utah devoted a considerably smaller amount of time to the teaching of beginning drawing than the amount of time suggested in the courses of study from the other states and city districts. The average number of weeks for the Utah schools was approximately five, while in the other states and city districts the range was from nine to eighteen or twenty weeks.

A number of the letters received, as well as the courses of study, indicated a trend toward making beginning drawing at the junior high school level a part of the planning in the general shop.

In the courses of study where drawing was taught as a separate unit, nineteen, 86%, of them placed the emphasis on mechanical orthographic projection. In comparison, of the schools contacted in Utah, eighteen, 90%, taught mechanical orthographic projection.

Sketching was taught by eighteen, 90%, of the schools contacted in Utah, at the beginning of the drawing unit. Fourteen, 70%, used cross section paper as an aid in teaching orthographic sketching, while ten, 50%, used isometric ruled paper as an aid in teaching isometric sketching. Other types of pictorial sketching received little attention.

The courses of study from the other states and the city districts revealed a much broader use of pictorial sketching than is the practice in the Utah schools. The most noticeable difference was in the teaching of the pupils to read and interpret graphs, charts and maps. None of the schools contacted in Utah included the teaching and interpretation of graphs, charts and maps in their beginning

drawing unit, and only two schools felt that it should be included.

Recommendations. The writer offers the following recommendations after a careful analysis of the study:

1. That on this beginning level a greater portion of the time be spent in developing the pupil's ability to make freehand sketches.
2. That the curriculum in drawing be broadened to include experiences which might enable the pupil to gain an ability to interpret many kinds of drawings.
3. That the making of working drawings be of something that is useful, meaningful and commonplace in the experiences of the learner.
4. That the teacher-training institute of the state include a class in its undergraduate work designed to prepare the prospective teacher for teaching beginning drawing at the junior high school level.
5. That drawing on the beginning level should be integrated with the shop work.

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APPENDICES

APPENDIX A

LETTER TO SUPERINTENDENTS OF STATES
AND LARGE CITY DISTRICTS

C
O P Y Original on State of Utah Department of
Public Instruction letterhead

We are in the process of evaluating our Study Guide for Beginning Drawing on the Junior High School level here in our State.

In order to make the study guide of most value to our teachers, we feel we should have some idea as to what other schools are offering their pupils at the beginning drawing level. We would appreciate very much if you would send us a copy of the study guide or course of study that you provide for your instructors in beginning drawing.

Yours very truly,

/s/ Von H. Robertson

VON H. ROBERTSON, DIRECTOR
Trade and Industrial Education

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APPENDIX B

QUESTIONNAIRE

Directions: In those questions requiring either "Yes" or "No" will you please indicate your answer by encircling the appropriate one.

In order to make the questionnaire of most value, will you please answer every question.

1. Do you teach Beginning Drawing as a separate unit in your Industrial-Arts program? Yes No
2. If your answer to question one above is "No" please answer the following:
 - A. Do you teach drawing as a part of the planning in your other courses? Yes No
3. If answer to question one above is "Yes" please answer the following:
 - A. Length of course in weeks _____
 - B. Number of periods per week _____
 - C. Length of periods in minutes _____
 - D. Indicate grade level: 7th 8th 9th

Sketching

1. Do you teach freehand sketching as a part of your Drawing Unit? Yes No
 If answer is "yes," where in the unit do you teach it?
 Beginning _____ Middle _____ End _____
2. Do the pupils use cross section paper to sketch their problems? Yes No
3. Do the pupils use isometric ruled paper to sketch their problems? Yes No
4. Do the pupils use plain paper to sketch their problems? Yes No

5. Do you teach the pupils to sketch objects
 in: Isometric Yes No
 Oblique Yes No
 Perspective Yes No
 Orthographic Yes No
6. Do the pupils sketch from models? Yes No
7. Do the pupils sketch the projects they will
 make in their other industrial arts classes? Yes No

Mechanical Drawing

1. Do the pupils use the following drawing tools:
 T-square Yes No
 Triangles Yes No
 Compass Yes No
 Architect Scale Yes No
 Ruler Yes No
2. Do you teach the pupils to make mechanical
 drawings of objects in:
 Isometric Yes No
 Oblique Yes No
 Orthographic Yes No
3. Do the pupils ink any of their drawing plates? Yes No
4. Do the pupils draw the projects they will
 make in their other industrial arts classes? Yes No

Lettering

1. Do you teach lettering as a part of the
 Drawing Unit? Yes No
2. Do the pupils do lettering plates? Yes No
3. Do you limit the lettering to only that
 necessary to complete the drawing? Yes No
4. Indicate how you assign the lettering to
 the pupils.
 A. Practice lettering for the entire period Yes No
 Approximate number of periods _____
 B. Practice lettering for a few minutes each
 period Yes No
 Approximate number of minutes _____

General

- | | | |
|--|-----|----|
| 1. Do you teach the pupils to draw the various types of graphs as a part of your drawing unit? | Yes | No |
| 2. If answer is "no", do you feel that graphs should be included in the beginning drawing unit? | Yes | No |
| 3. Do you use instruction sheets as an aid in teaching drawing? | Yes | No |
| 4. Do the pupils use a textbook written especially for drawing?
If so, please list title, author and publisher: | Yes | No |
| 5. Do you keep the class on an even front? | Yes | No |
| 6. Do you feel that your teacher training should have included a class designed to better prepare you to teach drawing on the junior high level? | Yes | No |

APPENDIX C

QUOTATIONS FROM LETTERS RECEIVED

1. "So far as drawing is concerned most of our schools are following a plan very similar to the one I am sending. There is some variation.

"Our eventual plan will include drawing as a part of a general graphic arts unit. We are working away from instruction in techniques of drafting and manipulation of equipment at this level. We plan to emphasize understanding with much more time spent on free hand sketching and increased ability in interpretation.

"Integration with the rest of the school program, especially the shop courses, is to be increased and a much greater degree of orientation is our main objective."

2. "At present we do not have a study guide or a course of study in beginning drawing that we can provide our instructors. However, we are compiling a course of study for beginning Mechanical Drawing. It will include nine instructional units, the first one being 'Drawing the Language of Industry,' and the last one being 'Planning and Designing a Project.'"

3. "Under separate cover I am forwarding to you a problems book on mechanical drawing which has been used in the junior high schools of this city for a number of years. A number of teachers have made ever so many adaptations with this course of study and others have abandoned it completely. We're probably moving in the direction to make drawing a much more integral part of shop work."

APPENDIX D

STATES AND LARGE CITY DISTRICTS
FROM WHICH REPLIES WERE RECEIVED

Alabama	Birmingham, Alabama
Arizona	Oakland, California
Arkansas	Sacramento, California
California	San Francisco, California
Colorado	Denver, Colorado
Connecticut	Washington, D.C.
Delaware	Miami, Florida
Georgia	Atlanta, Georgia
Illinois	Chicago, Illinois
Indiana	Indianapolis, Indiana
Iowa	Des Moines, Iowa
Maine	Louisville, Kentucky
Massachusetts	Baltimore, Maryland
Michigan	Boston, Massachusetts
Minnesota	Detroit, Michigan
Mississippi	Grand Rapids, Michigan
Montana	Minneapolis, Minnesota
Nebraska	St. Paul, Minnesota
New Hampshire	Kansas City, Missouri
New Jersey	Saint Louis, Missouri
New Mexico	Omaha, Nebraska
New York	Newark, New Jersey
North Dakota	Buffalo, New York
Ohio	New York, New York
Oklahoma	Rochester, New York
Oregon	Syracuse, New York
Pennsylvania	Akron, Ohio
Rhode Island	Cleveland, Ohio
South Carolina	Columbus, Ohio
South Dakota	Dayton, Ohio
Tennessee	Oklahoma City, Oklahoma
Texas	Philadelphia, Pennsylvania
Vermont	Pittsburgh, Pennsylvania
Virginia	Dallas, Texas
Washington	Houston, Texas
West Virginia	San Antonio, Texas
Wisconsin	Richmond, Virginia
	Seattle, Washington
	Milwaukee, Wisconsin

APPENDIX E

TEXTS RECOMMENDED IN LIEU OF COURSE OF STUDY

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