ABSTRACT

THE ROLE OF INDUSTRIAL ARTS IN THE ACHIEVEMENT OF SELECTED OBJECTIVES OF ECONOMIC EFFICIENCY AS PERCEIVED BY MICHIGAN INDUSTRIAL ARTS TEACHERS

by Gerald L. Jennings

STATEMENT OF THE PROBLEM. This study focused on clarifying the role of industrial arts in the achievement of those objectives for education that are concerned with developing economic efficiency. Its specific purposes were (1) to describe student behaviors that represent the achievement of economic competence, (2) to determine whether selected groups of secondary level industrial arts teachers have significantly different perceptions of the student behaviors to be sought in industrial arts, and (3) to determine whether the teacher perceptions are significantly different from those of leaders in industrial arts teacher education.

Research hypotheses stated that industrial arts teachers would perceive the objectives of economic efficiency in significantly different ways, because of the nature of their own teaching situation or professional status. The variables of grade level, area of teaching, socio-economic level of students, class size and years of teaching experience were used for the tests of hypotheses.

METHODOLOGY. A review of literature concerned with economic life-activities provided a description of subject matter, and student needs and behaviors associated with developing economic competence. A list of 45 behavioral statements was formulated for use in a survey instrument that was distributed to a sample of 397 secondary level Michigan industrial arts teachers.

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The chi-square median test served as the test of significance for ten hypothesized and two non-hypothesized variables. An item analysis was made for the 45 behavioral statements with the variables of grade level and area of teaching as the basis for comparing the industrial arts teacher group responses.

FINDINGS. Significant values of X^2 were obtained for the analysis of industrial arts teacher responses when the teachers were grouped according to the variables of socio-economic level of students, class size, teaching experience and the institution where the bachelor's degree was earned. A significant difference was also found in the comparison of industrial arts teacher and teacher educator responses.

CONCLUSIONS.

1. Teachers of lower socio-economic class students perceive the role of industrial arts in the achievement of objectives of economic efficiency as less important than teachers of middle or upper class students.
2. Teachers with very large classes (averaging 31 or more) perceive the role of industrial arts in the achievement of objectives of economic efficiency as less important than teachers with medium size or small classes (less than 31 students).
3. Teachers in the early years of their teaching careers (1-3 years) perceive the role of industrial arts in the achievement of the objectives of economic efficiency as more important than teachers who have taught for a number of years (more than 3 years).

4. Secondary level industrial arts teachers generally perceive the role of industrial arts in the achievement of the objectives of economic efficiency as less important than the leaders in industrial arts teacher education.

IMPLICATIONS. Teachers who work with large numbers of students from low socio-economic environments apparently limit the range of goals used to guide their programs. Goal selection in this case must be based upon something other than the needs of students for developing economic competence. Also, it appears that industrial arts teachers in the beginning years of their teaching careers are more open to the use of a broad range of economic goals for their subject area than are teachers with several years of teaching experience. The differences in industrial arts teacher and industrial arts teacher educator responses on the questionnaire suggest the possibility of a limited understanding by the teachers of the scope of economic life-functions and the needs of students to prepare for these functions.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

College of Education

1968

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ACKNOWLEDGEMENTS

The writer is very much indebted to a number of individuals for their contributions in making this thesis a reality. For their time and counsel given throughout its development, appreciation is extended to the members of the doctoral guidance committee, Dr. Charles Blackman, Dr. Jacob Stern and Dr. William Faunce. Special thanks go to the major adviser on this committee, Dr. C. Blair MacLean, whose personal interest and concern aided immeasurably in the realization of this professional goal.

The professional contribution and encouragement of two colleagues, Mr. Raymond LaBounty and Dr. H. James Rokusek was very significant to the successful completion of this research study. Also to be recognized is the assistance given in the preparation of computer materials by Mr. Edmond Goings, Professor in Mathematics, Eastern Michigan University. Others from this University who so willingly helped include Dr. Edward Green, Dr. Charles Helppie, Dr. Winton Kloosterman and Dr. Earl C. Kelley.

Greatest appreciation is extended here to the wife of this writer, Mary. Her tireless devotion throughout the time this project was in progress was demonstrated in more ways than can be described.

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CHAPTER I

A DESCRIPTION OF THE STUDY

Statement of the Problem

The great technological advances of the past quarter century have drastically altered production practices and increased the output of American industries. Equally drastic changes in patterns of living have resulted from a new economic status provided for the people of this country. With a projected gross national product totaling more than 700 billion dollars in 1970, as compared with 350 billion in 1950, it is quite evident that there is more capital for investment, there are more goods to be purchased and more jobs available for any capable person. (14:2) In a sense, society has become highly economically motivated.

Every individual needs to experience economic independence and security. Efficient performance in economic matters can be learned in the schools if educational objectives are prepared to provide these learnings. With the rapidly changing economic conditions which exist today, schools should give increased attention to objectives related to the development of efficient economic behavior by their students.

Curricula in economics are gaining increased attention in the social sciences, according to the report of the Joint Council on Economic Education. (8:iv) The relationship of economic education to subject areas other than the social sciences is worth noting. The Commission on Education for Economic Competence of the Association for Supervision and

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Curriculum Development states that: "Economic education will have its greatest impact in the social studies and in those areas more or less directly allied with the discipline itself--business education, home economics, and industrial arts, among others." (2:26)

Since total economic education cuts across the lines of many subject matter areas, including industrial arts, its implementation becomes the responsibility of these curricula as well. Therefore, objectives related to the development of efficient economic behavior need to be defined and described with greater meaning for these applied curricula.

Essentially, the problem in this study was to provide a clearer interpretation of the role of secondary school industrial arts in the achievement of objectives of economic efficiency. To accomplish this, the study first focused attention on describing possible student behaviors related to demonstrating the achievement of economic efficiency. Since the achievement of such behaviors depends a great deal upon how teachers perceive the role of their classroom program, the study also described the teacher perceptions of the role of industrial arts in the achievement of objectives of economic efficiency.

Purposes of the Study

There were three broad purposes for this study of objectives for developing economic efficiency in secondary school industrial arts programs. These were:

1. To present an operational definition of the objectives of economic efficiency for industrial arts through a description of the behavioral outcomes to be sought in

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industrial arts when working to achieve the objectives of economic efficiency.

2. To determine whether selected groups of secondary level Michigan industrial arts teachers have significantly different perceptions of the behavioral outcomes to be sought in industrial arts when working to achieve the objectives of economic efficiency.
3. To determine whether group patterns of the teachers' perceptions of the behavioral outcomes differ significantly from perceptions of a panel of leaders in industrial arts teacher education.

Need for the Study

Those educational objectives which express a specific concern for the development of economic efficiency were identified and described in the first complete form by the Educational Policies Commission in its book of 1938, The Purposes of Education in American Democracy. (4:90-105) This book contains a listing and interpretation of ten objectives of economic efficiency to be achieved in the programs of American schools. It served as the initial point of reference for this study.

Since the time when the original list was formulated, many interpretations and analyses of these objectives have been provided by federal, state and local educational groups. It is doubtful that the objectives have ever been used directly by any one group. More likely, they have served as guidelines for the specification of objectives relevant to a particular program. An important consideration involving these objectives concerns their adequacy for guiding the teacher toward developing

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a more meaningful program. This question was explored by a group of distinguished educators and reported on by Nolan Kearney in the 1953 Russell Sage Foundation publication, Elementary School Objectives. (8) Kearney described the goals of elementary education in terms of observable behavior. In 1957 Will French reported on a study project in the textbook, Behavioral Goals of General Education in the High School. (6)

Two particular questions explored by French and his associates in the project on behavioral goals were:

> What is the nature of the desired outcomes of a really effective program of general education in high school?
> What shall teachers look for and accept as a realization of the purposes of general education? (6:25)

In speaking of the importance of behavioral goals or outcomes for general education, French stated that:

> The evaluation of a program of general education in terms of anything but behavioral competence substitutes an indirect, and perhaps an unreliable and inappropriate, measure for one that is direct and pertinent. Two of the first steps toward further improvement in the high school's general education program would seem to be (a) the acceptance of the idea that its outcomes are best described in terms of behavioral competence, and (b) the development of more explicit statements of some of the principal kinds and levels of behavior which it is reasonable for general education in high school to undertake to achieve. (6:34)

The broad goals of a program must be translated into what the McConnell Committee in A Design for General Education refers to as "performance" expected of students. (10) This student performance can be described in carefully selected statements of behavioral outcomes. Such learner behaviors may be considered the best indicators of what has resulted from a program. The point to be emphasized here is that when educational objectives are prepared, student behavior should be considered. Tyler stresses this point when he says:

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> The most useful form for stating objectives is to express them in terms which identify both the kind of behavior to be developed in the student and the content or areas of life in which this behavior is to operate. (13:30)

Behavioral outcomes for industrial arts have not received much attention, particularly in terms of outcomes reflecting solutions to contemporary problems. Wilber has probably made the most significant analysis of objectives, including behavioral outcomes, for a total industrial arts curriculum. (15:47-54) The American Vocational Association has also provided direction with its statement of educational objectives and behavioral changes. (1:19-28) The most recent and detailed analysis of specific objectives was that by Clay, in a study on creativity in industrial arts. He developed a listing of behavioral outcomes for industrial arts directed at the encouragement of creative behavior by industrial arts teachers. (3:234-238)

The attention given to updating the broader objectives of educational programs has increased during the past decade. This followed the wave of scepticism regarding the effectiveness of general education programs since the race to conquer space began in the late 1950's. Educators in industrial arts, in particular, have been doing quite a bit of "soul-searching" in an attempt to more clearly describe the relationship and the contributions of this subject area to the total general education program. Two rather extensive industrial arts curriculum development projects presently being conducted at Stout State University and The Ohio State University are evidence of this type of searching. Both of these projects appear to be emphasizing the relatedness of industrial arts to the total secondary school curriculum. (5:60) (11:112)

Hostetler, in his report on objectives to be emphasized in industrial arts, compares the objectives presented by eight different

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individuals or professional groups in order to determine whether and how the emphasis on objectives changed between 1928 and 1960. He concluded with a listing of four broad objectives "considered basic for industrial arts as a whole":

1. To develop in each student an insight and understanding of industry and its place in our culture.
2. To discover and develop talents of students in the technical fields and applied sciences.
3. To develop technical problem-solving skills related to materials and processes.
4. To develop in each student a measure of skill in the use of the common tools and machines. (7:20-21)

Direct reference to the objectives of economic efficiency is not evident in industrial arts literature. When they appear they are within the context of broader objectives. This is illustrated not only in Hostetler's objectives, but in four of Wilber's nine objectives that refer to such things as occupations, work, vocations, and consumer problems:

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes, and operation, products, and occupations.

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4. To increase consumer knowledges to a point where students can select, buy, use, and maintain the products of industry intelligently.
5. To provide information about, and--in so far as possible--experiences in, the basic processes of many industries, in order that students may be more competent to choose a future vocation.

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9. To develop a certain amount of skill in a number of basic industrial processes. (7:42-43)

One of the problems associated with stating objectives so broadly is that differences in working definitions and interpretations given to certain words or phrases often lead to quite different translations of their meaning by different teachers in a subject area. These differing translations are exhibited in the diverse and unrelated learning

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activities which often appear in the industrial arts programs at different schools in a system. The importance in developing a proper relationship between broad educational objectives and those for a specific subject area is stressed by Sommers and Face in their discussion on preparing industrial arts objectives. They offer a number of suggestions for improving the possibilities that such a relationship might develop. These are:

1. The objectives of industrial arts must grow from and contribute to the objectives of education.
2. A hierarchy of objectives should be developed.

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4. Educational objectives should be stated in terms of the types of change expected in a learner at the conclusion of instruction.

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6. The educational objectives must give a precise indication of how well the learner is expected to meet the specified objectives. (12:31-34)

The final determiner of whether or not an objective ever becomes operational is the attitude the teacher assumes toward the importance of the objective. It should be asked whether the teacher sees the objective. It should be asked whether the teacher sees the objective as being worthy of implementing. Also, does the objective make enough sense to the teacher so that it can be used? These are questions which deserve consideration, for they can provide clues to how realistic the objective may be for classroom use.

The several needs described here and considered in this study were:

1. The need to translate objectives for industrial arts from those for general education.
2. The need to translate the broader objectives for a program into a form which indicates the kind of "performance" to be expected of the student.

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3. The need to determine the perceptions of industrial arts teachers toward the appropriateness of the objectives discussed in this study--the objectives of economic efficiency.

Assumptions of the Study

Assumptions made in this study reflect a concern for giving proper consideration to the objectives of economic efficiency for industrial arts, as well as the important matter of associating the learner's behavior with the learning process. The following assumptions have been used in guiding the development of this study:

1. Objectives of economic efficiency are an important concern for secondary schools today.
2. Behaviors related to the achievement of economic efficiency are primarily learned behaviors.
3. Behavioral habits or actions related to the achievement of economic efficiency can be described for industrial arts.
4. Behavioral outcomes related to the objectives of economic efficiency can be assessed in terms of their value to the educative process by the industrial arts teacher.
5. The role an educational program serves can be described in terms of the behavioral outcomes which are achieved in that program.
6. The teacher perceives a particular role for his subject area in the behaviors which he believes should be manifested through that subject area.

Delimitations of the Study

This study was concerned primarily with industrial arts programs as they serve a general education function. Beyond this conditional factor, the following delimitations were applied:

1. Only those behavioral statements related to the achievement of objectives of economic efficiency in industrial arts programs were considered.
2. Behavioral statements that could be operationalized within the structure of the comprehensive junior and/or senior high school, grades seven through twelve, were given primary attention.
3. No attempt was made to describe specific learning experiences to be used in achieving the behaviors referred to in this study.
4. The population sampling for the study was taken from the total membership of the Michigan Industrial Education Society for the 1966-67 school year. It included only industrial arts teachers from Michigan who were teaching in either junior or senior high school programs at the time the questionnaire was distributed.
5. Initial grouping of the teachers to permit comparison of sub-groups was done according to grade level (junior or senior high) and their area of teaching (limited area or multiple area*). Regrouping was done to permit the study of teacher

*Limited area industrial arts teachers were considered in this study to be those teachers who include one technical content area, such as drawing or electronics, in their industrial arts course at one time. Multiple area teachers are those who include a number of these areas in a course at one time.

perceptions as affected by (1) industrial arts class size, (2) socio-economic level of students, and (3) years of teaching experience.

Formulation of the Hypotheses

Previously it was stated that if a teacher accepts an objective as appropriate for his subject area, he is more likely to attempt to encourage student behaviors that result in the achievement of the objective. He may also encourage other teachers to do the same thing. It was further pointed out that if a teacher views an objective as appropriate for his subject area, he will perceive that objective as representing a particular role the program should play as a part of the total educational curriculum.

The role of a subject matter area may be described in terms of the objectives which are used to guide that program. For instance, if the objective is to develop in each student an insight and understanding of industry and its place in our culture, the role of the program in relation to this objective would apparently be one of orienting the student to the industrial components of this society. If the teacher sees his program as playing a significant role in assisting students to achieve efficient economic behavior, he will likely emphasize those objectives which are related to the development of such behaviors.

A question which might be asked at this point is what kinds of things would affect how teachers perceive the role of their subject area in education? If differences do exist in the way teachers perceive their subject area, is it because of the nature of immediate teaching conditions, or because of more distant kinds of factors? For example, does the grade level of the particular teacher's program affect his perceptions of

the total subject area role? Or, does the term of teaching experience affect the way the teacher perceives his subject area?

A number of factors could be responsible for the variations in perceived roles. Besides the grade level factor, the teaching area arrangement (limited or multiple area) within which the teacher operates may have some bearing on the matter. The size of the industrial arts classes or the socio-economic status of the students may have an effect on the teacher's perceptions of the subject area. The institution where the teacher received his professional preparation could have shaped these perceptions. Factors which would not seem to be as directly related to immediate perception formation might include such things as the length of time the teacher has spent in the profession, or his present age.

If significant differences in perceived roles exist in relation to one of these factors or variables, some idea may be established as to the relative importance or value of one teaching situation or teacher condition over the other. For example, multiple area teachers may be more accepting than limited area teachers of a group of outcomes which teachers should express an equal concern for achieving. Teachers of very large classes may have quite a different outlook on programs in industrial arts than teachers of small classes because of the problems which are created with a large number of students in a classroom.

The hypotheses for this study were derived from a description of the several variables that could affect how the teacher perceives the role of his subject area. In general, the differences in perceptions are presented in terms of teacher group relationships as affected by these variables. General hypotheses that were formed include:

1. There is a significant difference in the way junior high

and senior high industrial arts teachers perceive behavioral items related to the objectives of economic efficiency.

2. There is a significant difference in the way multiple area and limited area industrial arts teachers perceive behavioral items related to the objectives of economic efficiency.
3. There is a significant difference in the way industrial arts teachers with predominantly small, medium or large classes perceive behavioral items related to the objectives of economic efficiency.
4. There is a significant difference in the way industrial arts teachers with predominantly upper, middle or lower socio-economic level students perceive behavioral items related to the objectives of economic efficiency.
5. There is a significant difference in the way industrial arts teachers with limited teaching experience and those with a great deal of teaching experience perceive behavioral items related to the objectives of economic efficiency.
6. There is a significant difference in the way all industrial arts teachers combined and a group of specialists in industrial arts teacher education perceive behavioral items related to the objectives of economic efficiency.

Summary

This study was directed at the problem of clarifying the role of industrial arts in the achievement of the objectives of economic efficiency. First, a description was provided of student behaviors which would reflect the achievement of economic competence in industrial arts. Then a survey was conducted to permit the study of industrial arts teacher

perceptions of the role of their subject area in relation to these objectives. A sample of Michigan industrial arts teachers was used in this survey. Teacher group responses on the survey instrument were compared with each other and with the responses of a panel of leaders in industrial arts teacher education.

The need to give attention to the objectives of economic efficiency in education is even greater today than when the Educational Policies Commission first proposed their statement on these objectives in 1938. The fact that one of the primary purposes of general education is to provide opportunity for individuals to develop basic knowledge, attitudes and skills which would enable them to become economically competent is rather widely accepted. The problem that remains, if appropriate learnings are to take place, is that educators must develop a better understanding of the role each subject area in a curriculum plays in helping students achieve economic competence. The answer to this problem may be in the description of (a) the kinds of student behaviors to be achieved in a particular subject area, and (b) teacher perceptions of the behaviors they expect should be achieved in the subject area.

The assumption presented for this study stated that the objectives of economic efficiency are an important concern of secondary education, that they can be described in behavioral terms, and that these behaviors can be learned in the secondary school curriculum. It was also assumed that teachers perceive as important those behaviors which describe a particular role their subject area should have in education.

The study was delimited to describing educational outcomes related to the achievement of efficient economic behavior that could be operationalized in the program of general education. The sample of industrial

arts teachers used in the survey of teacher perceptions was taken from the membership of the Michigan Industrial Education Society.

Hypotheses were formulated to make comparisons of teacher responses when the teachers were grouped according to grade level, area of teaching, student socio-economic level, class sizes and teaching experience. A select group of industrial arts teacher educators was used to make comparisons between their responses and those of the industrial arts teachers.

Chapter II offers a survey of literature which expressed the concern for developing economic competence through secondary education. Competence was discussed as it involved such processes as occupational choice, work, consumer activities, and making economic analyses. Chapter III discusses the process of translating the objectives of economic efficiency into student behavioral goals to be achieved through industrial arts. These statements provided the content for the survey instrument which was used to gather industrial arts teacher responses for the study of their perceptions.

Chapter IV concerns the approach and method which was used in the study of teacher perceptions. Chapter V contains the statistical analysis of the data which resulted from the survey. A summarization of this information along with conclusions and implications for industrial arts are presented in Chapter VI.

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CHAPTER II

A REVIEW OF LITERATURE ON DEVELOPING EFFICIENT ECONOMIC BEHAVIOR THROUGH SECONDARY EDUCATION

Introduction

Nearly every facet of life in our society is affected to some degree by economic factors or conditions. "Most of us hold some sort of job to earn an income, and most of us spend money to acquire the goods and services we want." (46:2) These are ordinary acts of life which can be termed economic behavior. These acts are basic to our way-of-life. (46:2)

Because of such common every day events, nearly everybody has something to say about economics. Choices of "right" answers to economic problems seem to be unlimited because of the diversity of experiences different individuals have which guide their judgements on economic matters. This multiplicity of interpretations on the nature of efficient economic behavior is involved in a host of variables associated with human values. Placed in the framework of objectives for general education, these interpretations seem to become even more disparate.

It is necessary in any discussion of economic matters to establish a level of objectivity and rationality which will limit the effects of emotionalism and prejudice that pervade with inadequate educational experience. In discussing education to develop economic literacy three

questions were considered in this chapter. These are: (a) What are the needs of youth which support economic efficiency as a specific goal in education? (b) What are the limits of this goal for secondary education? and (c) What are the elements of this goal that make it interpretable and functional to the individual classroom teacher? The attempt was made first to define terminology commonly associated with the objectives of economic efficiency. This was followed by a discussion on the need to develop efficient economic behavior in general education, with a review of the scope and functions of the objectives of economic efficiency as applied in secondary education.

A Broad Definition of Economic Efficiency

Limited reference is made to the term economic efficiency in the literature. Two specific and somewhat different applications of the term were found. The first, and that which applied most directly in this study, made reference to the development of efficient economic behavior by the individual as a responsible citizen in our democratic society. It refers to the development of an acceptable or desirable level of performance to be achieved by the individual while he works to solve the economically-oriented problems of life. This use of the term had its origin in the statement of the purposes of education in a democratic society as presented by the Educational Policies Commission. (21:90)

A second reference to economic efficiency appeared in the textbook Economics and Its Significance by Martin and Miller. (46:35) These authors used economic efficiency as a goal for the economic system of the nation. Because of its reference to the nation's

economic system, this use differs from the individual-centered approach of the Educational Policies Commission.

The scope of economic efficiency as a goal in general education is clarified by French and his associates who stated that the individual needs to develop economic competence, because of:

> the desirability of becoming economically literate and self-supporting; of making a wise choice of life work; of beginning basic common preparation for it; and of fulfilling the citizen's responsibility for safeguarding our natural and human resources. (26:88)

From the above statement, and those of the Educational Policies Commission, it appears that the nature of the individual's performance in each of these areas of concern would be a measure of his level of economic competence. This performance would of course reflect the extent to which the individual has achieved economic efficiency.

A Reference to General Education

The literature abounds with material on the topic of general education. It would serve no significant purpose to review this literature in detail in this study. References cited here were selected to provide a framework for the discussion which follows.

Bergman discussed the problem of defining general education and revealed that a great deal of confusion exists as to the meaning of the term. In classifying various definitions and meanings, he found that they fitted roughly into the following eleven different categories:

1. Education which contributes to the adjustment of the individual to his environment.
2. Education which gives preparation for the needs and problems of life.
3. Education for responsible citizenship.
4. Education for intelligent action.

5. Education which is concerned with the whole individual and his total personality.
6. Education for intellectual discipline.
7. Education in which specialization is avoided.
8. Education which provides for the unity and integration of human knowledge.
9. Education which emphasizes general principles.
10. Education for culture and basic knowledge.
11. Education which emphasizes scientific progress. (10:460)

From these eleven categories Bergman proposed his own definition, which he regards as representative:

> General education refers to that broad, integrated non-vocational and non-specialized part of a person's education which leads to personal growth and responsible citizenship by preparing him for satisfactory adjustment to the needs and problems of his environment, and for active participation in the many aspects of living. (10:460)

Baker traced the history of the general education movement through the years and revealed that it has acquired in the course of time six essential purposes or objectives. He described these as:

1. General education is universal education.
2. General education is practical education.
3. General education is education for citizenship.
4. General education is education of the whole man.
5. General education is individualized education.
6. General education is a unifying force. (8:345)

Using these six purposes, Baker developed a definition which, though long in form, seems to encompass the concerns for understanding general education as it applied in this study:

> General education is the theory of education evolved to fit all students--not just the upper ten percent--to live in their time. It is not precisely liberal education, because liberal education, as often defined and practiced, will not fit all students; nor is it vocational education, because vocational education omits the values and richness of life beyond material things. General education is an attempt to give students as much training and learning as they can comprehend, use, and enjoy. It attempts to make them better citizens by giving them a useful basis for the understanding of local, national, and world problems so that they may contribute, both as followers and leaders, to a better world. It attempts to make them better persons by giving them a practical basis of understanding of personal,

> emotional, and vocational problems and by giving them a luxurious basis for the understanding of music, art, and literature so that their lives will not lack that which they are capable of enjoying, but which they might forever miss if their education represents a great democratic, educational endeavor to raise every person to that state of practical, intellectual, and emotional understanding to which the ancient Greeks, by their use of experimental methods, attempted to raise only their upper class. In this endeavor, general education attempts to raise every person toward that level as far as he can progress and in a manner which he will understand and enjoy. (8:346)

The Need to Develop Efficient Economic Behavior Through the Educational System

The means by which man obtains the material necessities for life are infinitely different from those of past years. Entirely new interpretations are being provided to describe man's involvement in his work and the way in which he uses his earnings today. Attitudes toward the work effort, consumption of goods and services, and the ownership of property have changed significantly over the past fifty years. Old modes of response to the complex economic problems of life today are not adequate because of the increased number of forces which are playing a part in the formulation of such problems. These forces are not only founded in basic economic conditions, but they include the social and moral structure of our culture. There is every indication that the rate of change in conditions will increase even more significantly in the future. (24:13) (14:9)

There are recurring points of emphasis in the literature which discuss topics related to developing economic competence. Such references were found in sociology, guidance and counseling, economics and general education. It is from these major fields of study that the references were sought for this discussion on economic efficiency.

The task of helping youth comprehend and work with the many factors and forces associated with the economic problems in life is one of the prime responsibilities of the educational system of the nation. This fact was stressed by a number of prominent individuals and groups, including the Educational Policies Commission. The Commission expressed the view that:

> The school is only one of the many influences in [the] various fields of human life. Its responsibility extends to all of these areas, but in some areas the weight of education rests on the schools more exclusively than in others . . . Under modern economic and industrial conditions preparation for economic efficiency is largely a function of the school. (21:48)

The Association for Supervision and Curriculum development indicated in its text entitled, Educating for Economic Competence, that:

> The curriculum must be so designed that it equips students to deal intelligently with the problems their generation will be called upon to resolve. And, more than ever, in the future these problems will be economic in origin. (4:2)

This task is one which cannot be further slighted or overlooked because of the compounded effects of the problem upon the future adult population of our society. The committee for Economic Development emphasized this point in its report, entitled, Economic Literacy for Americans:

> We recognize that many high school students lack the maturity and full understanding required to do a good job of reaching their own conclusions on complex economic issues. But these are young men and women who will soon be the citizens of tomorrow. Unless they are given the opportunity for this kind of economic analysis under objective and sympathetic guidance in the schools, we have little right to hope that they will be able to reach reasoned conclusions on their own as they vote and live in our free democratic society. (15:33)

The inadequacy of some of the former and existing approaches to preparing for one of the most important economic acts in life--the individual's work--was clearly emphasized by Hook. He described the

effects of present conditions of change and the possible outcomes of these conditions when they are not properly handled:

> Techniques, know-hows, operative skills change so rapidly in industry that the student who has been trained to perform certain specific tasks run the risk of suffering from what Veblen called 'trained incapacity'. (36:158)

Hook stated also that the hope of our educational system cannot be simply to help the individual adjust to the conditions at hand, simply because these conditions are continually in a state of flux and, as such, adjustment is not enough. Public education must hope to develop an awareness in the individual of these conditions of life in the context of an historical evolution of human activities. (36:58)

The references cited here have stressed that the responsibility for assisting students in understanding economic problems has increased in direct relation to the increasing complexity of the problems. It can be concluded from this that greater emphasis should be given to developing an adequate perspective on the nature of these economic life-problems, as well as for providing basic experiences in how to proceed in solving the problems.

The Scope and Elements of the Objectives of Economic Efficiency

In its analysis of the objectives for education in a democratic society, the Educational Policies Commission presented a classification of objectives for education. It attempted to clarify those things which the individual needs to develop in order to live in the democratic society. The Commission referred to these as, "the objectives of education--qualities and conduct to be encouraged by all educational agencies for all American citizens." (21:48) Its proposal indicated that there

are four aspects to educational purpose. "These aspects center around the person himself, his relationships to others in home and community, the creation and use of material wealth, and socio-civic activities." (21:48) The "four great groups of objectives" which resulted were:

1. The Objectives of Self-Realization
2. The Objectives of Human Relationship
3. The Objectives of Economic Efficiency
4. The Objectives of Civic Responsibility (21:48)

Elaboration on each of these four groups of objectives included a description and definition of their individual functions. In their reference to the objectives of economic efficiency, the Commission discussed:

> The economic sphere--the creation and satisfaction of material wants. Here we consider the education of the individual as a producer, a consumer, an investor. The importance of such education in providing the indispensable material basis for comfort, safety, and even life itself is clear. The objectives within this general area will be classified under the heading of the objectives of economic efficiency. (21:46)

Further analysis of the "economic sphere" by the Commission lead to the development of a list of ten areas of economic involvement in life. These areas emphasize the extent of the responsibilities of the citizen in his economic activities:

> Work. The educated producer knows the satisfaction of good workmanship.
> Occupational Information. The educated producer understands the requirements and opportunities for various jobs.
> Occupational Efficiency. The educated producer succeeds in his chosen vocation.
> Occupational Adjustment. The educated producer appreciates the social value of work.
> Personal Economics. The educated consumer plans the economics of his own life.
> Consumer Judgment. The educated consumer develops standards for guiding his expenditures.
> Efficiency in Buying. The educated consumer is an informed and skillful buyer.
> Consumer Protection. The educated consumer takes appropriate measures to safeguard his interests. (21:90)

Almost twenty years after the work of the Educational Policies Commission was published, a large group of specialists in education was organized under the sponsorship of the Educational Testing Service, Russell Sage Foundation, to formulate a list of behavioral goals for the high school. Their efforts were edited by Will French and published in 1957 as Behavioral Goals for General Education in High School. While using the "four great groups of objectives" as a guide in their work, the committee of specialists developed an outline of topics as further specification of the kinds of growth which should be manifested in youth to help them achieve maturity in all realms of life. A summary of those topics which appeared in their analysis as a measure of growth toward economic competence in youth follows:

Growth Toward Self-Realization

- Preparing to Make Intelligent Choice of Life-Work
- Becoming a More Efficient Worker Through Actual Work Experience
- Becoming a More Intelligent and Economically Literate Consumer

Growth Toward Desirable Interpersonal Relations in Small Groups

- Improving Economic Competence and Independence in Family and Small Group Situations
- Becoming a Good Member of Work-Groups
- Manifesting Interest and Participation in the Economic Affairs of the Community

Growth Toward Effective Membership or Leadership in Large Organizations

- Identifying Himself with Large Groups and Organizations Interested in Cultural, Social, Economic, and Political Affairs, and Becoming an Effective Member of Them
- Seeing Vocational Activities in Their Cultural Settings
- Supporting Measures of Federal, State, and Local Government, and Voluntary Organizations Designed to Conserve Human and Natural Resources

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Seeing the Principal Problems Involved in the Operation of Our Economic System and Revealing an Interest in Maintaining and Expanding Its Values

Recognizing the Problems Related to Organized Business and Organized Labor; Being Sensitive to Both the Uses and Abuses of These Rights (26:63,88,and 89)

Two characteristics of the list prepared by French and his associates which contrast it with the list prepared by the Educational Policies Commission can be seen as: (a) The content of the list by French and Associates is more comprehensive and more representative of contemporary thinking on what education in economics includes, and (b) it offers more assistance to the teacher who needs to understand better what is to be achieved in order to establish economic competence.

The eight areas of interest presented in the Commission list represent a concern, primarily, for two aspects of economics--consumption and production. These are very significant components of economic activities, but as represented here they are limiting. The emphasis in these eight items tends to be upon selecting an occupation, performing in the formal work situation and conducting consumer activities.

The twelve topics presented in the French list are inclusive of a large number of ideas and concepts which represent economic education of a broader scope. Therefore, it might be concluded that the concern as represented in this list is for achieving total economic literacy.

The general conclusion to be drawn from these references is that there are four major processes involved in achieving economic competence. These are: (a) occupational choice, (b) work, (c) consumer activity, and (d) making economic analyses. References which describe the specific nature of these processes are discussed in the following sections.

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Occupational Choice

Occupation Defined.--Among the three or four major decisions which the individual makes in his lifetime is that which moves him in the direction of his life-work. According to definitions provided by a number of authors in the field of sociology, life-work refers to that general pattern or succession of related jobs filled by the individual which is commonly identified as the individual's occupation, vocation, or career. (51:599) (18:276) (52:203) (32:49)

Borow defined occupation as the "employed activity in which the tasks involved are similar from situation to situation." (11:27) Super, referred to an occupation as "a group of similar jobs in several establishments." (11:8) Because of the likeness in these two statements, either of them could serve as a definition of occupation.

The Importance of Occupational Choice.--It is quite likely that man's entire personal history and even his achievement of moral stature may depend to a considerable extent upon the character of his occupational experiences. According to Donohue, the very nature of man's existence may well depend upon the form of his career or occupation. (17:206)

Dubin made two rather interesting observations concerning occupational choice. He stated that:

> It is notable in our society that occupational choices are commonly made relatively early in the life history of the individual. Also typically in our society these occupational choices are for general fields, rather than specific work assignments. (18:251)

The Process of Choice Making.--It is a generally accepted idea that the educational system in a democratic society has a responsibility

for preparing the individual to make his choice of an occupation. A major problem which develops in this process, though, results from the fact that so little is known about the forces that affect the decisions and choices. (31:6) What is known rather clearly is that "an appropriate and satisfactory occupational choice can be made only if the individual considers his capacities, interests, and goals." (31:6)

Super stated that the problem of occupational choice is, in fact, "a process rather than an event," because the decisions on the choice are so dependent upon an understanding of the self. He further indicated that the term "process" should "denote a whole series of choices, generally resulting in the elimination of some alternatives and the retention of others." (70:184)

Describing a Theory on Occupational Choice.--A number of specialists in guidance and counseling as well as sociology indicate that efforts to state a single comprehensive theory of occupational choice have proven fruitless. (57:58) Notable attempts were made by Eli Ginzberg and his associates, but even their study was seriously questioned by Hutson, because of its lack of adequate supportive research. (37:574)

The Ginzberg study traced the process of occupational choice through stages based on the characteristics of choice or the presumed determinants of choice. According to their point of view, the individual tends to make his choices with emphasis upon different factors at different age levels. Their approach was developmental, and is described by them as follows:

> Our basic assumption was that an individual never reaches the ultimate decision at a single moment in time, but through a series of decisions over a period of many years; the cumulative impact is the determining factor. (31:27)

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They identified three periods of time when there occurs a determination of occupational choice; the period of fantasy choices (between ages six and eleven approximately); the period of tentative choices (during adolescence); and that of realistic choices (early adulthood). (31:60)

In line with the Ginzberg theory, Super and Overstreet stated that, "Increasingly mature behavior is expected with increasing age; reality orientation is indicative of maturity; therefore, increasing reality orientation is expected with increasing age." (71:6)

The Ginzberg theory was challenged by Small, who did a study which compared well-adjusted boys, ages 15-19, with emotionally disturbed boys of the same age. He found no evidence of a developmental progression towards a realism of vocational choice. He did recognize that reality factors and elements of fantasy operate simultaneously; that well-adjusted boys made vocational choices which were more realistic than did the emotionally disturbed boys. The choices of the latter group were more reflective of fantasy.

One of the most interesting aspects of Small's efforts toward identifying a theory of occupational choice was his description of the relationships between individual perceptions, ego strength, and environment. He concludes that the distinction between fantasy and reality in a vocational choice are dependent upon the adequacy or strength of the ego. Because the ego is conditioned by the nature of the environment factor, it was observed by Small that the reality choices accompanied the tendency for environment-involvement in the well-adjusted boys, whereas the environment-avoidance fantasies were observed in the disturbed boys. (67:1-21) A conclusion to be drawn from this finding by Small is that if

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reality choices are to be made by the adolescent boy, an attempt should be made to help him identify in a positive manner with his environment.

Super and Overstreet accepted the theory developed by Ginzberg and his associates and proceeded from there to study the vocational maturity of ninth grade boys. Though their research data referred specifically to the group of ninth graders under study (142 boys in Middletown, New York), the implications for the educational program as well as the guidance and counseling effort extend throughout the high school years. Vocational maturity as these authors used it in this study, was defined as "the maturity of an individual's vocationally related behavior in his actual life stage (whether or not it is the life stage expected for him) as shown by his behavior in dealing with vocational developmental tasks as compared with the behavior of others dealing with the same developmental tasks." (71:141)

The major conclusions from the Super and Overstreet study of the ninth-grade boys were:

1. There was an awareness of the need to make a vocational choice, but it tended to be rather general and focused on the more immediate choices.
2. The specificity of information about preferred occupations was rather substantial, considering that ninth-graders need to make decisions largely of direction rather than of actual entry, but knowledge of duties, conditions of work and other important characteristics of the occupation was found to be limited.
3. The specificity of planning was low, as more than half of the ninth-grade boys had apparently done little about getting information on which to base high school plans. About one-third of the boys made no mention of appropriate high school plans related to their preferred occupations, and post-high school planning was not very different. The group generally accepted responsibility for making the choice, though.
4. Almost one-half the ninth-grade boys aspired to occupations which were appropriate for their intelligence, but slightly more than half of them wished to enter occupations that seemed inappropriate in terms of the intelligence required.

Also, almost half of them had vocational preferences which did not agree with their interests as measured by Strong's Vocational Interest Blank.

5. In considering the matters of self-understanding and self-acceptance as they effect the wisdom of the choice, it seemed apparent that the typical ninth-grade boy has not yet reached a stage at which wisdom of vocational preference can be expected.
6. Though the mental ability can be sufficiently well appraised by the ninth-grade year, in order to establish a basis for estimating the amount and level of education which is likely to be appropriate for an individual, a substantial number of these boys are not yet ready to decide on direction or endeavor, or specifically, on a future occupation. (71:148-149)

Implications for Education.--Studies made by the persons quoted here, especially Super and Overstreet, offer several implications for the preparation of educational goals and curricula. The gap created by the lack of a specific theory on occupational choice may be bridged by these implications. Such implications, though they refer specifically to the early adolescent years, suggest something about the developmental nature of the task of learning to make an occupational choice. In summary they are:

1. The early adolescent stage is one, not of making and implementing a vocational choice, but rather of developing planfulness, of preparing to make a series of educational and occupational decisions. Therefore, the program of school experiences should provide for the learning of this planning process.
2. Many boys do not make good use of the resources that are available to aid them in their orientation to careers. They tend to know something about the requirements of the occupation to which they aspire, but little about the duties, conditions of work, and opportunities in the

preferred occupations. The typical ninth-grader needs to be given a broader perspective on the world of work.

3. Education in the ninth grade should be so organized as to make available experiences which foster a planful approach to developmental tasks, to arouse an awareness of the need to make preoccupational and occupational choices which they will be called upon to make and to the factors which they should consider in making these choices. It should not require the making of definitive, directional, educational and occupational choices in this grade. (71:148-158)

Work

Defining Work.--The distinction between career or occupation and work is not often noticeable or even discussed. Yet, there is a difference in the point of reference of each which should be recognized. Dubin emphasized this fact when he said that,

> The entrance on a career carries with it a whole series of future expectations extending through the effective lifetime of the individual. Working usually takes place within a short time perspective. Entering a career usually has a lengthy time perspective for the individual.

In speaking in more specific terms on work, he also stated that, "Work is the acceptance of employment with the primary objective of securing the income that it provides. Each job is viewed as an isolated interval in the process of earning an income." (18:276)

The topic of work has been the focus of attention by religious leaders, philosophers, sociologists, industrialists and educators throughout the history of civilized mankind. Most often the concern has

been for assessing the goodness or badness of work. Only during the past half century has a concerted effort been extended to study and understand work in terms of its meaning to the worker's life and being. Nosow and Form have presented extensive material along these lines in their textbook, entitled, Man, Work, and Society. (57)

The concern in this discussion on work is primarily for the development of an understanding of those factors which give recognition to what work is today, and how secondary school students can come to know what it is about.

A rather broad definition for work is provided by Borow, as he says that, "work is activity calling for the expenditure of effort toward some definite achievement or outcome. Paid or not, hard or easy it is always effort toward a specified end." (11:27) Gross simply stated that work is described by the "activities performed by the worker." (32:49) The description of work provided by Super seems to provide sufficient substance to serve in this study as a general definition of the term. He said that work activity denotes the content of the work or job, therefore work involves an activity which has a describable content. (70:8)

Understanding the Nature of Work--The changing work scene in this country over the past two hundred years has undoubtedly led to a realignment of work attitudes and values. Though the life of every working person is affected by the nature of his work, quite a variety of attitudes on work have persisted. Speaking in terms of the historical pattern of work, Nosow and Form made the following observation on the changing meaning of work:

> Historically, the mass of the population has not been consciously concerned with the meaning of work. As an integral part of everyday life, work was meshed with all major institutional functions. Typically work consisted of a set of activities hereditarily prescribed as part of a particular status position in the community. (57:9)

The condition described here illustrates how the process of understanding the characteristics of work in years past was quite a reasonable task. Sons could not only observe directly their fathers performing work tasks, but they at times became directly involved in a family effort at making a living. The factory system, child labor laws and more recently the tremendous emphasis upon obtaining as much schooling as possible have encouraged youth to avoid contact with those things and experiences in life which help them develop adequate impressions of the work process.

Super added another dimension to the picture presented above when he said:

> Increasingly, the world's work is being done behind wire fences, inside brick walls, and behind closed doors through which only those who have employees' passes, who are 'old enough to be reliable' and 'young enough to be attractive', are admitted. It is hard enough for a youth even to get a glimpse of the working world; it is much more difficult for him to get a chance to try his hand at it. (70:90)

Miller and Form expressed concern that quite often young people do not recognize the fact that work is the unescapable fate of the majority of men and women today. "Despite a recent cultural tendency to deemphasize hard work and to accentuate 'having a good time', work still remains the most important segment of adult life." (51:115)

The study of work in today's complex society can be a task of great magnitude. Because of the many uncontrollable variables which may confuse and frustrate the research effort, sociologists often choose to study conditions in the less complex societies and then project their

findings to include the more complex society. Such was the situation in the study of the peoples of Dobu, a small Melanesian island near New Guinea. This study was done by R. F. Fortune and reported in his textbook, Sorcerers of Dobu. (28) The major conclusions on this study of work in the Dobuan society offer suggestions for understanding work relationships in our society. Five propositions or generalizations about such relationships were developed by Gross from the analysis of this study. A few of the significant concepts relating to the work effort are found in these generalizations:

1. Work normally involves authority relationships.
2. Work normally involves a division of labor.
3. Work is not an isolated activity, but is tied up with the whole social system.
4. Work is tied up with attitudes of right and wrong.
5. Individual behavior may be understood in terms of the total social structure and culture surrounding the work situation. (33:20-28)

It was suggested by Miller and Form that studies of the effect of work on the individual and on his social behavior, though few and fragmentary, could be done on four levels. The four levels which they presented include several basic ideas or concepts that are very similar to those presented by Gross. The four levels were given as:

1. The impact of specific work routines on the workers.
2. The social atmosphere of the work plant as it affects all workers, irrespective of occupational habits.
3. The consequence of occupational and industrial routines on the extra-work adjustment of the person.
4. The attitude of the worker toward his job, as it affects his outlook in life. (51:115)

Friedman and Havighurst did a comparison study of worker attitudes toward the meaning of their work. They used five occupational groups, including unskilled and semi-skilled steelworkers, coal miners, skilled craftsmen, department store salesmen, and physicians to represent their groups. Their findings offer some idea of the variety of

feelings workers in differing occupational groups have toward their work functions. A table which describes the factors for comparison and their arrangement is shown as follows:

TABLE I

COMPARISON OF FIVE OCCUPATIONAL GROUPS (UNSKILLED AND SEMI-SKILLED STEELWORKERS, COAL MINERS, SKILLED CRAFTSMEN, DEPARTMENT STORE SALESMEN, AND PHYSICIANS) ON THE MEANINGS OF WORK

Meaning	Steelworkers (unskilled and semi-skilled) Percent	Coal Miners Percent	Skilled Craftsmen Percent		Sales People Percent	Physicians Percent
			20-65	Over 65		
1. No meaning other than money	28	18	10	11	0	0
2. Routine	28	19	*	15	21	15
3. a. Self-respect			30		12	7
b. Prestige, respect of others	16 (3a,b)	18 (3a,b)	15	24 (3a,b)	11	13
4. Association	15	19	18	20	20	19
5. a,b, and c. Purposeful activity, self-expression, new experiences	13	11	28	30	26	15
d. Service to others	*	16†	*	*	10	32
Number of people responding	128	153	242	208	74	39

* Not covered in the questionnaire or interview.
† Work has given me a chance to be useful.
Taken from The Meaning of Work and Retirement by Eugene A. Friedman and Robert J. Havighurst. (27:173)

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It can be seen that there were five major points on which they made their comparisons. The analysis of their findings on these five points helps to illustrate the meaning of work to certain groups of workers. The analysis is summarized here to include the following:

1. The workers of lower skill and socioeconomic status are more likely than the higher-status group to see their work as having no other meaning than that of earning money.
2. The five occupational groups all value association with people at their work about equally as a positive meaning of work.
3. Work as a routine which makes the time pass is recognized about equally by all five groups.
4. In various degrees all groups discover self-respect and secure respect or recognition from others by means of their work.
5. Physicians show a high awareness of the 'service to others' meaning of work.
6. Work is important to all five groups as a source of interesting, purposeful activity but skilled craft and white collar groups stressed the extra-financial meanings of work to a much greater extent than did the workers in heavy industry. (27:173)

Some Conclusions on Work.--After studying these writings and research findings, it appears that work is more than the activity which describes the job. It is a complex form of human involvements and relationships in one of the most important realms of life-activity. Though it has a variety of meanings for workers, it is still the focal point of man's day-to-day patterns of life.

The educational program in the schools of this nation should offer a means for students to develop many insights into the meaning of work through any number of its curricular areas. This point was emphasized by Donohue, who said that though it may be:

> neither necessary nor possible for the high school to examine in detail all occupations, it should be possible for it to instill an appreciation of work in its fullness and to suggest something of its enormous contemporary variety . . . Somewhere in its program [the high school] should find a place for education through work, for a savoring of the actual rewards of craftsmanship as

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Consumer Activity

A quarter century ago the Education Policies Commission voiced a concern which seems quite relevant even today. It stated that many of the problems encountered by adults who are faced with personal financial difficulties result not entirely from the lack of sufficient income or persisting poor health, but quite often from the careless and wasteful practices of consumption and use of the goods and services which they deem necessary for life. (21:101)

Consumption and Consumers.--Consumption, consumers, and consumption goods and services were defined rather explicitly by the Joint Council on Economic Education as follows:

1. In economics, the process of satisfying your wants is called consumption and the people whose wants are satisfied are consumers. Consuming, or the using of goods and services to satisfy our wants directly, may take place quickly, e.g., eating food or burning coal, or it may take place over a long period of time, e.g., "consuming" a car by driving it for ten years until it wears out, or living in a house for fifty years.
   Having a service performed for one, e.g., having one's hair cut is just as much "consumption" as wearing clothes or sitting in a chair.
2. Consumption goods and services are those goods and services which satisfy our wants directly (e.g., food) in contrast to capital goods (e.g., tools, machines), which do not satisfy our wants directly but help us produce what we want. (39)

This definition is very similar to one presented by Kelley. He added a point which classifies goods more specifically, by saying:

> Ordinary consumer goods . . . vary in the length of time they are capable of rendering human satisfactions. Those with a normal useful life of less than a year are arbitrarily classified as "non-durable goods," whereas those capable of rendering utility for more than a year are "durable goods." (43:2)

Services, in contrast to service-rendering goods, are consumed as produced. (43:2)

Consumer economics is a specialty within the field of economics. It deals with economic activity and economic systems from the viewpoint and interests of the ultimate consumer. According to Kelley, "consumer economics is concerned with the quality as well as quantity of consumption, utility, and human welfare." (43:2)

Social Conditions and Economics.--A review of literature from several different disciplines, including sociology, economics and education, revealed three rather significant facts concerning the nature of the problem faced by our society which affects directly the area of consumption. These facts are: (a) fewer and fewer people are able to produce more and more goods; (b) generally, this society is fast becoming a consumer-oriented society and less a producer-oriented society; and (c) the age group including 15-25 year olds have today greater influence on the consumer market than any other age group. (24) (43)

Briefly, the situation which accounts for these facts results from improved production techniques, an increase in income and general affluence for a majority of people in the nation, and a change in the value on producing the goods we need and use. Coupled with these conditions is the present imbalance in population distribution by age groups, because of the post-World War II baby boom. With the greater affluence of families, these young adults and youth greatly influence the consumer market of our nation.

The problems of the American consumer have gained the increased attention of both state and federal government in the past few years. In 1966 President Johnson created a new post of adviser on consumer

affairs. Also in that year at least 20 states established consumer protection agencies under the jurisdiction of their attorneys general. One of the most significant events to occur in federal legislation in the past two years was the passing of the Fair Packaging and Labeling Act of 1966 (S985--PL89-755). This bill provided for greater government regulation in the labeling of food, drugs, cosmetics and household supplies. (16:351-362) These forms of government action, though intended to help every consumer, provide an increased margin of protection for those hurt most by false advertising and retail practices--the economically disadvantaged. It does not lessen the need, however, for the individual to be alert to his own responsibilities in setting standards for consumption.

The Educated Consumer.--In its original thesis on economic efficiency the Educational Policies Commission presented several statements concerning the responsibilities of the educated consumer. These statements reveal the scope of consumer concerns as viewed at that time:

1. The educated consumer plans the economics of his own life.
2. The educated consumer develops standards for guiding his expenditures.
3. The educated consumer is an informed and skillful buyer.
4. The educated consumer takes appropriate measures to safeguard his interests. (21:101-106)

A more complete and descriptive list of consumer responsibilities was presented by Kelley. This list provides a better picture of the kinds of things an individual might learn in an effort to become a more efficient consumer. These were presented as follows:

1. To maintain a proper balance of interests between income production or acquisition and consumption.
2. To recognize that businessmen use consumer reaction in the market to guide production, and to act accordingly.
3. To use, but not abuse, desirable customer services and privileges offered by business.

4. To make intelligent use of buying guides and instructions for the use and care of merchandise furnished by business.
5. To exercise reasonable care in buying and to co-operate with salespersons by disclosing essential information as to needs and limitations.
6. To co-operate with the proper enforcement agencies by reporting all cases of known acts of fraud, dishonesty, and violation of the law.
7. To support efforts of progressive businessmen and others to make the economy function more directly in the consumers' interest. It is unfair to expect enterprisers to continue their efforts to serve consumers more efficiently when the latter ignore these efforts and encourage less conscientious businessmen by patronizing them. (43:15)

Consumer education as it applies to industrial arts was studied in some detail by Schmitt in his doctoral dissertation. He refers to the work of Hobson concerning consumer education in the schools, which stated that consumer education includes:

1. Wise choice. Money should be used to best suit the need of the individual. Training should show the student how to select his strongest desires and needs, and satisfy both.
2. Wise buying. This represents the popular connotation of consumer education. After choice making, the problem becomes one of selecting an item from the many available.
3. Social responsibility as a consumer. This concept links the consumer action to its effect on society. The recent war with its rationing and substituting of goods, and the going without entirely, illustrates many examples of the consumer society relationship.
4. Intelligent use of consumer goods. Obviously the longer the item will serve our needs, the more our resources may be devoted elsewhere to raise the standard of living.
5. Competent money management. Modern living makes requisite the ability to count change, keep simple records, and handle accounts and plan for the future. (35:118)

Economic Analyses

An area of economic life which remains to be explored is one involving economic problems of a broader scope than those of occupational choice, work or consumer activities. The purpose here is to consider those economic functions which every citizen has a personal responsibility

for understanding, whether or not they call for day-to-day decision-making activities.

The analysis of economic understandings which should be developed by citizens in our society has been studied rather thoroughly by national groups and individuals concerned with economic education. (4) (6) (13) (15)

A brief review will be made of the total spread of economic studies in the secondary school program, as seen by those who have prime responsibility for directing programs in economics.

Perry's Report.--One description of the economic understandings to be developed in the high school was reported by Perry in the American Business Education Yearbook, 1958 edition. His efforts toward identifying a list of such understandings was reported as follows:

> The Economic Education Workshop at Northwestern University recently produced a check list of economic areas that might be included in the school's program of economic education. This check list is excellent from the point of view of information to be learned. With the possibility of not doing justice to the total outline, the sixteen basic divisions are presented below:
>
> I. Basic Productive Resources
> II. Specialization or Division of Labor
> III. The Economic System of the United States
> IV. How We Measure Our Nation's Production
> V. Our Money and Banking System
> VI. Role of Government in the United States Economy
> VII. The Role and Significance of Business in Our Economy
> VIII. Role and Significance of Organized Labor in Our Economy
> IX. Role and Significance of Agriculture in Our Economy
> X. Distribution of Income
> XI. Individual and Family Finance
> XII. Economic Security
> XIII. Ups and Downs of Business
> XIV. International Economics
> XV. Comparative Economic Systems
> XVI. Economic Aspects of the United States and World Population Problems (61:21)

According to Perry, this list is similar to though not as detailed as that provided by the Council for Advancement of Secondary Education as reported in the textbook Key Understandings of Economics, which he considered an outstanding document on the subject. (61:21)

The National Task Force Report.--In 1961, a nationally prominent group of economic specialists, as members of the National Task Force on Economic Education, set out to provide some direction for programs in economic education. Their purpose was to spell out the needs for economic education in the schools and to discuss some of the principal economic concepts that should be part of the working knowledge of high school graduates. Following the publication of their report, entitled, Economic Education in the Schools, two tasks were set down as a follow-up to their efforts. These were (a) to define the concepts which teachers could work with in teaching economics in their classrooms and (b) to show how this teaching could be accomplished. The first task was undertaken by James D. Calderwood, who prepared a teachers' guide which includes a description of the basic concepts and ideas that can be learned in economics.

The National Task Force identified seven major areas of modern economics of which it hoped every high school graduate would have some understanding. These areas are listed as they appeared in the Report of the National Task Force. (56)

1. What economics is all about, why it is important, and how one thinks about economic problems.
2. The nature of the persistent economic problem faced by all societies: wants, scarce resources, the need for decision-making, and the need for an economic system of some kind.
3. The market economy of the United States: how it is decided in the U. S. today (a) what goods and services will be produced, (b) how they will be produced, (c) what total

level of production will be maintained, and (d) how what is produced will be shared among the American people.

4. Economic growth and stability: the long- and short-run performance of the American economy. (a) Economic growth--the long-run problems associated with increasing the total production of goods and services faster than the rate of population growth so that living standards can rise, and (b) Economic stability--the determinants of the level of income and employment in the short-run or how to manage our economy so that we can have full employment without inflation.
5. The distribution of income: the factors determining the distribution of income among individuals and groups in the U. S. and thus determining who will get the goods and services produced.
6. The U. S. in the world economy: the importance of world trade and finance to the U. S. and the ways in which the achievement of our economic goals is related to world economic developments.
7. Other economic systems: how other societies organize economic life to achieve their goals--not only the communist countries but also the democratic societies of the West and the developing nations of Asia, Africa, and Latin America.

Calderwood's Analysis.--From the statements listed here, Calderwood developed the Teachers Guide to Developmental Economic Education Program: Part I. Economic Ideas and Concepts. The scope of concern in economic education is well illustrated with the topics for study listed in the table of contents used in the teachers' guide. For this reason the table of contents is presented here in full.

Outline of the Ideas and Concepts Discussed

I. The Importance of Economics and the Nature of Economic Understanding
   - A. Why Economics Is Important.
     1. Dealing with economic problems
     2. Making economic decisions
     3. Developing capacity to think objectively
   - B. What Economics Is and What It Is Not.
     1. Economics as a social science
     2. Micro-economics and Macro-economics
     3. Abstract reasoning
     4. Scientific method and economic theory
     5. Statics and dynamics
     6. Value judgments
     7. Economic skills

II. The Central Economic Problem in All Societies: Wants, Scarce Resources, the Need for Decision Making, and the Need for an Economic System.
- A. Economic Wants.
  1. Defined and identified
  2. Their never-ending nature
- B. Consumption, Consumers, and Consumption Goods and Services.
  1. Meanings of terms
  2. Consumption goods in contrast to capital goods
- C. Production and Producers.
  1. Need for production
  2. Meanings of terms
  3. Middlemen as producers
- D. Productive Resources or the Factors of Production.
  1. Land or natural resources
  2. Labor
  3. Capital goods or capital
  4. Entrepreneurship
- E. The Principles of Production.
  1. Technological progress
  2. Division of labor or specialization
  3. Labor productivity
  4. Saving, investment, and capital formation
  5. The principle of diminishing returns
- F. Scarcity and the Need for Decision Making.
  1. The basic fact of economic life
  2. Economizing or the allocation problem
  3. Opportunity cost
- G. Need for an Economic System.
  1. An economic system defined
  2. Any economic system must answer four questions
  3. Economic systems vary widely

III. The Modified Market Economy of the U. S.
- A. Private Enterprise Economy.
  1. Private enterprise
  2. Modified private enterprise or mixed economy
  3. Free enterprise
- B. Profits and the Profit Motive.
  1. Profit
  2. The profit motive
- C. The Circular Flow of Income.
  1. In general
  2. Between business and the public
  3. Between the public and the government
  4. Between savers and investors
  5. Significance
- D. Markets.
  1. The market as an institution
  2. Decentralized decision making
  3. The market as a mechanism

4. The market as an organized situation permitting buyers and sellers to deal with one another
5. Supply and demand interacting upon each other
6. Some goods and services not provided through the market

E. Demand and Supply.
1. Demand
2. Supply
3. Elasticity of demand

F. Prices.
1. Definition
2. Determination
3. Other terms
4. Changes as regulators of a price-directed economy

G. Competition.
1. Definition
2. Characteristics of a competitive market
3. Price competition
4. Non-price competition
5. Effects

H. Monopoly.
1. U. S. economy not one of pure competition
2. Definition
3. Economic significance

I. Anti-Trust Laws.
1. Responses to problem of monopoly
2. Basic philosophy
3. Dilemmas

J. Regulation of Public Utilities.
1. Case of government regulation of business
2. Price fixing and quality control
3. Economic significance
4. Characteristics of regulated industries

K. Economic Role of Government.
1. Modified private enterprise
2. Regulatory function
3. Allocation of resources through taxing and spending (public receipts and expenditures)
4. Economic issues in deciding its extent

IV. Economic Growth and Stability.

A. Economic Growth.
1. Increase in per capita output
2. Importance of rapid growth
3. Productive capacity as a limiting factor
4. Effective demand as a prerequisite

B. Economic Stability.
1. Meaning
2. Inflation
3. Depression and recession
4. The problem

C. Measuring the Performance of the Economy.
1. Household budgets

2. Balance sheet and income statement in bookkeeping and accounting
3. Social accounting or national income accounting
4. Gross National Product
   - Rate of growth
   - Real GNP or real output
5. National Income
6. Personal and Disposable Income
7. Index numbers

D. Main Forces Determining the Level of National Production and Income.
1. Changes in total spending or total effective demand
2. Fluctuations in private investment or business spending
3. Variations in consumer spending
4. Dynamic interdependence

E. Fiscal Policy for Economic Stability.
1. Fiscal Policy
2. Government spending
   - Government purchases of goods and services
   - Transfer payments
3. Tax changes
4. Compensatory fiscal policy
   - Federal budget
   - Budget surplus or deficit
5. National debt and public debt

F. Money, Banking, and Monetary Policy for Economic Stability.
1. The nature and functions of money
   - Demand deposits or checking accounts
   - Money as a medium of exchange and as a standard and store of value
   - Money spending and the velocity of circulation
2. Where does money come from?
   - Lending and investing activities of banks
   - Credit and debt
   - Bank reserves
3. How does the government try to control the money supply and for what purpose?
   - Federal Reserve System
   - Monetary policy or monetary management
4. Effectiveness of monetary policy
5. The role of gold
6. Cost-push and administered price inflation

V. Distribution of Income.

A. Market Determination of Income.
1. Money incomes
2. Real incomes
3. Differences in income

B. Economic Justice.
   1. Inequality in income distribution
   2. Redistribution of Income
C. Role of Profits.
D. Personal Distribution of Income.
E. Labor, Wages, and Labor Unions.
   1. Labor productivity
   2. Real wages and money wages
   3. Unions and collective bargaining
F. Farm Incomes.
G. Economic Security.

VI. U. S. in the World Economy.
   A. Importance of World Trade and Investment to U. S.
      1. Exports
      2. Imports
      3. International investment
   B. Basis of World Trade.
   C. Economic Problems in World Trade.
      1. Foreign exchange rates
      2. The Balance of Payments
         Deficit in Balance of Payments
         Exchange control
      3. Tariffs
         Protecting new industries
         Providing economic self sufficiency
         Protecting jobs and wages of domestic workers

VII. Other Economic Systems.
   A. The Spectrum of Economic Systems.
   B. The Changing Nature of Economic Systems. (13:xi-xv)

Eyster's Interpretation.--Eyster, in a discussion on the need for economic education presented his own views of what might be considered areas of economic concepts to be used in the general education of every person. He indicated that, "these areas of economic understandings do not comprise all of general education. However, because of changes that have taken place, they have become essential understandings for all people." (22:16) Eyster offered the following as statements of important economic concepts:

1. The essential characteristics and principles of the American business and labor system, what it is, how it operates, and the role it plays in the economic and occupational lives of all people.

2. An understanding of business practices and procedures, such as consumer credit, installment selling, guarantee of quality, and service agreements that enable consumers to utilize completely and to benefit fully from the economic goods and services offered by business.
3. Principles of management of personal business affairs, enabling one to enjoy the highest possible standard of living compatible with his income.
4. The business of government (not the organization and operation of government), with special emphasis upon government business, such as the management and use of public lands, production of power, insurance against possible losses, lending of money, and subsidization of industries.
5. Basic economic principles, such as the operation of the law of supply and demand, real wages, prices, and marginal utility. (22:16)

Summary

The educational system in the democratic society has a responsibility for providing learning experiences for youth to permit the development of "common" or basic understandings and competence in economic life-activities. Such experiences can and should be provided through a program of general education.

The objectives of economic efficiency as originally described by the Educational Policies Commission were extended by French and his associates to include a broadened scope of economic activities. The examination of these objectives revealed four major economic activities which require the achievement of competent behavior by the individual. These included (a) occupational choice, (b) work, (c) consumer activity and (d) making economic analyses.

Occupational choice was described by Super as a process rather than an event. This theory was supported by the interpretations on the process as presented by Ginzberg and Small. Super and Overstreet determined from their study of ninth-graders that education in the

high school should be organized to present occupational planning as a developmental process.

Work was interpreted as the process of earning an income and as an activity with a describable content. It is always effort toward a specified end. Work is hard for youth to understand today, because it takes place where they cannot see it being performed and in situations where they cannot experience it themselves. As expressed by Miller and Form, work is really more than an activity since it is involved in a complex of social relationships in the setting where it is performed. It is through the study of these relationships that we can best come to understand what work is today.

Consumer activities have taken on quite a new meaning today as changing social values and technological developments have altered the economic structure of the nation from one with a producer-orientation to one with a consumer-orientation. The consumer today has a responsibility not only for maintaining his own welfare, but for directing the market economy of the nation. This occurs through the conduct of his own performance with certain consumer tasks.

The ability to make analyses of economic problems requires the development of a broad orientation to the economic activities of people and the understanding of basic economic principles. This task generally remains the responsibility of programs in social science in the schools. Yet, with the tremendous variety of topics which fall in the realm of economics, every curricular area has a significant contribution to make in this effort. Industrial arts stands to offer as much or more than most other areas, with its concerns for the productive activities of man in industry.

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CHAPTER III

THE DEVELOPMENT OF OBJECTIVES TO ACHIEVE EFFICIENT ECONOMIC BEHAVIOR THROUGH INDUSTRIAL ARTS

Introduction

When viewing the problem of curriculum development in the high school, it should be kept in mind that educational objectives are "the criteria by which materials are selected, content is outlined, instructional procedures are developed and tests and examinations are prepared." (42:3) With this basic principle of curriculum development to guide them, educators should find the task of educational planning quite reasonable. The fact is, though, that too often the preparation of objectives is ignored while a program is being planned. Even worse, effort may be expended to describe objectives and then they are never referred to after the teaching begins on a particular unit of study.

The usual reason objectives are not stated is that the individual preparing the program probably did not know how to identify objectives, or he may not have had a real understanding of their relative value to the program. Whenever existing objectives are ignored by teachers, it is likely that the intended user found them uninterpretable, unrealistic, or simply unoperational. The results in either case are the same--an educational program with little direction, loose ends, and nothing by which to measure the achievement which might take place.

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The Process of Developing Educational Goals to Achieve Economic Efficiency

Tyler, in discussing the process of preparing behavioral goals for education, refers to the importance of subject matter to this process. He suggests that if behavioral goals are to be developed, subject matter related to the goals must first be described. Further, he indicates that the subject matter may be derived from the analysis of materials which specialists in the subject area define as concepts that reflect a particular body of knowledge. (42:17)

It is also important that learner needs be considered when preparing educational goals. When referring to the economic areas of life-activity, it should be asked, what kind of individual performance is required to achieve economic competence? The description of these performance requirements can serve as norms or standards for achievement. (42:6) It follows, then, that these requirements become the learner needs which must be satisfied. It can be concluded from these statements that in knowing something about the kind of knowledge which lends order and meaning to the economic problems of life, learner needs and the kinds of behavioral responses which are required to achieve economic efficiency can be identified.

Major Aspects of the Economic Activities in Life

It appears, from the review of literature related to the development of economic competence, that sources for ideas and information are found in a number of subject areas, including psychology, sociology, guidance and counseling, and secondary education. The analysis of materials from these areas reveals several major aspects to the process of

developing economic competence. An outline of these major aspects includes the following:

I. Selecting an Occupation
   - A. Knowing and understanding the self
   - B. Planning educational and vocational activities
   - C. Obtaining occupational information
   - D. Developing an occupational perspective

II. Performing in the Work Situation
   - A. Job activity skills and knowledge
   - B. Work routine
   - C. Social atmosphere
   - D. Attitudes and extra-work adjustment

III. Conducting Consumer Activities
   - A. Purchasing goods and services
   - B. Using goods and services

IV. Making Economic Analyses of Industrial Activity
   - A. Labor and production resources
   - B. Production methods and procedures
   - C. Distribution of production goods

Student Needs Associated with Specific Elements of Economic Efficiency

As discussed previously, the achievement of economic efficiency involves a complex of learnings about such things as individual behavior, social relationships and economic conditions in the cultural setting. A more complete interpretation of these learnings is provided when they are translated into specific kinds of needs to be fulfilled by educational

programs. The satisfaction of these needs will provide the student a better chance to achieve an acceptable level of economic efficiency.

When grouped under the major economic functions of (a) selecting an occupation, (b) performing in the work situation, (c) conducting consumer activities, and (d) making economic analyses, the needs appear as presented below. These statements were derived from the analysis of literature pertaining to economic life-activities.

Selecting an Occupation

1. The need to understand and accept oneself.
2. The need to identify and describe personal interests.
3. The need to become involved in one's environment.
4. The need for educational planning, including an analysis and reanalysis over a period of time of the direction being taken.
5. The need to become familiar with job names, the conditions of work, and the duties in preferred occupations.
6. The need to recognize sources for information on occupations and how to plan for entering an occupation.
7. The need to assume responsibility for making tentative choices and to recognize alternative choices in occupations.
8. The need to develop a perspective on occupations.

Performing in the Work Situation

1. The need to experience something which characterizes job activity.
2. The need to recognize and accept authority relationships.
3. The need to see the purpose in a division of labor.
4. The need to have experience in a work routine.

5. The need to sense the effect of the social structure and atmosphere on the work attitude.
6. The need to recognize how the individual's feelings toward his work affect his extra-work adjustment.
7. The need to recognize the kinds of goals an individual can have for his work.
8. The need to realize that work has various meanings for the worker, such as it provides a means for:
   a) making a living.
   b) earning money.
   c) associating with people.
   d) passing time.
   e) discovering self-respect.
   f) being of service to others.
   g) participating in interesting, purposeful activity.
   h) obtaining extra-financial benefits.

Conducting Consumer Activities

1. The need to realize the importance of consumption goods and services, and capital goods to the economy.
2. The need to understand the role of the consumer in the economy.
3. The need to balance income with consumption.
4. The need to present appropriate reactions to the kinds and quality of goods placed on the market.
5. The need to use buyers guides and directories for identifying and selecting consumer goods for purchase.
6. The need to employ instructional manuals for the proper use and care of goods which are purchased.

7. The need to perform maintenance tasks according to the manufacturer's instructions on goods which are purchased.
8. The need to describe with accurate information, individual requirements for goods to be purchased.
9. The need to identify and support fair market practices.
10. The need to use, without abusing, the consumer services provided.

Making Economic Analyses

The learner needs presented in this section were derived primarily from the analysis of Calderwood's list of concepts for economic education. (8:xi-xv) A number of these concepts were not directly related to the interpretation of man's industrial activities, since his concern was for all aspects of economic education. Therefore, only those concepts which related to the interests of industrial arts for providing a description of industry were used in the following list of needs:

1. The need to recognize the importance of labor, raw materials and capital as resources for production.
2. The need to interpret significant measures of production output.
3. The need to recognize factors which determine what will be produced and how it will be produced.
4. The need to understand the economic relationship between middlemen and producers.
5. The need to recognize factors which contribute to technological progress.
6. The need to understand the meaning of the principle of diminishing returns.

7. The need to recognize the role of private enterprise and entrepreneurship in the economy.
8. The need to understand the importance of investments to the achievement of progress in industry.
9. The need to describe the meaning of production capacity.
10. The need to recognize the purpose and need for collective bargaining.

Statements of Objectives for Industrial Arts

Industrial Arts in General Education

Two purposes can be served by this brief review of the objectives of industrial arts. First, the role of industrial arts in general education can be illustrated best by indicating the extent of concern expressed in its objectives for providing certain kinds of educational experiences. Second, and more specifically, the extent to which economic activities in life have been a concern of industrial arts is implied in its objectives.

The objectives of economic efficiency are most often included as parts of or implied in the broad objectives for industrial arts. This is evidenced in the list of nine objectives presented by Wilber:

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes and operations, products, and occupations.
2. To develop recreational and avocational activities in the area of constructive work.
3. To increase an appreciation for good craftsmanship and design, both in the products of modern industry and in artifacts from the material cultures of the past.
4. To increase consumer knowledges to a point where students can select, buy, use, and maintain the products of industry intelligently.
5. To provide information about, and--in so far as possible--experiences in, the basic processes of many industries, in order that students may be more competent to choose a future vocation.

6. To encourage creative expression in terms of industrial materials.
7. To develop desirable social relationships, such as cooperation, tolerance, leadership and followership, and tact.
8. To develop safe working practices.
9. To develop a certain amount of skill in a number of basic industrial processes. (47:42-43)

Thoughts, such as exploring industrial occupations, or increasing consumer knowledge, give some indication of the inclusiveness of these objectives in reference to economic activities.

The Ohio State Department of Education, in a booklet on standards for industrial arts in the junior and senior high schools, presented a list of six functions for industrial arts. These functions are also referred to as objectives or guiding principles for industrial arts. The form of the titles for the functions make it necessary to include the description of their content in order to see how studies in economics are included in them.

> The Orientation Function. Experience in industrial arts should help the junior and senior high school pupil become better oriented in an industrial society by exploring many types of tools, materials, processes, products, and occupations. Manipulation should be primarily a means for promoting other ends. Habits and skills derive their value from appropriate use. The emphasis is rather upon obtaining a pattern of knowledge, attitudes, habits, skills, and understandings essential to individual and group welfare in a technological society. One of the basic outcomes of the orientation function is its value in assisting the pupil in making an occupational choice which may lead him into vocational preparation in the final years of his educational program.

> The Technical Function. Industrial arts should provide as many opportunities as possible for pupils to spend at least a year in any phase of work where orientation may help to define specialized interests that can be pursued with profit. The opportunity, for example, should be provided for a pupil to delve into the intricacies of cabinet or furniture making, electrical communications and power, lighting, automotives, printing a monograph, making a cabin or a boat including drawing the design and writing the specifications, designing and making a small machine, studying the occupational possibilities of certain local industries, or any similar problem or group of related problems in one or more areas of the industrial arts program.

The Avocational Function. Industrial arts also provides opportunities to cultivate a wide variety of useful, wholesome, and enduring leisure time interests, and activities. Collection and appreciation is involved in addition to manipulation. The importance of this function is increasing. There is now almost as much time for leisure as for labor and sleep together. Increased leisure time affords not only an educational opportunity but it also becomes a liability and a responsibility with which the school must cope.

The Consumer Function. A primary purpose of industrial arts is to aid the individual in developing intelligent attitudes and understandings concerning the selection and use of the products of industry. This involves studies and experiences covering a variety of topics and problems ranging from the production of raw materials, through the processes and problems involved in their wise use by the ultimate consumer. It should and must help him achieve consumer literacy since he needs to live intelligently in the midst of an involved technology.

The Social Function. Experiences in industrial arts through activities in the shop or laboratory, as well as outside, should help the students develop desirable social habits and attitudes. The program is concerned, for example, with helping pupils understand and formulate wholesome opinions toward such things as integrity of workmanship, sanitation, housing, wages and hours of labor, safety, preservation of natural resources, or any other related social problem.

The Cultural Function. Experiences in industrial arts should help the individual enjoy a finer culture as regards materials in an involved technological society. This means helping him develop and use his material inheritance. For example, the pupil can learn to know style or design in architecture, furniture, rugs, pottery, silverware, glass, dress, china, printing, machinery, and other items of common use, and appreciate the forces that have influenced them. With a cultured taste, he is prepared to surround himself with those things from which he can derive life-long satisfaction. (28:70)

Olson used these functions as guidelines for the development of his study on the derivation of subject matter from technology. He omitted the orientation function because he felt it was quite naturally a part of all the other functions, and he inserted an "occupational function". He indicated, though, that the over-all content remained the same for both groupings. The analysis of the occupational function which he made probably represents one of the few if not the only such

analysis of industrial activities to derive content for industrial arts on the topic of occupations. (29:77-78)

Hostetler made a comparison study of the objectives which have been proposed for industrial arts over a period of thirty years. Among those he considered were the lists presented by several well-known educators and state departments of education. These included the lists of:

1. Warner, 1928 (45:34)
2. Proffitt, 1938 (43:41,61)
3. Wilber, 1948 (47:42-43)
4. The American Vocational Association, 1953 (2:18)
5. Olson, 1957 (29:77-78)
6. The State Department of Education, Florida, 1959 (16:vi-vii)
7. The State Department of Education, Mississippi, 1959 (25:15-156)
8. The Chicago Board of Education, 1959 (10:3-5)

From his somewhat historical analysis of these objectives Hostetler derived what he considered to be four particular objectives believed to be, "unique to industrial arts. . . which should be emphasized in our public school programs." (20:19) These were presented along with a commentary on their meaning as follows:

1. To develop in each student an insight and understanding of industry and its place in our culture.

   No student can lay claim to being an educated person today unless he has some understanding of the industrial society. Industry is a dominant element in this society. It is the responsibility of the schools to help each student understand the world in which he lives. While this may be done through courses in economics, sociology, and physical sciences, these courses are often taught in such a way that the student studies about these phenomena rather than

actively participating in them. Industrial arts, on the other hand, when organized to give significant learning experiences (i.e., Bick's project in city planning or Maley's on research and experimentation) enables the student to gain insights and understanding through active participation.

One of the functions of industrial arts is the development of meaning through application to the occupational and productive activities of the society. The student who is truly educated must know more than the theoretical aspects of communication, science, art, government, etc. He must see relationships among these subjects and develop a sense of their purposes since each area is a part of the experiences leading to his complete integration into his society.

2. To discover and develop talents of students in the technical fields and applied sciences.

One of our social responsibilities is to provide opportunities for the individual to develop to his fullest. Students in our schools represent a diversity of talents. It is the school's responsibility to help students discover and develop their talents, and it is the responsibility of industrial arts to help them discover and develop the talents in technical fields and applied sciences. The best way to discover talents is to provide experience situations in which the talents may appear. Industrial arts provides experiences in technical education which provides the opportunity for the discovery of technical abilities.

3. To develop technical problem-solving skills related to materials and processes.

Teaching industrial arts shopwork should begin with a problem approach. Man has developed tools and machines to solve his problems, to get the job done more easily and quickly. As new problems arise, new tools are designed to meet these problems. To use tools and materials in industrial arts, when properly directed by the teacher, leads to creative thinking, the application of principles of science and mathematics, as well as technological developments.

If we oversimplify the total task of education and agree that the central purpose of education is to enable the student to solve all of his problems (emotional, social, communicative, vocational, etc.), we would then say that the purpose of industrial arts is to provide experiences which will enable the student to solve the technical problems of living in a highly industrialized age. The experiences provided should give the student an opportunity to apply science, mathematics, and other facets of his general education to the solution of practical problems in the industrial arts shop.

4. To develop in each student a measure of skill in the use of common tools and machines.

> Skill is essential in every industrial arts program. If used properly it becomes the tool which the student uses to achieve his goals--it leads him to insights and understanding of industry; it helps him discover and develop his talents in the technical fields; and it aids in the development of problem-solving skills. If, on the other hand, it is used improperly, the student will become its slave. It becomes an end in itself, and a program of industrial arts interested primarily in developing manipulative skills can hardly be justified except for the slow learner.
>
> To be able to use the common hand and machine tools correctly, safely, and skillfully is perhaps as important to the industrial arts student as the mastery of brush techniques is to the artist, or as the skillful use of the dissecting set and microscope is to the student of biology. In each case, skills and techniques are means to ends and not ends in themselves. However, some of these skills are important enough to teach them "on purpose." Every student should be encouraged to perform every task skillfully to the best of his ability and time available. Pride in workmanship comes from a job well done. (20:18-20)

Other than those major works on the objectives of industrial arts which make reference to developing economic competencies, a number of less-known statements were found in the literature. These appeared to reflect more of the contemporary thinking on what industrial arts might encompass in the school curriculum. Miller, for instance, completed a doctoral dissertation in which he examined the objectives of industrial arts with respect to selected sociological factors of contemporary American society. In this he indicated that the analysis of objectives revealed several common characteristics of industrial arts, which indicated that it should:

1. Be exploratory in nature.
2. Emphasize the individual student's personal development.
3. Emphasize certain personal-social traits in individuals.
4. Contribute to the guidance of individuals. (25)

Bateson and Stern referred to the contribution of industrial arts in providing vocational guidance and occupational orientation. They stated

that there are two objectives which industrial arts can achieve more effectively than any other subject area or activity of the school curriculum.

> The first of these has to do with the process of assisting the individual to choose an occupation--vocational guidance, and the second has to do with vocational preparation for industrially oriented occupations. (4:8)

Stephenson and Brierly discussed vocational guidance in terms of it being an integral component of industrial arts. They reported on the use of a vocational guidance unit in the ninth grade industrial arts course, and the opportunities provided in this to explore careers. They stated that through industrial arts, students "learn the basics of several large segments of industry and in the process develop and discover interests and abilities." (40:36) Similar points were made by Moeller (27:28), Brown (5:27), Reed (31:25), and Schmitt (37:28).

In spite of the opportunities which may be inherent in industrial arts for developing an occupational orientation and awareness of the work world, Ziel argued:

> The world of work is only remotely related to the activities manifested in the industrial arts unit shops of today. The industrial arts teacher has the obligation to interpret the industrial environment to students by a meaningful translation of the multiple forces inherent in the dynamic world of work. (49:26)

Caldwell also emphasized this point in his statement on the goals for industrial arts. Apparently he is concerned with the existence of the attitude that industrial arts is strictly a limited form of vocational education for the non-academically oriented student, as he said:

> Industrial arts can inject into an academically status-minded educational attitude a new dignity for the technology of our day and a new respect for the infinite variety of talents and roles required by it. Aside from the intellectual values of the experience, surely the opportunity for a boy to work in a

> shop under the direction of a good teacher can supply the very experience around which he can, in searching for his own best self, establish an agreeable relationship with the world of things and fellow workers. It is not impossible that in many instances this last achievement of industrial arts education will be the greatest for the general good. (9:10)

Siegel made the point that the kinds of work activities provided in industrial arts are in contrast to those identified as specific trade training. He expressed the belief that through industrial arts students may acquire a cluster of work skills which will meet the entrance requirements for a variety of occupations. (38:34) This thought was also emphasized by Brown, who said: "Students in industrial arts classes acquire habits of accuracy, perserverance, and neatness that are necessary in any occupation." (5:27)

The area of consumer activities was mentioned in a number of references which discussed goals for industrial arts. (22:19) (30) (31:25) Schmitt's study probably offered the best analysis of consumer education in industrial arts, as it considered the selection, use and care of certain durable goods. One of Schmitt's major concerns was to determine the kinds of learning activities which are preferred for consumer education in industrial arts. He was able to identify eighteen learning activities through the responses to his survey instrument:

1. Discuss products in which the use of different materials would have improved their value (i.e., artificial leather with real leather, baseball glove).
2. Discuss characteristics of various materials used in shop projects.
3. Discuss relationship between cost and quality of article.
4. Examine various articles to illustrate to the class good and poor construction (i.e., books, gift articles).
5. Illustrate various methods used to hold or fasten articles together and discuss advantages and disadvantages of each method (i.e., welding, bolts, nuts).
6. Show relationship between construction and use.
7. Have students determine what elements make up 'good design.'

8. Explain how the material affects the design (i.e., limitations of glass, strength of steel, etc.).
9. Compare articles of good workmanship and poor workmanship.
10. Illustrate good construction methods of bracing to acquire stability and strength.
11. Study operating instructions for some of the industrial arts shop's machines.
12. Show how misuse reduces a product's life (i.e., pass around examples of ball-bearings that have not been oiled properly).
13. Discuss importance of checking over contents of a purchase immediately upon receiving to check on discrepancies.
14. Perform periodic maintenance on a machine.
15. Disassemble, clean, adjust and reassemble an article following the manufacturer's directions.
16. Discuss periodic checks and their importance.
17. Have students lubricate equipment as specified by the manufacturer.
18. Recognize materials that should be kept away from heat. (32:109-110)

Statements of Goals Presented by French and Associates

The text by French and Associates provides an extensive and detailed list of behavioral statements as a guide for the development of learning activities. This list is directed at any curricular area in the high school which has a major purpose in providing learning experiences for general education. Since the major function of industrial arts in the high school is one of general education, this list offers significant thoughts and direction for preparing behavioral outcomes for industrial arts.

Two particular factors stand to support the use of French's statements in this study of behavioral goals for industrial arts. These factors are: (a) The list was developed by a group of specialists from a number of subject matter fields and, therefore, may be considered a valid representation of the concerns in general education; and (b) the variety and comprehensiveness of the inclusive statements provides every

subject matter area of the high school a resource from which to draw ideas and information.

Not all of the statements in the French list related directly to industrial arts. Therefore, the selection of those which would be appropriate for use was achieved by referring to the broader objectives on industrial arts. Behavioral statements that appeared to satisfy the requirements of the objectives presented by Wilber (47) or Hostetler (20) were selected and grouped under the four major aspects of economic activity. Statements derived from this analysis included the following:*

Outcomes related to occupational choice

1. Accumulates information about the many available vocations, particularly those likely to be available to him. (p. 122)

2. Utilizes many resources for gaining some first-hand information about the vocations in which he might be interested: observation of workers, visits to factories, conferences with counselors, teachers, reading, tests, films, etc. (p. 122)

3. Becomes aware of new occupational patterns and requirements emerging from such developments as electronics, automation, and the use of atomic power. (p. 123)

4. Recognized that any vocational area offers various kinds of jobs, and endeavors to become familiar with their advantages and disadvantages, working conditions, job activities, requirements for entering and for success in those which interest him. (p. 123)

5. Understands that not all the work on any job can be interesting or fun, but that there is satisfaction in a day's work well done. (p. 123)

6. Understands the extent to which command of the fundamental processes of communication is necessary to success in vocations in which he is especially interested. (p. 124)

7. Feels responsible for making a choice of occupation. (p. 127)

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*The behavioral statements on this and the following pages were taken from French (17). Page numbers only are given with each statement.

8. Is informed concerning the kind, length, and general cost of training for occupations and jobs in which he has an interest. (p. 124)

9. Selects the college, university, trade or vocational school best suited to his needs in terms of a good education in his chosen field of work, and is preparing to meet its entrance requirements. (p. 125)

10. Is interested in seeing vocational films and film strips of general or an exploratory nature. (p. 125)

11. Learns about as many kinds of jobs as possible and requirements for success in them. (p. 125)

12. Begins to narrrow down his occupational interests to one or more areas, and to learn about the kind of training needed for occupations in these areas. (p. 125)

13. Begins as soon as possible to plan for formal education, after high school or vocational training, that is suited to his vocational interests. (p. 126)

14. Reads simple blueprints, recipes, and other types of work directions with understanding. (p. 126)

Outcomes related to understanding work

15. Becomes more familiar with business organizations (corporate and small), labor unions, and the professional organizations as they relate to his occupational interests. (p. 126)

16. Exhibits the common personal qualities and work habits needed for success in the world of work: initiative, promptness, courtesy, cooperation, cleanliness, neatness. (p. 127)

17. Respects all kinds of socially useful work and sees the value of any work that enables man to satisfy his needs--physical, emotional, intellectual, social. (p. 127)

18. Exhibits wholesome pride in his work or craftsmanship. (p. 127)

19. Exhibits reasonable competence in using and caring for the tools, equipment, or materials related to his emerging occupational interests. (p. 127)

20. Is learning to estimate details of a job, to use the basic tools and equipment, to plan how the work should be done, and to be responsible for the quality of his own work if his choice of vocation requires these abilities. (p. 124)

21. Uses fundamental vocational skills, such as reading, computation, and writing. (p. 128)

22. Has had a little experience with a few of the most common tools. (p. 128)

23. Follows instructions in handling costly and fragile equipment. (p. 166)

24. Shows a sense of social responsibility in conserving school supplies and protecting school and other public property. (p. 167)

25. Uses properly and keeps in good order the tools and equipment shared by a class or other group to which he belongs. (p. 167)

26. Is prompt, cooperative, and generally compliant in carrying out reasonable instructions on a job. (p. 167)

27. Is reliable in doing a job even when unsupervised. Does not merely make a pretense of working. (p. 167)

28. Feels responsible for giving a good day's work for a day's pay. (p. 167)

29. Has an attitude of responsibility toward his work which others in the group can count on. (p. 167)

30. Has learned how to make a report of his work-results with clarity and simplicity. (p. 167)

31. Reads about and discusses some of the economic forces that may affect his vocational life (new discoveries and inventions in business and industry--changing standards and opportunities in professions--and problems of production and distribution of goods and services.) (p. 168)

32. He considers a vocation from the standpoint of service to his fellow men as well as from its financial possibilities. (p. 190)

33. Discusses lucidly the place and value of his chosen career in the greater society. (p. 190)

34. Works consistently well because he believes that the quality of his work will have an effect upon the status of his chosen profession or vocation. (p. 190)

35. Has visited, or read about, and so understands something of the operations of a large industrial organization, and of a labor organization. (p. 212)

36. Has some understanding of the role of labor unions in our economy. Knows the approximate extent to which workers are organized into unions in this country and the chief reasons for the development of unions. (p. 212)

37. Begins to identify some of the factors which contribute to a worker's economic problems: lack of basic education, lack of opportunity for adult education related to his job, increasing demands of technology, automation, housing, illness, etc. (p. 212)

Outcomes related to consumer activities

38. Knows where to obtain accurate information about the products he wishes to buy and is persistent and skillful in using this information when making many of his purchases. (p. 128)

39. Chooses whether or not to buy pre-processed or assembled goods, with full knowledge of what is saved or lost in preparation time and what may be lost in quality and price. (p. 128)

40. Keeps his possessions in adequate repair. (p. 129)

41. Is able to use many common craft tools for simple operations. (p. 129)

42. Finds out what is known about the merits of various kinds of detergents, lubricants, abrasives, etc. for cleaning and protecting household goods and equipment. (p. 129)

Outcomes related to making economic analyses

43. Knows what jobs are available in the community, trends in employment, and the requirements and opportunities for various jobs. (p. 169)

44. Recognizes the importance of free public education for all and of opportunity for continued vocational education for all workers of the community. (p. 169)

45. Understand the importance of essential crops to our industrial life and the need to import those not produced in the United States, or not produced in sufficient quantities or cheaply enough to meet our industrial needs; e.g. certain fibers, rubber, and industrial oils. (p. 199)

46. Appreciates the achievements of science and technology in discovering new sources for the materials we are already using, in finding new and more efficient ways of extracting resources from known deposits, in finding uses for materials known but not usable, and in discovering and creating new resources. (p. 203)

47. Recognizes that all synthetics are produced from some natural resource and that their use does not lessen the need for conservation. (p. 203)

48. Knows that the ultimate purpose of our economic system is to produce and to distribute as many and as much as possible of the goods and services which our people want in order to maintain a high standard of living, and accepts this as his basic criterion for making judgments regarding our economic life. (p. 208)

49. Is able to discuss some of the principal issues of organization, management, and control of production, distribution, and consumption of goods and services in a technical age. (p. 209)

50. Studies the changes that the past fifty years have shown in the nature of employment. (p. 209)

51. Recognizes the advantages to the public of big business, such as efficiency of mass production methods, technological progress through research, patent laws, control of raw material supplies, and advantages inherent in volume of purchase and sales. (p. 210)

52. Learns something of the chief types of American unions and their patterns of organization. (p. 211)

53. Is becoming familiar with labor organizations and problems when and as they affect his immediate area. (p. 211)

54. Is able to explain something of the role of management in manufacturing and other enterprises. (p. 211)

Stating Objectives in Behavioral Form

Preparing Behavioral Statements

The proper development of objectives for industrial arts requires that they be stated in the form of behavioral goals. Sommers and Face presented this as a basic consideration for developing objectives for industrial arts. More specifically, "educational objectives should be stated in terms of the types of change expected in the learner at the conclusion of instruction." (39:33)

Tyler extended this interpretation of the form for educational objectives in saying:

> A statement of objectives clear enough to be used in guiding the selection of learning experiences and in planning instruction will indicate both the kind of behavior to be developed in the student and the area of content or of life in which the behavior is to be applied. (42:30)

Further specification of the form for behavioral goals or outcomes was offered by Mager in his text on preparing instructional objectives. In this he concluded with three questions which serve as criteria for determining the adequacy of an objective when it is presented as a behavioral statement:

1. Does the statement describe what the learner will be doing when he is demonstrating that he has reached the objective?
2. Does the statement describe the important conditions (givens and/or restrictions) under which the learner will be expected to demonstrate his competence?
3. Does the statement indicate how the learner will be evaluated? Does it describe at least the lower limit of acceptable performance? (23:52)

Statements of Objectives for Industrial Arts to Achieve Efficient Economic Behavior

What kinds of student behaviors should be manifested through industrial arts experiences in the high school? This fundamental question served as the basis for the preparation of objectives found in this phase of study on developing economic competence through industrial arts. Industrial arts experiences are considered here as any directed learning experiences that could occur in an industrial arts program--grades seven through twelve. When presented in terms of student performance, this question may appear as: What kind of performance in the economic areas of life will the student be able to demonstrate at the completion of his experiences in industrial arts?

It is clearly recognized that students are not all capable of the same kind of performance. Therefore, any proposal for describing a

particular level of performance may serve only to suggest a norm for measuring student performance. The achievement of anything less than what is proposed may result in a significant deficiency in some area.

Procedural elements for the development of statements which illustrate the kinds of behavior to be expected of industrial arts students were presented in earlier sections of this chapter. They are reviewed here in summary form:

1. Identify and organize the subject matter which describes the economic problems of life.
2. Define the needs of students in relation to the subject matter and indicate what the subject matter offers for educational purposes.
3. Select those aspects of the subject matter which fit within the bounds defined by the broader objectives of industrial arts.
4. Write the behavioral statements to satisfy the three criteria presented by Mager for writing behavioral outcomes.

Behavioral statements that result from the application of each step of this procedure are illustrated in the following section. These statements are organized and described according to selected subject topics, in order to show their relationship to the content derived from the economic affairs of life.

Each statement is preceded by the phrase "The student will be able to . . . " to emphasize that a particular kind of performance is to be demonstrated by the student upon the completion of his studies in industrial arts.

Statements Associated with Making a Choice of Occupation.--The first group of statements is intended to contribute to the satisfaction of the needs of the student to develop self-understanding, to search out and find information on occupations, to complete some kind of educational and vocational planning and to develop an occupational perspective.

1. The student will be able to indicate his own aptitudes and abilities for work in the industrial-technical areas.
2. The student will be able to judge his performance in work activities on the basis of his own capabilities.
3. The student will be able to describe the purposes of post-high school vocational education for the worker.
4. The student will be able to specify the requirements for education or training after high school which is suited to emerging vocational interests.
5. The student will be able to identify and analyze industrial employment trends in the community.
6. The student will be able to compare the factors of salaries, working conditions and job requirements for vocation in industries.
7. The student will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the financial returns it provides for the worker.
8. The student will be able to describe and compare the organizational structure of large and small industrial firms.
9. The student will be able to describe the work structure in local industries in terms of occupational title, job activities and job relationships.

10. The student will be able to describe the occupational changes resulting from developments in electronics, automation, cybernetics, and atomic power.

Statements Associated with Performing in the Work Situation.--The second group of statements is intended to contribute to the satisfaction of the needs of the student to become familiar with work activities and to develop basic work skills, to experience a work routine, to appreciate the effect of the social atmosphere on work, and to recognize the meaning of worker attitudes on extra-work adjustment.

1. The student will be able to make simple sketches and drawings of objects.
2. The student will be able to estimate volume, area, quantity, and dimensions.
3. The student will be able to use hand tools and machines common to the trade or industrial job in which he indicates an interest.
4. The student will be able to measure with rules, gages, and meters.
5. The student will be able to follow operating instructions when tooling-up and using machinery.
6. The student will be able to interpret the information used for describing an operational procedure.
7. The student will be able to make a report on the results of his work with clarity and simplicity.
8. The student will be able to use appropriate technical terminology to communicate with other persons while working to solve technical problems.

9. The student will be able to demonstrate minimal competence in using the tools related to his emerging occupational interests.
10. The student will be able to demonstrate safe work habits.
11. The student will be able to describe the physical, emotional, and psychological effects of repetitive operations on the human being.
12. The student will be able to work effectively with a group.
13. The student will be able to work effectively and efficiently when alone or under supervision.
14. The student will be able to judge the value of work as it satisfies the social needs of man.
15. The student will be able to judge the value of work as it satisfies the physical needs of man.
16. The student will be able to judge the value of work as it satisfies the intellectual needs of man.

Statements Associated with Consumer Activities.--The third group is intended to contribute to the satisfaction of the needs of the student to develop sound habits in the purchase and use of consumer goods and services.

1. The student will be able to illustrate, by example, the principles of design.
2. The student will be able to select products for purchase on the basis of the comparative information he obtains, such as cost and quality of construction.
3. The student will be able to recognize the advantages in

purchasing products which have been tested and approved by federal or private research laboratories.

4. The student will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory.
5. The student will be able to keep personal possessions in adequate repair.
6. The student will be able to disassemble, clean, adjust and reassemble an article according to the manufacturer's directions.
7. The student will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine.
8. The student will be able to make simple electrical repairs on household items, such as lamps, extension cords, and appliances.
9. The student will be able to select appropriate lubricants, abrasives, and cleaning solutions used in cleaning and protecting household goods and equipment.

Statements Associated with Process of Making Economic Analyses in Relation to Industrial Activities.--The fourth group of statements is intended to contribute to the satisfaction of the needs of the student to understand the purposes for and nature of labor and production resources, significant production methods and procedures, and the distribution of goods.

1. The student will be able to present examples of the achievements of science and technology in discovering new sources for and new forms of raw materials.

2. The student will be able to describe the changes, over the past 100 years, in methods for extracting raw materials.
3. The student will be able to describe the basic processes for making the synthetics used by industry for the goods it produces.
4. The student will be able to specify the sources for raw materials used in industrial operations in the community.
5. The student will be able to specify the advantages inherent in volume purchasing and sales by industry.
6. The student will be able to describe the role of labor unions in our economy.
7. The student will be able to define the major purposes of national labor unions.
8. The student will be able to describe the role of management in industry.
9. The student will be able to identify factors which contribute to a worker's economic problems, such as a lack of basic education, and the increasing demands of technology.
10. The student will be able to discuss the affects of market research on production.
11. The student will be able to describe the phases of production from product design to packaging.
12. The student will be able to define and compare quantity production and custom production methods used by industry.
13. The student will be able to identify the changes and trends in production methods resulting from the use of research findings.

14. The student will be able to describe the affects of an imbalance in the supply and demand of goods and services.

Summary

The major purpose in this chapter was to present statements of objectives to achieve economic efficiency in a form appropriate for use in industrial arts. The process of developing educational goals was illustrated with subject matter derived from the analysis of economic life-activities. Then, the objectives for industrial arts in general education were studied to determine the extent of concern for economic learnings. Finally, statements of behavior for achieving economic competence in industrial arts were presented.

The process of developing educational goals calls for the consideration of at least two factors: (a) the subject matter which evolves from certain life-activities, and (b) the description of learner needs as determined by the demands for performance in these life-activities.

Existing statements of objectives for industrial arts appear, generally, to express a concern for developing economic competence. But, two problems are brought into focus in the review and analysis of these statements. These are: (a) the diverse and often confusing manner in which the statements are presented make them difficult to interpret, and (b) the tendency to refer to limited aspects of economic life-activities, such as occupational exploration or consumer knowledge, does not illustrate the true scope of the activities themselves or the possibilities for experiences in industrial arts. Collectively, the statements of objectives presented by Wilber, Olson and Hostetler serve as a

point of reference for describing the contributions of industrial arts in the achievement of economic efficiency.

French's statements of goals for the high school offer a number of suggestions for behaviors which might be achieved in industrial arts. The most significant thing to be noted, though, was the attempt by French to translate statements of objectives into behavioral statements. This provided a more functional form of objective. Refinement of this form was achieved in the preparation of statements to be used for industrial arts by applying Mager's criteria for preparing instructional objectives.

The final step in describing the possible contribution or role of industrial arts in the achievement of the objectives of economic efficiency was to present a list of behavioral statements for industrial arts. These statements were categorized in terms of the major economic functions of occupational choice, work, consumer activities and making economic analyses. Each statement was presented to indicate the kind of performance to be demonstrated by the industrial arts student.

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CHAPTER IV

DESIGN OF THE STUDY

The Approach

There were two major aspects to this study as called for by its purposes: (a) to define in operational form the objectives of economic efficiency for use in industrial arts, and (b) to determine whether selected groups of industrial arts teachers and teacher educators have significantly different perceptions of objectives of economic efficiency to be achieved in industrial arts. A survey of literature provided a description of economic life-activities which deserve attention in education. A list of statements on economic behaviors to be achieved in industrial arts was developed from an analysis of general education goals and existing objectives for industrial arts. These statements provided the framework for a survey instrument used in the study of teacher and teacher educator perceptions. This chapter describes the method and procedure used to study these perceptions.

Use of Subject Area Specialists in the Assessment of Behavioral Statements

At the outset it was apparent that the problem of describing student behaviors relating to the development of economic competence would involve a number of areas in education. Specifically, these included economics, sociology, guidance and industrial education. It

was determined that to give appropriate coverage to the matter of describing student behaviors relevant to the achievement of economic competence, each of these areas would have to serve as a resource for information and facts. This study became, therefore, a form of inter-disciplinary research project. It also serves to illustrate and emphasize the inter-disciplinary nature of industrial arts as it characterizes the industrial activities of man.

The first step in the preparation of the research instrument was to further refine the list of 52 behavioral statements for industrial arts which appears in Chapter III. This was done to ascertain whether the statements reflected content that could be legitimately derived from one or more of the major areas of education involved. This evaluative step required the efforts of five specialists representing economics, sociology, guidance, secondary education and industrial arts.* These specialists were each sent identical lists of the statements to study on their own. A few days after that time an interview session was held with each of them separately to gather their informal reactions to the statements. Approximately one and one-half hours was spent in each of the interviews. Two questions on the nature of each of the 52 behavioral statements were directed at the specialists. These were: (a) Did the statements represent knowledge, values, or skills relevant to or definitive of your subject area in education?; and, (b) Considering the role of secondary general education, does the content of each statement represent an appropriate outcome for the high school? Questions were also presented in the interview on such matters as the wording and grammatical

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*Further discussion on the selection and use of subject area specialists appears on page 104.

structure of the statements. Responses were recorded on the interview form scale, as well as by the writing in of pertinent comments.* The interviews resulted in the original 52 statements being reduced to a total of 45. These 45 were used in the final survey instrument.

Determining the Perceptions of the Industrial Arts Teachers and Teacher Educators

The relationship of teacher perceptions of objectives to teaching behavior deserves careful consideration. The significance of this relationship was emphasized by Nerbovig in her study on teacher perceptions of the function of objectives in education. She stated that:

> A key concept in curriculum and learning has been that education becomes significant to the degree that important objectives are perceived and acted upon by those in the teaching-learning situation. (12:1)

The Nature of Perception.--In spite of the difficulty encountered in identifying a clear definition of perception, many ideas have been formulated on the meaning of the process of perceiving. Perceiving has been defined by a number of psychologists as, "a process by which the organism relates itself to its surrounds. In perceiving, the individual interprets, discriminates, and identifies objects and conditions experienced to be existing in the environment." (2:4)

One of the outstanding proponents of the use of perception theory in education, Floyd Allport, described perception as, "the way things look to us or the way they sound, feel, taste, or smell." (1:14) This refers to the material or physical objects in the individuals's environment.

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*The interview instrument used with the subject area specialists appears in Appendix A_3.

In order to extend the term perception to include less tangible kinds of things, such as theoretical concepts pertaining to events or situations, this definition must be projected. Allport further stated:

> Perception also involves, to some degree an understanding awareness, a "meaning" or a "recognition" of these objects . . . Thus we can include all the senses and can interpret perception as covering the awareness of complex environmental situations as well as of single objects. (1:14)

Much of the discussion and research developed on perception theory centers upon the problem of describing perceptions of individuals to rather simple environmental stimuli. These are things of an immediate image nature, or things with a physical form and shape which rather easily and quickly elicit a response. This is sufficient for use by psychologists in the laboratory, but falls short of satisfying the need of persons interested in studying responses to complex event situations. Snygg and Combs emphasized this point by saying:

> Historically, psychologists have used the word perception to refer only to, "a single, unified meaning obtained from sensory processes while a stimulus is present." To describe acts of knowing, understanding, or forming ideas, they have used the words "cognition" or "conception." (4:30)

The position Snygg and Combs take on perception is one which applied in this study. The teacher responses to a choice of behavioral goals for use in industrial arts is a form of differentiation these authors refer to in the following statement:

> In this book, however, the word "perception" is used to refer to differentiations the individual is capable of making in his perceptual field whether an objectively observable stimulus is present or not. There seems little need for more than one process to explain these events. Differentiations in the phenominal field resulting in perceptions of seeing, hearing, smelling, or feeling are precisely the same as those made in conceiving, knowing, or understanding. Although the subject matter varies, the process is the same. The differentiation of an idea or a concept is not basically different from the differentiation of a scent, a sound, or the printed words on a page. (4:30)

Perception and Behavior.--In this study the term behavior was used in reference to three different situations. One involved student behaviors as described by statements of outcomes for industrial arts. The second referred to teaching behavior, or the act of teaching. The third situation considered the behaviors of industrial arts teachers who responded on a survey instrument. The responses of these teachers on the instrument are viewed here as a form of behavior.

The relationship of perception to behaviors is clarified by Snygg and Combs when they say that, "behavior, without exception is determined by the perceptual field at the moment of action. To produce a change in behavior, then, it will be necessary to produce some change in the individual's perceptual field." (4:36) The interest in this study was not to change teacher behavior, but simply to describe the teachers' perceptions as indicated by the nature of their behaviors in responding on the survey instrument.

Formation of Teacher Groups for the Study

It was proposed earlier that the way teachers perceive their subject area depends upon the conditions which surround them. Some aspects of these conditions are common enough to be used as variables in the study of their effect upon teacher perceptions. In this study a number of teacher grouping arrangements based upon certain variables were established. Hypotheses were formulated on the basis of the following five variables:

1. Grade level (junior high or senior high)
2. Area of teaching (multiple area or limited area)
3. Class size (average size of industrial arts classes)

4. Student socio-economic level (as defined by a standard scale for socio-economic class)
5. Years of teaching experience (total number of years teaching in industrial arts)

Research Hypotheses

One of the major objectives of this study was to compare the perceptions of selected groups of industrial arts teachers toward the objectives of economic efficiency. Hypotheses were developed from this objective to make comparisons of teacher group responses. The first six of these hypotheses refer to teacher groupings arranged according to grade level and area of teaching. Teachers were regrouped for each of three additional hypotheses, according to the variables of student socio-economic level, class size and teaching experience. The last hypothesis was directed at comparing all teacher groups with a panel of leaders in industrial arts teacher education.

Group differences were described in terms of the difference in group median scores. An over-all median score was computed from the responses of the industrial arts teachers on the survey instrument. Null (H_o) and alternate (H_1) hypotheses were presented on each of the grouping arrangements, with the chi-square median test serving as the test of significance.

1. H_o: There is no difference between the median score on economic statements selected by (A) junior high school multiple area teachers and the median score on economic statements selected by (C) senior high school multiple area teachers. (H_o: $Mdn_A = Mdn_C$)

H_1: The median score on economic statements selected by (A) junior high school multiple area teachers is greater than the median score on economic statements selected by (C) senior high school multiple area teachers. (H_1: $Mdn_A > Mdn_C$)*

2. H_o: There is no difference between the median score on economic statements selected by (B) junior high school limited area teachers and the median score on economic statements selected by (D) senior high school limited area teachers. (H_o: $Mdn_B = Mdn_D$)

   H_1: ($Mdn_B > Mdn_D$)

3. H_o: There is no difference between the median score on economic statements selected by (A) junior high school multiple area teachers and the median score on economic statements selected by (D) senior high school limited area teachers. (H_o: $Mdn_A = Mdn_D$)

   H_1: ($Mdn_A > Mdn_D$)

4. H_o: There is no difference between the median score on economic statements selected by (B) junior high school limited area teachers and the median score on economic statements selected by (C) senior high school multiple area teachers. (H_o: $Mdn_B = Mdn_C$)

   H_1: ($Mdn_B < Mdn_C$)

5. H_o: There is no difference between the median score on economic statements selected by (A+B) all junior high school teachers and the median score on economic statements selected by (C+D) all senior high school teachers. (H_o: $Mdn_{A+B} = Mdn_{C+D}$)

   H_1: ($Mdn_{A+B} > Mdn_{C+D}$)

6. H_o: There is no difference between the median score on economic statements selected by (A+C) all multiple area teachers and the median score on economic statements selected by (B+D) all limited area teachers. (H_o: $Mdn_{A+C} = Mdn_{B+D}$)

   H_1: ($Mdn_{A+C} > Mdn_{B+D}$)

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*Hereafter, all alternate hypotheses will appear in symbolic form.

7. H_o: There is no difference between the median score on economic statements selected by (E) teachers with upper class students or (F) teachers with middle class students or (G) teachers with lower class students. ($Mdn_E = Mdn_F = Mdn_G$)

   H_1: ($Mdn_E \neq Mdn_F \neq Mdn_G$)

8. H_o: There is no difference between the median score on economic statements selected by (G) teachers with classes averaging from 10-20 students or (H) teachers with classes averaging from 21-30 students or (I) teachers with classes averaging 31 and over. ($Mdn_G = Mdn_H = Mdn_I$)

   H_1: ($Mdn_G \neq Mdn_H \neq Mdn_I$)

9. H_o: There is no difference between the median score on economic statements selected by (J) teachers with 1-3 years teaching experience or (K) teachers with 4-6 years teaching experience or (L) teachers with 7-10 years teaching experience or (M) teachers with 11-15 years teaching experience or (N) teachers with 16 or more years teaching experience. ($Mdn_J = Mdn_K = Mdn_L = Mdn_M = Mdn_N$)

   H_1: ($Mdn_J \neq Mdn_K \neq Mdn_L \neq Mdn_M \neq Mdn_N$)

10. H_o: There is no difference between the median score on economic statements selected by (A+B+C+D) all industrial arts teachers and the median score on economic statements selected by (X) a group of industrial arts teacher educators. ($Mdn_{A+B+C+D} = Mdn_X$)

    H_1: ($Mdn_{A+B+C+D} \neq Mdn_X$)

Preparation of the Research Instrument

The research instrument was developed to gather information on two matters: (a) a description of the teacher and his teaching program in terms of what he was teaching and the general nature of his teaching situation; and, (b) to provide a means for recording the responses of teachers to a select list of behavioral statements, from which a description of their perceptions would be developed.

General Information on the Teacher and the Teaching Situation

A "Personal Data Sheet" was prepared to include the items by which the teachers could be classified. A total of thirteen items was listed to provide information on:*

1. Grade level where presently teaching.
2. The matter of teaching in a government reimbursed program.
3. Technical area or areas included in that industrial arts course which is taught most of the time by the teacher.
4. Size of the teacher's school.
5. Number of industrial arts teachers in the school.
6. Socio-economic position of the majority of industrial arts students.
7. Average size of the teacher's industrial arts classes.
8. Teacher's age.
9. Total number of years of teaching experience.
10. Educational level achieved by the teacher.
11. Name of the school from which the bachelor's degree was received.
12. The teacher's major areas of study at both the bachelor's and master's level.
13. Type of teaching certificate held by the teacher.

Grade Level.--Several hypotheses called for the classification of teachers as junior high school or senior high school teachers.

*A copy of the "Personal Data Sheet" appears in Appendix C_2.

Respondents to the survey instrument were asked to check the grade or grades which they were teaching at the time. The scale was presented as follows:

__ 6th or below
__ 7th
__ 8th
__ 9th
__ 10th
__ 11th
__ 12th
__ other_____

Classification was then achieved by grouping those grades which were marked, e.g., if the teacher checked "7th, 8th, 9th", he was classified a junior high school teacher. Similarly, if a teacher checked "9th, 10th, 11th", he was classified a senior high school teacher. The 9th grade was considered for this study as a junior high grade when it was the only grade checked. Teachers who checked "6th or below", or who wrote in something other than one of the more standard arrangements, were removed from the sampling.

Government Reimbursed Programs.--A basic concern of this study was that it be directed at programs in industrial arts. A problem which immediately arises is that programs in vocational-industrial education and industrial arts are quite often confused with each other. It was necessary, therefore, to devise a means to permit the selection of only those teachers who had a major degree of involvement in teaching industrial arts. Therefore, the respondent was asked whether or not his involvement was in a program supported by government reimbursable funds. Since there are schools in which both reimbursed vocational and non-reimbursed industrial arts programs are offered, the question was

directed to the respondent in terms of the course which he taught most of the time--whether it was or was not government reimbursed.

Technical Areas of Teaching.--Teachers in industrial arts are often identified by the technical area or areas they are teaching, such as woodworking or drawing. Titles like these lend themselves easily to a classification system. For this study it was necessary to place teachers in the sample in groups identified as multiple area teachers and limited area teachers.

Respondents were asked to indicate on the following scale the technical area or areas that they included in the industrial arts course they taught most of the time.

__ automotive or power mechanics
__ ceramics
__ drawing
__ electricity or electronics
__ graphic arts or printing
__ jewelry
__ leather
__ materials testing
__ metalworking
__ plastics
__ textiles
__ woodworking
__ building construction
__ other _____

Determination of multiple or limited area teaching was established by weighing the importance of the particular technical areas indicated, and the likelihood that they would be combined to create a multiple area or limited area situation. The areas of woodworking, metalworking and graphic arts or printing were considered major areas. Any combination with one of these was judged as creating a multiple area situation. When only one of the major areas or only two of the minor areas were indicated, the teaching was considered to be of a limited area type.

School Size and Number of Industrial Arts Teachers.--Two general factors which help to describe the nature of the school situation are school size and the number of teachers who teach industrial arts classes. Hypotheses could be developed to determine the relationship between these factors and how teachers perceive the role of their program. The presence of professional peers in a program might have some bearing on the way a teacher perceives the objectives for his program.

Respondents in this study were asked to indicate the appropriate figures which represented their schools on the following scales:

To determine the range within which the total number of students in the school appears--

__ 0-500
__ 501-1000
__ 1001-1500
__ 1501-2000
__ 2001-2500
__ Over 2500

To determine the total number of industrial arts teachers in the school--

__ 1-2
__ 3-4
__ 5-6
__ 7-8
__ 9-10
__ Over 10

Socio-Economic Position of Students.--A hypothesis was formulated for this study to consider the socio-economic position of the majority of the respondent's industrial arts students. It was reasoned that quite often teachers perceive a particular role for their programs because of what they see as the social or economic status of their students. Some of these role perceptions may be well founded and lead to a constructive teaching program. Other of these perceptions may result in the development

of negative attitudes toward students and the teaching task because the teachers do not see the students as "desirable" types.

The research hypothesis on this topic was developed to see if there were differences in over-all role perceptions because of the way industrial arts teachers view the socio-economic standing of their students. The teachers were asked to respond to a simple social class scale by checking the group in which they believed the majority of their industrial arts students appeared. Eight categories for socio-economic class were listed. The three major groups of upper, middle and lower class were divided to form the sub-groups presented below:

__ Middle-UPPER
__ Lower-UPPER
__ Upper-MIDDLE
__ Middle-MIDDLE
__ Lower-MIDDLE
__ Upper-LOWER
__ Middle-LOWER
__ Lower-LOWER

Industrial Arts Class Size.--The size of classes has become a significant issue in many schools today. For industrial arts, over-crowded shops can present a number of very serious laboratory management problems which are not resolved simply by moving in another desk. The concern in this study is for whether or not perceptions vary because of the numbers of students in the industrial arts classes. A hypothesis was developed to determine the effect of class size relationships.

Respondents were asked to indicate the over-all average size of their industrial arts classes on the following scale:

__ 10-15
__ 16-20
__ 21-25
__ 26-30
__ 31-35
__ Over 35

Teacher Age and Teaching Experience.--It is quite possible a relationship might exist between the teacher's age or tenure of teaching experience and the way he perceives the role of his subject area. Without knowing the nature of the teaching experiences teachers have had, it can only be proposed that if significant differences appear between experience or age groups, these two variables deserve further study as they involve factors which influence the teachers' classroom programs. There are likely a number of ways this theory might be studied to derive additional information. The choice here was simply to explore the possibilities of a relationship with these variables in mind.

As it appeared on the research instrument for this study, the teacher was asked to indicate his age and the number of years teaching experience he had accumulated. The range within which his age appeared was checked on the following scale:

__ 20-30
__ 31-40
__ 41-50
__ 51-60
__ 61-70

The number of years teaching experience was determined by a similar means, but the intervals on the scale were not even. It was theorized that the larger number of teachers in the sample would likely appear in the group with the fewer years of experience. If differences in group responses were to be noted, the groupings would need to be exclusive enough to indicate differences. Therefore, the intervals were arranged on the scale for number of years teaching experience as follows:

__ 1-3
__ 4-6
__ 7-10
__ 11-15
__ 16-20
__ Over 20

General Questions on Teacher Status.--Four items on the Personal Data Sheet were presented to gather information on the educational status of the respondents. These statements were used to further assist in the selection of the final teacher sample. The questions referred to the degree and teaching certificate held by the teacher, the institution where the bachelor's degree was granted, and the major areas of study completed in college. No hypotheses were formulated on these statements.

Behavioral Statement Inventory Checklist

The "Inventory Checklist" was prepared to include the statements on economic behaviors to which the sample of industrial arts teachers would respond. These teachers were asked to indicate the degree to which they believed each statement represented an outcome which should be achieved through secondary school industrial arts.

Chapter III described the manner by which the initial listing of behavioral statements was formulated. Also included was a list of behavioral statements arranged under the topics of occupational choice, work, consumer activities, and making economic analyses. These statements were the product of a study of literature on developing efficient economic behavior.

The process of preparing the inventory checklist involved the following steps:

1. Review of preliminary list of 52 behavioral statements by five subject area specialists.
2. Organize and scale the statements.
3. Run a pilot test on the instrument.
4. Revise as required.

Since the step involving the use of subject area specialists was discussed earlier in this chapter, descriptions of the remaining steps appear in the following sections.

Organizing the Statements.--The list of behavioral statements at this point was organized under the topics of occupational choice, work, consumer activity and making economic analyses.* In order to encourage the respondents to treat each of the 45 statements in terms of its individual characteristics, it was necessary to randomly order the list. This was accomplished through the use of a table of random numbers. (5:366-370) The table was entered a minimum of 45 times. When a number reappeared after having been selected, repeated entrees were made until a new and usable number was found.

Scaling the Instrument.--The instrument was scaled so that the respondents would indicate the degree to which they felt each behavioral statement on the instrument represented an outcome which should be achieved by the student in industrial arts. Four response choices were offered for each statement in symbolic form along the left-hand column of the instrument. The symbols represented the following scaling factors:

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*The list as presented to the subject matter specialists appears in Appendix A.

D = Definitely an outcome which should be achieved through industrial arts.

P = Probably an outcome which should be achieved through industrial arts.

R = Rarely an outcome which should be achieved through industrial arts.

N = Never an outcome which should be achieved through industrial arts.

This four-choice scale was used because it could be dichotomized easily. A choice of "D" or "P" was considered to represent a response in favor of the behavioral statement as an outcome for industrial arts. Similarly, an "R" or "N" choice was viewed as indicating a lack of support for the behavioral statement.

Pilot Instrument Testing.--The first complete form of the instrument was tested for such factors as readability and consistency, by administering it to a pilot group of industrial arts teachers. Two such pilot tests were performed.

The first pilot test was made with a group of eight secondary level industrial arts teachers. Of this group six were senior high limited area teachers and two were junior high school multiple area teachers. The following components were a part of that instrument:*

1. A letter of introduction.
2. A personal data page with nine questions concerning the respondent's teaching situation.
3. The inventory checklist with its instructions and the 45 behavioral statements
4. A questionnaire evaluation page.

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*A copy of the first pilot test instrument appears in Appendix B.

Scaling on the first pilot instrument included the use of four factors. Each of these was represented by a letter symbol on the instrument. These were presented as follows:

D = Definitely an outcome which should be achieved through industrial arts.

P = Probably an outcome which should be achieved through industrial arts.

U = Unlikely as an outcome to be achieved through industrial arts.

N = Never an outcome which should be achieved through industrial arts.

Respondents to the pilot test were asked to evaluate the instrument. This was intended as a means for identifying specific kinds of problems associated with the design of the instrument. They were asked to comment on the questions:

1. How long did it take you to complete this inventory?
2. Did the introductory statements at the beginning of the questionnaire help you understand the general purpose of the inventory?
3. Were the instructions for responding clear and adequate?
4. In reference to Section II -- Inventory Checklist:
   a. Did the items have meaning?
   b. Which items would you exclude because they were not meaningful?
   c. Which items were difficult to read because of wording?
   d. Should the inventory be:
      __ lengthened?
      __ shortened?
      __ used as it is?

5. Would you have answered this inventory if you had received it in the mail without any verbal communication on the subject?

After an assessment was made of the responses and comments given by these eight teachers, it was felt that the choice of words for one of the scaling statements was inappropriate. The statement "Unlikely as an outcome to be achieved through industrial arts", was considered to be inconsistent in meaning with the other three scaling statements.

The sample of teachers used for the first pilot test was dominantly senior high school limited area teachers. Because a more balanced sample group might have offered a chance to gather responses from a group more typical of the major population sampling which would be used for the study, it was decided that a larger pilot group should be used. This was to include more junior high teachers so that a balance might be achieved between the two levels.

The second pilot test was administered to a group of twelve industrial arts teachers, including six from the junior high and six from the senior high grades. The instrument for this test differed from that for the first pilot test in the following ways:*

1. Of the four statements used for scaling the instrument, the third was changed to read, "R = Rarely an outcome which would be achieved through industrial arts."

2. The fourth question on the instrument evaluation page was restated to read as follows:

   In reference to Section II--Inventory Checklist--

   a. Did the items have meaning?

   b. Which items would you exclude because they were not grammatically correct?

*A copy of the second pilot test instrument appears in Appendix B.

c. Which items were not clear?

d. Should the inventory be

___ lengthened?

___ shortened?

___ used as it is?

The Final Instrument.--Three questions which did not appear on either pilot instrument were added to the personal data page of the final instrument. These were concerned with information on the socio-economic level of industrial arts students, industrial arts class size, and the name of the institution where the bachelor's degree was earned by the teacher. These were added because it appeared from the pilot tests that more information might be needed to discriminate among the teacher groups.*

Except for the addition of these three questions an attempt was made to reduce the total length of the final instrument. This was intended to permit faster reading of its contents, as well as easier handling for mailing.

The behavioral statements were shortened slightly by removing the first two words in each statement, which were always "The student". These were then presented in bold letters at the top of each page of statements in the checklist. The reader was directed to read each behavioral statement as though these two words preceded it.

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*Further discussion on the total list of personal data questions appears on pages 97-103 of this chapter.

The Research Population

Source for the Sample

The membership of the Michigan Industrial Education Society provided the source for the sample of industrial arts teachers used in this study. Approximately 1000 of these members were industrial arts teachers. This number represented 60 percent of the total industrial arts teacher population of 1650 in the State of Michigan. The decision to use this organization as a source for the population sampling in this study was based upon the fact that its mailing list represented the most complete and current source of names and addresses for industrial arts teachers in the State of Michigan. A check on the geographic distribution of these teachers indicated that almost every school system in the State was represented. Therefore, it was believed to be a fair and accurate representation of the total population.

Selecting the Sample

The membership roster for the Michigan Industrial Education Society listed teachers by the grade level and technical specialties they were teaching. This provided a ready means for identifying the groups which were needed. Each of the members had been given a membership number. Identification and selection of those who would form the sampling population was accomplished by using this number rather than personal names. The teachers were selected and their membership numbers listed under one of the four major groups--junior high multiple area, junior high limited area, senior high multiple area, or senior high limited area teachers. Each of these members was then provided a new

number to form four lists of sequential numbers beginning with one. These lists included a total of 995 teachers from which the desired sampling total of 400 teachers (100 in each sub-group) would be selected. The total numbers in these groups were found to be:

Junior High Multiple Area Industrial Arts Teachers	120
Junior High Limited Area Industrial Arts Teachers	79
Senior High Multiple Area Industrial Arts Teachers	241
Senior High Limited Area Industrial Arts Teachers	555
TOTAL	995

Since the junior high limited area group included only 79 teachers, it was necessary to use all the teachers in the junior high groups to gain the desired total of 200 junior high teachers. The senior high groups had to be reduced to totals of 100 each. This was accomplished through use of a table of random numbers. (5:366-370) The table was entered a minimum of 100 times for each group until the desired total was reached. After the 400 numbers were selected the teachers' names, home addresses and identification numbers were placed on 3" x 5" cards and filed to facilitate mailing.

It could not be expected that every teacher would appear on the questionnaire returns in the same group he was originally classified because of possible teaching assignment changes during the school year. Therefore, some shifting of the totals for each sub-group was considered probable. This was also considered reason enough to permit the use of different totals for the sample groups in the junior high grades.

After the groups had been selected and the names of teachers identified, it was discovered that two of the junior high limited area teachers were not in positions indicated by the membership list. Therefore, their names were removed and the total for that group was lowered

to 77 teachers. The final sub-group sizes as provided by the membership list appeared as follows:

Junior High Multiple Area Industrial Arts Teachers	= 120
Junior High Limited Area Industrial Arts Teachers	= 77
Senior High Multiple Area Industrial Arts Teachers	= 100
Senior High Limited Area Industrial Arts Teachers	= 100
TOTAL	397

Distribution of the Survey Instrument

Copies of the survey instrument were printed to form three sheets of material. The first sheet was a letter of introduction with each teacher's name typed in the salutation and the researcher's hand-written signature in the closure. The second and third sheets were printed on two sides and included the instructions with the 45 behavioral statements.* Each teacher's identification number was placed on the back page of their copy before it was mailed.

First Mailing

The first mailing of the questionnaire was made to the sampling of 397 teachers during a three-day period. A single business size envelope with the questionnaire and a self-addressed stamped envelope was mailed first-class to each teacher. Within two days the returns began appearing in the mail. These were each tallied on the 3" x 5" address cards and filed for later use. A total of 188 (42 percent) returns were received by the 14th day after the first mailing was completed.

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*A copy of the final survey instrument appears in Appendix C.

Follow-up Request

A follow-up request was mailed to each of those teachers who had not responded by the 14th day after the first mailing. This request was printed on a post-card with each teacher's name typed in the greeting, and the researcher's signature hand-written in the closure.* These were mailed to the 209 teachers who had not responded at this point.

Second Mailing

On the 35th day after the first mailing of the questionnaire, a second copy was mailed to 110 teachers who had not yet responded. A revised introductory letter was prepared as an appeal for their reconsideration of the request for assistance.**

The last return was received on June 20, two months from the time of the first mailing.*** At that time the total returns reached 335 (84 percent). This was considered a sufficiently high number to eliminate the need for any further requests for responses.

Processing of the Returns

As each questionnaire was received, it was checked to determine whether or not it fit the sample. This included a check with several validating criteria. Returned questionnaires were invalidated if:

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*A copy of the follow-up post-card appears in Appendix C.

**A copy of the revised letter of request appears in Appendix C.

***A complete time-table for the mailing of the questionnaire appears in Appendix C.

1. The respondent failed to respond to more than three behavioral statements.
2. The respondent had left the teaching profession, or was not directly involved in teaching at the time.
3. The respondent was teaching other than industrial arts classes a major part of the time, such as industrial-vocational classes or in some other subject area.
4. The respondent was teaching both junior high and senior high industrial arts classes and could not be placed specifically in one of the four sub-groups.
5. If the respondent was not certified to teach industrial arts at the secondary level.

It was found that of the total 334 (84 percent) returns, 59 (15 percent) were invalidated for the following reasons:

Incomplete questionnaire	10
Respondent not teaching or not available to respond	15
Respondent teaching other than industrial arts	15
Respondent teaching both junior high and senior high	6
Respondent not certified to teach industrial arts	13
	59 (15%)

Each questionnaire was coded and prepared for scoring after all the returns had been received. Coding made it possible to transfer the information to punch cards for computer scoring.

Each of the response choices for the personal data questions was transposed into a number which could be punched on a computer card. There were 13 different statements to which responses were given on the personal data page.

Each of the response choices for the behavioral statements was also transposed into a number. These became a 1, 2, 3, or 4, for the

choices of D, P, R, or N, respectively. There was a total of 45 responses on the behavioral statement inventory.

Statistical Analysis

The chi-square median test was used to test each of the 10 hypotheses in terms of whether the samples of teacher groups came from populations with the same medians. As required for this non-parametric test, the teacher group scores were placed in an ordinal scale. All teacher scores were categorized as those scores which were above the total combined median or those which were at or below this median. Frequencies of scores in these two categories were cast in a contingency table of the appropriate size for each hypothesis. No more than 20 percent of the cells in any particular contingency table had expected frequencies of less than 5.

All tests of the hypotheses were made at the .05 level of significance. The null hypothesis for each major hypothesis was rejected in favor of its alternate hypothesis if the computed value of X^2 did not equal or exceed the value for chi-square presented in the table of critical values. (13:249) Two-by-two contingency tables with one degree of freedom were used to make comparisons of the teacher groups as called for in hypotheses 1 through 6 and 10. Two-by-three contingency tables with 2 degrees of freedom were developed to test hypotheses 7 and 8. Hypothesis 9 required the use of a 2 x 5 contingency table with 4 degrees of freedom.

Since the chi-square test is insensitive to the effects of order when $df > 1$, percentages of teacher scores above or below the combined

median were computed. Direction and order of the frequencies could then be observed through these percentage values.

Individual item analyses were made on each of the 45 behavioral statements. A teacher response to a statement was categorized as either favorable or unfavorable. The frequencies of teacher group responses on each statement were then used to make group comparisons. Four teacher groups were formed according to grade level and area of teaching. With 2 response categories and 4 groups, a 2 x 4 contingency table was developed and chi-square computed with 3 degrees of freedom.

The analysis of individual items also involved comparing the secondary level industrial arts teacher with the industrial arts teacher educator responses. Percentage values for all teacher responses favoring each item were computed and compared with the favorable responses of the industrial arts teacher educator group.

Inferential as well as descriptive techniques were used in the interpretation of the tests of hypotheses and the analysis of teacher group responses on individual items.

Summary

This chapter described the method used to determine how industrial arts teachers perceive the role of industrial arts in the achievement of the objectives of economic efficiency. A survey instrument was prepared to obtain teacher responses to selected behavioral statements which reflect the achievement of economic competence. These responses were viewed as a form of behavior demonstrated by the teacher and they were used to describe how the teacher perceives the role of industrial arts in relation to the objectives of economic efficiency.

An initial list of behavioral statements was presented to five subject area specialists. Their reactions to the content and structure of the statements served as a screening and validation device for the final list of statements.

In order to determine whether differences in teacher responses would result from certain environmental or personal conditions, a number of these conditions were selected as variables for study. They included grade level, area of teaching, socio-economic level of students, class size, and years of teaching experience.

Ten major research hypotheses were developed for the study. These were designed to compare teacher group differences in terms of the group median scores which resulted from teacher responses on the questionnaire. A panel of eight leaders in industrial arts teacher education was also asked to respond to the statements on the questionnaire. Comparisons were then made between their responses and the teacher responses.

Two pilot tests were made to check the instrument for meaning and consistency. A total of twenty secondary industrial arts teachers were involved in these tests. Slight revisions were made in the design of the instrument following each test.

The final questionnaire was mailed to a population sampling of 397 secondary level Michigan industrial arts teachers. This sampling was drawn at random from the Michigan Industrial Education Society membership list for 1966-67. The initial mailing of the questionnaire was followed by a post card and eventually a second questionnaire until 84 percent of the teacher sample responded.

The statistical analysis of materials on the returned questionnaires included the chi-square median test for the 10 major hypotheses

and the individual item analyses. Percentage values for group responses were also computed to describe the order and direction of scores whenever significant values of X^2 were obtained. Chapter V discusses in detail the analysis of data.

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CHAPTER V

ANALYSIS OF THE DATA

Introduction

Teacher responses to 45 selected behavioral outcomes for industrial arts were collected on the questionnaire which was distributed to 397 Michigan industrial arts teachers. Of this group, 275 returns were used to provide the data which appear in this chapter.

A similar questionnaire was distributed to a group of 8 industrial arts teacher educators. The responses of these specialists have also been analyzed and interpreted in this chapter.

Distribution of Respondent Scores

Each of the 275 returns was scored by awarding one point for each favorable response on the dichotomized four-choice scale.* The distribution of the total range of scores--where the maximum number of favorable choices was equal to a score of 45--is presented in Table 2. A median of 33 and a total mean of 32.70 resulted for this distribution.

*Choices of "D" or "P" were considered as favorable responses on the questionnaire.

TABLE 2

FREQUENCY OF INDUSTRIAL ARTS TEACHER SCORES ON THE SURVEY SCORING SCALE

Score	Freq. N	Cumulative Freq. N	%
45	10	10	3
44	4	14	5
43	9	23	8
42	11	34	12
41	8	42	15
40	12	54	18
39	14	68	24
38	9	77	28
37	18	95	34
36	19	114	41
35	13	127	46
34	7	134	48
33	14	148	53
32	15	163	59
31	11	174	62
30	15	189	68
29	13	202	73
28	8	210	74
27	10	220	80
26	8	228	82
25	6	234	85
24	8	242	88
23	9	251	91
22	6	257	93
21	0		
20	3	260	94
19	2	262	95
18	2	264	96
17	5	269	98
16	1	270	98
15	0		
14	0		
13	0		
12	0		
11	3	273	99
10	1	274	99
9	1	275	100
8	0		
7	0		
6	0		
5	0		
4	0		
3	0		
2	0		
1	0		

Teacher Group Scores

The major hypotheses of this study called for the grouping of teachers in several different arrangements. Scores for the sub-groups which resulted were computed so that comparisons could be made among the groups. Table 3 presents these scores as group means in the same arrangements called for by the hypotheses.

TABLE 3

TEACHER GROUPINGS USED IN THE TESTS OF MAJOR HYPOTHESES

Teacher Group	N	$\bar{X}$
(Grade Level and Area of Teaching)		
Junior High Multiple Area	93	32.78
Junior High Limited Area	59	32.11
Senior High Multiple Area	41	31.07
Senior High Limited Area	82	33.85
All Junior High	152	32.44
All Senior High	123	32.46
All Multiple Area	134	31.92
All Limited Area	141	32.98
(Socio-Economic Level of Students)		
Upper Class	25	32.28
Middle Class	195	33.34
Lower Class	53	30.55
(Average Size of Industrial Arts Classes)		
10-20 Students	90	33.22
21-30 Students	149	33.34
31 Students or More	53	30.55
(Years of Teaching Experience)		
1-3 Years	54	35.33
4-6 Years	60	31.75
7-10 Years	66	32.19
11-15 Years	43	33.39
16 Years or More	44	31.52

In addition to the sub-group arrangements referred to in Table 3, teachers were also grouped according to their age and the institution from which they received their bachelor's degree. These groupings are listed in Table 4 with their respective group mean scores. No hypotheses were formulated on these patterns.

TABLE 4

TEACHER GROUPINGS NOT USED IN TESTS OF HYPOTHESES

Teacher Group	N	$\bar{X}$
(Teacher Age)		
20-30 Years Old	94	33.69
21-40 Years Old	101	32.87
41-50 Years Old	46	32.58
51-60 Years Old	27	30.66
61 Years Old or More	6	25.50
(Institution Granting the Bachelor's Degree)		
Eastern Michigan University	34	36.15
Central Michigan University	35	33.37
Michigan State University	31	32.58
Wayne State University	27	32.40
Western Michigan University	57	31.07
Northern Michigan University	26	29.96

Teacher Educator Scores

The returns of the industrial arts teacher educators were scored in the same manner as those of the secondary teachers. These 8 resulting scores are listed in Table 5 by frequency on the scoring scale.

TABLE 5

FREQUENCY OF INDUSTRIAL ARTS TEACHER EDUCATOR SCORES ON THE SURVEY SCORING SCALE

Score	Frequency
45	1
44	0
43	1
42	2
41	0
40	0
39	2
38	1
37	1
Total	8

The computed mean for these scores was 40.62 and the median was found to be 40.50. Both of these values are considered to be significantly higher than the values for the secondary level teachers, which were 32.70 and 33 respectively.

Conclusions on the Distribution of Group Scores

When considering the total sampling mean as a fixed value, some indication of direction in sub-group means can be observed. An attempt is made here only to describe this direction and not to determine the degree of significance which may exist.

Tables 2, 3, 4 and 5 indicate that:

1. The group mean of senior high school limited area teachers is higher than the other three group means. The group mean of the senior high multiple area teachers was the lowest of the four groups.

2. The group mean for all junior high teachers was almost identical to that of all senior high teachers.
3. The group mean of all limited area teachers was slightly higher than the group mean score of all multiple area teachers.
4. Teachers with the majority of their students from the lower socio-economic class had a group mean score lower than either of the other two socio-economic groups.
5. Teachers with industrial arts class sizes averaging 31 or more had a lower group mean score than either of the other two groups.
6. The group mean for industrial arts teachers with from one to three years of experience is quite a bit higher than the group mean of teachers with four to six years of experience.
7. The group mean for teachers who are 20 to 30 years old is slightly higher than the group means for all other groups. As teacher age increases, the group means appear to decrease.
8. The industrial arts teacher educator group mean score was much higher than the combined mean score for all industrial arts teachers.

Testing of the Hypotheses

Ten major hypotheses were presented for testing. These were tested with the data computed from the 275 returns of Michigan industrial arts teachers. Comparisons among the teacher sub-groups were made by comparing the medians of the several sub-groups. With the total sampling median as a fixed value, all scores were placed in one of two categories--

those which were above this total median of 33 and those which were at or below it. The frequencies in these two categories were then used as bases for comparison. These tests are described in this section.

Comparison of Junior High Multiple Area and Senior High Multiple Area Teacher Group Scores

The null hypothesis of the first major hypothesis stated that there was no difference between the median scores on the economic statements selected by the group of junior high school multiple area teachers when compared with the group of senior high multiple area teachers (H_0: $Mdn_A = Mdn_C$). The alternate hypothesis indicated that the median score of junior high multiple area teachers would be higher than the median score of senior high multiple area teachers (H_1: $Mdn_A > Mdn_C$). The chi-square test of these scores produced a value of .446. At the .05 level of significance with 1 degree of freedom, this value did not equal or exceed the critical chi-square value of 2.71 required for the 2-tailed test. Therefore, the null hypothesis could not be rejected.

The number of teachers in these two groups is presented in Table 6 as those whose scores were above the median and those whose scores were at or below the median.

TABLE 6

NUMBER OF JUNIOR HIGH MULTIPLE AREA AND SENIOR HIGH MULTIPLE AREA TEACHER SCORES ABOVE OR BELOW THE COMBINED MEDIAN

Grade Level and Area	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
Jr. High Multiple	46	(49)	47	(51)	93	(100)
Sr. High Multiple	19	(47)	22	(53)	41	(100)
Totals	65		69		134	

Comparison of Junior High Limited Area and Senior High Limited Area Teacher Group Scores

The null hypothesis for the second major hypothesis indicated that the median scores of junior high school limited area and senior high limited area teachers would be equal (H_o: $Mdn_B = Mdn_D$). The alternate hypothesis stated that the median of junior high limited area teachers would be greater than the median of senior high limited area teachers (H_1: $Mdn_B > Mdn_D$).

The chi-square test produced a value of .962, which did not exceed the critical value required for this test on these two groups of limited area teachers. Therefore, the null hypothesis could not be rejected. The group sizes with their respective frequencies distributed about the median are presented in Table 7.

TABLE 7

NUMBER OF JUNIOR HIGH LIMITED AREA AND SENIOR HIGH LIMITED AREA TEACHER SCORES ABOVE OR BELOW THE COMBINED MEDIAN

Grade Level and Area	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
Jr. High Limited	26	(44)	33	(56)	59	(100)
Sr. High Limited	43	(58)	39	(42)	82	(100)
Totals	69		72		141	

Comparison of Junior High Multiple Area and Senior High Limited Area Group Scores

The null hypothesis for the third major hypothesis stated that the median scores of junior high school multiple area teachers and senior high school limited area teachers would be equal (H_o: $Mdn_A = Mdn_D$). The alternate hypothesis indicated that the median score of the junior high multiple area teachers would be greater than the median score of the senior high limited area teachers (H_1: $Mdn_A > Mdn_D$). The chi-square test of the group frequencies presented in Table 8 provided a value of .178. Since this value did not exceed the critical value of chi-square, the null hypothesis could not be rejected.

TABLE 8

NUMBER OF JUNIOR HIGH MULTIPLE AREA AND SENIOR HIGH LIMITED AREA TEACHER SCORES ABOVE OR BELOW THE COMBINED MEDIAN

Grade Level and Area	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
Jr. High Multiple	46	(49)	47	(51)	93	(100)
Sr. High Multiple	43	(58)	39	(42)	82	(100)
Totals	89		86		175	

Comparison of Junior High Limited Area and Senior High Multiple Area Teacher Group Scores

The null hypothesis for the fourth major hypothesis indicated that the median scores of junior high school limited area teachers and senior high multiple area teachers would be equal (H_o: $Mdn_B = Mdn_C$). The alternate hypothesis stated that the median score of junior high school limited area teachers would be less than the median score of senior high school multiple area teachers (H_1: $Mdn_B < Mdn_C$). The X^2 value for these groups was found to be .049, which did not exceed the critical value. Therefore, the alternate hypothesis for this group comparison could not be accepted because the null hypothesis was not rejected. Totals for these group scores as they range about the median are presented in Table 9.

TABLE 9

NUMBER OF JUNIOR HIGH LIMITED AREA AND SENIOR HIGH MULTIPLE AREA TEACHER GROUP SCORES ABOVE OR BELOW THE COMBINED MEDIAN

Grade Level and Area	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
Jr. High Limited	26	(44)	33	(56)	59	(100)
Sr. High Multiple	19	(47)	22	(53)	41	(100
Totals	45		55		100	

Comparison of All Junior High and All Senior High Teacher Group Scores

The null hypothesis for the fifth major hypothesis stated that the median scores of all junior high teachers and all senior high teachers would be equal (H_o: $Mdn_{A+B} = Mdn_{C+D}$). The alternate hypothesis indicated that the median score of the junior high teachers would be greater than the median score of senior high teachers (H_1: $Mdn_{A+B} > Mdn_{C+D}$). The computed X^2 value for these groups represented in Table 10 was .249, which was below the required value of chi-square. The null hypothesis was, therefore, not rejected in this test.

TABLE 10

NUMBER OF ALL JUNIOR HIGH AND ALL SENIOR HIGH TEACHER GROUP SCORES ABOVE OR BELOW THE COMBINED MEDIAN

Grade Level	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
All Junior High	72	(47)	80	(53)	152	(100)
All Senior High	62	(51)	61	(49)	123	(100)
Totals	134		141		275	

Comparison of All Multiple Area and All Limited Area Teacher Group Scores

The null hypothesis for the sixth major hypothesis indicated that the median scores of all multiple area teachers and all limited area teachers would be equal (H_o: $Mdn_{A+C} = Mdn_{B+D}$). The alternate hypothesis stated that the median score of multiple area teachers would be greater than the median score of limited area teachers (H_1: $Mdn_{A+C} > Mdn_{B+D}$).

The value of X^2 for these groups as represented in Table 11 was equal to .002, which was much less than the required value. Therefore, the null hypothesis was not rejected.

TABLE 11

NUMBER OF ALL MULTIPLE AREA AND ALL LIMITED AREA TEACHER GROUP SCORES ABOVE OR BELOW THE COMBINED MEDIAN

Teaching Area	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
All Multiple Area	65	(48)	69	(52)	134	(100)
All Limited Area	69	(49)	72	(51)	141	(100)
Totals	134		141		275	

Comparison of Teacher Groups According to the Socio-Economic Level of Their Students

Major hypothesis number seven was directed at comparing the group responses of teachers when they classified their industrial arts students according to the socio-economic level which they felt the majority of the students represented. The levels were presented on the questionnaire so that they could be categorized as upper, middle and lower socio-economic class.

The null hypothesis for this problem was stated to indicate that there was no difference between the median scores on economic statements selected by (E) teachers with upper class students or (F) teachers with middle class students or (G) teachers with lower class students (H_o: $Mdn_E = Mdn_F = Mdn_G$). The alternate hypothesis stated that these medians would not be equal (H_1: $Mdn_E \neq Mdn_F \neq Mdn_G$).

Group scores were arranged in a 2 x 3 contingency table to provide the totals which appear in Table 12. The computed X^2 value was 8.16, which was greater than the critical value of 4.60. Therefore, the null hypothesis was rejected in favor of the alternate hypothesis.

It can be concluded from these results that the way the industrial arts teacher views the socio-economic level of students in their classes has some effect upon what the teacher considers to be important outcomes for industrial arts programs. Percentages of group frequencies reveals that teachers who judge their students as upper and middle class responded much the same on this statement, whereas the teachers with lower class students showed a much lower percentage favoring these outcomes for industrial arts.

TABLE 12

NUMBER OF TEACHER GROUP SCORES ABOVE OR BELOW THE COMBINED MEDIAN WHEN ARRANGED BY STUDENT SOCIO-ECONOMIC LEVEL

Socio-Economic Level	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
Upper Class Students	11	(44)	14	(56)	25	(100)
Middle Class Students	105	(52)	90	(48)	195	(100)
Lower Class Students	17	(32	36	(68)	53	(100)
Totals	133		140		273	

Comparison of Teacher Groups According to the Size of the Classes

The eighth major hypothesis involved the comparison of teacher group scores when arranged according to the average size of their industrial arts classes. The categories of class size were ordered as those with 10-20 students, those with 21-30 students and those with over 30 students.

The null hypothesis indicated that the median scores for the teacher groups when arranged in this pattern would be equal (H_0: $Mdn_H = Mdn_I = Mdn_J$). The alternate hypothesis stated that these scores would not be equal (H_1: $Mdn_H \neq Mdn_I \neq Mdn_J$).

A 2 x 3 contingency table was developed with the scores arranged as those which were above the median and those which were at or below the median. Totals for these groups are presented in Table 13.

TABLE 13

NUMBER OF TEACHER GROUP SCORES ABOVE OR BELOW THE COMBINED MEDIAN WHEN ARRANGED BY CLASS SIZE

Class Size	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
10-20 Students	42	(46)	48	(54)	90	(100)
21-30 Students	80	(53)	69	(47)	149	(100)
31 Students or More	7	(28)	18	(72)	25	(100)
Totals	129		135		264	

The computed X^2 value for these groups was 5.92. This value was greater than the required value of 4.60, with 2df at the .05 level of significance. The null hypothesis was, therefore, rejected and the alternate hypothesis accepted for this comparison test of teacher groups.

These results suggest that industrial arts teachers with larger classes--31 or more students--do not show as much acceptance as teachers with less than 31 students of outcomes associated with developing economic competence through industrial arts.

Comparison of Teacher Groups According to the Number of Years of Teaching Experience

Major hypothesis number nine was directed at determining whether there was a difference in the median scores of teachers on the conomic statements when they were grouped according to the number of years they had been teaching. Five age groupings were formed in order to make the comparison. The null hypothesis stated that the group medians would be equal (H_o: $Mdn_K = Mdn_L = Mdn_N = Mdn_P$). The alternate hypothesis was presented as the opposite of this condition

(H_o: $Mdn_K \neq Mdn_L \neq Mdn_M \neq Mdn_N \neq Mdn_P$).

Table 14 lists the 5 groups with the totals in the form of a 2 x 5 contingency table. Chi-square computed with these totals provided a value of 6.17. This value was less than the required value of 7.78, with 4df at the .05 level of significance. Therefore, the alternate hypothesis could not be accepted.

TABLE 14

NUMBER OF TEACHER GROUP SCORES ABOVE OR BELOW THE COMBINED MEDIAN WHEN ARRANGED BY YEARS OF TEACHING EXPERIENCE

Number of Years	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
1-3 Years	34	(63)	20	(37)	54	(100)
4-6 Years	24	(40)	36	(60)	60	(100)
7-10 Years	32	(48)	34	(52)	66	(100)
11-15 Years	21	(49)	22	(51)	43	(100)
16 Years or More	21	(47	23	(53)	44	(100)
Totals	132		135		267	

Comparison of the Secondary Level Industrial Arts Teacher and the Industrial Arts Teacher Educator Group Scores

The tenth hypothesis to be tested was concerned with comparing the combined scores of all the secondary level industrial arts teachers with those of the group of industrial arts teacher educators. The null hypothesis for this test stated that there would be no difference in the median scores for these two groups (H_o: $Mdn_{A+B+C+D} = Mdn_X$).

In order to compare these two groups, their scores had to be combined to provide a common median score. The new median was found to be 34. The resulting group totals were cast in a 2 x 2 contingency table. It was observed that the teacher educator group had no scores at or below the combined median of 34. Therefore, it was apparent that the group medians were not equal. This observation was further supported by the computed median score of 40.50 for the teacher educator group as compared

with the median of 33 for the industrial arts teachers. Therefore, the null hypothesis was rejected in favor of the alternate hypothesis of unequal medians.

Non-Hypothesized Group Relationships

Several descriptive factors appeared on the questionnaire for which no hypotheses were formulated. Computation for the major hypotheses suggested the possibility of making several other types of group comparisons. These non-hypothesized factors are described here with their related chi-square values.

Comparison of Teacher Groups According to Teacher Ages

The 275 respondents were grouped according to their ages. Five age groupings were formed with the scores arranged as those above the total median and those which were at or below that median. The resulting 2 x 4 contingency table is illustrated as Table 15.

The chi-square test was used to determine whether or not the medians of these groups were equal. The computed X^2 provided a value of 2.20, which was less than the required value of 6.25. Therefore, it was concluded that these medians were equal.

It was observed that some variation in responses existed between the youngest age group (20-30 years old) and the second group (31-40 years old). When considering the possibility that the teacher age groupings might vary in a similar manner as the teaching experience groupings, a test of these first two age groups seemed to be quite appropriate. A 2 x 2 table was developed to test the possibility of a

significant difference. The computed X^2 value was found to be only .863, which was much less than the necessary amount. It was obvious from this that such differences did not exist.

TABLE 15

NUMBER OF TEACHER GROUP SCORES ABOVE OR BELOW THE MEDIAN WHEN ARRANGED ACCORDING TO TEACHER AGE

Teacher Age	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
20-30 Years	50	(53)	44	(47)	94	(100)
31-40 Years	47	(46)	54	(54)	101	(100)
41-50 Years	21	(46)	25	(54)	46	(100)
50 Years and Over	13	(40)	20	(60)	33	(100)
Totals	131		143		274	

Comparison of Teacher Groups According to the Institution Where the Bachelor's Degree was Earned

The total population sampling of Michigan industrial arts teachers produced a distribution of teachers who had earned bachelor's degrees from a number of universities in the State of Michigan. Six of these schools of higher education were represented in sufficient numbers to permit the testing of differences between the teacher groups representing the schools. Table 16 lists the six schools which were considered. A total of 210 teachers in the population sampling attended these institutions. The remaining 65 teachers were from other schools, which were not represented in sufficient numbers to be included in the test.

A 2 x 6 contingency table was used to arrange the group totals for a chi-square test. The computed value of X^2 was 10.20. This was higher than the critical value of 9.24 with 5df at the .05 level of significance. It was concluded from this test that there was a significant difference in the median scores of teacher groups which represented 6 major degree granting institutions in the State of Michigan.

TABLE 16

NUMBER OF TEACHER GROUP SCORES ABOVE OR BELOW THE MEDIAN WHEN ARRANGED ACCORDING TO THE INSTITUTION GRANTING THE BACHELOR'S DEGREE

Institution	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
Eastern Mich. Univ.	24	(71)	10	(29)	34	(100)
Western Mich. Univ.	24	(42)	33	(58)	57	(100)
Central Mich. Univ.	17	(46)	18	(54)	35	(100)
Northern Mich. Univ.	9	(35)	17	(65)	26	(100)
Michigan State Univ.	15	(48)	16	(52)	31	(100)
Wayne State Univ.	11	(41)	16	(59)	27	(100)
Totals	100		110		210	

In order to illustrate the extent and direction of these differences, the means of the group scores were computed. These means are presented in Table 4. Ranking of the means showed that the teacher group representing Eastern Michigan University had a higher mean ($\bar{X}$ = 36.15) than any of the other five groups. The greatest difference appeared between the groups from Eastern Michigan University and that from Northern Michigan University, which had a mean score of 29.96.

Comparison of Teacher Groups According to the Number of Years Teaching Experience

The major hypothesis concerning years of teaching experience produced a value of chi-square which was not significant when all of the 5 levels of experience were considered together. In studying the individual group totals, it appeared that a rather large difference existed between the first group (teachers with 1-3 years of experience) and the second group (teachers with 4-6 years of experience). Therefore, a 2 x 2 contingency table was developed to test this condition. Table 17 lists the values for these 2 groups.

TABLE 17

NUMBER OF TEACHER GROUP SCORES ABOVE OR BELOW THE MEDIAN FOR TEACHERS WITH 1-3 YEARS AND 4-6 YEARS EXPERIENCE

Years Experience	Above Mdn. N	%	At or Below Mdn. N	%	Totals N	%
1-3 Years	34	(63)	20	(37)	57	(100)
4-6 Years	24	(40)	36	(60)	60	(100)
Totals	58		56		114	

Chi-square was computed and a value of 5.98 was established. With 1df at the .05 level of significance, this value exceeded the critical value. It could be concluded from these results that the willingness of teachers to accept the behavioral outcomes for industrial arts which relate to the economic objectives of education is reduced rather drastically after the initial years of experience.

Item Analysis of the Behavioral Statements

Teacher sub-groups were compared in their responses to each individual item on the survey instrument. This was done to determine in specific terms the kinds of things teachers favored as outcomes for industrial arts and whether or not the nature of a particular teaching situation might affect such choices to any extent.

In this section each behavioral item is treated in terms of the responses made to it by the several groups of teachers and the panel of industrial arts teacher educators. Chi-square tests were made on those items where frequency of responses showed a possibility for teacher group differences.

Effects of Grade Level and Area of Teaching Variables

The sub-groupings of junior-senior high school, and limited area-multiple area teachers were compared for individual item responses. A 2 x 4 contingency table with the total number of favorable (D and P) and unfavorable (R and N) responses was used to determine whether or not significant differences existed.

Chi-square values for all of the behavioral items are listed in Table 18. Seven of the 45 statements provided significant values of chi-square. These were items 16, 18, 19, 20, 28, 36, and 43. Values of X^2 were considered significant at 6.25 with 3df at the .05 level of significance.

TABLE 18

CHI-SQUARE VALUES ON INDIVIDUAL ITEMS WHEN COMPARING TEACHER GROUPS BY GRADE LEVEL AND AREA

Item Number	X^2 Value	Item Number	X^2 Value
1	.36	24	1.22
2	3.23	25	2.40
3	5.86	26	1.33
4	NC*	27	2.91
5	NC	28	7.17
6	NC	29	NC
7	NC	30	4.14
8	NC	31	NC
9	NC	32	2.60
10	NC	33	2.99
11	NC	34	.81
12	1.87	35	6.19
13	4.52	36	6.64
14	NC	37	5.04
15	NC	38	NC
16	8.25	39	2.61
17	NC	40	3.99
18	11.49	41	NC
19	6.65	42	NC
20	10.00	43	9.16
21	2.95	44	NC
22	NC	45	5.92
23	1.76		

*Not computed. When 20% or more of the cells in the 2 x 4 table had values of less than 6, no chi-square was computed as it could not be considered valid.

Those 7 items which showed significant values of chi-square are discussed individually in the following sections.

Assessing Factors Which Give a Vocation Value.--A significant value of chi-square for item 16 showed that a difference existed between the responses of 4 groups of teachers on this topic. This item stated that, "the student will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the

financial returns it provides for the worker." Table 19 presents the values for the teacher group responses.

TABLE 19

TEACHER GROUP RESPONSES TO THE STATEMENT ON ASSESSING FACTORS WHICH GIVE A VOCATION VALUE

Teacher Group	Favorable Responses* N	%	Unfavorable Responses** N	%	Totals N	%
Jr. High Mult.	59	(65)	34	(35)	93	(100)
Jr. High Lim.	36	(61)	23	(39)	59	(100)
Sr. High Mult.	32	(78)	78	(22)	41	(100)
Sr. High Lim.	64	(78)	18	(22)	82	(100)
Totals	191		84		275	

*Favorable responses were indicated by the teacher's choice of a "D" or "P" on the questionnaire.

**Unfavorable responses were indicated by the teacher's choice of a "R" or "N" on the questionnaire.

It was noted in the column values that both senior high teacher groups had higher percentages than the junior high teachers in favor of the statement as an outcome for industrial arts.

Describing the Purposes of Vocational Education.--Item 18 proposed that "the student will be able to describe the purposes of post high school vocational education." Group responses to this statement as shown in Table 20 indicate that the senior high groups showed very similar percentages in favor of this an an outcome--both of which were higher than the junior high groups. The X^2 value of 11.49 was the highest value for any of the individual items on the questionnaire.

TABLE 20

TEACHER GROUP RESPONSES TO THE STATEMENT ON DESCRIBING THE PURPOSES OF VOCATIONAL EDUCATION

Teacher group	Favorable Responses N	%	Unfavorable Responses N	%	Totals N	%
Jr. High Mult.	69	(74)	24	(26)	93	(100)
Jr. High Lim.	35	(59)	24	(41)	59	(100)
Sr. High Mult.	33	(81)	8	(19)	41	(100)
Sr. High Lim.	69	(84)	13	(16)	82	(100)
Totals	206		69		275	

Comparing Selected Factors for Vocations in Industry.--The senior high limited area teacher group favored item 19 above the other 3 groups. It stated that, "the student will be able to compare factors of salaries, working conditions and job requirements for vocations in industries." Table 21 provides the values for comparing these 4 groups on this item.

TABLE 21

TEACHER GROUP RESPONSES TO THE STATEMENT ON COMPARING SELECTED FACTORS FOR VOCATIONS IN INDUSTRY

Teacher Group	Favorable Responses N	%	Unfavorable Responses N	%	Totals N	%
Jr. High Mult.	58	(64)	35	(36)	93	(100)
Jr. High Lim.	39	(66)	20	(34)	59	(100)
Sr. High Mult.	24	(58)	17	(42)	41	(100)
Sr. High Lim.	64	(78)	18	(22)	82	(100)
Totals	185		90		275	

Performing Basic Engine Servicing Operations.--In contrast to the other statements which provided a significant value of X^2, the responses of junior high limited area teachers on item 20 were higher in the percentage favoring it than the other groups. This item stated that, "the student will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine." Table 22 lists the group responses to this statement.

TABLE 22

TEACHER GROUP RESPONSES TO THE STATEMENT ON PERFORMING BASIC ENGINE SERVICING OPERATIONS

Teacher Group	Favorable Responses N	%	Unfavorable Responses N	%	Totals N	%
Jr. High Mult.	69	(74)	24	(26)	93	(100)
Jr. High Lim.	52	(88)	7	(12)	59	(100)
Sr. High Mult.	33	(81)	8	(19)	41	(100)
Sr. High Lim.	64	(78)	18	(22)	82	(100)
Totals	218		57		275	

Recognizing the Advantages in Tested and Approved Products.--Both limited area teacher groups expressed greater approval than the multiple area groups for item 28. This item stated that, "the student will be able to recognize the advantages in purchasing products which have been tested and approved by federal and private research laboratories." Table 23 illustrates the values for the 4 teacher group responses on this item.

TABLE 23

TEACHER GROUP RESPONSES TO THE STATEMENT ON RECOGNIZING THE ADVANTAGES OF TESTED PRODUCTS

Teacher Group	Favorable Responses N	%	Unfavorable Responses N	%	Totals N	%
Jr. High Mult.	59	(64)	34	(36)	93	(100)
Jr. High Lim.	48	(81)	11	(19)	59	(100)
Sr. High Mult.	28	(66)	13	(34)	41	(100)
Sr. High Lim.	63	(77)	19	(23)	82	(100)
Totals	198		77		275	

Illustrating the Sources for Basic Raw Material Used in Community Industries.--Differences in teacher group responses to item 36 though they existed, did not appear to coincide with any hypothesis which might be formulated along the lines of grade level or area of teaching. This item stated that, "the student will be able to illustrate, by using examples, the sources for basic items and raw materials used in industrial operations in the community."

The junior high limited area teacher group and senior high multiple area teacher group each had the same percentages favoring this outcome for industrial arts. Table 24 illustrates the totals which resulted.

TABLE 24

TEACHER GROUP RESPONSES TO THE STATEMENT ON ILLUSTRATING THE SOURCE FOR THE RAW MATERIALS OF INDUSTRY

Teacher Group	Favorable Responses N	%	Unfavorable Responses N	%	Totals N	%
Jr. High Mult.	74	(80)	19	(20)	93	(100)
Jr. High Lim.	39	(66)	20	(34)	59	(100)
Sr. High Mult.	27	(66)	14	(34)	41	(100)
Sr. High Lim.	66	(81)	16	(19)	82	(100)
Totals	206		69		275	

Identifying the Changes and Trends in Production Methods.--The last item on the survey to show a significant value of X^2 on group comparisons was number 43. This item stated that, "the student will be able to identify the changes and trends in production methods resulting from the use of research findings." Neither junior high group showed a strong direction of preference on this item as they showed a nearly equal number of responses favoring and disfavoring the statement.

The senior high school groups differed so that the senior high limited area teachers were much more in favor of the item than the senior high multiple area teachers. The latter group showed the lowest percentage of teachers preferring the item as an outcome for industrial arts. These differences can be seen in Table 25.

TABLE 25

TEACHER GROUP RESPONSES TO THE STATEMENT ON IDENTIFYING THE CHANGES AND TRENDS IN PRODUCTION METHODS

Teacher Group	Favorable Responses N	%	Unfavorable Responses N	%	Totals N	%
Jr. High Mult.	48	(52)	45	(48)	93	(100)
Jr. High Lim.	29	(49)	30	(51)	59	(100)
Sr. High Mult.	13	(32)	28	(68)	41	(100)
Sr. High Lim.	49	(60)	33	(40)	82	(100)
Totals	139		136		275	

Comparison of Industrial Arts Teacher and Teacher Educator Responses on Each Item

An item analysis was also made to compare the responses of the industrial arts teachers as a combined group with the panel of leaders in industrial arts teacher education. The intent in this analysis was to determine if there was any particular direction to the choice preferences for these two groups. The degree of acceptance by either or both groups could be observed for each item on the survey instrument. Table 26 presents the respective values for these 2 groups in terms of the percentages of those persons who made a favorable choice ("D" or "P") on the four-choice behavioral outcome scale.

TABLE 26

PERCENTAGES OF INDUSTRIAL ARTS TEACHERS AND TEACHER EDUCATORS FAVORING INDIVIDUAL BEHAVIORAL ITEMS

Item	Percentage of Teacher Educators	Percentage of Secondary Teachers	Item	Percentage of Teacher Educators	Percentage of Secondary Teachers
1	75	75	24	88	83
2	63	30	25	100	54
3	100	42	26	63	30
4	100	100	27	100	49
5	63	97	28	75	72
6	100	99	29	100	100
7	100	98	30	75	48
8	75	95	31	100	88
9	75	89	32	88	40
10	100	77	33	100	57
11	100	87	34	88	62
12	100	32	35	100	76
13	100	47	36	100	75
14	88	92	37	100	49
15	100	91	38	100	93
16	88	69	39	37	26
17	88	99	40	100	82
18	75	75	41	100	91
19	100	68	42	88	96
20	88	43	43	100	50
21	88	80	44	100	88
22	100	94	45	100	77
23	100	78			

This method of comparing individual item responses revealed that the teacher educators and secondary industrial arts teachers had nearly the same percentage of responses favoring 20 of the 45 behavioral items These items were:

1. The student will be able to identify industrial employment trends in the community.

4. The student will be able to work effectively with a group.

6. The student will be able to make simple sketches of objects.

7. The student will be able to measure with rules, gages, and meters.

11. The student will be able to make a report on the results of his work with clarity and simplicity.

14. The student will be able to disassemble, clean, adjust and reassemble an article according to the manufacturer's directions.

15. The student will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory.

17. The student will be able to work effectively and efficiently under supervision.

18. The student will be able to describe the purposes of post high school vocational education.

21. The student will be able to identify factors which contribute to a worker's economic problems, such as a lack of basic education, and the increasing demands of technology.

22. The student will be able to work effectively and efficiently when alone.

24. The student will be able to judge the quality of a product on the basis of how it satisfies the rules of design.

28. The student will be able to recognize the advantages in purchasing products which have been tested and approved by federal or private research laboratories.

29. The student will be able to demonstrate safe work habits.

31. The student will be able to estimate volume, area, quantity, and dimensions.

38. The student will be able to follow operating instructions when tooling-up and using machinery.

39. The student will be able to describe the physical, emotional, and psychological effects of repetitive operations on the human being.

41. The student will be able to interpret the information used for describing an operational procedure.

42. The student will be able to keep personal possessions in adequate repair.

44. The student will be able to judge his performance in work activities on the basis of his own capabilities.

Of these 20 items, number 39 appeared to be favored by a very small number in both groups in nearly the same percentages. This could be interpreted as a rejection of the item by both groups.

Almost all of the remaining 25 behavioral items were favored by the industrial arts teacher educator group over the secondary level teacher group. For some of these items the differences in percentage of favorable responses would suggest that significant differences in belief as to what should be achieved in industrial arts exists.

The items which were favored by the industrial arts teacher educators over the secondary industrial arts teachers were:

2. The student will be able to describe the requirements for adequate distribution of goods.

3. The student will be able to describe and compare the organizational structure of large and small industrial firms.

10. The student will be able to judge the value of work as it satisfies the intellectual needs of man.

12. The student will be able to define the major purposes of national labor unions.

13. The student will be able to describe the role of management in industry.

16. The student will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the financial returns it provides for the worker.

19. The student will be able to compare the factors of salaries, working conditions and job requirements for vocations in industries.

20. The student will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine.

23. The student will be able to judge the value of work as it satisfies the physical needs of man.

25. The student will be able to describe the occupational changes resulting from developments in electronics, automation, cybernetics, and atomic power.

26. The student will be able to discuss the effects of market research on production.

27. The student will be able to present examples of the achievements of science and technology in discovering new sources for and new forms of raw materials.

30. The student will be able to describe the affects of an imbalance in the supply and demand of goods and services.

32. The student will be able to describe the role of labor unions in our economy.

33. The student will be able to describe the phases of production from product design to packaging.

34. The student will be able to judge the value of work as it satisfies the social needs of man.

35. The student will be able to use appropriate technical terminology to communicate with other persons while working to solve technical problems.

36. The student will be able to illustrate, by using examples, the sources for basic items and raw materials used in industrial operations in the community.

37. The student will be able to describe the work structure in local industries in terms of job activities and job relationships.

40. The student will be able to indicate his own aptitudes and abilities for work in the industrial-technical areas.

43. The student will be able to identify the changes and trends in production methods resulting from the use of research findings.

45. The student will be able to define and compare quantity production and custom production methods used by industry.

In this list of 22 statements of behavioral outcomes for industrial arts, items 2, 26, and 30 might be considered as not having the strong support of either group. These items were all concerned with rather complex economic concepts associated with the production and distribution of goods.

The only behavioral statements in the list of 45 which were selected by the industrial arts teachers over the teacher educators were the following:

5. The student will be able to make simple electrical repairs on household items, such as lamps, extension cords, and appliances.

8. The student will be able to select products for purchase on the basis of the comparative information he obtains, such as cost and quality of construction.

9. The student will be able to select appropriate lubricants, abrasives, and cleaning solutions used in cleaning and protecting household goods and equipment.

All three of these statements referred to consumer activities having to do with either purchasing or maintaining goods.

Conclusions on the Item Analysis

The nature of the secondary teacher group responses on the 7 behavioral statements, which provided a significant value of X^2, did not suggest a major trend in direction. There were a number of observations to be made when the items were grouped according to the 4 major economic life-activity areas of occupational choice, work, consumer activity and making economic analyses.

Three of the 7 items (no's 16, 18 and 19) expressed a concern for the process of occupational choice. In all 3 cases the senior high limited area teacher group indicated the highest percentage of approval for these statements. On 2 of these items (no's 16 and 18), both senior high groups indicated greater approval than the junior high groups.

Two of the 7 items (no's 20 and 28) were related to consumer activities. For both of these items the junior high limited area teacher group indicated greatest approval.

The remaining 2 items (no's 36 and 43) of the 7 were associated with the process of making economic analyses of industrial activities. The senior high limited area teacher group provided the highest percentage of approval on these items.

The analysis of items involving the comparison of all secondary teacher responses with the teacher educator responses suggested 2 major conclusions: (a) The teachers and teacher educators indicated about the same degree of approval on items which in most instances described basic work functions and consumer activities, and (b) the teacher educators favored above the teachers a large group of items which represented concern for the process of making economic analyses.

Summary

The responses of the 275 Michigan industrial arts teachers and 8 prominent industrial arts teacher educators who returned questionnaires were analyzed and reported in this chapter. Measures of the mean and median for teacher group scores, and percentages of responses were used to make between-group comparisons of teacher responses. Chi-square tests of significance were used to test 10 major hypotheses about the medians of the several sub-groups of teachers. All tests were made at the .05 level of significance. Individual items on the questionnaire were also analyzed for differences in teacher sub-group responses.

Scoring of the secondary industrial arts teacher returns provided a total mean of 32.70 and a median of 33 on a scoring scale where the maximum possible score was 45. Similar scoring of the industrial arts teacher educator returns resulted in a mean of 40.60 and a median of 40.50.

Tests of the 6 hypotheses involved the comparing of medians for teacher groups arranged according to grade level and area of teaching. No significant values for X^2 were obtained for these tests. Two-by-two contingency tables were used to compare the groups of junior and senior high, multiple area and limited area teachers. A critical value of 2.71 for X^2 was required for the 2-tailed test.

A significant value of X^2 was obtained for the hypotheses test involving the comparison of teacher groups which were arranged according to the socio-economic level of their students. This value of X^2 was 8.15, which exceeded the critical value of 4.60 with 2 degrees of freedom. A conclusion from this test is that the socio-economic status of students, especially where lower class students are concerned, affects the perception teachers have of what should be achieved in industrial arts classes. The direction of the teacher scores showed that teachers of the lower socio-economic students accepted fewer of the outcomes than the teachers of middle or upper class students.

The comparison of medians for teacher groups arranged according to the average number of students in the industrial arts classes resulted in a value of X^2 equal to 5.91. This was also a significant value. It could be concluded that the size of an industrial arts teacher's classes also affect his perception of goals that should be sought in industrial arts. The direction of the scores in this test indicated that teachers of classes over 30 in number accepted fewer of the behavioral outcomes than the 2 groups of teachers with class sizes ranging from 10-20 and 21-30.

The median test for teacher groups which were arranged by years of teaching experience provided a value of chi-square equal to 6.17. This was less than the value required for a 2 x 5 contingency table. When the

first 2 groups were compared, though, a value of 5.98 resulted. The direction of scores for these 2 groups alone showed that teachers with less than 4 years of experience accepted the greater number of behavioral outcomes for industrial arts. The conclusion from this might be that experience in teaching alters significantly the perception the teacher has of the role of industrial arts.

The analysis of the individual items on the questionnaire, as it involved the comparison of teacher groups arranged by grade level and area, provided a significant value of chi-square on 7 of the 45 items. It might be concluded from this, as well as the test of hypotheses concerning group scores, that the grade level (junior or senior high) and the area of teaching (multiple or limited area) do not affect in a significant way the perception of industrial arts teachers toward the kinds of outcomes on economic behavior which should be achieved in industrial arts.

Tests on non-hypothesized factors included comparison of teacher age groups as well as groupings arranged by graduating institutions. No significant value of X^2 was found for the age groupings. Comparison of the groups formed by the institutions which granted the teachers bachelor's degrees did provide a significant value though. A value of 10.20 for X^2 indicated that the medians for the teacher groups representing 6 universities in the State of Michigan were not equal. Teachers with degrees from Eastern Michigan University had the highest percentage of scores above the median.

The analysis of industrial arts teacher educator responses on the individual behavioral statements, when compared with the secondary teachers, showed that teacher educators and teachers had the same

percentage of favorable responses on 20 of the statements. Teacher educators had a higher percentage of favorable responses on 22 of the behavioral statements. The secondary teachers had a higher percentage of favorable responses on only three of the statements. It could easily be concluded from this analysis, the comparison of mean scores and the chi-square that the teacher educators were much more accepting of the economic behavioral statements than the secondary level teachers.

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CHAPTER VI

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Summary

The achievement of economic competence by the individual stands as one of the major concerns in this society. The increasing complexity of economic problems today calls for the clarification of how every facet of modern educational curricula contribute to the achievement of the objectives of economic efficiency. This study was directed at the problem of clarifying the role of industrial arts in the achievement of these objectives.

The proper interpretation of man's industrial activities in the industrial arts program involves not only a description of the processes of production, but should recognize man in his relationship with industry. This relationship involves him in such economic life-activities as (a) choosing an occupation, (b) performing the work function, (c) conducting consumer functions, and (d) making analyses of economic conditions. These are economic areas of life in which the individual must become competent.

In a review of literature a number of authors stated that the most functional educational objectives are those which describe the kind of performance that is to be expected of the learner. These statements of behavior are the operational form of the broader objectives of education. The first purpose of the study was, therefore, to present an

operational definition of the objectives of economic efficiency for industrial arts through a description of the kind of student behaviors to be achieved.

Nerbovig emphasized that educational goals become effective to the extent that teachers perceive the goals as appropriate for their programs. The way teachers perceive goals is the final indicator of whether the goals are used to direct their programs.

It was proposed that teachers perceive goals as appropriate for their programs in different ways, because of the nature of their teaching situation or their own professional status. Two other purposes of this study were based upon this proposal. One of these two was to determine whether selected groups of high school industrial arts teachers had significantly different perceptions of behavioral statements related to the objectives of economic efficiency. The other purpose was directed at determining whether the teacher perceptions differed from those of a select panel of leaders in industrial arts teacher education.

The assumptions of this study were that objectives of economic efficiency are an important concern for secondary education, including industrial arts. Also, behaviors related to the achievement of these objectives are primarily learned behaviors which can be assessed in terms of their educative value. Finally, teachers perceive a particular role for their subject area in the behaviors they believe should be manifested by it.

This study was delimited to a description of behavioral outcomes which relate to the achievement of the objectives of economic efficiency. No attempt was made to describe specific learning experiences associated with these outcomes.

A study of literature in economics, sociology, secondary education, guidance and industrial education provided guidelines for determining student needs associated with achieving economic competence. From these needs were derived 52 statements on learner behaviors to be achieved in industrial arts when working toward the objectives of economic efficiency.

Subject area specialists representing economics, sociology, secondary education, guidance and industrial education were used as resource persons in assessing the adequacy of the statements as behaviors to be achieved in industrial arts. A list of 45 behavioral statements resulted from their evaluation.

A questionnaire was developed to include the final list of 45 statements on economic behavior. This questionnaire was structured to gather industrial arts teacher responses on the appropriateness of the individual statements for use in industrial arts. Two pilot tests were run before the finished questionnaire was distributed to a sampling of secondary level industrial arts teachers.

The population sampling which received the questionnaire included a total of 397 Michigan industrial arts teachers. This sampling was selected at random from the membership of the Michigan Industrial Education Society for the year 1966-67.

Grouping of the teacher sampling was used to provide a means for comparing teacher responses on the questionnaire in terms of certain variables associated with the teaching situation or teacher status. These groups were arranged according to grade level, area of teaching, socio-economic level of students, class size and teaching experience. Research hypotheses were formulated to consider these grouping arrangements. Additional grouping was done to consider teacher age and the name of the

institution where the teacher earned the bachelor's degree. No hypotheses were developed for these last two grouping arrangements.

A total of 84 percent of the teacher sampling returned the questionnaires. These returns were coded and scored. A high score was judged as indicating greatest approval of the statements as behaviors to be achieved in industrial arts.

The chi-square median test and computed percentage values on group scores were used to test ten major hypotheses and to make comparisons of teacher group scores. Hypothesized differences were found to be not significant when teacher group scores were arranged according to grade level, area of teaching and years of teaching experience. Significant values of X^2 were obtained at the .05 level of significance when teachers were grouped according to student socio-economic level and industrial arts class size. A study of the direction of the scores in these two grouping arrangements showed that teachers of lower socio-economic students and teachers with classes of 31 or more students had lower group scores than other teacher groups.

Non-hypothesized tests of significance were made with teacher group scores arranged according to teacher age and the institution from which the teacher earned the bachelor's degree. Significant values of X^2 were not obtained for groups arranged according to teacher age. A significant value of X^2 resulted from the test of groups from different institutions. Teachers who received their bachelor's degree from Eastern Michigan University had a significantly higher group score than teachers who received degrees from five other universities in the State of Michigan.

The scores of a panel of eight leaders in industrial arts teacher education were computed by means similar to that for industrial arts

teachers. All of these eight scores were above the combined median score for industrial arts teacher and teacher educators, and, therefore, considered to be significantly higher than the scores of the industrial arts teachers.

An individual item analysis compared group responses on each of the 45 behavioral statements. Teachers were grouped for this analysis according to grade level and area of teaching. Significant values of X^2 were found on 7 of the 45 statements when teachers were grouped in this manner. Percentage of favorable responses on individual items were computed for all teachers combined and compared with responses of teacher educators. These two groups showed similar percentages of favorable responses on 25 of the 45 items. The teacher educators showed higher percentages of favorable responses than the secondary level teachers on 22 of the items, whereas the teachers favored only three of the items over the teacher educators.

Conclusions

The analysis of data from the survey on how Michigan industrial arts teachers perceive the role of industrial arts in the achievement of objectives of economic efficiency has resulted in the following conclusions:

1. Teaching at the junior high or senior high level does not affect how the teacher perceives the role of industrial arts in the achievement of the objectives of economic efficiency.
2. Teaching in a multiple area or limited area situation does not affect how the teacher perceives the role of industrial arts in the achievement of the objectives of economic efficiency.

3. Teachers of lower socio-economic class students perceive the role of industrial arts in the achievement of objectives of economic efficiency as less important than teachers of middle or upper class students.
4. Teachers with very large classes (averaging 31 or more) perceive the role of industrial arts in the achievement of objectives of economic efficiency as less important than teachers with medium size or small classes (less than 31 students).
5. Teachers in the early years of their teaching careers (1-3 years) perceive the role of industrial arts in the achievement of the objectives of economic efficiency as more important than teachers who have taught for a greater number of years (more than 3 years).
6. Teachers who received their bachelor's degree from Eastern Michigan University perceive the role of industrial arts in the achievement of the objectives of economic efficiency as more important than teachers who earned degrees from other universities in Michigan.
7. Secondary level teachers generally perceive the role of industrial arts in the achievement of the objectives of economic efficiency as less important than leaders in industrial arts teacher education.

Implications and Recommendations

There appears to be quite a difference in how industrial arts teachers perceive the role of their subject area in providing for the development of economic competence. The distribution of teachers scores on the survey instrument illustrates this condition. The variables used in this study did not reveal all of the reasons why teachers in the sample differ so much on their selection of behaviors to be achieved in industrial arts. It is very likely that variables other than grade level and area of teaching need to be considered.

It should be noted that teachers who work with large numbers of students from lower socio-economic environments apparently limit the range of the goals used to guide their programs. Goal selection in this case must be based upon something other than the needs of students for developing economic competence. It also appears that teachers in the beginning years of their teaching careers are more open to the use of a broad range of economic goals for their subject area than are teachers with several years of experience. The data may also have been suggesting that teachers who are recent graduates of universities in Michigan more readily accept the objectives of economic efficiency than do past graduates of these schools. A shift in philosophical orientation may be in evidence if this condition exists.

The analysis of individual behavioral statements was made with the teachers grouped according to grade level and area of teaching. The fact that only 7 of the 45 statements provided significant values of X^2 when group responses were compared, is further evidence that these variables were not highly important. It was found, though, that senior

high school teachers responded more favorably than junior high school teachers to statements which referred to vocational planning. This might suggest that senior high teachers are more concerned with this aspect of the industrial arts program than are junior high teachers.

Since the industrial arts teacher educators expressed greater approval of the behavioral statements than the secondary level teachers, it appears that there is quite a difference in the thinking at these two levels. The item analysis revealed that these two groups differed most on those statements involving the making of economic analyses. Since these statements generally involved complex theoretical concepts, teachers may have felt that they were unrealistic. Or, it may have been that the teachers had less of an orientation to the ideas in these statements than to those associated with work or consumer activities. A number of implications for secondary level and teacher education programs in industrial arts appear from this analysis.

Every attempt should be made in industrial arts programs to relate the concepts and learning activities associated with developing economic competence to real life situations. Subject matter that describes current occupational structures, work patterns, consumer problems and economic conditions must be brought into the daily experiences of the secondary student. A large number of resources are available for the industrial arts teacher who is truly concerned with having his program represent relevant life experiences in these economic areas. Many of the existing industrial arts curriculum materials and teaching methods that direct attention to "busy" activities of limited scope can be replaced by material and methods that develop a more complete awareness of life problems.

Evidence in this study points to the possibility that study materials associated with economic activities like occupational planning and consumer functions should be an integral part of the industrial arts program. Too often these things have been presented as supplementary materials, and are therefore more often than not left out of the program entirely. Just as naturally, the materials associated with making economic analyses of industrial activities can be a regular component of industrial arts subject matter. Many of the concepts in this economic area are the basis for the industrial processes which are most typically studied in present industrial arts programs. The proper study of man's industry should include these economic concepts.

The junior high grades can be used quite readily to introduce learning experiences for the development of behaviors to achieve economic competence. For example, broad orientation experiences that reflect the structure of the industrial organization and the nature of occupations can help to lay the ground-work for some of the decision-making processes that must occur in the later grades. Individual and group activities can be used to focus the learner's attention on work processes and his own ability and capacity for certain types of work.

Senior high school industrial arts programs can provide for learning the more complex behaviors associated with developing economic competence. The exploratory concept is still important in these grades and should be continued, but attention must be increasingly focused on the direction of experiences. On completion of the senior year in high school, a student should be quite aware of his achievements in his efforts to become economically competent.

One of the points emphasized in this study was that development of behavioral goals for industrial arts to achieve economic competence involves a description of subject matter concepts closely associated with economics, sociology and guidance. If the task of developing these objectives is to be completed, the industrial arts teacher must have both an awareness of the need for and the ability to work with teachers from these other subject areas. Curriculum planning that brings these related subject areas together would provide a means by which the over-arching concepts related to creating efficient economic behavior might evolve into meaningful learning experiences. A simple redesign of subject matter may not be enough in this effort though. It may also be necessary to create quite a different teaching-learning environment. This would call for a total analysis of conditions needed for learning the concepts identified by subject area specialists.

Teacher education institutions carry a share of the responsibility for directing events in secondary education. One of the implications for industrial arts teacher education that appears from the findings in this study concerns leadership for curriculum change. Much of the innovation for change and progress in education should come from the teacher education institutions. If a reemphasis in the kinds of objectives to be sought in industrial arts is to occur, a proper theoretical base must be laid in these universities and colleges. An analysis of major educational objectives will have to be conducted to derive a description of desirable student behaviors similar to those presented in the study.

The teacher education programs must provide professional study experiences in the analysis of educational materials to derive objectives

for teaching. It would seem that if this is to be accomplished, these programs would themselves have to demonstrate how a coordinated effort can be extended to analyze subject matter and to describe educational needs of learners.

Several recommendations for further study and development on the problem of the role of industrial arts in the achievement of the objectives of economic efficiency are presented here as:

1. Industrial arts teacher education programs should be developed to permit the careful analysis and study of operational or behavioral goals for the classroom teacher.
2. Further analysis of the behavioral statements presented in this study should be made to determine the level of education at which certain goals might be achieved.
3. Resource specialists from other subject areas should be used to assist in the process of describing and assessing goals for industrial arts.
4. Variables such as school budget factors, conditions of teaching facilities and levels of administrative support should be used in the study of how teachers perceive the role of industrial arts.
5. Further analysis of the variables used in this study should be made on the 45 individual items. Since only 7 of the 45 items proved to reflect significant differences in perceptions of teachers grouped according to the variables of grade level and area of teaching, other variables would likely show some effect.

6. Studies should be conducted on the relationship of how teachers perceive the role of their subject area and the nature of their own teaching.
7. An attempt should be made to determine whether and how teacher perceptions of their subject area role change with a change in teaching situation.

The most significant outcome of this study seems to be that industrial arts teachers in Michigan differ a great deal in how they perceive the role of their subject area. This fact may indicate that there is a lack of consistent direction in industrial arts programs in the State of Michigan. Therefore, the last recommendation from this study is that a concerted effort be extended to describe a desirable direction and to provide teachers with curriculum materials which can contribute to the achievement of goals that are identified as important.

APPENDICES

APPENDIX A

PRELIMINARY INVENTORY CHECKLIST

A_1 SUBJECT AREA SPECIALISTS

A_2 COVER LETTER FOR PRELIMINARY INVENTORY CHECKLIST

A_3 PRELIMINARY INVENTORY CHECKLIST

APPENDIX A_1

SUBJECT AREA SPECIALISTS

Dr. Edward Green
Professor in Sociology and Head of Department
College of Arts and Sciences
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Dr. Charles E. Helppie
Professor in Economics
College of Arts and Sciences
Eastern Michigan University

Dr. Earl C. Kelley
Visiting Professor in Education
College of Education
Eastern Michigan University

Dr. Winton Kloosterman
Professor in Guidance and Counseling
College of Education
Eastern Michigan University

Dr. H. James Rokusek
Professor in Industrial Education
Department of Industrial Education
Eastern Michigan University

APPENDIX A_2

COVER LETTER FOR PRELIMINARY INVENTORY CHECKLIST

March 21, 1967

Dear Dr. _____:

Thank you for accepting my request for assistance with my research project. As I indicated on the telephone, my primary interest is in working with curricula in industrial arts at the secondary education level. One part of this research project involves identifying the kinds of behaviors which students in secondary school industrial arts programs should demonstrate in relation to one particular objective in general education--the achievement of economic efficiency.

As a person who has a special interest in curriculum development, I would like to ask for your expert opinion on the matter of what kinds of behaviors should be elicited through industrial arts programs which will help in the realization of this objective.

The behavioral statements on the attached list are intended to reflect behavioral outcomes which are appropriate for use in general education. The concepts which are a part of these outcomes are found in several areas of education, yet they are considered to be common to industrial arts. You are being asked to study the total list, consider the items in terms of their value as behavioral statements for secondary education, and respond as directed on the introductory page to the checklist. Please make comments you feel are needed and add those behavioral statements which you see as being important.

If you have questions, please feel free to call me at home (434-0117) or at my office (483-6100, extension 2186).

Respectfully yours,

Gerald L. Jennings
Department of Industrial Education

APPENDIX A_3

STUDENT BEHAVIORAL RESPONSES TO THE OBJECTIVES OF ECONOMIC EFFICIENCY

A Preliminary Inventory Checklist

Introduction

Broad statements of objectives for educational programs do not tell how the student is to behave once the objectives are achieved. This is evidenced in such typical objectives for industrial arts as the following:

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes, and operation, products, and occupations.
2. To increase consumer knowledges to a point where students can buy, use, and maintain the products of industry intelligently.
3. To provide information about, and--in so far as possible--experiences in, the basic processes of many industries, in order that students may be more competent to choose a future vocation.
4. To develop a certain amount of skill in a number of basic industrial processes.

The items listed on the following pages describe the responses which students in junior and senior high school industrial arts programs could make to learning activities directed at the achievement of economically efficient behavior. In other words, if a student responds in the manner indicated in each item, he should be more capable of responsible performance in such economic functions as occupational choice, work, consumer activities and solving basic economic problems.

You are being asked to help in identifying possible student behaviors which reflect economic efficiency by selecting those items in this listing which seem to be appropriate concerns for industrial arts in the secondary schools.

Instructions

In order to indicate your choice of items, please encircle the coded letter in the right hand margin for the statement which best expresses your opinion. The judgmental statements and their coded symbols will be:

A An appropriate behavior to be achieved in industrial arts.
NA Not an appropriate behavior to be achieved in industrial arts.
U An unclear behavior item.

Please consider each item independently and without regard to how many times it may appear. Feel free to make any comments on the items or to add any which you see as important.

STUDENT BEHAVIORAL RESPONSES TO THE OBJECTIVES OF ECONOMIC EFFICIENCY

A Preliminary Inventory Checklist

1. The student will be able to describe the work structure in local industries in terms of occupational title, job activities, and job relationships. A NA U

2. The student will be able to compare the factors of salaries, working conditions and job requirements for vocations in industries. A NA U

3. The student will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the financial returns it provides for the worker. A NA U

4. The student will be able to indicate his own aptitudes and abilities for work in the industrial-technical areas. A NA U

5. The student will be able to describe and compare the organizational structure of large and small industrial firms. A NA U

6. The student will be able to judge his performance in work activities on the basis of his own capabilities. A NA U

7. The student will be able to describe the occupational changes resulting from developments in electronics, automation, cybernetics, and atomic power. A NA U

8. The student will be able to identify factors which contribute to a worker's economic problems, such as a lack of basic education, and the increasing demands of technology. A NA U

9. The student will be able to identify and analyze industrial employment trends in the community. A NA U

10. The student will be able to use the hand tools and machines common to the trade or industrial job in which he indicates an interest. A NA U

11. The student will be able to interpret the information used for describing an operational procedure. A NA U

12. The student will be able to specify the requirements for education or training after high school which is suited to emerging vocational interests. A NA U

13. The student will be able to describe the purposes of post high school vocational education for the worker. A NA U

14. The student will be able to judge the value of work as it satisfies the physical needs of man. A NA U

15. The student will be able to judge the value of work as it satisfies the intellectual needs of man. A NA U

16. The student will be able to judge the value of work as it satisfies the social needs of man. A NA U

17. The student will be able to describe the physical, emotional and psychological effects of repetitive operations on the human being. A NA U

18. The student will be able to demonstrate safe work habits. A NA U

19. The student will be able to work effectively with a group. A NA U

20. The student will be able to work effectively and efficiently under supervision. A NA U

21. The student will be able to work effectively and efficiently when alone. A NA U

22. The student will be able to demonstrate minimal competence in using the tools related to his emerging occupational interests in industry. A NA U

23. The student will be able to make simple sketches of objects. A NA U

24. The student will be able to make simple drawings of objects. A NA U

25. The student will be able to measure with rules, gages, micrometers and meters. A NA U

26. The student will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory. A NA U

27. The student will be able to make a report on the results of his work with clarity and simplicity. A NA U

28. The student will be able to estimate volume, area, quantity, and dimensions. A NA U

29. The student will be able to use appropriate technical terminology to communicate with other persons while working to solve technical problems. A NA U

30. The student will be able to define the major purposes of national labor unions. A NA U

31. The student will be able to describe the role of labor unions in our economy. A NA U

32. The student will be able to describe the role of management in industry. A NA U

33. The student will be able to select products for purchase on the basis of the comparative information he obtains, such as cost and quality of construction. A NA U

34. The student will be able to illustrate, by example, the principles of design. A NA U

35. The student will be able to recognize the advantages in purchasing products which have been tested and approved by federal or private research laboratories. A NA U

36. The student will be able to keep personal possessions in adequate repair. A NA U

37. The student will be able to follow operating instructions when tooling-up and using machinery. A NA U

38. The student will be able to select appropriate lubricants, abrasives, and cleaning solutions used in cleaning and protecting household goods and equipment. A NA U

39. The student will be able to disassemble, clean, adjust and reassemble an article according to the manufacturer's directions. A NA U

40. The student will be able to make simple electrical repairs on household items, such as lamps, extension cords, and appliances. A NA U

41. The student will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine. A NA U

42. The student will be able to specify the sources for raw materials used in industrial operations in the community. A NA U

43. The student will be able to describe the changes, over the past 100 years, in methods for extracting raw materials. A NA U

44. The student will be able to present examples of the achievements of science and technology in discovering new sources for and new forms of raw materials. A NA U

45. The student will be able to describe the basic processes for making the synthetics used by industry for the goods it produces. A NA U

46. The student will be able to describe the affects of an imbalance in the supply and demand of goods and services. A NA U

47. The student will be able to describe the requirements for adequate distribution of goods. A NA U

48. The student will be able to specify the advantages inherent in volume purchasing and sales by industry. A NA U

49. The student will be able to describe the phases of production from product design to packaging. A NA U

50. The student will be able to define and compare quantity production and custom production methods used by industry. A NA U

51. The student will be able to identify the changes and trends in production methods resulting from the use of research findings. A NA U

52. The student will be able to discuss the effects of market research on production. A NA U

APPENDIX B

PILOT INSTRUMENT

APPENDIX B_1

COVER LETTER FOR PILOT INSTRUMENTS I AND II

Dear

As a teacher of industrial arts subjects, you are in a position to be of immeasurable assistance in a research project which may be able to make a significant contribution to the improvement of industrial arts programs in the State of Michigan. The project is directed at clarifying the role of industrial arts at the secondary school level. The specific concern is to identify the kinds of behaviors which students in industrial arts programs should demonstrate in relation to one particular objective of general education--the achievement of economic efficiency.

The questionnaire which accompanies this letter of request represents a compilation of behavioral outcomes to be considered for industrial arts programs. These outcomes describe the kinds of responses which students in junior and senior high school industrial arts programs could make to learning activities directed at the achievement of economically efficient behavior.

I would like to request your assistance, as one of a selected group of Michigan industrial arts teachers, by having you indicate your judgment on this topic. The thing for you to ask is whether or not the items on this list represent the kinds of behaviors which should be achieved in industrial arts.

Your feelings about these items may vary from one to another. The degree of your acceptance for each item can be indicated in the spaces provided on the questionnaire. I would like to ask that you consider every item and make a response for each one.

To facilitate an accurate accounting of the participants in this project, each of them is being asked to provide some personal data at the beginning of the questionnaire, such as grade level, area of teaching, professional preparation, etc. The information you provide on this sheet will be kept <u>absolutely</u> confidential.

Thank you for your consideration of this request and for helping in the completion of this project.

Respectfully yours,

Gerald L. Jennings
Department of Industrial Education

APPENDIX B_2

PERSONAL DATA SHEET FOR PILOT INSTRUMENT I

Instructions: Please check or write in a response to each statement below.

1. Indicate the grade or grades in which you are presently teaching.
   - __ 6th or below
   - __ 7th
   - __ 8th
   - __ 9th
   - __ 10th
   - __ 11th
   - __ 12th
   - __ Other_____

2. Indicate the technical area or areas of instruction which you include in that industrial arts course which you teach most of the time.
   - __ Automotive or power mechanics
   - __ Ceramics
   - __ Drawing
   - __ Electricity or electronics
   - __ Graphic arts or printing
   - __ Jewelry
   - __ Leather
   - __ Materials testing
   - __ Metalworking
   - __ Plastics
   - __ Textiles
   - __ Woodworking
   - __ Building construction
   - __ Other _____

3. Indicate the size of your school by checking the range grouping within which your student population appears.
   - __ 0-500
   - __ 501-1000
   - __ 1001-1500
   - __ 1501-2000
   - __ 2001-2500
   - __ Over 2500

4. Indicate the number of teachers teaching industrial arts courses in your school.
   - __ 1-2
   - __ 3-4
   - __ 5-6
   - __ 7-8
   - __ 9-10
   - __ Over 10

5. Indicate the range within which your age appears.
   - __ 20-30 years
   - __ 31-40
   - __ 41-50
   - __ 51-60
   - __ 61-70

6. Indicate the number of years teaching experience in industrial arts which you have had.
   - __ 1-5
   - __ 6-10
   - __ 11-15
   - __ 16-20
   - __ 21-25
   - __ 26-30

7. Indicate your educational background (college).
   - __ Bachelor's Degree
   - __ Master's Degree
   - __ 15 semester hours (23 quarter hours) or more beyond the Master's.

8. Indicate your major area of study in college.

   Bachelor's level
   - __ Industrial Arts
   - __ Other (Name) _____

   Master's level
   - __ Industrial arts
   - __ Other (Name) _____

9. Indicate the type of teaching certificate you presently hold.
   - __ Secondary Permanent, State of Michigan
   - __ Secondary Provisional, State of Michigan
   - __ Temporary, State of Michigan
   - __ Other (Name)_____

APPENDIX B_3

INSTRUCTION SHEET FOR PILOT INSTRUMENT I

Introduction

The statements in this inventory represent behavioral responses which students in secondary school industrial arts programs could make to learning activities which are directed at the achievement of economically efficient behavior. If a student responds in the manner indicated in each item, he should be more capable of responsible performance in such economic functions as occupational choice, work, consumer activities, and solving basic economic problems.

Instructions

Please indicate the degree to which you feel each of these statements represents a behavior which should be achieved through secondary school industrial arts programs.

To indicate the degree to which you see each item as an outcome for industrial arts, encircle the letter which is the coded symbol for the word expressing your choice of response. The symbols and their meanings are:

D Definitely an outcome which should be achieved through industrial arts.
P Probably an outcome which should be achieved through industrial arts.
U Unlikely as an outcome to be achieved through industrial arts.
N Never an outcome which should be achieved through industrial arts.

Typical behavior statements illustrating the manner in which you are to mark your responses are shown below:

1. ___D P U N The student will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory.

2. ___D P U N The student will be able to define his responsibilities for making a choice of occupation.

3. ___D P U N The student will be able to define socially useful work.

In marking a response encircle ONE letter only.

Please respond to EVERY statement.

Leave the short line in front of the symbols BLANK.

APPENDIX B_4

BEHAVIORAL OUTCOME INVENTORY CHECKLIST FOR PILOT INSTRUMENT I

Interpretations of symbols:
D Definitely an outcome which should be.....
P Probably an outcome which should be.....
U Unlikely as an outcome to be.....
N Never an outcome which should be.....

1. ___ D P U N The student will be able to identify industrial employment trends in the community.

2. ___ D P U N The student will be able to describe the requirements for adequate distribution of goods.

3. ___ D P U N The student will be able to describe and compare the organizational structure of large and small industrial firms.

4. ___ D P U N The student will be able to work effectively with a group.

5. ___ D P U N The student will be able to make simple electrical repairs on household items, such as lamps, extension cords, and appliances.

6. ___ D P U N The student will be able to make simple sketches of objects.

7. ___ D P U N The student will be able to measure with rules, gages, and meters.

8. ___ D P U N The student will be able to select products for purchase on the basis of the comparative information he obtains, such as cost and quality of construction.

9. ___ D P U N The student will be able to select appropriate lubricants, abrasives, and cleaning solutions used in cleaning and protecting household goods and equipment.

10. ___ D P U N The student will be able to judge the value of work as it satisfies the intellectual needs of man.

11. ___ D P U N The student will be able to make a report on the results of his work with clarity and simplicity.

12. ___ D P U N The student will be able to define the major purposes of national labor unions.

13. ___ D P U N The student will be able to describe the role of management in industry.

14. ___ D P U N The student will be able to disassemble, clean, adjust and reassemble an article according to the manufacturer's directions.

15. ___ D P U N The student will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory.

16. ___ D P U N The student will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the financial returns it provides for the worker.

17. ___ D P U N The student will be able to work effectively and efficiently under supervision.

18. ___ D P U N The student will be able to describe the purposes of post high school vocational education.

19. ___ D P U N The student will be able to compare the factors of salaries, working conditions and job requirements for vocations in industries.

20. ___ D P U N The student will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine.

21. ___ D P U N The student will be able to identify factors which contribute to a worker's problems, such as a lack of basic education, and the increasing demands of technology.

22. ___ D P U N The student will be able to work effectively and efficiently when alone.

23. ___ D P U N The student will be able to judge the value of work as it satisfies the physical needs of man.

24. ___ D P U N The student will be able to judge the quality of a product on the basis of how it satisfies the rules of design.

25. ___ D P U N The student will be able to describe the occupational changes resulting from developments in electronics, automation, cybernetics, and atomic power.

26. ___ D P U N The student will be able to discuss the effects of market research on production.

27. ___ D P U N The student will be able to present examples of the achievements of science and technology in discovering new sources for and new forms of raw materials.

28. ___ D P U N The student will be able to recognize the advantages in purchasing products which have been tested and approved by federal or private research laboratories.

29. ___ D P U N The student will be able to demonstrate safe work habits.

30. ___ D P U N The student will be able to describe the affects of an imbalance in the supply and demand of goods and services.

31. ___ D P U N The student will be able to estimate volume, area, quantity, and dimensions.

32. ___ D P U N The student will be able to describe the role of labor unions in our economy.

33. ___ D P U N The student will be able to describe the phases of production from product design to packaging.

34. ___ D P U N The student will be able to judge the value of work as it satisfies the social needs of man.

35. ___ D P U N The student will be able to use appropriate technical terminology to communicate with other persons while working to solve technical problems.

36. ___ D P U N The student will be able to illustrate, by using examples, the sources for basic items and raw materials used in industrial operations in the community.

37. ___ D P U N The student will be able to describe the work structure in local industries in terms of job activities and job relationships.

38. ___ D P U N The student will be able to follow operating instructions when tooling-up and using machinery.

39. ___ D P U N The student will be able to describe the physical, emotional, and psychological effects of repetitive operations on the human being.

40. ___ D P U N The student will be able to indicate his own aptitudes and abilities for work in the industrial-technical areas.

41. ___ D P U N The student will be able to interpret the information used for describing an operational procedure.

42. ___ D P U N The student will be able to keep personal possessions in adequate repair.

43. ___ D P U N The student will be able to identify the changes and trends in production methods resulting from the use of research findings.

44. ___ D P U N The student will be able to judge his performance in work activities on the basis of his own capabilities.

45. ___ D P U N The student will be able to define and compare quantity production and custom production methods used by industry.

APPENDIX B_5

EVALUATION SHEET FOR PILOT INSTRUMENT I

1. How long did it take you to complete this inventory?_____

2. Did the introductory statements at the beginning of the questionnaire help you understand the general purpose of the inventory? (YES) (NO)
   Comments:

3. Were the instructions for responding clear and adequate? (YES) (NO)
   Comments:

4. In reference to Section II--Inventory Checklist:

   a. Did the items have meaning? (YES) (NO)
      Comments:

   b. Which items would you exclude because they were not meaningful?

   c. Which items were difficult to read because of wording?

   d. Should the inventory be:

      __ lengthened?
      __ shortened?
      __ used as it is?

5. Would you have answered this inventory if you had received it in the mail without any verbal communication on the subject?
   (YES) (NO) If you answered "NO", why not?

APPENDIX B_6

PERSONAL DATA SHEET FOR PILOT INSTRUMENT II

Instructions: Please check or write in a response to each statement below.

1. Indicate the grade or grades in which you are presently teaching.
   - __ 6th or below
   - __ 7th
   - __ 8th
   - __ 9th
   - __ 10th
   - __ 11th
   - __ 12th
   - __ Other _____

2. Indicate the technical area or areas of instruction which you include in <u>that industrial arts course</u> which you teach most of the time.
   - __ Automotive or power mechanics
   - __ Ceramics
   - __ Drawing
   - __ Electricity or electronics
   - __ Graphic arts or printing
   - __ Jewelry
   - __ Leather
   - __ Materials testing
   - __ Metalworking
   - __ Plastics
   - __ Textiles
   - __ Woodworking
   - __ Building construction
   - __ Other _____

3. Is the course which you teach most of the time supported by reimbursed funds from the government? __ YES __ NO

4. Indicate the size of your school by checking the range grouping within which your student population appears.
   - __ 0-500
   - __ 501-1000
   - __ 1001-1500
   - __ 1501-2000
   - __ 2001-2500
   - __ Over 2500

5. Indicate the number of teachers teaching industrial arts courses in your school.
   - __ 1-2
   - __ 3-4
   - __ 5-6
   - __ 7-8
   - __ 9-10
   - __ Over 10

6. Indicate the range within which your age appears.
   - __ 20-30 years
   - __ 31-40
   - __ 41-50
   - __ 51-60
   - __ 61-70

7. Indicate the number of years teaching experience in industrial arts which you have had.
   - __ 1-5
   - __ 6-10
   - __ 11-15
   - __ 16-20
   - __ 21-25
   - __ 26-30

8. Indicate your educational background (college).
   - __ Bachelor's Degree
   - __ Master's Degree
   - __ 15 semester hours (23 quarter hours) or more beyond the Master's

9. Indicate your major area of study in college.

   Bachelor's level
   - __ Industrial arts
   - __ Other (Name) _____

   Master's level
   - __ Industrial arts
   - __ Other (Name) _____

10. Indicate the type of teaching certificate you presently hold.
    - __ Secondary Permanent, State of Michigan
    - __ Secondary Provisional, State of Michigan
    - __ Temporary, State of Michigan
    - __ Other, (Name) _____

APPENDIX B_7

INSTRUCTION SHEET FOR PILOT INSTRUMENT II

Introduction

The statements in this inventory represent behavioral responses which students in secondary school industrial arts programs could make to learning activities which are directed at the achievement of economically efficient behavior. If a student responds in the manner indicated in each item, he should be more capable of responsible performance in such economic functions as occupational choice, work, consumer activities, and solving personal economic problems.

Instructions

Please indicate the degree to which you feel each of these statements represents a behavior which should be achieved through secondary school industrial arts programs.

To indicate the degree to which you see each item as an outcome for industrial arts, encircle the letter which is the coded symbol for the word expressing your choice of response. The symbols and their meanings are:

D Definitely an outcome which should be achieved through industrial arts.
P Probably an outcome which should be achieved through industrial arts.
R Rarely an outcome which should be achieved through industrial arts.
N Never an outcome which should be achieved through industrial arts.

Typical behavioral statements illustrating the manner in which you are to mark your responses are shown below:

1. ___ D P R N The student will be able to describe the advantages inherent in volume purchasing and sales.

2. ___ D P R N The student will be able to define his responsibilities for making a choice of occupation.

3. ___ D P R N The student will be able to define socially useful work.

PLEASE:

In marking a response encircle ONE letter only.

Respond to EVERY statement.

Leave the short line in front of the symbols BLANK.

APPENDIX B_8

BEHAVIORAL OUTCOME INVENTORY CHECKLIST FOR PILOT INSTRUMENT II

Symbol meanings:
D Definite an outcome which should be . . . .
P Probably an outcome which should be . . . .
R Rarely an outcome which should be . . . .
N Never an outcome which should be . . . .

1. ___ D P R N The student will be able to identify industrial employment trends in the community.

2. ___ D P R N The student will be able to describe the requirements for adequate distribution of goods.

3. ___ D P R N The student will be able to describe and compare the organizational structure of large and small industrial firms.

4. ___ D P R N The student will be able to work effectively with a group.

5. ___ D P R N The student will be able to make simple electrical repairs on household items, such as lamps, extension cords, and appliances.

6. ___ D P R N The student will be able to make simple sketches of objects.

7. ___ D P R N The student will be able to measure with rules, gages, and meters.

8. ___ D P R N The student will be able to select products for purchase on the basis of the comparative information he obtains, such as cost and quality of construction.

9. ___ D P R N The student will be able to select appropriate lubricants, abrasives, and cleaning solutions used in cleaning and protecting household goods and equipment.

10. ___ D P R N The student will be able to judge the value of work as it satisfies the intellectual needs of man.

11. ___ D P R N The student will be able to make a report on the results of his work with clarity and simplicity.

12. ___ D P R N The student will be able to define the major purposes of national labor unions.

13. ___ D P R N The student will be able to describe the role of management in industry.

14. ___ D P R N The student will be able to disassemble, clean, adjust and reassemble an article according to the manufacturer's directions.

15. ___ D P R N The student will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory.

16. ___ D P R N The student will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the financial returns it provides for the worker.

17. ___ D P R N The student will be able to work effectively and efficiently under supervision.

18. ___ D P R N The student will be able to describe the purposes of post high school vocational education.

19. ___ D P R N The student will be able to compare the factors of salaries, working conditions and job requirements for vocations in industries.

20. ___ D P R N The student will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine.

21. ___ D P R N The student will be able to identify factors which contribute to a worker's economic problems, such as a lack of basic education, and the increasing demands of technology.

22. ___ D P R N The student will be able to work effectively and efficiently when alone.

23. ___ D P R N The student will be able to judge the value of work as it satisfies the physical needs of man.

24. ___ D P R N The student will be able to judge the quality of a product on the basis of how it satisfies the rules of design.

25. ___ D P R N The student will be able to describe the occupational changes resulting from developments in electronics, automation, cybernetics, and atomic power.

26. ___ D P R N The student will be able to discuss the effects of market research on production.

27. ___ D P R N The student will be able to present examples of the achievements of science and technology in discovering new sources for and new forms of raw materials.

28. ___ D P R N The student will be able to recognize the advantages in purchasing products which have been tested and approved by federal or private research laboratories.

29. ___ D P R N The student will be able to demonstrate safe work habits.

30. ___ D P R N The student will be able to describe the affects of an imbalance in the supply and demand of goods and services.

31. ___ D P R N The student will be able to estimate volume, area, quantity, and dimensions.

32. ___ D P R N The student will be able to describe the role of labor unions in our economy.

33. ___ D P R N The student will be able to describe the phases of production from product design to packaging.

34. ___ D P R N The student will be able to judge the value of work as it satisfies the social needs of man.

35. ___ D P R N The student will be able to use appropriate technical terminology to communicate with other persons while working to solve technical problems.

36. ___ D P R N The student will be able to illustrate, by using examples, the sources for basic items and raw materials used in industrial operations in the community.

37. ___ D P R N The student will be able to describe the work structure in local industries in terms of job activities and job relationships.

38. ___ D P R N The student will be able to follow operating instructions when tooling-up and using machinery.

39. ___ D P R N The student will be able to describe the physical, emotional, and psychological effects of repetitive operations on the human being.

40. ___ D P R N The student will be able to indicate his own aptitudes and abilities for work in the industrial-technical areas.

41. ___ D P R N The student will be able to interpret the information used for describing an operational procedure.

42. ___ D P R N The student will be able to keep personal possessions in adequate repair.

43. ___ D P R N The student will be able to identify the changes and trends in production methods resulting from the use of research findings.

44. ___ D P R N The student will be able to judge his performance in work activities on the basis of his own capabilities.

45. ___ D P R N The student will be able to define and compare quantity production and custom production methods used by industry.

APPENDIX B_9

EVALUATION SHEET FOR PILOT INSTRUMENT II

1. How long did it take you to complete this inventory? _____

2. Did the introductory statements at the beginning of the questionnaire help you understand the general purpose of the inventory? (YES) (NO)
Comments:

3. Were the instructions for responding clear and adequate? (YES) (NO)
Comments:

4. In reference to Section II--Inventory Checklist:

   a. Did the items have meaning? (YES) (NO)
   Comments:

   b. Which items would you exclude because they were not grammatically correct?

   c. Which items were difficult to read because word meanings were not clear?

   d. Should the inventory be:

   __ lengthened?
   __ shortened?
   __ used as it is?

5. Would you have answered this inventory if you had received it in the mail without any verbal communication on the subject?
(YES) (NO) If you answered "NO", why not?

_____
Signature (Optional)

APPENDIX C

FINAL INSTRUMENT

C_1 COVER LETTER FOR FIRST QUESTIONNAIRE MAILING

C_2 QUESTIONNAIRE PERSONAL DATA SHEET

C_3 QUESTIONNAIRE INVENTORY CHECKLIST

C_4 FOLLOW-UP PRINTED POST CARD

C_5 FOLLOW-UP COVER LETTER FOR SECOND QUESTIONNAIRE MAILING

C_6 DATA COLLECTING SCHEDULE

APPENDIX C_1

COVER LETTER FOR FIRST QUESTIONNAIRE MAILING

As a teacher of industrial arts subjects, you may be able to make a significant contribution to the improvement of industrial arts programs in the State of Michigan through participation in a special research project. The project is directed at clarifying the role of industrial arts at the secondary school level. Its specific concern is for one particular objective of general education--the achievement of economic efficiency.

The questionnaire which accompanies this letter of request includes a list of behavioral outcomes to be considered for industrial arts programs. These outcomes describe the kinds of responses that students in junior and senior high school industrial arts programs might make to learning activities which are directed at the achievement of economically efficient behavior.

I would like to request your assistance, as one of a selected group of Michigan industrial arts teachers, by having you indicate your judgment on this topic. The thing for you to ask is whether or not the items in this list represent behaviors which should be achieved through industrial arts. Your feelings about these items may vary from one to another. The degree of your acceptance for each item can be indicated in the spaces provided on the questionnaire.

To facilitate an accurate accounting of the participants in this project, each is being asked to provide some personal data at the beginning of the questionnaire, such as grade level, area of teaching and professional preparation. The information you provide on this sheet will be kept <u>absolutely</u> confidential.

Would you help, please, by completing both parts of the questionnaire--the personal data sheet and the inventory checklist--and returning it to me in the enclosed envelope?

I thank you for your consideration of this request and for assisting in the completion of this project.

Respectfully yours,

Gerald L. Jennings, Assistant Professor
Department of Industrial Education
Eastern Michigan University

APPENDIX C_2

QUESTIONNAIRE PERSONAL
DATA SHEET

Instructions: Please check or write in a response to each statement below.

(1) Indicate the grade or grades which you are presently teaching.
__ 6th or below __ 10th
__ 7th __ 11th
__ 8th __ 12th
__ 9th __ Other_____

(2) Is that industrial arts course which you teach most of the time supported by reimbursed funds from the government?
__ YES
__ NO

(3) Indicate the technical area or areas of instruction which you include in THAT INDUSTRIAL ARTS COURSE WHICH YOU TEACH MOST OF THE TIME.
__ Automotive or power mechanics
__ Ceramics
__ Drawing
__ Electricity or electronics
__ Graphic arts or printing
__ Jewelry
__ Leather
__ Materials testing
__ Metalworking
__ Plastics
__ Textiles
__ Woodworking
__ Building construction
__ Other _____

(4) Indicate the size of your school by checking the range grouping within which your student population appears.
__ 0-500 __ 1501-2000
__ 501-1000 __ 2001-2500
__ 1001-1500 __ Over 2500

(5) Indicate the number of teachers teaching industrial arts courses in your school.
__ 1-2 __ 7-8
__ 3-4 __ 9-10
__ 5-6 __ Over 10

(6) Indicate the socio-economic position of the majority of your industrial arts students.
__ Middle-UPPER __ Lower-MIDDLE
__ Lower-UPPER __ Upper-LOWER
__ Upper-MIDDLE __ Middle-LOWER
__ Middle-MIDDLE __ Lower-LOWER

(7) Indicate the range within which the over-all AVERAGE size of your industrial arts classes appear.
__ 10-15 __ 26-30
__ 16-20 __ 31-35
__ 21-25 __ Over 35

(8) Indicate the range within which your age appears.
__ 20-30 __ 51-60
__ 31-40 __ 61-70
__ 41-50

(9) Indicate the number of years teaching experience in industrial arts which you have had.
__ 1-3 __ 11-15
__ 4-6 __ 16-20
__ 7-10 __ Over 20

(10) Indicate your education background.
__ Bachelor's Degree
__ Master's Degree
__ 15 sem. hrs (23 qtr hrs) or more BEYOND THE MASTER'S

(11) Write in the name of the school from which you received your Bachelor's Degree.

_____

(12) Indicate your major area of study in college.
Bachelor's level
__ Industrial arts
__ Other (Name) _____

Master's level
__ Industrial arts
__ Other (Name) _____

(13) Indicate the type of teaching certificate you presently hold.
__ Secondary Permanent, State of Michigan
__ Secondary Provisional, State of Michigan
__ Temporary, State of Michigan
__ Other (Name)_____

APPENDIX C_3

QUESTIONNAIRE INVENTORY CHECKLIST

Introduction

The statements in this inventory describe behavioral responses that students in secondary school industrial arts programs could make to learning activities which are directed at the achievement of economically efficient behavior. If a student responds in the manner indicated in each item, he should be more capable of responsible performance in such economic functions as occupational choice, work, consumer activities, and solving personal economic problems.

Instructions

Please indicate the degree to which you feel each of these statements represents an outcome which should be achieved through secondary school industrial arts programs. Encircle the letter which is the coded symbol for the word expressing your choice of response. The symbols and their meanings are:

D DEFINITELY an outcome which should be achieved through industrial arts.
P PROBABLY an outcome which should be achieved through industrial arts.
R RARELY an outcome which should be achieved through industrial arts.
N NEVER an outcome which should be achieved through industrial arts.

Typical behavioral statements illustrating the manner in which you are to mark your responses are shown below. Note that EACH STATEMENT should be prefaced with the words "The student".

THE STUDENT . . .

1. D P R N will be able to describe the advantages inherent in volume purchasing and sales.

2. D P R N will be able to define his responsibilities for making a choice of occupation.

3. D P R N will be able to define socially useful work.

Please respond to EVERY statement and encircle ONE letter only for each statement.

The Checklist

THE STUDENT . . .

1. D P R N will be able to identify industrial employment trends in the community.

2. D P R N will be able to describe the requirements for adequate distribution of goods.

3. D P R N will be able to describe and compare the organizational structure of large and small industrial firms.

4. D P R N will be able to work effectively with a group.

5. D P R N will be able to make simple electrical repairs on household items, such as lamps, extension cords, and appliances.

6. D P R N will be able to make simple sketches of objects.

THE STUDENT . . .

7. D P R N will be able to measure with rules, gages, and meters.

8. D P R N will be able to select products for purchase on the basis of the comparative information he obtains, such as cost and quality of construction.

9. D P R N will be able to select appropriate lubricants, abrasives, and cleaning solutions used in cleaning and protecting household goods and equipment.

10. D P R N will be able to judge the value of work as it satisfies the intellectual needs of man.

11. D P R N will be able to make a report on the results of his work with clarity and simplicity.

12. D P R N will be able to define the major purposes of national labor unions.

13. D P R N will be able to describe the role of management in industry.

14. D P R N will be able to disassemble, clean, adjust and reassemble an article according to the manufacturer's directions.

15. D P R N will be able to plan work activities to provide for the conservation of supplies in the shop or laboratory.

16. D P R N will be able to assess those factors which give a vocation value, such as the service it provides for mankind and the financial returns it provides for the worker.

17. D P R N will be able to work effectively and efficiently under supervision.

18. D P R N will be able to describe the purposes of post high school vocational education.

19. D P R N will be able to compare the factors of salaries, working conditions and job requirements for vocations in industries.

20. D P R N will be able to perform basic engine servicing operations, such as providing lubrication and fuel, and cleaning the engine.

21. D P R N will be able to identify factors which contribute to a worker's economic problems, such as a lack of basic education, and the increasing demands of technology.

22. D P R N will be able to work effectively and efficiently when alone.

23. D P R N will be able to judge the value of work as it satisifes the physical needs of man.

24. D P R N will be able to judge the quality of a product on the basis of how it satisfies the rules of design.

25. D P R N will be able to describe the occupational changes resulting from developments in electronics, automation, cybernetics, and atomic power.

THE STUDENT . . .

26. D P R N will be able to discuss the effects of market research on production.

27. D P R N will be able to present examples of the achievements of science and technology in discovering new sources for and new forms of raw materials.

28. D P R N will be able to recognize the advantages in purchasing products which have been tested and approved by federal or private research laboratories.

29. D P R N will be able to demonstrate safe work habits.

30. D P R N will be able to describe the affects of an imbalance in the supply and demand of goods and services.

31. D P R N will be able to estimate volume, area, quantity, and dimensions.

32. D P R N will be able to describe the role of labor unions in our economy.

33. D P R N will be able to describe the phases of production from product design to packaging.

34. D P R N will be able to judge the value of work as it satisfies the social needs of man.

35. D P R N will be able to use appropriate technical terminology to communicate with other persons while working to solve technical problems.

36. D P R N will be able to illustrate, by using examples, the sources for basic items and raw materials used in industrial operations in the community.

37. D P R N will be able to describe the work structure in local industries in terms of job activities and job relationships.

38. D P R N will be able to follow operating instructions when tooling-up and using machinery.

39. D P R N will be able to describe the physical, emotional, and psychological effects of repetitive operations on the human being.

40. D P R N will be able to indicate his own aptitudes and abilities for work in the industrial-technical areas.

41. D P R N will be able to interpret the information used for describing an operational procedure.

42. D P R N will be able to keep personal possessions in adequate repair.

43. D P R N will be able to identify the changes and trends in production methods resulting from the use of research findings.

44. D P R N will be able to judge his performance in work activities on the basis of his own capabilities.

45. D P R N will be able to define and compare quantity production and custom production methods used by industry.

APPENDIX C_4

FOLLOW-UP PRINTED POST CARD

May 4, 1967

Dear_____:

About two weeks ago you received a questionnaire from me on behavioral outcomes for industrial arts. Your responses on this questionnaire will be of vital importance to the success of its related research project in secondary school industrial arts.

If you have not returned this questionnaire, may I urge you to complete it, please. If you have already done so, may I express my sincere appreciation for your assistance.

Respectfully yours,

Gerald L. Jennings
Dept. of Industrial Education

APPENDIX C_5

FOLLOW-UP COVER LETTER FOR SECOND QUESTIONNAIRE MAILING

Dear _____:

A few weeks ago you received a questionnaire from me concerning outcomes for industrial arts. It was one of 400 mailed to industrial arts teachersin the State of Michigan. The type of research analysis which is to be made from the data on these questionnaires demands a careful selection of the population sampling. Therefore, those who were asked to complete one were chosen because of the extent of their own professional commitment and the nature of their particular teaching situation. To date 73 percent of the original questionnaires have been returned in completed form.

Since the time when you received that questionnaire I am quite certain many things have been happening with you and your teaching program. Very possibly it got lost in the shuffle. Maybe things have been simple too hectic for you to find the half hour needed to fill it out. I can well appreciate the possibility of these things occurring.

I would like to ask, though, if you might reconsider completing the questionnaire, since it is so vital to the over-all accuracy of the final research report. I feel very certain that the findings of this research project will have something of significance to contribute to industrial arts in the State of Michigan.

In case you may have misplaced the original questionnaire, I am enclosing another one which is just like the first. May I ask again for your help . . . ?

I might mention that the information on the personal data sheet will be kept absolutely confidential. Also, the question for you to keep in mind as you study the items in the checklist is whether or not they represent behaviors which should be achieved through industrial arts.

Thank you!

Sincerely yours,

Gerald L. Jennings
Assistant Professor
Department of
Industrial Education

APPENDIX C_6

DATA COLLECTING SCHEDULE

1.	April 17, 18, and 19, 1967	First mailing of questionnaire to 397 Michigan industrial arts teachers.
2.	May 5, 1967	Questionnaire returns received. 204 returns equals 51%
3.	May 6, 1967	First reminder by postal card to 193 teachers.
4.	May 22, 1967	Questionnaire returns received. 290 total returns equals 72%
5.	May 25, 1967	Second mailing of questionnaire to 110 Michigan industrial arts teachers.
6.	June 28, 1967	Last questionnaire return received for a total of 335 returns or 84%.

APPENDIX D

LIST OF INDUSTRIAL ARTS TEACHER EDUCATORS

APPENDIX D

LIST OF INDUSTRIAL ARTS TEACHER EDUCATORS

Dr. Ralph C. Bohn, Chairman
Industrial Arts Department
Division of Sciences and Applied Arts
San Jose State College
San Jose, California 95114

Dr. Paul W. DeVore, Professor
Department of Industrial Arts and Technology
State University College
Oswego, New York

Dr. Wesley Face, Professor
School of Applied Science and Technology
Stout State University
Menomonie, Wisconsin 54751

Dr. Donald Maley, Head
Industrial Education Department
College of Education
University of Maryland
College Park, Maryland 20740

Dr. Delmar W. Olson, Chairman
Department of Industrial Arts
College of Fine and Professional Arts
Kent State University
Kent, Ohio 44240

Dr. Willis E. Ray, Professor
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Dr. Robert S. Swanson, Dean
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