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Determining the Extent, In Terms of Behavior Growth to Which Industrial Arts Teachers in Utah are Achieving the Objectives of Industrial Arts

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DETERMINING THE EXTENT, IN TERMS OF BEHAVIOR GROWTH TO WHICH INDUSTRIAL ARTS TEACHERS IN UTAH ARE ACHIEVING THE OBJECTIVES OF INDUSTRIAL ARTS

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INTRODUCTION

It is evident that, if industrial arts teachers have subscribed to a set of objectives to guide or give direction to their teaching program, they should be used. It is not sufficient to formulate the aims then lay them aside to collect dust. Rather these aims or objectives should be used effectively as a learning guide. Upon these objectives the teacher should build his whole program.

It has been said that objectives really mean behavioral growth on the part of the students. If such is the case, the objectives must be translated into a desired behavior pattern outcome. The student's behavior at the finish of a course should be different from that when he started or learning has probably not taken place. The teacher must know the various behaviors being sought; that is, the kinds of behavior which he desires to develop, or his teaching is not likely to be effective.

Then the teacher must enumerate the learning activities which will bring about the behavior growth desired. Each behavior change listed should suggest specific items of subject matter that should be included in the course if attainment of the objectives is to be achieved. Only if a learning activity contributes toward bringing about one or more desired behavior changes, should it be included as a part of the course.

Purpose

This research study will be devoted to:

1. Attempting to determine the degree to which the objectives of Industrial Arts are being achieved in Utah in terms of desired

behavior growth.

2. Selecting the activities that the Industrial Arts teachers judge to contribute most to the program.

Scope

This study will include only the Industrial Arts teachers at Junior and Senior high school level and, will be confined to the limits of the state of Utah. It is a survey study of opinions and is not designed for subjection to advanced statistical analysis.

Method of procedure

The questionnaire was used to gather the necessary data. Since the study was made on a state-wide basis this method was thought to be the most practical.

A letter of explanation accompanied each questionnaire, pointing out the importance of the study and, soliciting the aid of the teachers in completing the questionnaire so the desired information could be compiled and evaluated. A follow-up letter was sent to the teachers to insure a better return. Copies of the questionnaire, accompanying letter, and the follow-up letter are to be found in the Appendix.

The questionnaire listed a group of learning activities related to Industrial Arts. The teacher was asked to do two things: First, he was to indicate the degree or extent that the activity was carried out in his program; second, he was to indicate the importance of the activity based on his professional judgment. Both responses were set up on a three degree rating scale.

A total of 186 questionnaires were sent to the Industrial Arts teachers of Utah. One hundred and seven, or 57.5 per cent, responded. Three of these were not tabulated as the teachers were engaged in elementary work and the study was designed for the secondary level. There

were four more returned unanswered by teachers who were not teaching Industrial Arts.

Close scrutiny of the tables will reveal that the total number of responses to the activities varies. This is caused by the failure of some teachers to reply to each activity listed on the questionnaire. In many cases, only one of the two required responses for each activity was made. Thus, it was necessary to compute the percentages on the basis of the number of responses reported for each activity.

REVIEW OF LITERATURE

Industrial arts is a relatively new field in the educational world of today, but since its conception it has been dedicated to the values of general education. Its purpose has been to offer a broader, enriched training that will help all students to successfully take their places in an industrial society. Never was it specifically designed for the sole purpose of increasing the supply of skilled workers. (18, p. 58)

Voth and Hunter compiled 199 annotated references of the objectives of industrial arts as presented by the professional literature during the period 1920 to 1933. They point out that there existed a wide diversity in the purposes of industrial arts as expressed by some teachers while there was a great similarity among others. It is conceivable that it is better to have objectives and disagree as to purpose than to have no objectives at all. A call was made to the teachers in the field to re-define their purposes so that they might be in accord. (15, p. 1-60)

From the beginning many professional people tried to lay out a clear, definite vision of what they hoped to accomplish in industrial arts. Ericson claimed this involved a selection of the aims of industrial arts and a selection of the projects and experiences that would prove most valuable in attaining these goals. (7, p. 320)

As early as 1928, Robert W. Selvidge explained that our fundamental objective is to effect as favorable as we can, the lives and habits of our pupils. To do this involves the answering of three basic questions: What do you expect a pupil to know; what do you expect him to be able to do; and what attitudes and habits do you expect him to have at the end

of a given period of training. (10, p. 389)

Dr. Selvidge severely chastized those who formulated objectives in vague and intangible words. He wanted them stated so clear, definite, and simple that one might know whether or not they could be reached. To him, the statement of an objective should be a simple and definite statement of what the teacher is trying to do. If not stated this way, there is serious doubt whether the objectives ever affect the content of a course, or the classroom practice of a single individual. In such a case the objectives prove worthless. (11, p. 78-79)

In 1934 Selvidge asserted that:

> Objectives should not be thought of as vague and remote educational ideals but as a list of specific changes which teachers should endeavor to make in the lives of students. They are the teachers program, and he should feel under obligation to provide experiences which will make a reasonable contribution to the end sought. (5, p. 28)

To do this, the teacher must know definitely what the desirable ideals, attitudes, habits, and accomplishments are, and then provide experiences for that specific purpose. The experiences should be selected because of their contribution to one or more objectives. (5, p. 28-31)

Some people interested in industrial arts, felt that the "tool skill" objectives would be developed at the expense of the others. Many writers have brought this to our attention, and have admonished the teacher to make just as definite provisions for the attainment of those objectives as they do for the skill objectives. Dr. Selvidge was among the first to realize this and to attempt to do something about it. It was his belief that skills are an essential part of a job, but the attitudes and habits desirable are not a necessary part of any job. Therefore, well-planned experiences must be provided that will develop

these desirable traits. Self reliance is not an essential part of a job; its development depends upon how the job is handled. Pride in workmanship is not a part of the instructions on a job; it comes as a result of a job well done. (5, p. 48)

Many different methods have been used by industrial arts instructors for the selection of activities or experiences to use as subject matter. Wilber sums them up this way:

> Trade analysis technique, which lends itself well to the development of tool skills, but neglects all other objectives.
>
> The "student interest" method which provides adequate stimulus to make the work interesting but precludes any possibility of attaining predetermined objectives, except as they happen to be accomplished by the activities chosen.
>
> The "teacher interest" method where teachers carry into classroom their hobbies and interests thus narrowing the field.
>
> Course of study or syllabus approach is sometimes used where teachers are not sure of this objectives or they are required to follow a course of prescribed activities. The value of this method lies in the thought and planning that went into the course to begin with. A course slavishly followed through will not rise above the original objectives set up to be attained.
>
> Chance and inspiration method---teacher sees a project in a window or magazine and introduces it to the group to follow as a class project. Such a method cannot accomplish much toward attaining objectives. (16, p. 53-54)

Emanuel E. Ericson emphasizes the trade analysis method as late as 1946. In his book, "Teaching the Industrial Arts," he says that the first step in selecting subject matter is to analyze the trade to determine all the items that can be taught in the shop. Those items must be analyzed and a selection made of the ones which prove most valuable in achieving the objectives. This method is thought by many to be most adequate. (8, p. 270-276)

According to Wilber, none of the methods enumerated above accomplished the desired results and he introduced a new selecting technique

for teachers to follow:

> This survey of methods indicates that, whereas each has its own merits and weaknesses, all fall short when measured against the yardstick of attainment of all the objectives commonly accepted for industrial arts teaching. Now the attainment of an objective clearly means that a change must have been made in the students behavior. It a student fails to behave differently in regard to any particular objective after he has completed a given course then that objective has not been attained. It appears, therefore, that a direct frontal attack should be made on this problem. To the writer's knowledge no such direct approach has ever been made in this field. It is time that we analyze our objectives fully and carefully in terms of the definite changes in behavior which we desire so that both teacher and student may know the direction we are trying to move. (16, p. 54)

In substantiation of Wilber's recommendation, Hiram Cromer, in his doctoral dissertation, stated:

> . . . considerable criticism has been directed against the tendency to declare objectives on paper and ignore them in the teaching process. Probably one of the reasons for this discrepancy which exists between written objectives and actual classroom practice is that they are stated in terms of the functions of industrial arts rather than in the behavior pattern of youth which should take place as a result of their experiences. (6, p. 182)

Even though Selvidge had vision of this technique way back in the third decade of the century, very little had been done along this line up to 1945. Since that time, however, several attempts have been made to interpret the objectives of industrial arts in terms of desired behavior. It is probable that Wilber presented us with the first results of such work. In his book, "Industrial Arts in General Education," the objectives he has selected for industrial arts have been analyzed in terms of suggested behavior changes expected from students. No student is expected to develop all the behavior changes listed, but the attainment of as many as possible is the ideal toward which the teacher should strive. (17, p. 46-54)

If the objectives really mean changes in behavior on the part of

students, then the test for judging whether any specific item of subject matter should be included in a given course is to determine if it contributes to the bringing about of one or more of the desired behavior changes. If it does not, it should be discarded. The total amount of experiences or activities selected should contribute to all the objectives. Wilber has tabulated just such a list of lessons, projects, and activities that will contribute to the achievement of the behavior changes expected. (17, p. 57-85)

Dr. William J. Micheels has been doing similar work at the University of Minnesota. In a paper presented before the Industrial Arts Division of the American Vocational Association in Boston, December 3, 1952 he stressed the principle of translating typical objectives into behavioral descriptions so that the teacher might know the type of behavior he is supposed to help students achieve. This must be done if we are to develop a sound evaluation program. Micheels has used the industrial arts objectives of the American Vocational Association (hereafter shown as A.V.A.) as a starting point. The objectives are defined in behavioral terms, and this descriptions are broken down still more to clarify, improve, and give added meaning to the objectives. (9, p. 1-10)

The writer has found only one other source where the objectives have been translated into such a behavior pattern. The Industrial Arts Division of the A.V.A. made such a translation in their revised bulletin "A Guide to Improving Instruction in Industrial Arts," published in 1953. This bulletin points out that translating objectives into behavior growth expected of pupils is a relatively difficult task as it requires a considerable grasp of human learning and behavior, of social conditions and of democratic traditions. An objective defined in

behavioral terms is, in a sense, a definition of the ideal citizen. This could account for the scarcity of written material along this line. It is interesting to note that both Wilber and Micheels are included on the committee that revised this latest edition of the A.V.A. bulletin.

The objectives of industrial arts are listed, along with the desired behavior that will accompany achievement of the objective, and a list of "learning activities" is enumerated which will bring about the desired behavior. Learning activities in this sense, is synonomous with instructional content. An example of this whole process is illustrated on page nineteen of this writing.

As a result of a great increase in industrial activities, and as a result of the method of selecting subject matter based on its contribution to certain desirable behaviors, the number of shop activities included in the industrial arts curriculum will also increase. The United States Office of Education has issued a phamphlet substantiating this fact. The phamphlet suggests, as an example, that if we assume "consumer education" to be a valid objective of industrial arts, then we must develop abilities for intelligently selecting commodities with reference to the purposes they are to serve, judging prices, evaluating materials and construction, using the commodities in the most efficient manner, and caring for them so as to make them as durable as possible. It further implies that:

> In the not far distant future some school may undertake to provide an information course in the selection, use, and care of furniture. (14, p. 11)

We can readily see that the trend is definitely in the direction of broadening pupil experiences in industrial arts. Too frequently the experiences are confined to a narrow field of activities. This is in direct conflict with our rapidly expanding field of industrial materials. (13, p.44)

The teacher of industrial arts must include the broadened experiences and information that will help toward an understanding of industry, its products, and services, and their influence in our social order. Stucki sums it up very well in the following quotation:

> In order for industrial arts to show even a small part of the industrial life of our country, every means must be used that will put across to the boy or girl something of the expansiveness and greatness of that life.
>
> Industry of today uses many new materials and others are constantly being found. The industrial arts teacher cannot rely on work done in colleges many years ago. He must keep up to date. (12, p. 258)

INDUSTRIAL ARTS EDUCATION

The term "industrial arts" is relatively new in our modern world of education although the world has known some type of manual training for centuries. Earliest records disclose that apprenticeship training existed among the Egytians and Babylonians. Apprenticeships also were in effect during the Greek and Roman reigns, and were predecessors of medieval apprenticeship. During the middle ages, apprenticeship training was practically the only form of education that existed.

Manual training, as a school subject, originated from the teachings and beliefs of men like Cominius, Rousseau, Pestalozzi, and Froebel. If any one name was singled out as the pioneer in the development of the thought that later crystallized into what we know as manual training, it would be that of John Henry Pestalozzi (1746-1827).

The introduction of manual training to the United States dates back to the Centennial Exposition at Philadelphia in 1876. Dr. Calvin M. Woodward of the Engineering Department of Washington University, St. Louis, Missouri, and President J. D. Runkle of Massachusetts Institute of Technology, found at the Exposition what they believed to be an efficient school method of instruction and training in the use of tools. This was the Russian system of manual training that was exhibited by Victor Della-Vos, representative of the Russian Imperial Technical School at Moscow. This Russian system consisted of a series of exercises, arranged in what was considered to be a logical order for teaching purposes, and was essentially a laboratory method of teaching.

Later, Professor Woodward developed a manual training institution at his own school in St. Louis and became the leader in the manual training movement in the United States.

President Runkle's influence was instrumental in the equipping of several shops at his institution where the Russian method of teaching was used.

Otto Salomon, who developed Swedish Sloyd, must be mentioned in connection with his influence on manual training. Sloyd consisted of the completion of one hundred objects that made up a course which was supposed to develop hand skill that would function to advantage in many kinds of situations. Proponents of Sloyd did not regard it as trade training, but as a pre-apprenticeship training. From Salomon and his school at Naas, many ideas were borrowed and introduced into our own schools under the name of manual training.

Woodward, Runkle, and other advocates thought of manual training primarily as a means of general education and development. Its purpose was not to train skilled mechanics.

Manual training, as then conceived, rested upon the old faculty psychology. Such a wholesale "transfer of learning" is denied by psychologists today. Neither the growth nor the results expected of manual training had proven satisfactory, therefore, in the middle of the first decade of the twentieth century there was a movement to make the manual training more vocational.

Many of the leaders of manual training for general education purposes, realized that both the Russian system and Sloyd system were too formal, that the work became dull and tiring. It was originally designed to educate the student for real life activities, but the use of a set number of projects or exercises, with no other emphasis, severed it from

real life as completely as other school activities. This group of leaders, convinced of the general educational values of manual training, searched for new ideas and areas to emphasize their philosophy. Thus, the beginning of the aesthetic or industrial art movement, as well as the beginning of the movement for specific vocational training, both divisions being a part of the general term "Manual Training", or as it was later known, "Industrial Education."

The public school teachers were critical about placing manual training in the school curriculum and it was not until the last few years of the 19th century that they began to assume a more friendly attitude toward it.

In response to the growing interest in industrial education, in 1906 a group of men organized the National Society for the Promotion of Industrial Education. This influential organization looked upon the whole problem of industrial education. It was readily apparent to them that there was great value and a need in our society for manual training from the standpoint of both general education and specific vocational training. This Society did much to promote and bring about the progression of industrial education.

After the United States legislature passed the Vocational Education Act of 1917 (Smith-Hughes law) the name of the organization was changed to the "National Society for Vocational Education." In 1926 this organization merged with the "Vocational Education Association of the Middle West" under the new name, "American Vocational Association."

The A.V.A. developed the first set of objectives for industrial arts education that was nationally advertised, and for a long time was the only national association representing this field of education.

It is significant that out of the early forms of manual training there has gradually evolved an enlarged and enriched subject known as industrial arts education, with objectives distinctly different from those of vocational industrial education. Vocational industrial education is concerned primarily with providing training to develop skill in specific occupational or trade areas. Industrial arts is a necessary part of general education whose function is to interpret and to give an appreciation and understanding of our industrial society as a vital part of our every day living. This can be accomplished by a study of the organization, materials, processes, and products of industry, and by dealing with the problems pertaining to the worker's world.

Each is necessary, and each will continue to develop so they might serve the purposes for which they were constituted.

PRESENTATION OF THE PROBLEM

Origin and development of the A.V.A. industrial arts objectives

The story of these objectives begins at the 1927 Convention of the American Vocational Association at Los Angeles, California. A group of persons especially interested in industrial arts petitioned the Executive Committee of the Association to appoint a committee to make a further study of problems discussed at the convention and to make a report at the next meeting. (1, p. 2) The greatest problem confronting this group was the wide diversity existing in the industrial arts program throughout the United States. Transcripts of industrial arts credit could not be evaluated by the schools because they had no idea of the experiences the students had gone through, nor any conception of just what an industrial arts program consisted.

Differences in length and frequency of shop periods; in quality and types of experiences offered; and in instructional methods of teaching, as well as other particulars, added to the confusion. It was felt that school administrators were unfavorably impressed by all the confusion and apparent lack of decision as to what industrial arts was really trying to accomplish. (2, p. 88)

Critics of industrial arts alleged that there was a lack of agreement as to acceptable objectives of the work, and, a lack of agreement as to the content of a program for the realization of the objectives. The question specifically raised in Los Angeles was: Is it not possible to agree on reasonable definite standards in industrial arts, expressed in such terms as to be helpful to teachers and supervisors in planning courses of study, and to administrative authorities and school patrons

in evaluating results? (2, p. 88)

To seek an answer to this question, early in 1928 a committee on "Standards of Attainment in Industrial Arts Teaching" was appointed by A.V.A. president, R. L. Cooley. This committee included: Charles F. Bauden, Board of Education, Philadelphia, Pennsylvania; William T. Bawden State Teachers College, Pittsburg, Kansas; Clyde A. Bowman, The Stout Institute, Menomonie, Wisconsin; Emanuel E. Ericson, State Teachers College, Santa Barbara, California; Maris M. Proffitt, U. S. Office of Education, Washington, D. C.; William E. Roberts, Board of Education, Cleveland, Ohio; and Robert W. Selvidge, University of Missouri, Columbia, Missouri. They commenced their work in March, 1928, being given no definite assignment, but with instructions to proceed on their own. It was decided to limit the work of the committee to a study of those things which the boy should know and be able to do in the field of industrial arts. (1, p. 2)

At the New Orleans convention, December, 1929, a list of "Operations" and "Units of Related Knowledge" pertaining to six shop subjects were presented by the committee, together with suggestions as to the practical uses of the compiled material. Large numbers of supervisors and teachers cooperated in preparing this list. The year of 1930 was spent in a "Study of Time Allotments," the objective being a statement of the amount of time recommended for each of the learning units developed the previous year for the six shop activities.

The committee was dissatisfied with their work and recommended, at the convention of December, 1930, that the list of learning units should be carefully studied and revised, that the study of "time allotments" should be deferred until this list was completed, and that cooperation

of a large number of shop teachers and supervisors was essential if the study was to be effective. (1, p. 3-5)

Because of his recognized standing in this field, and especially because of his pioneer work in the analysis and preparation of instructional materials, the committee requested Professor Robert W. Selvidge to take the leadership in this task.

His first step was to formulate a tentative statement of the principle objectives for the realization of which experiences must be provided. He felt that the objectives should not conflict with those of general education, that industrial arts, as a part of general education, had the responsibility to provide experiences which would develop certain traits, habits and points of view which were neglected in other phases of general education. (1, p. 6)

Subsequent suggestions and studies led to revisions and extensions of the statements of the objectives of the industrial arts teacher until such a list was developed that was sufficiently clear and definite to furnish a standard of attainment where the teacher is able to check his work in order to determine whether the changes in the individual are being accomplished. The things for which the industrial arts teachers should assume a large measure of responsibility are stated as follows: (2, p. 12)

SUMMARY OF THE OBJECTIVES

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 or uses.

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

4. To develop in each pupil 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).

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

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

The next step was to select groups of experiences which appear to contribute to these objectives, and which would be available under normal school conditions. If such a set of objectives was to be attained, it was necessary to do more than shop work as only two objectives deal with actual skills. Information and experiences had to be selected which sould contribute directly to the various objectives. Professor Selvidge points out that confidence and pride in one's ability to do cannot be developed without some experience in doing. One cannot have an appreciation of good design and good workmanship without having had an opportunity to compare good and bad design, and good and bad workmanship. A feeling of self-reliance cannot be developed without experiencing responsibilities, and so it is with the other objectives. (2, p. 13)

Following this step, the committee made a detailed analysis of each group, choosing the principal learning units involved. It was not expected that the teacher should use everyone of the learning units, but should select the specific ones which would contribute most to the desired goals.

Lists of projects were made available and carefully analyzed by the committee to show specific things that could be learned through their construction. Special emphasis was placed on the fact that these projects were only suggestions, that it was no attempt to develop standardized courses of study. (2, p. 89) The important thing was, that the assignments, projects and jobs must be checked against the objectives to discover if they contribute to those objectives and the total number of assignments, jobs, and projects selected must have a wide enough range of activities or experiences to cover all the objectives. (2, p. 14)

The final step was to organize the material in a form suggestive of effective teaching methods. This was submitted at the A.V.A. Convention held at Pittsburgh, Pennsylvania, December 7, 1934 after more than six years work, as the final report of the committee, with the recommendation that the committee be discharged.

The report was printed and 11,000 copies distributed by the A.V.A. under the title, "Standards of Attainment in Industrial Arts Teaching." It is probable that no other publication in the field of industrial arts has been used by so many teachers and administrators, nor exerted such influence upon the progress of industrial arts in public education in this country.

In 1939, the stock of bulletins was nearly exhausted. In view of the great demand, the recommendation was made that the materials be carefully revised rather than reprinted. The Executive Committee

approved the recommendation and increased the personnel of the Committee to add to its effectiveness. Many suggestions for improvement and much new material was available to strengthen the publication and increase its usefulness as a teaching tool. World War II had begun before the manuscript could be completed and so there was an unavoidable delay. The revised bulletin was concluded in the summer of 1945 under the able chairmanship of Homer J. Smith, Professor of Industrial Education, University of Minnesota. It was given the title, "Improving Instruction in Industrial Arts." Released to the public in 1946, twenty thousand copies were distributed to every part of the country and they made a pronounced and significant contribution to the growth of industrial arts programs.

In this revised edition the twelve original objectives were reduced to nine. Stated in terms of teacher attempts rather than in the usual terms of departmental or field aims they are: (3, p. 51)

SUMMARY OF THE OBJECTIVES

1. Interest in Industry. To develop in each pupil an active interest in industrial life and in methods 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-discipline and Initiative. To develop in each pupil the habits of self-reliance, self-discipline, 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 worth leisure-time interests.

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 pupil 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.

It is readily apparent to one comparing this set of objectives with those of the old edition, that the goals or aims are the same. The difference being in the wording and phrasing. Again, emphasis was placed on the changes in pupils that the teacher must bring about through a carefully selected choice of experiences designed to promote that change. An extensive list of these activities accompanies each objective, suggesting how the objectives may be attained.

As a typical example, a list of those activities concerned with the fourth objective, "Cooperative Attitudes," follows: (3, p. 55)

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

1. Encourage pupils to assist each other on such shop tasks as gluing a project, cutting stock, and moving heavy materials.

2. Suggest that keeping things in order is a habit that pays dividends, that doing a full share is evidence of politeness and good breeding, and that it is a commendable thing to aid charitable organizations.

3. Plan a group or whole-class work such as the construction of stage scenery, hurdles, a piece of furniture for the public library, bulletin boards and trophy cases for the school hallways.

4. Interpret some of the regulatory aspects of current industrial life, the significance of management problems, the nature of employer-employee relationships of varied kinds, and matters of organizing and bargaining.

5. Instruct about the causes of discharge and separation from Industrial jobs, about factory safety programs, time study devices, training arrangements and personnel management activities.

6. Urge enlistment in school undertakings, so that there may be learning and practice for later participation in community affairs and among fellow workers.

7. Teach respect for the property of mates and for public property generally.

Teachers could select among these activities or add to them, the important thing being that a conscious and concrete effort must be exerted if the specific instructional aims are to be achieved. (3, p. 52)

When the supply of bulletings was depleted in 1951, leaders in the industrial arts division of the A.V.A. recommended another revision of the material. A new committee was appointed, and approximately 100 interested industrial arts people throughout the United States assisted in the work. The revised bulletin was published in July, 1953. Contents of this new edition have been brought up to date; the instructional content areas have been completely revised and enriched, and new sections added. Close scrutiny of the section on the objectives of Industrial Arts Education will find the same objectives and a similar list of "learning units" as stated in the old bulletin. The significant difference here is that each objective is translated into a behavior pattern which characterizes the objective.

The committee defined the school as essentially a behavior-changing institution. That is, school experiences make pupils different than they would be if they lacked these experiences. The changes accomplished are determined by the ideals and traditions of our culture. Once an objective has been agreed upon, then it must be translated into desired behavior growth if it is to be effective as a learning guide. Unless the objective can be defined in terms of desired behavior there is little likelihood that teaching for the objective can be effective. (4, p. 13)

Based on this principle, the objectives stated in the latest edition have been defined in terms of desired student behavior. The learning units or activities listed are those which will being about the desired

behavior. Once more the fourth objective is used for the example:

(4, p. 23)

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

Student Behavior which characterizes the objective

1. He will realize the importance of cooperation in group activity.
2. He will realize that large accomplishments are the result of effective cooperation.
3. He will see the relationship between group cooperation in the shop and group cooperation in larger units of society.
4. He will eagerly join in group activity and contribute to the common purpose.
5. He will protect the work of others.
6. He will work and act cooperatively in group activities.
7. He will show a willingness to aid and to cooperate with others by sharing tools, machines and materials with others and by taking turns.
8. He will readily ask help of others whenever he needs assistance.

Activities for Effecting the Desired Behavior

1. Have pupils assist each other on such shop tasks as gluing a project, cutting stock, and moving heavy materials.
2. Develop a pupil personnel system.
3. Plan group or whole class work, such as the construction of stage scenery, track hurdles, a piece of furniture for the public library, bulletin boards, and display cases for the school hallways.
4. Participate in production jobs which engage the whole class or part of the class.
5. Study the causes of discharge or separation from industrial jobs.
6. Interpret some of the regulatory aspects of current industrial life, the significance of management problems, the nature of employer-employee relationships of varied kinds, and matters of organization and bargaining.
7. Urge enlistment in school undertakings so that there may be learning and practice for later participation in community affairs and among fellow workers.

The development of the objectives of industrial arts education, as set forth by the A.V.A. has been followed through from the time of their inception in 1927 to the present time. The efforts of the various committees were directed to the accomplishment of one important end---that of assisting the teacher of industrial arts to promote and improve his

program. (4, p. 102) Largely through the efforts of these leaders, industrial arts has reached the place of prominence it holds today.

Results of the survey

The tables presented in this section represent the nine objectives of industrial arts as set forth by the A.V.A. Each contains a summary of the responses made by the industrial arts teachers of Utah, pertaining to the activities that will develop the desired behavior expected of the pupils in achieving that particular objective. The first table reveals that 15.3 per cent of the industrial arts teachers represented, did not include the first activity listed under the "Interest in Industry" objective in their program of study. Sixty-six and three-tenths per cent were using the activity to a limited degree, and 18.4 per cent had incorporated it extensively into their program. Only 5.1 per cent of the teachers felt the activity was not important; 58.8 per cent felt it to be fairly important; while 36.1 per cent determined it to be highly important.

Only two activities (6th and 7th) out of a total of twelve shown in Table 1, had more than fifty per cent of the responses listing them as being used extensively. Activities 11 and 12 were not used at all by approximately two-thirds of the respondents. Visits to local industries were thought to be very important by 52.6 per cent. In contrast, only 10.6 per cent used it extensively and another 40.6 per cent made limited use of it. Forty-nine per cent of the teachers deem it highly significant to attempt in various ways to increase the mechanical and industrial vocabularies of their pupils while 72 per cent see the extreme importance of stressing the dignity of the skilled worker in our society. More than 90 per cent of the industrial arts instructors incorporated these activities into their programs to some degree.

Table 1. Summarization of the responses to the activities pertaining to the objective "Interest in Industry." To develop in each pupil an active interest in industrial life and in the methods and problems of production and exchange

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Study the manufacture of common articles such as pencils, paper, glass, nails, asbestos, pipe, cement, clothing, veneer, plastics, pottery, lubricants.	15	15.3	65	66.3	18	18.4	5	5.1	57	58.8	35	36.1
2. Speak of the local production of such commodities as ice, lumber concrete electric power, newspapers.	21	21.7	59	60.8	17	17.5	9	9.2	57	58.2	32	32.6
3. Visit local industries.	47	49	39	40.6	10	10.6	6	6.2	40	41.2	51	52.6
4. Consider the major sources of raw materials and the methods of their initial processing and transportation--- lumber, coal, oil, gas, iron, cotton, wool, copper, leather, textiles.	10	10.4	70	72.9	16	16.7	3	3.2	51	54.2	40	42.6
5. Discuss new industries based upon new materials and methods of work, as well as increased mechanization in the preparation of certain well known products.	34	34.3	54	54.6	11	11.1	7	7.2	61	62.2	30	30.6
6. Attempts in various ways to increase the mechanical and industrial vocabularies of pupils.	4	4	44	44	52	52	1	1	21	21	78	78
7. Stress the dignity of industrial pursuits and the economic and social usefulness of skilled labor.	6	6	43	43	51	51	3	3	25	25	72	72

Table 1. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
8. Review a few industrial work apportunities at the professional level.	17	17.4	66	67.3	15	15.3	2	2	59	60.2	37	37.8
9. Cover working conditions in typical industries, as to payroll names, common wages and promotion routes, educational qualifications, unemployment.	29	29.3	61	61.6	9	9.1	6	6.1	61	61.6	32	32.3
10. Instruct as to local and distant preparation plans, such as special industrial schools, cooperative half-time training arrangements, apprenticeship programs.	32	32.3	56	56.6	11	11.1	16	16.2	48	48.5	35	35.3
11. Build interest in legislation affecting employers and employees, with emphasis upon laws affecting young workers.	64	64.7	32	32.3	3	3	28	28.6	50	51	20	20.4
12. Arrange talks by local merchants local labor officials and representatives of advertising and sales organizations.	58	59.2	31	31.6	9	9.2	23	23.9	55	57.3	18	18.8

Table 2 points out some extreme cases. The respondents almost unanimously ruled out the 4th activity as 94 per cent do not visit museums at all, and only four teachers believed it to be highly important. Eighty-nine per cent did not use activity 10, while 65 per cent felt it to be of no importance; 82.7 per cent did not use activity 12, with 46.4 per cent of those teachers expressing the opinion that it was not important enough to teach. Items 3, 6, 7, and 8 proved to be very unpopular also. The other extreme shows that only one instructor out of 98 who responded, decided that the 12th activity was not important, with better than 84 per cent judging it to be highly important. A total of seven out of the fourteen activities listed as being appropriate to this objective were not used to any extent by percentages ranging from 53 to 94. Just two items rated the check mark of "highly important" of 50 per cent or more of the instructors.

One-half of the teachers participating in the survey had an elementary type of foremanship designed to realize the concept of leadership, followership, and teamwork. This can be seen in Table 3. Approximately two-thirds of the teachers believe this to be a highly important activity in the industrial arts curriculum, with only 2 per cent advocating that it is not important enough to use. The third activity listed in this table was the only other one to be used extensively by 50 per cent or more of the instructors. Activities 5, 6, 9, and 12 are used very little in Utah. A quick glance at the table will show that the majority of activities are practiced some by the majority of teachers and, in line with this, they are thought to be fairly important items by the majority. It would seem that much of the success in achieving this objective is dependent on two activities.

Table 2. Summarization of the responses to the activities pertaining to the objective "Appreciation and Use." To develop in each pupil the appreciation of good design, materials and workmanship and the ability to select, care for and use industrial products wisely.

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Compare articles or recognized superior craftsmanship with those of inferior quality.	13	13.1	55	55.6	31	31.3	5	5.2	35	36.5	56	58.3
2. Judge pieces in variety that have been produced in the school shops or brought from homes for the purpose.	36	37.1	54	55.7	7	7.2	22	22.9	59	61.5	15	15.6
3. Study old and current catalogs of tools and machines, furniture, glassware, hardware, implements, vehicles.	53	53	43	43	4	4	33	33.3	59	59.6	7	7.1
4. Visit museums, then sales places where similar articles are displayed.	94	94	5	5	1	1	48	48.5	47	47.5	4	4
5. Study newer manufacturing methods such as die casting, spot and seam welding, wood lamination.	28	28.3	61	61.6	10	10.1	7	7.2	56	57.1	35	35.7
6. Enhance the proper valuation of substantial and beautiful structures in the community or in a nearby city---buildings, facades, and fronts, ceilings, floors, railings, monuments, towers.	60	60	33	33	7	7	27	27.6	55	56.1	16	16.3
7. Conduct experiments to test the qualities of common articles.	68	68	30	30	2	2	28	28.6	59	60.2	11	11.2

Table 2. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
8. Compare quantity and small-lot purchasing, cash and installment buying, bargain prices and special sales with relation to initial saving, spoilage, extravagance.	63	63	30	30	7	7	34	34.4	52	52.5	13	13.1
9. Discuss qualities necessary for consumer satisfaction in purchased articles: appearance, type of construction, application of art principles, durability, adaptability, style, finish, practicality.	20	20.2	62	62.6	17	17.2	8	8.3	59	60.8	30	30.9
10. Make and present individual lists of qualities desirable in common articles, such as a bicycle, pair of skates, ladder, wheelbarrow, fishing reel, refrigerator, chair, or sofa.	88	89.8	8	8.2	2	2	63	65	32	33	2	2
11. Make sales talks, holding the "salesman" to factual or logical bases for their assertions.	81	82.7	15	15.3	2	2	45	46.4	47	48.4	5	5.2
12. Make lists of poor work habits, such as hammering with a wrench, using a machine that is badly in need of adjustment, neglecting to lubricate moving parts.	10	10.2	34	34.7	54	55.1	1	1	14	14.3	83	84.6
13. Study manufacturer's directions for assembling and using machines, instruments and devices for both shops and homes.	20	20.4	43	43.9	35	35.7	6	6.2	38	39.2	53	54.6

Table 2. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
Note the prevention of fires, accidents due to poor upkeep, protection from wear preservation of surfaced, control of rust and corrosion.												
14. Study the value increase that results from fine work and decorative finish.	12	12.1	42	42.4	45	45.5	4	4	33	33.4	62	62.6

Table 3. Summarization of the responses to the activities pertaining to the objective "Self-Realization and Initiative." To develop in each pupil the habits of self-reliance and resourcefulness in meeting practical situations

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Construct some projects with equipment limited to the barest necessities, making it necessary for pupils to improvise in order to complete the work.	35	36.4	43	44.8	18	18.8	19	20	52	54.7	24	25.3
2. Organize an elementary type of foremanship so that concepts of leadership, followership and teamwork may be gained.	10	10	40	40	50	50	2	2	30	30.3	67	67.7
3. Plan rotating responsibilities for such tasks as cleaning the finishing room sink, oiling machines, sharpening tools, arranging the stock room and reconditioning paint brushes.	8	8.2	35	35.7	55	56.1	6	6.1	23	23.5	69	70.4
4. Emphasize problem-solving, creative effort, and proper reaction to adverse criticism.	8	8.3	62	64.6	26	27.1	4	4.2	45	46.9	47	48.9
5. Let selected pupils or an entire class assume responsibility for a school assembly or a parent-teacher program.	58	59.2	35	35.7	5	5.1	19	19.4	55	56.1	24	24.5
6. Accept a future-dated issue of the school paper for contributions by industrial arts pupils.	75	76.5	19	19.4	4	4.1	33	34.4	53	55.2	10	10.4
7. Locate and use reference material on topics of special interest. Note	29	30	55	56.6	13	13.4	9	9.3	58	59.7	30	31

Table 3. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
how craftsmen keep abreast of their trades through reading and formal courses.												
8. Work to a deadline on a job.	26	26.5	48	49	24	24.5	13	13.4	51	52.6	33	34
9. Plan a co-curricular organization of a mechanical or artistic nature.	63	69.2	22	24.2	6	6.6	39	42.4	39	42.4	14	15.2
10. Study the personal qualities which make for success on a job.	16	16.2	63	63.6	20	20.2	6	6.1	50	51	42	42.9
11. Use group projects as a systematic part of the total instructional program.	27	27.3	53	53.5	19	19.2	11	11.1	54	54.6	34	34.3
12. Let pupils be given all possible practice in making routine family purchases.	68	73.1	21	22.6	4	4.3	35	37.6	46	49.5	12	12.9
13. Have pupils act as hosts or guides to visitors.	37	37.4	50	50.5	12	12.1	10	10.3	65	67	22	22.7
14. Have pupils engage in the planning phase of the school shop activities.	20	20.4	59	60.2	19	19.4	11	11.2	50	51	36	36.8

Table 4 reveals that 70 per cent of the industrial arts instructors have developed pupil personnel systems in their shops as an aid in achieving cooperative attitudes among their students. Not a single teacher rendered this activity as being not important and, only 2 per cent did not have some kind of pupil personnel system. Having students assist each other with various jobs that arise in their work in the shop is another activity that the teachers judge to contribute largely to the fulfillment of this objective. Over 74 per cent use it---42.3 per cent extensively---and 55.7 per cent feel it to be of the utmost importance. Again, most of the activities listed on this table were found, to some degree, in the school programs of the majority of teachers, with that same majority thinking them fairly important in achieving the objective. It is interesting to note that the 5th and 6th activities, which have to do with interpreting the life and problems of industrial workers, are not deemed too necessary, and as such, are not found too much of a degree in the shop programs.

One can readily see, on checking Table 5, that the activities related to the objective of developing in each pupil desirable attitudes and practices with respect to health and safety are well incorporated in the teaching programs of industrial arts teachers in Utah. Seven out of twelve activities are used extensively by more than 50 per cent of the instructors and, three of the remaining five are stressed quite thoroughly in the curriculums. Visits to industry for the purpose of studying their safety programs, and studies of data pertaining to the health and safety of industrial people are the only activities that are not used to a large extent. Nine of the activities are thought to be highly important by more than 60 per cent of the participating instructors, with one percentage as high as 98. Several of these activities

Table 4. Summarization of the responses to the activities pertaining to the objective "Cooperative Attitudes." To develop in each pupil a readiness to assist others and to join in socially-accepted group undertakings

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Have pupils assist each other on such shop tasks as gluing a project, cutting stock, and moving heavy materials.	23	23.7	33	34	41	42.3	9	9.3	34	35	54	55.7
2. Develop a pupil personnel system.	2	2	28	28.6	68	69.4	0	0	28	28.6	70	71.4
3. Plan group or whole-class work, such as the construction of stage scenery, track hurdles, a piece of furniture for the public library, bulletin boards, and display cases for the school hallways.	23	23.7	47	48.4	27	27.9	17	17.5	49	50.6	31	31.9
4. Participate in production jobs which engage the whole class or part of the class.	26	26.8	50	51.5	21	21.7	19	19.6	54	55.6	24	24.8
5. Study the causes of discharge or separation from industrial jobs.	52	52.5	38	38.4	9	9.1	20	20.6	51	52.6	26	26.8
6. Interpret some of the regulatory aspects of current industrial life, the significance of management problems, the nature of employer-employee relationships of varied kinds, and matters of organization and bargaining.	54	55.7	39	40.2	4	4.1	30	31.9	52	55.3	12	12.8
7. Urge enlistment in school undertakings so that there may be learning and practice for later participation in community affairs and among fellow workers.	30	30.6	53	54.1	15	15.3	13	13.4	53	54.6	31	32

Table 5. Summarization of the responses to the activities pertaining to the objective "Health and Safety." To develop in each pupil desirable attitudes and practices with respect to health and safety.

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Note health or accident hazards about the shop and school and about the home and community areas. Do something to correct or to direct attention to unsafe places and practices.	2	2	39	39.4	58	58.6	0	0	20	20.2	79	79.8
2. Discuss lighting, heating, sanitary facilities, and the like, from the viewpoint of current trends in construction and use.	29	29.9	43	44.3	25	25.8	7	7.4	48	50.5	40	42.1
3. Visit a local industry and study its safety program.	70	72.9	22	22.9	4	4.2	7	7.3	55	57.3	34	35.4
4. Observe safety films.	18	18.2	48	48.5	33	33.3	0	0	34	34.3	65	65.7
5. Study machines and tools for their unique safety demands.	6	6	45	45.5	48	48.5	0	0	29	29.3	70	70.7
6. Use proper clothing and body protection, such as goggles when grinding and leg and foot guards when pouring molten metals.	3	3.1	27	27.9	67	69	1	1	10	10.3	86	88.7
7. Locate fire extinguishers throughout the shop with the several types of extinguishers available. Note how fires differ in origins and how this determines what extinguisher should be used.	15	15.3	33	33.7	50	51	3	3.1	20	20.4	75	76.5

Table 5. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
8. Develop safety regulations as a class project.	21	21.2	35	35.4	43	43.4	5	5	26	26.3	68	68.7
9. Use tools and machines properly.	1	1	13	13.1	85	85.9	0	0	2	2	97	98
10. Collect and post bulletin board materials such as safety and First Aid posters and news items pertaining to safety.	7	7.1	38	38.4	54	54.5	1	1	21	21.2	77	77.8
11. Study data on occupational diseases, industrial accidents, protective measures and pertinent legislation.	59	60.2	32	32.7	7	7.1	24	24.7	56	57.7	17	17.6
12. Provide First Aid equipment for use and employ First Aid practices when necessary.	2	2	20	20.2	77	77.8	1	1	9	9.1	89	89.9

had no one who felt that they were totally unimportant in contributing to the "health and safety" objective. It is apparent that instructors of industrial arts judge this objective to be of the utmost importance in their teaching work.

Careful scrutiny of Table 6 shows that four activities (3rd, 7th, 8th, 9th) out of twelve will not be found in more than two-thirds of the industrial arts programs in the State. Eight of the items are thought to be fairly important or highly important by most teachers and are actually put into practice to some extent. The 9th activity (study construction activities which can be carried on in apartments) is the only one that did not get majority approval as being at least fairly important in attaining the object "Interest in Achievement." Visits to museums to study craftsmanship are made by one teacher only, with nineteen others making such visits occasionally. The teachers are cognizant of the values that might be obtained from such visits as nearly 90 per cent indicated it to be of some importance. Another item of interest is the last one shown on the table. Reports of students' progress are made to parents by 96.9 per cent of the teachers. Only three respondents did not make such reports at some time or another, and only one rated it as being unimportant.

Table 7 is unique in that it reveals that all the activities listed under the objective "Habit of Orderly Performance" are found in at least 70 per cent of the industrial arts shops of Utah. Most of them get limited use, nevertheless, they are used. A majority of the items are believed to be highly desirable, with very few teachers judging them to be of no importance. It would seem that although not as much effort as possible is exerted toward attaining this objective, a considerable

Table 6. Summarization of the responses to the activities pertaining to the objective "Interest in Achievement." To develop in each pupil a feeling of pride in his ability to do useful things and to develop certain worthy free-time interests, particularly in the crafts.

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Provide a wide range of activities in the school shop so that every pupil can experience successful achievement.	3	3	30	30.3	66	66.7	1	1	14	14.1	84	84.9
2. Center the construction activities about enterprises which boys and girls find useful in their out-of-school living.	6	6.1	41	41.9	51	52	1	1	31	31.6	66	67.4
3. Visit museums, especially of the arts and industries type, to study craftsmanship.	78	79.6	19	19.4	1	1	11	11.6	59	62.1	25	26.3
4. Provide stimulating reading materials pertaining to the crafts and craftsmanship.	6	6	64	64.7	29	29.3	2	2	45	45.5	52	52.5
5. Provide opportunities to construct items which can be used in free-time or out-of-school activity.	6	6	61	61.6	32	32.4	2	2	53	54.1	43	43.9
6. Exhibit work done at home or outside of school. Have "working" exhibits in public places.	38	38.8	40	40.8	20	20.4	19	19.4	39	39.8	40	40.8
7. Build and repair toys at Christmas time in cooperation with civic organizations.	68	69.4	20	20.4	10	10.2	31	32.3	50	52.1	15	15.6

Table 6. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
8. Develop hobby clubs.	72	73.5	21	21.4	5	5.1	24	24.7	62	63.9	11	11.4
9. Study construction activities which can be carried on in apartments.	79	80.6	16	16.3	3	3.1	51	53.7	37	38.9	7	7.4
10. Have each pupil develop proficiency in some single activity of his choice.	25	26.3	49	51.6	21	22.1	15	16.1	42	45.2	36	38.7
11. Keep records of a cumulative nature so that pupil can check on his own achievements and so that successive teachers can arrange a sequency of experiences.	27	27.5	39	39.8	32	32.7	4	4.1	42	43.3	51	52.6
12. Report pupil progress to parents.	3	3.1	42	43.3	52	53.6	1	1	27	27.9	69	71.1

Table 7. Summarization of the responses to the activities pertaining to the objective "Habit of Orderly Performance." To develop in each pupil the habit of an orderly and efficient performance of any task.

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Have pupils participate in the planning phases of all shop activities.	30	30.6	54	55.1	14	14.3	16	16.5	60	61.9	21	21.6
2. Study planning processes just as skill and information are studied.	25	25.8	50	51.5	22	22.7	13	13.6	46	47.9	37	38.5
3. Require a pupil-made plan for each job.	13	13.4	36	37.1	48	49.5	7	7.3	29	30.2	60	62.5
4. Have facilities available to aid the pupil in his planning: references, drafting and layout facilities and visual aids.	3	3.2	42	44.2	50	52.6	1	1.1	20	21	74	77.9
5. Provide definite work space and storage facility for every pupil.	9	9.4	37	38.5	50	52.1	1	1	9	9.4	86	89.6
6. Study alternative ways for doing a job.	5	5.3	59	62.1	31	32.6	3	3.2	37	39.4	54	57.4
7. Require pupils to appraise the effectiveness of their planning while job is in process and when job is done.	10	10.3	67	69	20	20.7	2	2.1	50	52.1	44	45.8
8. Measure results objectively.	6	6.4	50	53.2	38	40.4	2	2.2	38	40.4	54	57.4
9. Plan next job in terms of accomplishments on previous job.	3	3.1	58	59.2	37	37.7	1	1	40	41.7	55	57.3

amount is done when comparison is made with the data on the other tables. Of course, the significant thing is the fact that 70 per cent of the instructors do have all of these activities in their courses of study.

In studying the figures contained in Table 8, we find that not one of the activities connected with this objective is used extensively by a percentage of teachers greater than 34 per cent. Five out of the seven are being used a moderate amount while the other two are completely non-existent in the programs of more than half of the respondents. The 6th activity is rated extremely low, both in the extent that it is being used and in its importance in achieving the objective. We find 82.3 per cent do not use this activity at all, 15.6 per cent make limited use of it, and 2.1 per cent use it extensively. Seven out of 94 teachers believe it to be highly important, fifty-two think it fairly important, and thirty-five listed it as not important. It appears that much must be done to realize the attainment of this objective in terms of the activities listed in this table.

Information taken from Table 9 brings to our attention that five of the seven activities related to the objective "Shop Skills and Knowledge", are well accepted by the industrial arts teachers in this State. Activity number 6 is applied by 85 per cent of the instructors, activity number 7 is applied by 72.7 per cent of the instructors, and 63.6 per cent apply the 8th activity. With the exception of the 4th item, all are used to some degree by at least 50 per cent of the teachers. It is apparently the belief that having students make lists of projects that would include similar operations to one just completed has little value in helping the student gain shop skill or knowledge. Nearly one-third of the responses deemed it as unimportant, and only 14.9 per cent determined it to be highly important. Much emphasis is placed on the

Table 8. Summarization of the responses to the activities pertaining to the objective "Drawing and Design." To develop in each pupil an understanding of all kinds of common graphic representations and the ability to express ideas by means of drawings and sketches

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Study many blueprints and sketches in actual use outside the schools.	42	44.2	43	45.3	10	10.5	13	13.7	61	64.2	21	22.1
2. Let there be much of the reading and interpreting sort of learning, together with the necessary amount of sketching, detailing, tracing, and the like.	24	25.8	49	52.7	20	21.5	10	10.9	52	56.5	30	37.6
3. Have experiences in home-planning by way of architectural drawing.	52	58.4	28	31.5	9	10.1	22	25.9	42	49.4	21	24.7
4. Give special attention to design, in keeping with the age or level of pupils dealt with and the total of time available.	14	14.9	48	51.1	32	34	12	13.1	37	40.2	43	46.7
5. Sketch many common things and study the design of modern products in great variety. (School drawing time in industrial arts should not be confined to mechanical and instrumental types, but should have everyday usefulness and much suggestion as to widely differing payroll jobs and positions.	36	37.5	49	51	10	10.5	20	21.5	54	58.1	19	20.4

Table 8. (continued)

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
6. Have pupils prepare large cards, charts, or scrapbooks to show good and bad types of design for various articles in common use. Let these samples include some from the realm of printing which involve layout, proportion, type size or style, color combinations, and others.	79	82.3	15	15.6	2	2.1	35	37.2	52	55.3	7	7.5
7. Insure that pupils have the concepts represented by the following common expressions: appearance of stability, structurally good, pleasing line, appropriate to its setting, etc.	22	23.7	47	50.5	24	25.8	13	14.3	46	50.5	32	35.2

Table 9. Summarization of the responses to the activities pertaining to the objective "Shop Skills and Knowledge." To develop in each pupil skill in the use of common tools and machines, and an understanding of the problems involved in common types of construction and repair

Activities	Extent of Activity						Importance of Activity					
	None		Limited		Extensive		Not Important		Fairly Important		Highly Important	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Have pupils use a variety of tools and machines in diverse situations.	5	5.2	46	47.4	46	47.4	2	2.1	37	38.1	58	59.8
2. Study the principles upon which machines operate and note how power is transmitted through them.	19	19	49	49	32	32	3	3	45	45	52	52
3. Work out simple devices to portray mechanical advantage as exemplified in the lever, screw, wheel, gear.	48	48.5	37	37.4	14	14.1	13	13.4	51	52.6	33	34
4. When pupils have completed a project or job, have them list others that would include the same and additional operations and have them make tool and machine lists to match blueprinted projects and jobs.	67	69.8	24	25	5	5.2	30	31.9	50	53.2	14	14.9
5. Practice selected operations in order to develop a relatively high degree of proficiency.	19	19.8	58	60.4	19	19.8	13	13.6	52	54.1	31	32.3
6. Demonstrate the proper use of tools and machines.	1	1	14	14	85	85	0	0	6	6.1	93	93.9
7. Have pupils work to reasonable standards.	2	2	25	25.3	72	72.7	0	0	10	10.1	89	89.9
8. Have pupils use accepted craft techniques for all shop projects.	2	2	34	34.4	63	63.6	4	4	24	24.3	71	71.7

teacher demonstrating the proper use of tools and machines, on having pupils work to reasonable standards, and having pupils use accepted craft techniques when building projects. The percentage of teachers who believe these activities highly significant are even more than the already high percentage who are applying them in their class work.

Many instructors indicated by their remarks that many of the "learning units" listed in this study were included in other curriculum areas of the school. Some of the Junior High teachers judged the activities to be pertinent to Senior High work, while some instructors even went so far as to say they were more related to Trade and Vocational training than industrial arts. Several respondents mentioned that they did not have time to teach such a comprehensive list of activities.

Rank-difference correlation

The author felt that the industrial arts instructors tended to rate high in importance those activities that were incorporated into their teaching programs. Conversely, it was felt that the activities rated lowest in importance would not be found as part of the instructional material. A rank-difference correlation of the responses in the "extensively" used column and the "highly" important column was made for each objective and substantiated these views.

Table 10. Rank-difference correlations of the responses in "Extensively" used columns and "Highly" important columns

Objective	Correlation
1. Interest in Industry	.73
2. Appreciation and Use	.97
3. Self-discipline and Initiative	.95
4. Cooperative Attitudes	.82
5. Health and Safety	.99
6. Interest in Achievement	.94
7. Orderly Performance	.94
8. Drawing and Design	.85
9. Shop Skills and Knowledge	.98

Glancing at Table 10 it can be seen that all of the correlations are extremely high, with several being almost perfect. The first objective received the lowest correlation because the respondents felt that visits to local industries were highly important while few of them actually made such visits, and several other activities were rated much higher in importance than they were actually used. Even then the correlation is relatively high. This statistical data show that there is a definite relationship between the importance of an activity as accorded by the teachers, and the degree or extent that it is found in their instructional programs.

SUMMARY

Questionnaire returns from 100 industrial arts instructors, who are currently teaching in the secondary schools of Utah, are the basis for this study.

The questionnaire contained ninety-five activities which might be used to achieve the objectives of industrial arts. Two responses for each activity was required of the teacher. First, he was asked to state his opinion of the importance of the activity. These responses were compiled into nine tables---one table for each objective of industrial arts so outlined by the A.V.A.

Of the twelve activities listed in Table 1 (which are those activities that will bring about the desired pupil behavior in attaining the objective "Interest in Industry"), at least 75 per cent of the teachers have activities one, two, four, six, seven, and eight incorporated into their courses of study to some extent. Items three, five, nine, and ten are used by 50 per cent or more of the teachers.

Table 2 reveals that five activities out of a total of fourteen, related to the objective "Appreciation and Use", are found in 75 per cent or more of the shop programs. These are items one, nine, twelve, thirteen, fourteen. The second, and fifth activities are found in at least 50 per cent of the programs.

Five activities, the second, third, fourth, tenth and fourteenth related to the objective "Self-realization and Initiative" are used by 75 per cent or more of the industrial arts teachers in Utah. Activities one, seven, eight, eleven, and thirteen are used by 50 per cent or more

of the respondents. This can be seen in Table 3.

Of the seven items shown on Table 4, only the first, second, and third are used by more than 75 per cent of the teachers. Items four and seven can be found in 50 per cent or more of the industrial arts programs.

Table 5 shows the responses pertaining to the objective "Health and Safety." Careful scrutiny reveals that only three items are not incorporated into the teaching programs of at least 75 per cent of the shops. These are the second, third and eleventh activities, and 50 per cent or more of the instructors use the second activity.

There are five activities in Table 6 that were developed in the classrooms of at least 75 per cent of the respondents. These are items one, two, four, five, and twelve. The sixth, tenth, and eleventh activities are used by more than 50 per cent of the instructors. Four activities are non-existent in 65 per cent or more of the industrial arts programs.

The teacher's responses show that seven out of nine activities, as displayed in Table 7, are being used in Utah industrial arts shops by 75 per cent or more of the teachers. The first and second activities are the only exceptions, and they are both used by at least 69 per cent of the respondents. It is apparent that the objective "Habit of Orderly Performance" receives a great deal of emphasis in this State.

Table 8 reveals a contrast between it and the data of Table 7. Figures presented in this table show only two activities (fourth and seventh) that are taught in the shops of 75 per cent or more of our industrial arts people. Items one and four are used by 50 per cent of them. Not one activity related to this objective was rated highly important by a majority of teachers.

The data recorded in Table 9 shows that "Shop Skills and Knowledge" is one of the more recognized objectives of this area. The first, second, fifth, sixth, seventh, and eighth activities are all used by more than 75 per cent of the instructors. Only item four will not be found in at least 50 per cent of the industrial arts programs.

A rank-difference formula was computed for each objective to determine if there was a correlation between the respondents choice of important activities and the activities that were included most in their programs. Table 10 reveals that there was a high correlation, pointing out the fact that the instructors tended to rate high in importance those activities they were teaching to a great extent, and rate low in importance the activities that they did not use. There were a few exceptions such as visits to industries and visits to arts and industrial museums, where relatively few teachers made such visits but considered them to be quite important. All of the activities were rated higher in importance than they existed in actual practice with only two items not being judged as being at least fairly important by a majority of responses.

Rank order of the objectives

It was thought that it might prove interesting to rank the objectives, first, in the order that they are used or emphasized in Utah and, second, in the order of importance as determined by the industrial arts teachers. Then a comparison can be made between the two rankings.

In order to do this, the percentage columns were totaled on each table and then an average percentage was found for each column. A weight of three points was given the "extensively" used and "highly" important columns; a weight of two points was given the "limited" use and "fairly" important columns; and a weight of one point was given the "not" used and "not" important columns.

It is assumed that the prominent leaders of the Industrial Arts Division of the A.V.A. believe that all the objectives formulated by them are of vital importance and that the activities listed are those that will bring about the attainment of those objectives. If the items are important in fulfilling the aims of industrial arts, then giving such a point value is felt to be justified. Thus, the respondent who has the activity to a great degree, or who think them highly important are rewarded for those responses.

After assigning the point values the three "use" columns of each objective were added and divided by three to obtain an average rating for that objective. The same calculations were applied to the three "important" columns with results as shown in Table 11.

Table 11. Rank order of the objectives of industrial arts as applied to the State of Utah

Objectives	Use		Importance	
	Score	Rank	Score	Rank
Health and Safety	74.8	1	87.8	1
Orderly Performance	74.6	2	83.7	2
Shop Skills and Knowledge	73.7	3	82.5	3
Cooperative Attitudes	65.4	4	73.5	6
Interest in Achievement	64.0	5	75.8	5
Interest in Industry	63.4	6	77.1	4
Self-realization and Initiative	61.5	7	72.6	7
Drawing and Design	58.4	8	70.1	8
Appreciation and Use	55.3	9	68.6	9

CONCLUSIONS

Industrial arts education, as a significant part of general education, has the function of interpreting our great industrial society to the oncoming generation. With the vast number of different industries found in the United States, which is expanding more each day, the number of activities taught in the industrial arts shops must be increased if we are to accomplish this aim. The list of activities in this study offers a good sampling of industrial life as we find it today, but it is realized that it must be revised as new industries are developed. It is not expected that all of the activities would be included in class instruction, but the inclusion of as many as possible is necessary if all of the objectives of industrial arts are to be attained.

The three objectives, "Habit of Orderly Performance," "Shop Skills and Knowledge," and "Health and Safety", are emphasized more than the others in Utah schools. All nine activities related to the "Habit of Orderly Performance" objective are included in 50 per cent or more of the shop programs. Teachers include seven of eight activities pertaining to "Shop Skills and Knowledge" in at least 50 per cent of their programs, and ten out of twelve activities related to the objective "Health and Safety."

"Interest in Industry," "Interest in Achievement", and "Cooperative Attitudes" receive median attention, while the "Self-realization and Initiative," "Appreciation and Use," and "Drawings and Design" objectives receive the least emphasis. Only seven out offourteen activities pertaining to "Appreciation and Use" are found in 50 per cent or more of

the industrial arts programs. Four out of twelve activities listed in the "Interest in Achievement" table are practically non-existent. Not a single activity related to "Drawings and Designs" is used extensively by a majority of teachers, nor is there one that is rated as being highly important by a majority.

It is beyond the scope of this study to determine the exact degree that these activities must be carried out to attain the objectives, but when compared with the others, it seems that Utah industrial arts teachers are failing to accomplish all they should in their attempt to attain the latter three objectives. At least they must do more to bring them up on a par with the other aims.

Suggested studies

Work in this particular phase of industrial arts suggested related areas for additional study. They are:

1. The need for an evaluative device that will measure the extent that industrial arts instructors are attaining the objectives they have chosen. Such a device would probably be best developed under an experimental situation that utilizes classroom control groups and experimental groups.

2. The need to develop a pattern of behavior growths that should result if the industrial arts teacher is to accomplish the accepted objectives of particular industrial arts subjects. If it is a good principle to translate objectives into a desired behavior pattern, then the industrial arts teacher must know what it is he is trying to accomplish. Such a list would aid considerably in developing a timely and effective evaluation program.

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APPENDIX

Logan, Utah
April 16, 1954

Dear Sir:

You, as an industrial arts instructor, have at one time or another, agreed upon a set of objectives to guide and direct your teaching program. Objectives, as such, are of little value unless translated into behavioral growth which you desire to produce in the pupils. After one has defined the objectives in terms of desired behavior it is then necessary to enumerate the learning activity which will develop the desired behavior pattern.

This survey is concerned with those "activities" that might bring about the desired behavior in pupils of industrial arts. The responses will be evaluated to determine the extent that industrial arts teachers in Utah are accomplishing the objectives, and to determine the activities that lend themselves most to the program. I shall use this as a Master's thesis which is being written under the supervision of Professor William E. Mortimer.

It will be greatly appreciated if you will complete the questionnaire in full and return it promptly to me in the stamped, self-addressed envelope. All names and information will be kept in strictest confidence. A summary of the results will be mailed to you at your request.

Thank you.

Very truly yours,

A. Kent Randall
Prefab 1514

ENDORSEMENT: I sincerely believe this study will help us in the evaluation of our industrial arts program in Utah. Your responses will be very valuable to Mr. Randall and will be appreciated.

Sincerely,

William E. Mortimer, Head
Industrial Education Department

QUESTIONNAIRE

Following is a list of activities related to industrial arts. Read each activity carefully and then make two responses. First, check the numeral "1" if the activity is not present in your program, the numeral "2" if the activity is present to a limited extent, or the numeral "3" if the activity is carried our intensively. Respond to activity as it actually exists.

Second, check the letter "a" if you think the activity is not important, the letter "b" if you think it fairly important, or the letter "c" if you think it highly important.

ACTIVITIES

EXAMPLE:
Make collections of manufactured products to illustrate the common processes.
1___ 2___ 3___ a___ b___ c___

1. Study the manufacture of common articles such as pencils, paper, glass, nails, asbestos, pipe, cement, clothing veneer, plastics, pottery, lubricants.
1___ 2___ 3___ a___ b___ c___

2. Speak of the local production and distribution of such commodities as ice, lumber concrete, electric current newspapers.
1___ 2___ 3___ a___ b___ c___

3. Visit local industries.
1___ 2___ 3___ a___ b___ c___

4. Consider the major sources of raw materials and the methods of their initial processing and transportation ---lumber, coal, oil, gas, iron, cotton, wool, copper, leather, textiles.
1___ 2___ 3___ a___ b___ c___

5. Discuss new industries based upon new materials and methods of work, as well as increased mechanization in the preparation of certain well known products.
1___ 2___ 3___ a___ b___ c___

6. Attempt in various ways to increase the mechanical and industrial vocabularies of pupils.
1___ 2___ 3___ a___ b___ c___

7. Stress the dignity of industrial pursuits and the economic and social usefulness of skilled labor.
1___ 2___ 3___ a___ b___ c___

8. Review a few industrial work opportunities at the professional level.
1___ 2___ 3___ a___ b___ c___

9. Cover working conditions in typical industries as to payroll names, common wages, promotions, educational qualifications, unemployment.
1___ 2___ 3___ a___ b___ c___

10. Instruct as to local and distant preparation plans, such as special schools, cooperative half-time training arrangements, apprenticeship programs.
1___ 2___ 3___ a___ b___ c___

11. Build interest in legislation affecting employers and employees, with emphasis upon laws affecting young workers.
1___ 2___ 3___ a___ b___ c___

12. Arrange talks by local merchants, local labor officials and representatives of advertising and sales organizations.
1___ 2___ 3___ a___ b___ c___

13. Compare articles of recognized superior craftsmanship with those of inferior quality.
1___ 2___ 3___ a___ b___ c___

14. Judge pieces in variety that have been produced in the school shops or brought from homes for the purpose.
1___ 2___ 3___ a___ b___ c___

15. Study old and current catalogs of tools and machines, furniture, glassware, hardware, implements, vehicles.
1___ 2___ 3___ a___ b___ c___

16. Visit museums, then sales placed where similar articles are displayed.
1___ 2___ 3___ a___ b___ c___

17. Study newer manufacturing methods and their applications, methods such as die casting, spot and seam welding, wood lamination.
1___ 2___ 3___ a___ b___ c___

18. Enhance the proper valuation of substantial and beautiful structures in the community or in a nearby city--building, facades and fronts ceilings, floors, railings, monument, towers.
1___ 2___ 3___ a___ b___ c___

19. Conduct experiments to test the qualities of common articles.
1___ 2___ 3___ a___ b___ c___

20. Compare quantity and small-lot purchasing cash and installment buying, bargain prices and special sales with relation to initial saving, spoilage, extravagance.
1___ 2___ 3___ a___ b___ c___

21. Discuss qualities necessary for consumer satisfaction in purchased articles: appearance, type of construction, application of art principles, durability, adaptability, style, finish, practicality.
1___ 2___ 3___ a___ b___ c___

22. Make sales talks, holding the "salesmen" to factual or logical bases for their assertions.
1___ 2___ 3___ a___ b___ c___

23. Make and present individual lists of qualities desirable in common articles, such as a bicycle pair of skates, ladder, wheelbarrow, fishing reel, refrigerator, chair, or sofa.
1___ 2___ 3___ a___ b___ c___

24. Make lists of poor work habits, such as hammering with a wrench, using a machine that is badly in need of adjustment, neglecting to lubricate moving parts.
1___ 2___ 3___ a___ b___ c___

25. Study manufacturer's directions for assembling and using machines, instruments, and devices for both shops and homes. Note the prevention of fires, accidents due to poor upkeep, protection from wear, preservation of surfaces, control of rust and corrosion.
1___ 2___ 3___ a___ b___ c___

26. Study the value increase that results from fine work and decorative finish.
1___ 2___ 3___ a___ b___ c___

27. Construct some projects with equipment limited to the barest necessities, making it necessary for pupils to improvise in order to complete the work.
1___ 2___ 3___ a___ b___ c___

28. Organize an elementary type of foremanship so that concepts of leadership, followership and teamwork may be gained.
1___ 2___ 3___ a___ b___ c___

29. Plan rotating responsibilities for such tasks as cleaning the finishing room sink, oiling machines, sharpening tools, arranging the stock room and reconditioning paint brushes.
1___ 2___ 3___ a___ b___ c___

30. Emphasize problem-solving, creative effort, and proper reaction to adverse criticism.
1___ 2___ 3___ a___ b___ c___

31. Let selected pupils or an entire class assume responsibility for a school assembly or a parent-teacher program.
1___ 2___ 3___ a___ b___ c___

32. Accept a future-dated issue of the school paper for contributions by industrial arts pupils.
1___ 2___ 3___ a___ b___ c___

33. Locate and use reference materials on topics of special interest. Note how craftsmen keep abreast of their trade through reading and formal courses.
1___ 2___ 3___ a___ b___ c___

34. Work to a deadline on a job.
1___ 2___ 3___ a___ b___ c___

35. Plan a co-curricular organization of a mechanical or artistic nature.
1___ 2___ 3___ a___ b___ c___

36. Study the personal qualities which make for success on a job.
1___ 2___ 3___ a___ b___ c___

37. Use group projects as a systematic part of the total instructional program.
1___ 2___ 3___ a___ b___ c___

38. Let pupils be given all possible practice in making routine family purchases.
1___ 2___ 3___ a___ b___ c___

39. Have pupils act as hosts or guides to visitors.
1___ 2___ 3___ a___ b___ c___

40. Have pupils engage in the planning phase of the school shop activities.
1___ 2___ 3___ a___ b___ c___

41. Develop a pupil personnel system.
1___ 2___ 3___ a___ b___ c___

42. Have pupils assist each other on such shop tasks as gluing a project, cutting stock, and moving heavy material.
1___ 2___ 3___ a___ b___ c___

43. Plan group or whole class work, such as the construction of stage scenery, track hurdles, a piece of furniture for the public library, bulletin boards, and display cases for the school hallways.
1___ 2___ 3___ a___ b___ c___

44. Participate in production jobs which engage the whole class or part of the class.
1___ 2___ 3___ a___ b___ c___

45. Study the causes of discharge or separation from industrial jobs.
1___ 2___ 3___ a___ b___ c___

46. Interpret some of the regulatory aspects of current industrial life, the significance of management problems, the nature of employer-employee relationships of varied kinds, and matters of organization and bargaining.
1___ 2___ 3___ a___ b___ c___

47. Urge enlistment in school undertakings so that there may be learning and practice for later participation in community affairs and among fellow workers.
1___ 2___ 3___ a___ b___ c___

48. Note health or accident hazards about the shop and school and about the home and community areas. Do something to correct or to direct attention to unsafe placed and practices.
1___ 2___ 3___ a___ b___ c___

49. Discuss lighting, heating, sanitary facilities, and the like, from the viewpoint of current trends in construction and use.
1___ 2___ 3___ a___ b___ c___

50. Visit a local industry and study its safety demands.
1___ 2___ 3___ a___ b___ c___

51. Observe safety films.
1___ 2___ 3___ a___ b___ c___

52. Study machines and tools for their unique safety demands.
1___ 2___ 3___ a___ b___ c___

53. Use proper clothing and body protection, such as goggles when grinding and leg and foot guards when pouring molten metals.
1___ 2___ 3___ a___ b___ c___

54. Locate fire extinguishers throughout the shop with the several types of extinguishers available. Note how fires differ in origins and how this determines what extinguisher should be used.
1___ 2___ 3___ a___ b___ c___

55. Develop safety regulations as a class project.
1___ 2___ 3___ a___ b___ c___

56. Use tools and machines properly.
1___ 2___ 3___ a___ b___ c___

57. Collect and post bulletin board materials, such as Safety and First Aid posters and news items pertaining to safety.
1___ 2___ 3___ a___ b___ c___

58. Study data on occupational diseases, industrial accidents, protective measures and pertinent legislation.
1___ 2___ 3___ a___ b___ c___

59. Provide First Aid equipment for use and employ First Aid practices when necessary.
1___ 2___ 3___ a___ b___ c___

60. Provide a wide range of activities in the school shop so that every pupil can experience successful achievement.
1___ 2___ 3___ a___ b___ c___

61. Center the construction activities about enterprises which boys and girls find useful in their out-of-school living.
1___ 2___ 3___ a___ b___ c___

62. Visit museums, especially of the arts and crafts and industries types, to study craftsmanship.
1___ 2___ 3___ a___ b___ c___

63. Provide stimulating reading materials pertaining to crafts and craftsmanship.
1___ 2___ 3___ a___ b___ c___

64. Provide opportunities to construct items which can be used in free-time or out-of-school activity.
1___ 2___ 3___ a___ b___ c___

65. Exhibit work done at home or outside of school. Have "working" exhibits in public places.
1___ 2___ 3___ a___ b___ c___

66. Build and repair toys at Christmas time in cooperation with civic organizations.
1___ 2___ 3___ a___ b___ c___

67. Develop hobby clubs.
1___ 2___ 3___ a___ b___ c___

68. Study construction activities which can be carried on in apartments.
1___ 2___ 3___ a___ b___ c___

69. Have each pupil develop proficiency in some single activity of his choice.
1___ 2___ 3___ a___ b___ c___

70. Keep records of a cumulative nature so that pupil can check on his own achievements and so that successive teachers can arrange a sequency of experiences.
1___ 2___ 3___ a___ b___ c___

71. Report pupil progress to parents.
1___ 2___ 3___ a___ b___ c___

72. Have pupils participate in the planning phases of all shop activities.
1___ 2___ 3___ a___ b___ c___

73. Study planning processes just as skills and information are studied.
1___ 2___ 3___ a___ b___ c___

74. Require a pupil-made plan for each job.
1___ 2___ 3___ a___ b___ c___

75. Have facilities available to aid the pupil in his planning: references, drafting and layout facilities and visual aids.
1___ 2___ 3___ a___ b___ c___

76. Provide definite work space and storage facility for every pupil.
1___ 2___ 3___ a___ b___ c___

77. Study alternative ways for doing a job.
1___ 2___ 3___ a___ b___ c___

78. Measure results objectively.
1___ 2___ 3___ a___ b___ c___

79. Require pupils to appraise the effectiveness of their planning while job is in process and when job is done.
1____ 2____ 3____ a____ b____ c____

80. Plan next job in terms of accomplishments on previous jobs.
1____ 2____ 3____ a____ b____ c____

81. Study many blueprints and sketches in actual use outside the schools.
1____ 2____ 3____ a____ b____ c____

82. Let there be much of the reading and interpreting sort of learning, together with the necessary amount of sketching, detailing, tracing and the like.
1____ 2____ 3____ a____ b____ c____

83. Have experiences in home planning by way of architectural drawing.
1____ 2____ 3____ a____ b____ c____

84. Give special attention to design, in keeping with the age or level of pupils dealt with and the total of time available.
1____ 2____ 3____ a____ b____ c____

85. Sketch many common things and study the design of modern products in great variety (School drawing time in industrial arts should not be confined to mechanical and instrumental types, but should have everyday usefulness and much suggestion as to widely differing payroll jobs and positions.
1____ 2____ 3____ a____ b____ c____

86. Have pupils prepare large cards, charts, scrapbooks to show good and bad types of design for various articles in common use. Let these samples include some from the realm of printing which involve layout, proportion, type size or style, color combinations, and others.
1____ 2____ 3____ a____ b____ c____

87. Insure that pupils have the concepts represented by the following common expressions: appearance of stability, structurally good, pleasing line, appropriate to its setting, etc.
1____ 2____ 3____ a____ b____ c____

88. Have pupils use a variety of tools, machines in diverse situations.
1____ 2____ 3____ a____ b____ c____

89. Study the principles upon which machines operate and note how power is transmitted through them.
1____ 2____ 3____ a____ b____ c____

90. Work out simple devices to portray mechanical advantage as exemplified in the lever, screw, wheel, gear.
1____ 2____ 3____ a____ b____ c____

91. When pupils have completed a project or job, have them list others that would include the same and additional operations. Have them make tool and machine lists to match blue-printed projects and jobs.
1____ 2____ 3____ a____ b____ c____

92. Practice selected operations in order to develop a relatively high degree of proficiency.
1____ 2____ 3____ a____ b____ c____

93. Demonstrate the proper use of tools and machines.
1____ 2____ 3____ a____ b____ c____

94. Have pupils work to reasonable standards.
1____ 2____ 3____ a____ b____ c____

95. Have pupils use accepted craft techniques for all shop projects.
1____ 2____ 3____ a____ b____ c____

Type of school (check one) Jr. High____ Sr. High____ Comb. Jr. & Sr. High____
Approximate enrollment (check one) Under 200_____ 200-500_____ Over 500_____
Remarks: _____

Logan, Utah
May 4, 1954

Dear Industrial Arts Teacher:

On April 17th I sent you a questionnaire concerning activities related to industrial arts. Up to the present time I have not received your reply. It would be of great value to have your program represented in the study, and I would be grateful for your response.

If it has been mailed, please accept my sincere thanks.

Kent Randall
Prefab 1514

(Copy of follow-up letter sent to Industrial Arts teachers)