THE OBJECTIVES OF INDUSTRIAL ARTS
A STUDY OF THE RELATIONSHIP
OF THEORY TO APPLICATION

A Thesis

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Master of Science

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by

Harold D. Bryan

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Approved for the Major Department

Charles L. Bell

Approved for the Graduate Council

Lawrence L. Boyles

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CHAPTER I

INTRODUCTION

When the industrial revolution of the late 19th Century overtook America, it spelled the death of the apprentice system. With the inception of mass production techniques, employees no longer needed to spend years learning a particular trade and thus millions of children lost the only link to a formal education they possessed. Under the old apprentice system, masters were obliged to teach enough reading, writing, and arithmetic for the apprentice to conduct business. In the factory system there was no need for the "3 R's" and thus child laborers were given little, if any, formal education. To combat this condition, legislation was passed to prohibit child labor and to require a primary education for all children in the United States. Mass education became, and continues to be, one of the foremost goals of America.

One immediately recognizable disadvantage of this legislation was the lack of contact of the students with the working world which they would someday be thrust into. To bridge this gap between formal education and the world of work, manual training came into existence as a formal subject in school curricula.

Manual training consisted, for the most part, of exercises in woodworking which, during the late 19th Century, were harmonious with the industry of the time. As industry broadened its scope, however, manual training lost much of its influence and gave way to a new and less vocationally oriented era. Dr. Charles Richards, a leader in industrial education, had the foresight to envision the vast changes in curriculum needed for industrial education. In 1904, he called for a new name and philosophy for manual training, thus "industrial arts" was born.[1] Other leaders such as Bonser, Bennett, Griffith, Selvidge, Ericson, and Warner took up the challenge of this new era and pressed for a broader approach to industrial education.[2]

Industrial arts in secondary schools today is a link between two worlds--education and work. If industrial arts is to fulfill its mission of introducing America's youth to the world of work, a set of goals common to all industrial arts programs must be recognized.

The establishment of a set of goals, however, is not enough to assure the fulfillment of the prime purpose of industrial arts; methods leading to fulfillment of the goals must be formulated and adhered to.

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[1]John L. Feirer and John R. Lindbeck, Industrial Arts Education, (Washington: The Center for Applied Research in Education, Inc., 1964), p. 14.

[2]Ibid.

II. THE PROBLEM

It is an easier matter to state an objective than to achieve it. This study was concerned with the relationship between theory and application, or more clearly, between the statement and achievement of an objective.

Statement of the Problem

What relationship exists between the nine objectives of industrial arts proposed by the American Council of Industrial Arts Teacher Education in terms of importance and application.

Hypothesis to be Tested

Do the nine objectives, as proposed above, receive emphasis commensurate with the stated degree of importance in the industrial arts programs of Kansas.

Purposes of the Study

The study helped test valid methods of effecting behavioral changes deemed important to fulfilling the nine objectives of industrial arts. Among questions that were to be answered were:

1. What objectives are the most widely accepted by industrial arts teachers?
2. How do the instructors in Kansas rate the importance of the various objectives?
3. What emphasis do the instructors place on the objectives in terms of practice in the shop?
4. What relationship exists between the stated importance and the actual practice or emphasis in the shop?

Limitations of the Study

This study had two major limitations: objectives used and the size of the sample.

The objectives used as a basis for the study were the nine objectives proposed by Ralph K. Nair in the Eighth Yearbook of the Council on Industrial Arts Teacher Education.[3] The writer recognized the existence of other objectives and they were given consideration in the study.

The population sample for the study consisted of eighty-one industrial arts instructors from the state of Kansas. They were chosen by a sampling of their respective district numbers. The compilation of the data in the study was arranged according to selected classifications.

METHOD OF RESEARCH

Before a test on the usability of a set of objectives could be performed, a valid set of objectives had to be chosen. The first step in this study centered around determining what objectives enjoyed the largest acceptance in the field of industrial arts. It was found that through the years, many authors and organizations proposed objectives that they deemed "the most valuable" to industrial arts education. In light of this, then,

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[3]Ralph K. Nair, "Planning Industrial Arts Facilities," Eighth Yearbook of the Council on Industrial Arts Education, (Bloomington: McKnight & McKnight Co., 1959), pp. 26-29

the writer felt that the nine objectives proposed by Nair were the most inclusive. These nine objectives, then, were used in the questionnaire sent out to the instructors for the purpose of gathering data for the study.

Having selected a common set of goals toward which industrial arts programs strive, it was then necessary to determine how the objectives could be fulfilled.

The key to measuring an objective is behavioral change. In order to conduct this study, it was necessary to determine what behavioral changes were to be expected with reference to the specific objectives. Once these changes were identified, it was essential to select desirable methods of effecting the changes.

The behavioral changes and suggested methods of effecting the changes were found, in large part, in the Nebraska Industrial Arts Curriculum Guide.[4] Further reading of other articles corroborated the statements found in the Curriculum Guide.

Once the behavioral changes and methods were accepted, the next task was to devise questions to test such changes. This was accomplished by restating the statement of method in the interrogative form.

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[4]Nebraska Advisory Committee on the Program of Industrial Arts, Industrial Arts for Nebraska High Schools, (Lincoln: Department of Education, 1959), p. 5.

The questions were compiled in the form of a questionnaire (p. 75 in the appendix) to be sent to 150 industrial arts instructors in the state of Kansas. The questions regarded practices in industrial arts laboratories and a ranking of the proposed nine objectives by the respective schools in order of importance.

One-hundred and fifty industrial arts teachers were selected at random by their district numbers. Of the 150 questionnaires mailed, 83 were returned. Because the results of this study reflect only the thoughts and actions of the 55.3% who returned the form, the specific conclusions were regarded with a little skepticism.

The returns were evaluated and recorded in terms of the relationship between the value placed on a particular objective and the emphasis placed on implementation of that objective in the industrial arts laboratory.

After evaluating the data received, an attempt was made to draw general conclusions regarding the relationship between theory of industrial arts and the actual practice and to outline recommendations for change.

DEFINITION OF TERMS

Industrial Arts. Those occupations by which changes

are made in the forms of materials to increase their values for human usage.[5]

Industrial Arts Education. A general study of the changes made by man in the forms of materials and of the problems of life related to those changes.[6]

Objectives of Industrial Arts. The purposes of a profession that lead to fulfillment of its stated philosophy. For that purpose of this study, the objectives used were:

1. To gain an understanding of American Industry and its place in our society.
2. To gain consumer knowledge in the selection, purchase, and maintenance of goods.
3. To develop the wise use of leisure time.
4. To help each student understand the world of work and himself, with aims of realistic selection of occupational choice.
5. To encourage the use of critical thinking in the form of planning and construction of projects.
6. To develop personal qualities through the use of democratic process in the shop.
7. To develop safe work habits and a concern for the safety and well-being of others.
8. To develop an aesthetic appreciation for the creative ability of himself and others.

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[5]Frederick Gordon Bonser and Lois Coffey, Industrial Arts for Elementary Schools, (New York: The MacMillan Publishing Co., 1939), p. 5.

[6]Ibid.

9. To develop skills in the use of the basic equipment and materials of a technical age.[7]

Control Sample. Two-thousand and twenty-seven responses from industrial arts teachers selected at random across the United States were used. This was a section used from a broad study conducted by Marshall L. Schmitt and Albert L. Pelley in 1966.[8]

Population Sample. Eighty-one out of 150 solicited responses from industrial arts teachers selected at random from the schools of Kansas.

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[7]Nair, loc. cit.

[8]Marshall L. Schmitt and Albert L. Pelley, Industrial Arts Education, No. FS5,233:33038, (Washington: U.S. Government Printing Office, 1966), p. 2

CHAPTER II

REVIEW OF LITERATURE

The search for supportive evidence in the preparation of this study revolved around three major areas: (1) determining a logical set of objectives for industrial arts, (2) defining those objectives in terms of behavioral changes, and (3) determining the relative importance and emphasis of each objective.

The search for objectives could not have begun without an overall goal or purpose of industrial arts. To this end, Wilber described industrial arts as:

> "That phase of general education which gives the student a basic understanding of industry, using various materials, machines, tools and equipment in preparation for future employment."[9]

Various authors and organizations attempt to convey their objectives as being the most important in fulfilling the prime objective as stated above. Dr. Earl Woody conducted a study in 1963 in an attempt to determine whose objectives received the most backing in the field of industrial arts. He stated, "the only conclusion that can be drawn from this study is that industrial arts teachers

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[9]Gordon O. Wilber, Industrial Arts In General Education, (Scranton: International Textbook Co., 1948), p. 2.

do not agree as to what the objectives of industrial arts are or should be."[10]

One of the first listings of objectives specifically written for industrial arts was published by a committee of the Iowa Association of Manual and Industrial Arts Teachers in 1926. The following objectives were those proposed by that committee.

1. To make contact with the practical applications of mathematics and science.
2. To develop initiative and creative thinking to stengthen interest in problem solving.
3. To awaken a vocational interest.
4. To aquire industrial information as a means of educational guidance.
5. To achieve self-expression through participation in various shop activities.
6. To develop physical and mental co-ordination.[11]

Later that same year, the Iowa Association merged with the National Society for the Promotion of Industrial Education and the Vocational Association of the Middle West to form the American Vocational Association.[12] The latter organization became one of the foremost

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[10]Earl T. Woody, "Analysis of the Perceived Objectives Among Industrial Arts Teachers," (Unpublished Doctors Dissertation, Colorado State College, 1963), p. 127.

[11]"Aims and Objectives for Industrial Arts in Schools," Industrial Arts Magazine, 15:340. September, 1926.

[12]Roy W. Roberts, Vocational and Practical Arts Education, History, Development, and Principles, (New York: Harper and Brothers Publishing Co., 1957), p. 543

authorities in industrial arts education.

At the 1928 convention, a committee on standards was appointed to prepare a report on the problems affecting industrial arts.[13] The sixth of these reports, under the direction of William E. Roberts, contained twelve objectives of industrial arts which were as follows:

1. To develop in each pupil an active interest in industrial life and in the methods of production and distribution.

2. To develop in each pupil the ability to select wisely, care for, and use properly the things he buys and uses.

3. To develop in each pupil the appreciation of good workmanship and good design.

4. To develop in each student an attitude of pride or interest in his ability to do useful things.

5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or unfamiliar situation.

6. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.

7. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.

8. To develop in each pupil the habit of careful, thoughtful work without loitering or wasting time (industry).

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[13]American Vocational Association, Standards of Attainment in Industrial Arts, Final Report of the Committee on Standards of Attainment in Industrial Arts, (Washington: American Vocational Association, 1934), p. 2.

9. To develop in each pupil an attitude of readiness to assist others when they need help and to join in group undertakings (co-operation).

10. To develop in each student a thoughtful attitude in the matter of making things easy and pleasant for others.

11. To develop in each pupil a knowledge and understanding of mechanical drawing, the interpretations of the conventions in drawings and working diagrams, and the ability to express his ideas by means of a drawing.

12. To develop in each pupil elementary skills in the use of common tools and machines in modifying and handling materials, and an understanding of some of the more common construction problems.

In 1934, Dr. Frederick Bonser and Lois Mossman, early leaders of the industrial arts movement, developed six objectives for industrial arts in their book, Industrial Arts for Elementary Schools:

1. To be aware of general health needs.

2. To be able to buy and use industrial products of good quality in material and construction and well adapted to their purpose, at costs that are reasonable. . . .

3. To love that which is beautiful, and be able to select and use products which are beautiful in themselves. . . .

4. To be sensitive to the well-being of others. . . .

5. To have permanent interest in the materials, processes, products, and achievements of industry. . . .

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[14] Ibid., p. 12.

6. To be reasonably dexterous in the handling of materials, tools, machines, and products found in the general environment.[15]

The American Vocational Association's Committee on Standards of Attainment in Industrial Arts Teaching was reactivated in 1939 to update the AVA's stand on industrial arts. In 1953, this committee, under the chairmanship of Chris N. Groneman, published a revised bulletin, A Guide to Improving Instruction in Industrial Arts, which contained the following list of revised objectives for industrial arts:

1. Interest in industry. To develop in each pupil an active interest in the industrial life and in the method and problems of production and exchange.

2. Appreciation and use. To develop in each pupil the appreciation of good design and workmanship and the ability to select, care for, and use industrial products wisely.

3. Self-realization and initiative. To develop in each pupil the habits of self-reliance and resourcefulness in meeting practical situations.

4. Cooperative attitudes. To develop in each pupil a readiness to assist others and to join happily in group undertakings.

5. Health and safety. To develop in each pupil desirable attitudes and practices with respect to health and safety.

6. Interest in achievement. To develop in each pupil a feeling of pride in his ability to do useful things and to develop worthy leisure time interests.

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[15]Frederick Bonser and Lois Mossman, Industrial Arts for Elementary Schools, (New York: The McMillan Co., 1934), pp. 14-15.

7. Orderly performance. To develop in each pupil the habit of an orderly, complete, and efficient performance of any task.

8. Drawing and design. To develop in each student an understanding of drawings and the ability to express ideas by means of drawing.

9. Shop skills and knowledge. To develop in each pupil a measure of skill in the use of common tools and machines and an understanding of the problems involved in common types of construction and repair.[16]

In 1959, Ralph K. Nair, in an article for the Eighth Yearbook of the Council on Industrial Arts Teacher Education, listed the following nine objectives for industrial arts programs:

1. To gain an understanding of American industry and its place in our society.

2. To gain consumer knowledge in the selection, purchase, and maintenance of consumer items.

3. To develop the wise use of leisure time.

4. To gain an understanding of the world of work and himself, with aims of realistic job selection.

5. To encourage the use of critical thinking.

6. To develop personal qualities through democratic process in the shop.

7. To develop safe work habits and a concern for the safety of others.

8. To develop an aesthetic appreciation for the creative ability of himself and others.

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[16]American Vocational Association, A Guide to Improving Instruction in Industrial Arts, (Washington: American Vocational Association, 1953), p.18.

9. To develop skills in the basic tools and equipment of a technical age.[17]

In 1960, E.E. Ericson and Kermit Seefeld published a book entitled, Teaching the Industrial Arts. In it they listed the following objectives:

1. Self-discovery by pupils of their own abilities and aptitudes, leading toward maturing life interest.

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

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

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

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

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

7. Ability to read and make sketches and drawings for illustrative and construction purposes.

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

9. Basic experiences in the use of tools, machines, and the materials of value, in order to carry on the future educational and professional works on scientific and technological levels.

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[17]Nair, loc. cit.

10. Development of the safety habits and a fundamental safety consciousness not only in the school, but also in the home and in future occupations.[18]

Again in 1968 the American Vocational Association updated its stand on industrial arts education by publishing the pamphlet, "A Guide to Improving Instruction in Industrial Arts." The five objectives listed in the guide were

1. Develop an insight in understanding industry and its place in our society.

2. Discover and develop talents, aptitudes, interests, in potentialities of individuals for the technical pursuits in the applied science.

3. Develop an understanding of industrial processes and the practical application of scientific principles.

4. Develop basic skills in the proper use of common industrial tools, machines, and processes.

5. Develop problem-solving in creative abilities involving the materials, processes and products of industry.[19]

The above listings of objectives strongly suggested, though not directly, that the final word, in industrial arts goals had been offered. There were many other listings of objectives that could have been quoted. The purpose here, however, was not to argue the relative merits of

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[18]E.E. Ericson and Kermit Seefeld, Teaching the Industrial Arts, (Peoria: Charles A. Bennett Pub. Co., 1960), pp. 260-61.

[19]American Vocation Association, A Guide to Improving Industrial Arts Instruction, (Washington: American Vocational Association, August, 1968), pp. 9-11.

each listing, but to show by the above sampling, that some confusion in the selection of objectives did exist. This confusion caused Dr. Karnes to state:

> For whatever reason, no clearly-defined, logically consistant theoretical structure, with its accompanying principles, has emerged and enjoyed general acceptance to the point that it influences practices in the field of industrial arts in a significant way. The development of a theory of industrial arts, along with its aims and objectives, remains the most crucial aspect of the problem of affecting improvement.[20]

Woody advances the theory further when he stated in his study that there was considerable disagreement among industrial arts teachers as to what the objectives of industrial arts should have been.[21]

It seemed apparent to this writer that rather than constructing new or different objectives, the leaders of industrial arts had merely been renumbering or rearranging components of previous listings. The primary difference between the various sets of objectives, it seemed, was one of scope, i.e., a movement toward the general as opposed to the specific.

The problem, then, as stated by Karnes and Woody was not in the determination of the right set of objectives.

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[20]M. Ray Karnes, "Improving Instruction in Industrial Arts Education," The Industrial Arts Teacher, May, 1960.

[21]Woody, op. cit., p. 4.

but in the inability on the part of those involved to recognize the obvious repetition which persisted among the various sets of objectives. The listings were actually contextual duplications. For this reason, then, the nine objectives listed by Nair were assumed to be as definitive as any of the others; thus they were chosen for this study. The fact that Schmitt also used these nine objectives in his broad study of over two thousand industrial arts programs from all over the United States added credence to the selection of these objectives over other listings.[22]

Defining Objectives in Terms of Behavioral Changes

There was no way to directly measure an objective. The objective was first defined as certain behavioral changes in the individual. Behavioral change simply defined was "the alteration or substitution of overt physiological or physical action, or internal and emotional processes."[23] Behavioral change, as it applies to industrial arts, was to promote changes in degree of skills, knowledge, attitudes, values, appreciations, and abilities.[24]

The Nebraska Guide cited three steps to establishing

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[22]Schmitt and Pelley, op. cit., pp. 2-7.

[23]Webster's New International Dictionary, (Springfield: C. C. Merriam Co., 1957), p. 79.

[24]Nebraska, op. cit., p. 5.

an objective with reference to behavioral change:

> First, it is essential to translate each objective into behavioral changes which are desired. An objective defined in behavioral terms is, in a sense, a definition of the ideal citizen or of optimal personal development. The two are not in conflict in a democratic society.
>
> The second step in the process is to enumerate the learning activities which will bring about the desired behavior changes. "Learning Activities" in this sense is synonymous with instructional content. Each behavior change will suggest numerous learner activities; things the pupil can design, things he can construct, experiments he can conduct, investigations he can make, trips and visits he can take, and pictures and films he can observe.
>
> The third step in the process is to study the desired behavioral changes from the point of view of what evidence should be gathered about the pupil learning and behavior to determine whether the desired changes have occured.[25]

The behavioral changes pertaining to each of the nine objectives of industrial arts were taken exclusively from the Nebraska Guide. The existence of similar changes may be found in many state guides for industrial arts. The extensive list of objectives and their respective behavior changes were listed below.

Objective I. The council of Industrial Arts Supervisors stated that to gain an understanding of American industry, students had to gain knowledge and skill in the principles of industry through two areas: study and

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[25]Ibid.

application.[26]

The Nebraska Guide for Industrial Arts listed the following behavioral changes as desirable for the first objective:

1. He will have some understanding of the industrial system in this country.
2. He will be able to describe some of the basic industries of this country--history, processes, products, importance to the country.
3. He will be aware of the industries in his community.
4. He will be able to carry on an intelligent discussion about industry.
5. He will associate industrial methods and activities with the experiences in the shop.
6. He will realize the importance of cooperation in group activity.
7. He will eagerly join in group activity and contribute to the common purpose.[27]

Objective II. Through association with and study of the various materials common to the consumer market, the students should be able to better judge the value of items for purchase.[28] Three changes in behavior are suggested in the Nebraska Guide:

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[26]American Council of Industrial Arts Supervisors, Industrial Arts Education, Washington: American Industrial Arts Association, 1963), p. 3.

[27]Nebraska, op. cit., p. 9.

[28]Harold G. Silvius, Teaching Successfully in Industrial Education, 2nd Edition, (Bloomington: McKnight and McKnight Co., 1967), p. 492.

1. He will purchase industrial products wisely.

2. He will take proper care of industrial products from the maintenance point of view.

3. He will have some knowledge of the materials that go into industrial products and knowledge of common processes by which the materials are shaped and assembled.[29]

Objective III. Leisure time in American society has been on the upswing for the past decade. The significance of positive use of this time has long been of the utmost importance to organized society. Industrial arts is in the position to make significant contributions to this facet of society with its unique experiences in crafts, as well as other areas.[30] To this end, five behavioral changes to look for with reference to students were:

1. He will develop and pursue a worthy hobby.

2 He will enjoy creating, repairing, and improving things.

3. He will know the sources of information related to his free-time activities and will seek information from these sources.

4. He will join and take an active part in free-time or hobby groups or clubs in the school and community.

5. He will realize the advisability of development of worthy free-time activities.[31]

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[29]Nebraska, op. cit., p. 9.

[30]Harold G. Gilbert, Children Study American Industry, (New York: William C. Brown Co., 1959). p. 60.

[31]Nebraska, op. cit., p. 15.

Objective IV. Very few of today's youth can look forward to a leisurely life absent of work. Education directed towards the world of work is therefore one of the most important phases of general education. This does not mean merely formal job training, but also basic introduction to the industrial world. The sounds of the shop: saws whirling, machines screaming, and hammers banging are also sounds of the industrial plant. The bustling activity of many people working simultaneously and harmoniously together is cognizant of the industrial situation.[32]

Not only does the potential worker need to know about the technical nature of society and the world of work, he must also understand how to adjust to life in the society.[33] Through industrial arts courses, students have an opportunity to explore their feelings by actual experience in the working world.

The ultimate aim of education is to prepare a child to enter into society as a contributing partner. Every industrial arts program should have a goal of vocational selection, not job training. Industrial arts has long been in a position to fulfill this objective, because of

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[32]Gilbert, op. cit., p. 18.

[33]Charles E. Shoemaker, Planning Industrial Arts Facilities, "Eighth Yearbook of the Council on Industrial Arts Teacher Education, (Bloomington: McKnight & McKnight Co., 1959), pp. 23-25.

its experimental basis.[34] An article from the organization bulletin summarized this position:

> Students experiment with and explore the application of these processes as they are used in industry. They are able to sample the different activities in great enough measure so that they can determine their likes and dislikes, their interests and aptitudes.[35]

The following behavioral changes for Objective Four were listed in the Nebraska Guide:

1. He will be aware of the industries in his community.
2. He will have some understanding of the differences between the various workers in industry as to pay, training, and working conditions.
3. He will be able to better select his vocation by having an understanding of occupational opportunities and requirements.[36]

Objective V. Critical thinking is based on the assumption that society needs persons qualified to think constructively, quickly, and efficiently in solving everyday problems. In industrial arts, the industrially related problems may be visually as well as intellectually, solved.[37] The American Vocational Association Bulletin of 1968

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[34] Loc. cit.

[35] State Department of Education, "Organization and Administration," Industrial Arts Education, (Albany: University of New York Press, 1960), pp. 19-20.

[36] Nebraska, op. cit., pp. 7-8.

[37] American Vocational Education Association, Improving Instruction in Industrial Arts, (Washington: American Vocational Education Association, 1968), p. 11.

summarized the problem as follows:

> If creativity is to be fostered as the hope of the future, there must be a concentrated effort to recognize, encourage, and nurture inquisitive minds in the classroom and the laboratory. This means a flexibility of methodology, a system to match changing conditions, and content to allow a certain amount of creativity and pragmatic problem solving. The very nature of our laboratory setting makes possible a concrete, understandable approach to teaching problem solving in critical thinking.[38]

There were five readily identifiable behavioral changes for Objective Five listed in the Nebraska Guide:

1. He will be able to solve the problems that are involved in common types of construction and repair.
2. He will be able to sketch and draw things he plans to make.
3. He will know the value of planning his work, project, or activity.
4. He will know proceedures which promote efficiency in performing a task.
5. He will develop an orderly method of approach in problem solving.[39]

Objective VI. Qualities involving the ability to lead, follow directions, give and take orders, and get along with others are the democratic ideals of our nation. These are also the qualities developed in the industrial arts shop.[40]

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[38] Ibid.

[39] Nebraska, op. cit., pp. 14-16.

[40] Shoemaker, op. cit., pp. 29-30.

Micheels stated that one of the greatest contributions that industrial arts made to society was the close contact and harmony of people working together.[41]

Behavioral changes related to this area were as follows:

1. He will realize the importance of co-operation in the shop with references to group activity.
2. He will realize that large accomplishments are the result of effective co-operation.
3. He will see the relationship between group co-operation in the shop and group co-operation in larger units of society.
4. He will eagerly join in group activity and contribute to the common purpose.[42]

Objective VII. Safety has always been one of the major concerns of the industrial arts teacher. In the shop, a student is working with tools that could be very dangerous. He needs, therefore, to observe the fundamental safety regulations set down by the instructor. Not only is it the purpose of industrial arts to protect the student in the shop, but it is also hoped that the safety attitudes he develops would be carried with him when he left.[43]

Some of the behavioral changes deemed necessary to Objective Seven included:

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[41]William J. Micheels, Industrial Arts Education, (Menomonie: Stout State Press, 1962), pp. 2-3.

[42]Nebraska, op. cit., pp. 12-13.

[43]Silvius and Curry, op. cit., pp. 430-33.

1. He will know the cause and effect of some of the common industrial accidents.

2. He will promote safe practices and habits in the shop.

3. He will have a knowledge of and be able to administer first aid.

4. He will know the shop safety regulations and follow them at all times.[44]

Objective VIII. In industrial arts, students are afforded an opportunity to be creative in the design and construction of projects. They explore various mediums such as wood, metal, and plastics. By constant association with materials and designs, a student gains a greater appreciation of his ability to create.[45]

Appreciation of ability was difficult to measure in terms of behavioral change since it usually was associated with attitudes. Some noted behavioral changes, however, were listed below:

1. He will have an understanding of the principles of good design.

2. He will be able to recognize and appreciate good workmanship and construction in certain types of industrial products.

3. He will apply principles of good design and workmanship in the school shop and in the home.

4. He will be familiar with the names of certain outstanding designers and with outstanding periods in design.

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[44] Nebraska, op. cit., pp. 13-14.

[45] Gilbert, op. cit., p. 9.

5. He will submit origional designs before beginning a project.

6. He will give and accept help in constructing projects.[46]

Objective IX. The primary purpose of industrial arts has long been to develop basic skills. When manual training began in the United States, the industry was closely aligned to it and individual operations were common to almost every industry. Technology has changed greatly but individual hand operations still retain a great role even in the largest factories.[47]

The last of the nine objectives was the underlying basis of most contemporary industrial arts programs. Behavioral changes for the ninth objective were:

1. He will be familiar with the common hand tools and be able to perform the common operations associated with them up to a standard compatable with his maturity level.

2. He will be familiar with the common industrial machines.

3. He will be able to use the common machines safely and effectively.

4. He will be able to solve the problems that are involved in common types of construction and repair.[48]

Rating the Objectives in Order of Importance

Although Woody's study attempted to determine the

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[46]Nebraska, op. cit., pp. 14-15.

[47]Silvius and Curry, op. cit., p. 276.

[48]Nebraska, op. cit., pp. 18-19.

most accepted objectives of industrial arts, it did not attempt to distinguish between individual objectives in terms of importance.

Marshall Schmitt and Albert Pelley conducted, as part of a broad survey of industrial arts programs, a study to determine the importance of the objectives of industrial arts to industrial arts teachers. Selected on a random basis, the 2,800 industrial arts instructors involved with the survey represented, geographically, the entire United States.

The results of the study concluded that only one of the nine objectives, "developing worthy leisure time activities," held little interest for industrial arts instructors.[49]

Such an outcome seemed realistic until one realized that this was an area in which the United States was seriously lacking. Each year, according to Silvius, Americans have not only more free time, but also an increased purchasing power with which to pursue some type of leisure activity.[50]

The impact of leisure time on the economy in the area of "fix it yourself" projects was staggering. As early as 1954, Time reported that this one area of hobbies had

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[49]Schmitt, op. cit., p. 28

[50]Silvius and Curry, op. cit., p. 572

grown into a six billion dollar a year industry.[51]

Silvius also emphasized the importance of this seemingly neglected area:

> The role of industrial arts education seems most apparent in providing youth and adults with experiences that could set the stage for the wholesome use of time now spent in useless idleness.[52]

Three objectives in Schmitt's study ranked high in degree of importance: (1) skill in the use of hand tools, (2) development of an appreciation for creative ability, and (3) encouragement to think critically. The remaining five objectives were rated by the industrial arts instructors as only medium in degree of emphasis.[53]

Because of the size of Schmitt's sample and of the high number of returns (97%), his study served as the control group for this thesis. The data of the next chapter was closely scrutinized by the writer in relation to Schmitt's study.

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[51] "The Shoulder Trade," Time, LXIV, 5, (August 2, 1954), p. 62.

[52] Silvius and Curry, loc. cit.

[53] Schmitt and Pelley, loc. cit.

CHAPTER III

RESULTS OF THE SURVEY

The Population

The eighty-three schools in the survey represented 20.4% of the 407 high schools in the state with industrial arts programs.[54] The results were grouped according to school size. Twenty of the 182 schools with enrollments of 42 to 149 were surveyed representing 10.9%.[55] Thirty-one of the 158 schools with 150 to 499 students enrolled were surveyed, this represented 19.62%.[56] Eight, or 25.8%, of the thirty-one schools with enrollments of 500 to 999 were surveyed.[57] Twenty-two of the thirty-two schools with enrollments of 1,000 or larger were surveyed, representing 61.11%.

The Instrument

The questionnaire (pp. 73-76) was prepared in two sections: (1) a list of thirty-four questions pertaining to practices in the shop, and (2) nine objectives to be arranged in order of importance.

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[54]Kansas State Department of Education, Kansas Education Directory for 1969-70, Bul. 340, (Topeka: Dept. of Ed.), pp. 24-62.

[55]Ibid.

[56]Ibid.

[57]Ibid.

[58]Ibid.

The questions were selected to be representative of behavioral changes related to specific objectives.

Recording the Data

Tables I, II, V, VII, IX, were read in the following manner. The nine objectives were listed on the left side of the table. The nine columns were numbered from one (1) to nine (9) with importance decreasing from left to right. Each dot represented the response of one instructor thus five dots in column one, beside the first objective, was interpreted as five instructors rating objective one as the most important of the nine objectives listed.

Tables II, IV, VI, VIII, and X recorded the data obtained from the scattergrams as percentages. The nine categories of importance as listed in the scattergrams were narrowed down to three categories to facilitate their correlation with other sections of the study.

Table XI gave a composite explanation of the previous tables. It read from top to bottom in order of decreasing importance. Each column represented the responses of each of the various groups of instructors in terms of ranking of the nine objectives in order of importance.

Tables XII, XIII, XIV, XV, XVI, XVII, XVIII, IXX, and XX, represented the responses of the eighty-one instructors to thirty-one questions regarding emphasis on particular objectives. The first column gave the numbers of the questions as they were found in the sample

questionnaire located in the appendix (p. 71). The next four columns represented degrees of emphasis on particular objectives. The bottom row of each table gave the percent for each of the four degrees of emphasis.

Evaluation of the Objectives in Terms of Relative Importance

The data obtained from the scattergrams was grouped according to three degrees of importance: High, Medium, and Low. That grouping made it easier to correlate the results of that section with other sections of the study.

To determine what effect, if any, school size had on the rated value of the objectives, the data was subdivided into four categories related to enrollments.

Table I (p. 33) represented the schools with enrollments of less than 150. As evidenced by the lack of definite grouping in the scattergram, the twenty instructors varied widely in their opinions. The response for critical thinking, safety, skill, and creative ability indicated a higher degree of importance than did leisure time, consumer knowledge, or personal qualities. The last three indicated little importance.

Table II (p. 35) indicated the value of each objective in percentages. Skill and safety ranked equally high in degree of importance with 60% respectively. While critical thinking ranked next highest with 45%, the fact that it also ranked 60% in the Medium column and 0% in the Low column indicated that its value was somewhere between

TABLE I

RESPONSES OF THE 20 INSTRUCTORS FROM SCHOOLS WITH 42-149 PUPILS INDICATING THE DEGREE OF IMPORTANCE OF THE NINE OBJECTIVES

	Descending Importance →								
	1	2	3	4	5	6	7	8	9
UNDERSTAND AMERICAN INDUSTRY		....			.... ..	..	.	.	.... ..
CONSUMER KNOWLEDGE		..	...	.	.	..	...	.... ..	..
LEISURE TIME			....	..		..	...	.... .	....
JOB SELECTION	....	..			....	....	..	....	
CRITICAL THINKING	..	....	....		..	..			
PERSONAL QUALITIES		..		..	..	..	.... ..	..	....
SAFETY	.... ..	....	..	..		....		..	
CREATIVE ABILITY		....	..	.... ..	..	..	..		..
SKILL	....	..	..		...		...		..

medium and high in degree of importance. Creative ability and job selection, on the other hand, ranked a solid medium with 50% and 40% respectively. Understanding industry ranked in both the medium and low column; thus the actual value was assumed to be somewhere between medium and low. Consumer knowledge, leisure time, and personal qualities were rated relatively low with 55%, 60% and 60% respectively.

According to the results of Table II, the twenty instructors in schools with less than 150 pupils ranked the objectives (in descending order of importance): safety or skill, critical thinking, creative ability, job selection, understanding industry, consumer knowledge, leisure time, and personal qualities.*

Table III (p. 35) represented the returns from thirty-one instructors in schools with an enrollment between 150 and 499 students. As evidenced by the scattergram, the responses were more closely grouped, indicating a greater agreement. Responses for understanding industry, consumer knowledge, and leisure time indicated little importance, while apparent grouping in the direction of most important was noted for responses for safety, creative

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*Because the values for safety and skill were the same, they were assumed to be of equal importance. In a listing of importance from 1-9, they would occupy interchangeable positions.

TABLE II

THE NUMBER AND PERCENT OF RESPONSES IN EACH CATEGORY FOR THE OBJECTIVES OF INDUSTRIAL ARTS, FROM THE TWENTY SCHOOLS WITH ENROLLMENTS FROM 42-149

	HIGH (1,2,3)		MEDIUM (4,5,6)		LOW (7,8,9)	
UNDERSTAND AMERICAN INDUSTRY	4	20.0%	8	40.0%	8	40.0%
CONSUMER KNOWLEDGE	5	25.0%	4	20.0%	11	55.0%
LEISURE TIME	4	20.0%	4	20.0%	12	60.0%
JOB SELECTION	6	30.0%	8	40.0%	6	30.0%
CRITICAL THINKING	9	45.0%	11	55.0%	0	00.0%
PERSONAL QUALITIES	2	10.0%	6	30.0%	12	60.0%
SAFETY	12	60.0%	3	15.0%	2	10.0%
CREATIVE ABILITY	6	30.0%	10	50.0%	4	20.0%
SKILL	12	60.0%	3	15.0%	5	25.0%

NOTE: The numerical values represent the actual number of the responses for each of the nine objectives. The percentage indicates the relationship of that value to the other two categories.

TABLE III

RESPONSES OF THE 31 INSTRUCTORS FROM SCHOOLS WITH 150-499 PUPILS INDICATING THE DEGREE OF IMPORTANCE OF THE NINE OBJECTIVES

	Descending Importance →								
	1	2	3	4	5	6	7	8	9
UNDERSTAND AMERICAN INDUSTRY	...	.		.... .	....		..	....	.... ..
CONSUMER KNOWLEDGE			.	.	....	....	....	....	.... ..
LEISURE TIME	.			....		....	..	....	....
JOB SELECTION	.... ..	....	.... ..	...	..	.	...		
CRITICAL THINKING	....	....	.... ..	...	...	.	..		
PERSONAL QUALITIES		..	.... .	.... ..	...	..	....	..	...
SAFETY	.... .	...	....	...	..	.... .		..	
CREATIVE ABILITY	..	.... ..	..	....	.	.... ..		....	
SKILL	....	....	....	..	....		...		

ability, skill, and job selection.

In Table IV (p. 38) the responses for critical thinking rated very high with twenty-two tallies representing 70.9%. The responses for safety and skill also rated high in degree of importance with 61.3% each. In the Medium column, the responses for job selection and creative ability were the most outstanding. The responses for understanding industry, consumer knowledge, leisure time, and personal qualities were rated the lowest by instructors. It was noted that this group attained a greater degree of agreement than did the other groups in the study.

The importance of the objectives to the group was (in descending order of importance): critical thinking, safety, skill, creative ability, job selection, personal qualities, understanding industry, consumer knowledge, and leisure time.*

Table V (p. 39) represented the responses of eight instructors in schools ranging from 500-999 pupils. Though not as closely grouped as the 150-499 group, Table V showed a definite preference for several objectives. The responses for understanding industry showed little agreement while consumer knowledge leaned heavily to the high degree and leisure time to the low. The responses for job selection maintained a unanimous

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*Because the values for safety and skill were equal, it was assumed that they were of equal importance.

TABLE IV

THE NUMBER AND PERCENT OF RESPONSES IN EACH CATEGORY FOR THE OBJECTIVES OF INDUSTRIAL ARTS FROM SCHOOLS WITH ENROLLMENTS FROM 150-499

	HIGH (1,2,3)		MEDIUM (4,5,6)		LOW (7,8,9)	
UNDERSTAND AMERICAN INDUSTRY	4	12.9%	9	29.0%	18	58.1%
CONSUMER KNOWLEDGE	1	3.2%	9	29.0%	21	67.7%
LEISURE TIME	1	3.2%	8	25.8%	22	70.9%
JOB SELECTION	11	35.5%	16	51.6%	4	12.9%
CRITICAL THINKING	22	70.9%	6	19.4%	3	9.7%
PERSONAL QUALITIES	7	22.6%	11	35.5%	13	41.9%
SAFETY	19	61.3%	10	32.3%	2	6.4%
CREATIVE ABILITY	10	32.3%	14	45.1%	7	22.6%
SKILL	19	61.2%	9	29.0%	3	9.7%

NOTE: The numerical values represent the actual number of the responses for each of the nine objectives. The percentage indicated the relationship of that value to the other two categories.

TABLE V

RESPONSES OF THE 8 INSTRUCTORS FROM SCHOOLS WITH 500-999 PUPILS INDICATING THE DEGREE OF IMPORTANCE OF THE NINE OBJECTIVES

	Descending Importance 1	2	3	4	5	6	7	8	9
UNDERSTAND AMERICAN INDUSTRY		..	.	.	..			.	.
CONSUMER KNOWLEDGE		...	...				.	.	
LEISURE TIME			..					....	..
JOB SELECTION	....								
CRITICAL THINKING		..		..		..	..		
PERSONAL QUALITIES				..		.	..	...	
SAFETY			..		..	..	..		
CREATIVE ABILITY		.					....	..	.
SKILL				.... .	..				.

high, while the responses for personal qualities, safety, creative ability, and skill were grouped more toward the medium and low degrees.

Table VI (p. 41) indicated that the group had a predominately middle attitude concerning the value of the various objectives. Job selection ranked highest with 100%. Consumer knowledge also ranked high with 75%. Understanding industry ranked 37.5% in the High column, 37.5% in the Medium column, and 25.0% in the Low column. The establishment of a value for the objective was difficult to ascertain in light of the above figures. With some reservation, it was assigned a value somewhere between medium and high because the Low column had the smallest percent.

In the Medium column, critical thinking, safety, creative ability, and skill all ranked relatively high with percentages of 50%, 50%, 50%, and 87.5% respectively. Only two objectives stand out in the Low column: leisure time and personal qualities, each with 75%.

The order of importance for the nine objectives as given in Table VI for the 500-999 group was (in descending order of importance): job selection, consumer knowledge, understanding industry, critical thinking or safety, creative ability, skill, leisure time, and personal

TABLE VI

THE NUMBER AND PERCENT OF THE RESPONSES IN EACH CATEGORY FOR THE OBJECTIVES OF INDUSTRIAL ARTS, FROM SCHOOLS WITH ENROLLMENTS OF 500 to 999

	HIGH (1,2,3)		MEDIUM (4,5,6)		LOW (7,8,9)	
UNDERSTAND AMERICAN INDUSTRY	3	37.5%	3	37.5%	2	25.0%
CONSUMER KNOWLEDGE	6	75.0%	0	0.0%	2	25.0%
LEISURE TIME	2	25.0%	0	0.0%	6	75.0%
JOB SELECTION	8	100.0%	0	0.0%	0	0.0%
CRITICAL THINKING	2	25.0%	4	50.0%	2	25.0%
PERSONAL QUALITIES	0	0.0%	2	25.0%	6	75.0%
SAFETY	2	25.0%	4	50.0%	2	25.0%
CREATIVE ABILITY	1	12.5%	4	50.0%	3	37.5%
SKILL	0	0.0%	7	87.5%	1	12.5%

NOTE: The numerical values represent the actual number of responses for each of the nine objectives. The percentage indicates the relationship of that value to the other two categories.

qualities.*

Table VII (p. 43) represented the responses of twenty-two instructors in schools with enrollments of 1,000 or more. The distribution of responses, as shown by the scattergram, indicated that considerable disagreement existed among the group of instructors.

The results indicated that the responses for understanding industry showed little importance, while the responses for consumer knowledge indicated a medium degree of importance.

The responses for leisure time were definitely low in importance, but the responses for job selection and critical thinking were middle of the road or medium. There appeared to be considerable disagreement according to the responses, as to the value of safety and skill, although both showed a slight trend toward little importance. The responses for personal qualities and creative ability indicated a medium degree of importance.

Table VIII (p. 44) gave a more accurate picture of the values placed on the nine objectives. Creative ability and safety were relatively high with values of 50% and 54% respectively. Although job selection rated

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*Because critical thinking, safety, creative ability, leisure time, and personal qualities had equal values respectively, they may be thought of as having equal importance to the instructors when rated on a scale from 1 to 9.

TABLE VII

RESPONSES OF THE 22 INSTRUCTORS FROM SCHOOLS WITH 1,000 OR MORE PUPILS INDICATING THE DEGREE OF IMPORTANCE OF THE NINE OBJECTIVES

	Descending Importance → 1	2	3	4	5	6	7	8	9
UNDERSTAND AMERICAN INDUSTRY	••	••	••••		••		••••	••••• •	•
CONSUMER KNOWLEDGE	••	•••		•••••	•••••	••••	•••		
LEISURE TIME				••			•••	•••••	•••• ••••• •••••
JOB SELECTION	•••• ••	••	•	••••		•••• ••••	••		
CRITICAL THINKING		••••		•••• •	•••• •••	•	•	••	
PERSONAL QUALITIES	••••	••	••	•	•	•••	••••	•••••	
SAFETY	•••• •		••	••	•	•	••	••	•••• •••
CREATIVE ABILITY	•	••••	••••	•	•••• •	••	••	•	
SKILL	•••• •		••	••	•	•	••	••	••••• •••

TABLE VIII

THE NUMBER AND PERCENT OF RESPONSES IN EACH CATEGORY FOR THE OBJECTIVES OF INDUSTRIAL ARTS, FROM SCHOOLS WITH ENROLLMENTS OF 1,000 AND ABOVE

	HIGH (1,2,3)		MEDIUM (4,5,6)		LOW (7,8,9)	
UNDERSTAND AMERICAN INDUSTRY	8	36.4%	2	9.1%	12	54.5%
CONSUMER KNOWLEDGE	5	22.7%	14	63.7%	3	13.6%
LEISURE TIME	0	00.0%	2	9.1%	20	90.9%
JOB SELECTION	9	40.9%	11	50.0%	2	9.1%
CRITICAL THINKING	6	27.2%	13	59.1%	3	13.7%
PERSONAL QUALITIES	8	36.4%	5	22.7%	9	40.9%
SAFETY	12	54.5%	7	31.8%	3	13.7%
CREATIVE ABILITY	11	50.0%	8	36.4%	3	13.7%
SKILL	7	31.8%	4	18.2%	11	50.0%

NOTE: The numerical values represent the actual number of responses for each of the nine objectives while the percentages indicate the relationship of those values to the other two categories.

40% in the High column, it was 50% in the Medium and 9.1% in the Low. That would indicate that although the high had considerable influence on job selection, it still remained in the Medium column. Consumer knowledge and critical thinking ranked medium with 63.7% and 59.1% respectively. Understanding industry, consumer knowledge, and skill were relatively low in value, as recorded in the table.

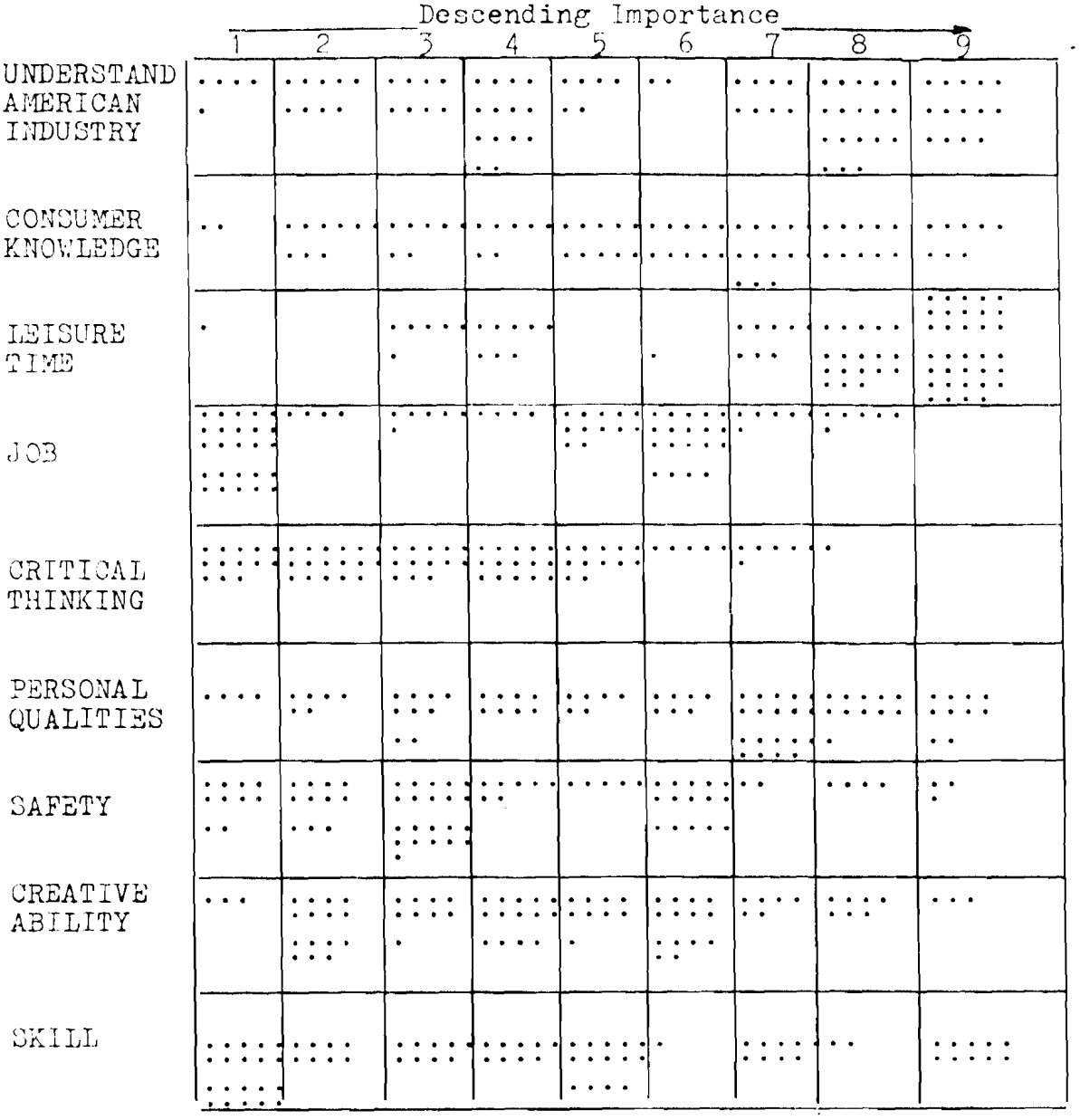
The order of importance of the nine objectives as listed by the twenty-two instructors in schools above 1,000 enrollment was (in descending order of importance): safety, creative ability, skill, job selection, critical thinking, consumer knowledge, personal qualities, leisure time, and understanding industry.

It was evident that among the eighty-one instructors, a certain amount of discord existed concerning the relative importance of the various objectives. It was important to note here, however, that there were eighty-one instructors, each with nine possible responses, thus the total responses numbered 729. In view of this, the lack of grouping of responses noted in Table VIII was more easily understandable.

Table IX (p. 46) was a composite scattergram of all instructors, regardless of the size of school. The confusion that was evidenced in the various tables for selected groups was even more pronounced in this

TABLE IX

RESPONSES INDICATING DEGREE OF IMPORTANCE OF THE OBJECTIVES OF INDUSTRIAL ARTS
(All Schools Reporting)



scattergram. It was difficult to determine the relationships of the objectives because of the nonconformity or lack of grouping. Slight trends toward the right, or low degree of importance, were noted for the responses for understanding industry, consumer knowledge, and personal qualities. The responses for critical thinking, safety, and skill, on the other hand, appeared to be grouped more to the left or high degree of importance. The more precise calculations of Table X were needed to make accurate determinations.

Table X (p. 43) represented the total number of responses pertaining to the degree of emphasis for the nine objectives. Safety ranked the highest in degree of importance with 53.1% of the total responses. Skill and critical thinking followed closely with 46.9% and 50.6% respectively. Creative ability ranked 44.4% in the importance of the nine objectives, as ranked collectively by the eighty-one instructors was: safety, critical thinking, skill, job selection, creative ability, consumer knowledge, understanding industry, personal qualities, leisure time. The ranking of the objectives by the eighty-one instructors collectively deviated somewhat from the ranking given the objectives by the selected groups. Table XI (p. 49) showed the relationship of these ratings.

TABLE X

THE NUMBER AND PERCENT OF RESPONSES IN EACH CATEGORY FOR THE OBJECTIVES OF INDUSTRIAL ARTS, FROM ALL SCHOOLS REPORTING

	HIGH (1,2,3)		MEDIUM (4,5,6)		LOW (7,8,9)	
UNDERSTAND AMERICAN INDUSTRY	22	27.2%	21	25.9%	38	46.9%
CONSUMER KNOWLEDGE	17	21.0%	27	33.3%	37	45.7%
LEISURE TIME	7	8.6%	14	17.2%	60	74.2%
JOB SELECTION	34	42.0%	35	43.2%	12	14.8%
CRITICAL THINKING	41	50.6%	32	39.5%	8	9.9%
PERSONAL QUALITIES	17	21.0%	23	28.4%	41	50.6%
SAFETY	43	53.1%	29	35.8%	9	11.1%
CREATIVE ABILITY	28	34.6%	36	44.4%	17	21.0%
SKILL	38	46.9%	23	28.5%	20	2.5%

NOTE: The numerical values represent the actual number of responses for each of the nine objectives. The percentage indicated the relationship of that value to the other two categories.

TABLE XI

THE ORDER OF IMPORTANCE OF THE NINE OBJECTIVES AS DETERMINED BY SCHOOL SIZE

	42 to 149	150 to 499	500 to 999	1,000 or above	All schools reporting
Descending Importance	SAFETY	CRITICAL THINKING	JOB SELECTION	SAFETY	SAFETY
	SKILL	SKILL	CONSUMER KNOWLEDGE	CREATIVE ABILITY	CRITICAL THINKING
	CREATIVE THINKING	SAFETY	UNDERSTAND AMERICAN INDUSTRY	SKILL	SKILL
	JOB SELECTION	CREATIVE ABILITY	CRITICAL THINKING	JOB SELECTION	JOB SELECTION
	UNDERSTAND AMERICAN INDUSTRY	JOB SELECTION	SAFETY	CRITICAL THINKING	CREATIVE ABILITY
	CONSUMER KNOWLEDGE	PERSONAL QUALITIES	CREATIVE ABILITY	CONSUMER KNOWLEDGE	CONSUMER KNOWLEDGE
	LEISURE TIME	UNDERSTAND PERSONAL QUALITIES	SKILL	PERSONAL QUALITIES	UNDERSTAND AMERICAN INDUSTRY
	PERSONAL QUALITIES	CONSUMER KNOWLEDGE	LEISURE TIME	LEISURE TIME	PERSONAL QUALITIES
		LEISURE TIME	PERSONAL QUALITIES	UNDERSTAND AMERICAN INDUSTRY	LEISURE TIME

It was important to note that the weight exerted by selected groups on the section entitled "All Schools" was dependent upon the number of instructors in the various groups. Although the exact order varied somewhat, instructors from the 42-149, 150-499, and above 1,000 groups expressed considerable agreement with the final or all school listing. The responses for safety, skill, creative ability, critical thinking, and job selection were listed in the upper half, while the responses for understanding industry, consumer knowledge, leisure time and personal qualities were in the lower half. The listing for the 501-1,000 group did not show any relation to the other groups. The groups, however, encompassed only eight of the total of eighty-one instructors.

Recording and Evaluation of the Questions

The thirty-four questions of the survey were intended to relate to and test the methods of securing behavioral changes in those students involved in the various industrial arts programs in Kansas. The questions were ranked according to four degrees of emphasis: (1) High, (2) Medium, (3) Little or Low, and (4) None.

It was important to recognize that "emphasis" and "importance" had related, yet separate, functions in

the study. Importance suggested a judgement of superiority, while emphasis was the force or stress given a thought.[59] The key, of course, was that importance implied thought while emphasis implied action.

Table XII (p. 52) represented the degree of emphasis pertaining to understanding industry. The results indicated that about one-third of the eighty-one instructors put high emphasis on the importance of understanding industry while a slightly larger, or two-fifths, put little emphasis on this objective. The remaining instructors, totaling a little less than one-third, indicated some emphasis on understanding industry.

The closeness of the percentages indicated some variation in shop practices among the various instructors. The emphasis for this objective was assigned a value of medium-high, or halfway between medium and high, on the basis of the information gathered.

Table XIII (p. 53) represented the total tallies for the four questions asked which pertained to emphasis on consumer knowledge. Of the instructors quizzed, over one-half indicated little or no emphasis on consumer knowledge, while about one-fourth indicated medium emphasis, less than one-fifth emphasized the study of consumer

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[59] Webster's New International Dictionary, op. cit., pp. 417 and 169

TABLE XII

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE UNDERSTANDING AMERICAN INDUSTRY AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

		DEGREE OF EMPHASIS				
		NONE	LITTLE	MEDIUM	HIGH	TOTAL
QUESTION NUMBER	1	8	16	35	22	81
	9	25	16	24	16	81
	11	10	3	16	52	81
	12	8	8	28	37	81
	21	44	26	6	5	81
	23	11	14	32	24	83
	T	106	83	141	156	
	%	20.4%	17.3%	29.4%	32.9%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High.

TABLE XIII

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE CONSUMER KNOWLEDGE AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

		DEGREE OF EMPHASIS				
		NONE	LITTLE	MEDIUM	HIGH	TOTAL
QUESTION NUMBER	3	16	20	31	14	81
	5	6	22	41	12	81
	6	62	16	5	0	83
	14	15	16	20	32	83
	T	100	74	97	58	
	%	32.2%	25.1%	28.7%	15.0%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under the specific headings of None, Low, Medium, or High.

knowledge in their shops. The final value assigned the objective consumer knowledge was a low degree of emphasis. It was given that value, even though a large percent indicated no emphasis, because almost one-half of the instructors rated it above the low degree level.

Table XIV (p. 55) was representative of the six questions asked which pertained to leisure time. A total of 294 responses or about three-fourths of the instructors indicated little or no emphasis on this objective in their shops, while an almost insignificant number or less than one-sixth stated that the objective was highly emphasized. A little more than one-tenth indicated some or medium emphasis. The large percentage of instructors stating no emphasis caused this objective to be given a value halfway between none and low degree of emphasis.

Table XV (p. 56) indicated the results of the four total questions asked which pertained to job selection. A total of a little over one-third of the instructors indicated that this objective received little or no emphasis in their shops. A little less than one-third showed that job selection received some but not too much emphasis. The number indicated a high degree of emphasis ranked almost equal to the number for no emphasis or a little over one-third. The value of emphasis given job selection

TABLE XIV

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE LEISURE TIME AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

		DEGREE OF EMPHASIS				
		NONE	LITTLE	MEDIUM	HIGH	TOTAL
QUESTION NUMBER	6	62	16	5	0	83
	7	66	6	3	7	82
	10	37	13	26	7	83
	15	16	16	19	32	83
	19	49	6	8	20	83
	20	60	6	4	13	83
	T	290	64	65	79	
	%	58.6%	12.1%	13.1%	16.2%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Mwdium, or High

TABLE XV

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE JOB SELECTION AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

	DEGREE OF EMPHASIS				
	NONE	LITTLE	MEDIUM	HIGH	TOTAL
2	19	25	25	14	83
10	37	16	26	0	83
11	0	3	28	52	83
12	8	8	16	50	82
T	64	52	95	120	
%	19.8%	15.7%	28.9%	35.6%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High.

was halfway between medium and high. This value was decided upon because of the large percents for both medium and high.

Table XVI (p. 58) represented the responses to the four questions pertaining to critical thinking. Of the eighty-one instructors quizzed, almost one-fourth indicated no emphasis was placed on this objective, and an almost equal number placed some emphasis on critical thinking. This objective was given a rating of high in degree of emphasis as ascertained by the data in the table.

Table XVII (p. 59) was representative of the four questions asked which pertained to personal qualities. The difference in emphasis among the instructors for this objective was evident. Over one-half of the instructors indicated little or no emphasis on this objective. About one-third of the instructors indicated they placed some emphasis on personal qualities while less than one-tenth stated they highly emphasized the objective. The difference in the ratings caused the objective to be classified as low in emphasis since the percentage for the "none" degree of emphasis was larger than for the medium degree.

Table XVIII (p. 61) showed the results of the four questions asked which pertained to safety. Less than

TABLE XVI

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE CRITICAL THINKING AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

	DEGREE OF EMPHASIS				
QUESTION NUMBER	NONE	LITTLE	MEDIUM	HIGH	TOTAL
17	26	24	20	12	83
18	9	8	16	50	83
27	6	4	12	61	83
34	25	6	40	12	83
T	66	42	88	135	
%	19.7%	12.9%	26.1%	41.1%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High.

TABLE XVII

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE PERSONAL QUALITIES AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

		DEGREE OF EMPHASIS				
		NONE	LITTLE	MEDIUM	HIGH	TOTAL
QUESTION NUMBER	15	26	25	26	6	83
	16	44	14	21	4	83
	24	26	20	28	9	83
	24	24	25	26	8	83
	T	120	85	101	27	
	%	37.9%	23.9%	30.9%	6.3%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High

one-fifth of the instructors indicated little or no emphasis and almost one-half emphasized safety in their shops to a high degree. Because of this high number, safety was given a rating of high in degree of emphasis in industrial shops.

Table XIX (p. 62) was representative of the responses to the six questions asked in the questionnaire which pertained to creative ability. About one-third of the instructors answered that they placed no emphasis on this objective. Although less than one-fifth indicated little emphasis on the objective, about one-fourth stated medium emphasis and only one-fifth stated that high emphasis was placed on creative ability. The results indicated that the value for creative ability was slightly below the low degree of emphasis.

Table XX (p. 63) showed the results of the five questions which pertained to skill. It was found that a little more than one-third of the eighty-one instructors placed little or no emphasis on skill. Another one-third emphasized the objective highly, with the remaining one-third stating only medium emphasis. This indicated that skill was somewhere between medium and high in degree of emphasis in the industrial arts shops.

TABLE XVIII

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE SAFETY AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

		DEGREE OF EMPHASIS				
		NONE	LITTLE	MEDIUM	HIGH	TOTAL
QUESTION NUMBER	28	4	8	21	50	83
	29	18	8	32	25	83
	30	14	11	28	30	83
	31	4	4	16	59	83
	T	40	31	97	164	
	%	12.1%	7.7%	28.7%	48.5%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High.

TABLE XIX

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE CREATIVE ABILITY AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

QUESTION NUMBER	DEGREE OF EMPHASIS NONE	LITTLE	MEDIUM	HIGH	TOTAL
2	15	12	43	13	83
8	31	17	16	19	83
13	15	14	19	35	83
26	14	25	37	7	83
32	60	6	4	13	83
33	32	24	13	14	83
T	167	98	132	101	
%	33.9%	19.0%	26.8%	19.9%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High.

TABLE XX

THE NUMBER OF RESPONSES TO EACH QUESTION PERTAINING TO THE OBJECTIVE SKILL AND THE TOTAL NUMBER AND PERCENT OF RESPONSES PER DEGREE OF EMPHASIS

	DEGREE OF EMPHASIS				
	NONE	LITTLE	MEDIUM	HIGH	TOTAL
3	6	8	18	51	83
9	32	24	14	13	83
11	10	25	33	15	83
28	28	16	23	16	83
33	2	6	31	44	83
T	78	79	119	136	
%	17.8%	17.9%	30.9%	33.3%	

NOTE: The percentage represents the total number of instructors who listed the particular objective under a specific heading such as None, Low, Medium, or High.

The Relationship Between the Degree of Importance and Emphasis of the Nine Objectives

To state the importance of an objective was only one phase of its test of relevance. If the objective was not applied, its importance was of little value. This section compares the relationship of relative importance of the objectives, as determined in the study, to the emphasis or actual application in the laboratory.

Table XX (p. 69) showed the relationship of the importance to the emphasis of the nine objectives.

Understanding industry was rated as medium-low in importance. It was apparent from the questions answered however, that the objective was emphasized quite highly in actual shop practices. This indicated a misunderstanding of the objective or failure to realize the method of implementing the objective.

Leisure time was rated as low in degree of importance, and about the same degree in emphasis. Like consumer knowledge, there was little conflict between theory and application. The objective indicated that crafts and hobby work played little importance in the shop programs of the schools in this study.

Job selection rated medium-high in emphasis. It was apparent that the instructors surveyed considered this objective as very important and at the same time provided experiences directed toward the goal.

Critical thinking was rated the same as job selection. The instructors listed it as medium-high in both importance and emphasis. Like job selection, it appeared as though the instructors showed little conflict between the theory and application of this objective.

Personal qualities was thought to be slightly above low in importance. The instructors followed this opinion by showing little emphasis in their laboratories. Although there was some difference between theory and application, the relationship was quite close.

Safety ranked high in both importance and emphasis. The relationship of the two columns indicated almost complete agreement.

Creative ability was rated medium-high in the degree of importance. Although the eighty-one instructors stated that the value of the objective was high, they failed to follow through with shop experiences aimed toward fulfilling the objective. A comparatively small relationship was found to exist between the theory and application of creative ability.

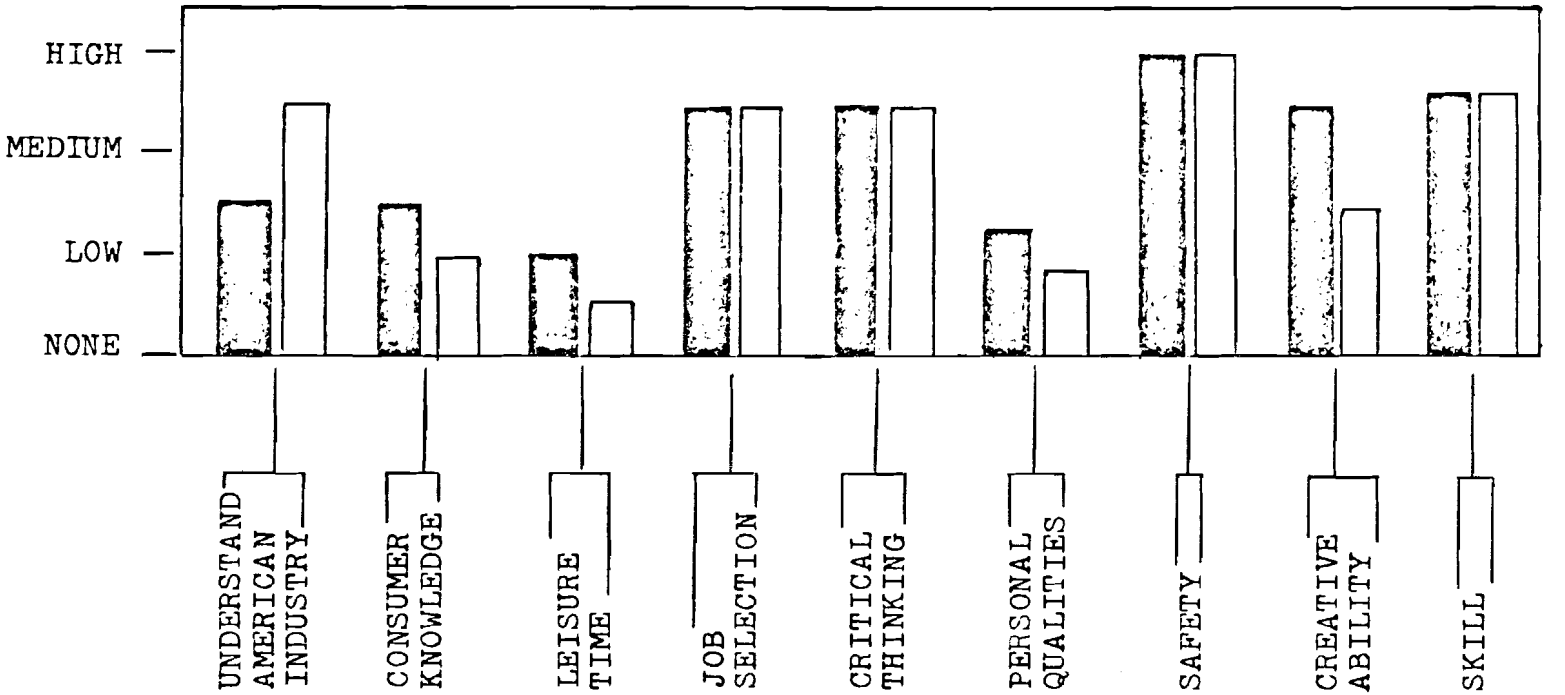
Skill was rated medium-high in both importance and emphasis, thus a definite and positive relationship existed between theory and application for skill.

From the information gathered, it appeared that there was considerable correlation or relationship between the stated importance of each objective and its

emphasis or applications in the industrial arts departments of those surveyed.

TABLE XXI

THE RELATIONSHIP OF THE STATED DEGREE OF IMPORTANCE OF THE NINE OBJECTIVES TO THE DEGREE OF APPLICATION IN THE SHOP



= Degree of importance of the objective as rated by 81 teachers.

= Degree of emphasis on application of the stated objective.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This study represented the thoughts and actions of eighty-one industrial arts teachers throughout the state of Kansas. While these individuals represented only 8.9% of the 920 instructors presently teaching in the state, it was hoped that because of the random sampling used, the results of the study were representative of most industrial arts programs in the state.

Summary of the Study

Before the specific summary a review of the purposes of the study would seem in order. The purposes for this study were three-fold: (1) to select one set of objectives pertinent to all industrial arts programs, (2) to determine the order of importance of those objectives to the industrial arts teachers of Kansas, and (3) to determine if the degree of emphasis placed on each objective correlated with the degree of importance.

The order of importance of the nine objectives for industrial arts, as listed by the eighty-one instructors was; safety, critical thinking, skill, job selection, creative ability, consumer knowledge, understanding industry, personal qualities, and leisure time.

Understanding industry, job selection, critical thinking and skill were highly emphasized in industrial arts laboratories, while safety received the highest degree of emphasis of those surveyed. Leisure time received the least emphasis while consumer knowledge, personal qualities, and creative ability were rated only slightly higher.

There appeared to be a positive relationship between the stated importance and emphasis of the objectives job selection, critical thinking, safety, and skill. Consumer knowledge, leisure time, and personal qualities were given somewhat less emphasis than their stated importance would seem to warrant. There was a very noticeable difference between the stated importance of understanding industry, and creative ability, and their actual high emphasis in the industrial arts laboratories.

Conclusions

Although confusion was found to have existed in the selection of objectives for industrial arts, it was readily apparent that duplication of objectives exists. It was assumed, then, that most of the various listings were the same in context.

Most industrial arts programs showed a positive relationship between the importance placed on an objective and the emphasis it received.

Recommendations

As a result of this study, the following recommendations were made for further study:

1. Industrial arts teacher training institutions should place further emphasis on the methods of achieving behavioral changes related to fulfilling the objectives of industrial arts.
2. Similar studies should be conducted in other geographical regions to determine whether the results are of a corresponding nature.
3. Follow-up studies should be conducted at regular intervals to detect changing attitudes of industrial arts teachers towards the objectives of industrial arts.

APPENDIX

May 8, 1970

Dear Fellow Teacher

I am conducting a study to accumulate facts concerning present industrial arts programs. I think you will agree that in order to progress, one must know where he presently stands. This is the purpose of the study.

You are one of 150 industrial arts teachers in this state who will receive this form. From a cross section, we should be able to see what is being emphasized in schools across the state.

Directions for completing the questionnaire are on the first page. For your convenience, the questions were kept short and the answers simple.

It is my sincere hope that your interest in our profession is great enough to motivate you to complete this questionnaire. You may be assured that this information you provide will be grouped in such a way that it will be impossible to identify any person or school.

Sincerely,

Harold D. Bryan

NSTRUCTIONS:

Answer each question by degree of emphasis, e.g., f it is not emphasized in your program, put a check mark n the first or None Column. Check only one column per uestion.

	HIGH	MEDIUM	LOW	NONE
. Does your department subscribe to and encourage the use of Industrial Arts periodicals?				
. Is design emphasized within the framework of your program?				
. Is any class time devoted to the study of consumer items?				
. Are any instructors involved in an industrial related guidance program in your school or community?				
. Do you utilize a student oriented tool maintenance program in your shop?				
. May extra credit for home maintenance work be gained in your program?				
. Does your department sponsor an Industrial Arts Club or other industrial arts related organizations?				
. Does your department sponsor or attend an annual industrial arts display or fair?				
. Is mass production model utilized as a part of your industrial arts program?				

10. Are you involved in any community service projects?

11. Is the relationship that exists between shop acquired skills and their industrial counterpart pointed out to your students?

12. Is a student personnel organization utilized in the shop (foreman, etc.)?

13. In the projects your students produce, are their designs usually taken from sources such as catalogs, magazines, etc.?

14. Are students allowed to work in the shop other than during their appointed time?

15. Do your students have a voice in the selection of the industrial arts curriculum offered at your school?

16. If you have a personnel organization, are the officials appointed?

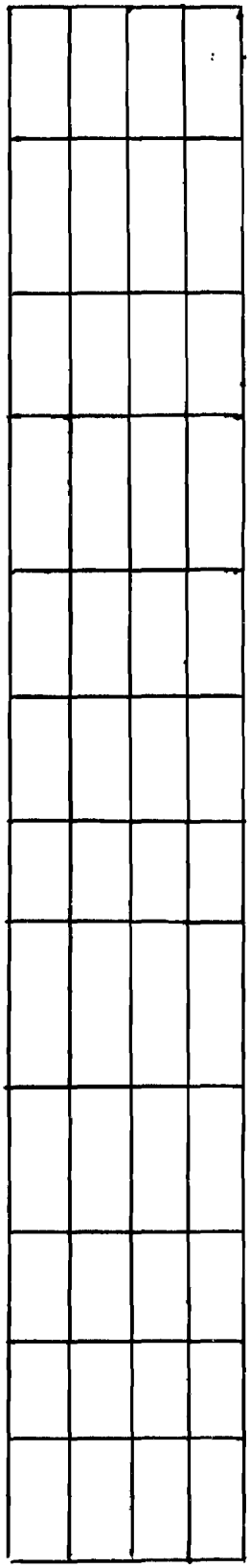
17. Is pressure exerted in the selection of projects for upper classmen, e.g., do you require certain projects for everyone in the class to make?

18. Are your students required to analize a project before they begin construction e.g., cost study, drawings, etc.?

19. Is a crafts program, geared towards developing hobbies, offered at your school?

20. Is your industrial arts club engaged in any community service projects:

21. Are films, made available by industry, used as a means of instruction in your program?



22. Are at least two industrial visitations made during the year?

23. Do you utilize discussions by outside speakers in your program?

24. Are student directed critiques used as a tool in evaluation of projects?

25. Do you incorporate as part of your total program the history of industrial arts, or the origin and growth of industry?

26. Are the discussions about designs of different eras used as a method of instruction in your program?

27. Are texts actively used in your course (assignments, etc.)?

28. Do you require your students to pass a safety test before using tools?

29. Do you follow up by giving periodic safety quizzes during the course of the year?

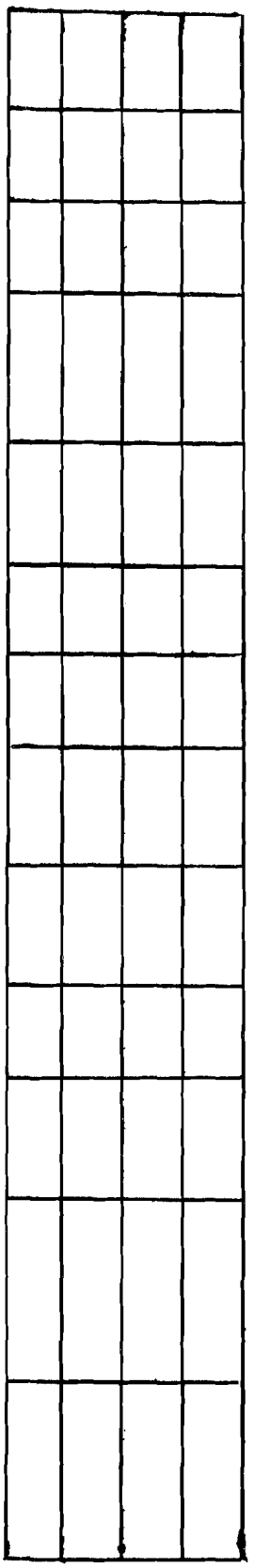
30. Do you rigidly enforce the wearing of safety glasses in areas of the shop where equipment is operating?

31. Do you grade on progress as much as the finished product?

32. Do you have a plastics program other than crafts (industrial processes, etc.)

33. Are students afforded an opportunity to experiment in areas not generally offered in your curriculum, e.g., rocketry, independent study, etc.?

34. Are outside requirements such as technical reports on articles related to industrial arts required in any of your departments classes?



Please rank each objective in decreasing order of importance from 1 to 9. The statement that you list as least important does not necessarily mean that you consider it not important at all, but is considered the least important of those listed.

A____. To gain an understanding of American industry and its place in our society.
B____. To gain consumer knowledge in the selection, purchase and maintenance of purchased items.
C____. To develop the wise use of leisure time.
D____. To help each student to understand the world of work and himself, with aims of realistic selection of occupational choice.
E____. To encourage the use of critical thinking in the form of planning and construction of projects.
F____. To develop personal qualities through the use of democratic process in the shop.
G____. To develop safe work habits and a concern for the safety of others.
H____. To develop an aesthetic appreciation for the creative ability of himself and others.
I____. To develop skills in the use of the basic tools, equipment, and materials in a technological age.

Do you feel that there are other goals than those listed that should be considered as valuable for industrial arts education? If so, please state them here._____

_____

_____

Do you feel that the industrial arts curriculum, as it applies to your school, cannot fulfill any of the above stated objectives?_____ (If you feel it cannot, write yes) List by letter any of the nine objectives you feel should be deleted._____

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