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COMMUNITY FACTORS IN THE DETERMINATION OF THE INSTRUCTIONAL AREAS OF AN INDUSTRIAL ARTS PROGRAM

by

Frank J. Irgang

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of the requirements for the degree of
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Committee in charge:

Dr. Frank W. Dalton, chairman
Dr. Stanley E. Dimond
Dr. C. Robert Hutchcroft
Dr. Howard R. Jones
Dr. H. Glenn Ludlow
Dr. Richard L. Weaver

Abstract

COMMUNITY FACTORS IN THE DETERMINATION OF THE INSTRUCTIONAL AREAS OF AN INDUSTRIAL ARTS PROGRAM

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The Problem. The purpose of this study was to define and investigate the community factors that should be included in the criteria used to determine the instructional areas of an industrial arts program. The final objective was to produce a practical list of community factors, arranged in order of importance, to be considered as outstanding determinants of instructional areas in the establishment or evaluation of an industrial arts program.

Methods Used in the Study. By analyzing literature related to the subject, a list of community factors, meeting certain criteria, was obtained. The list was then submitted to a committee of industrial arts instructors interested and involved in educational research to secure their opinions relative to the completeness of the list and the construction of a questionnaire format.

The data used in this study were provided by two groups of individuals. These groups consisted of (1) a jury of specialists selected from the field of industrial arts education, and (2) a sampling of industrial arts instruct-

ors from the state of Michigan. Each group was asked to indicate, by means of a five-point rating scale, the significance they believed each community factor should possess in determining the instructional areas of an industrial arts program. In addition, the industrial arts instructors were requested to indicate the significance each factor actually possessed in determining the instructional areas of their industrial arts programs. Statistical treatment of the information thus obtained provided a basis for certain conclusions.

Conclusions. The findings of this study revealed that the following 13 community factors, listed in order of importance, should be highly significant in determining the instructional areas of an industrial arts program:

1. Financial prospects for industrial arts equipment.
2. Financial ability to obtain desired materials and supplies for the industrial arts program.
3. Financial prospects for industrial arts space.
4. Attitude of the school board toward an industrial arts program.
5. Training possessed by the industrial arts teaching personnel now employed.
6. Attitude of the school administrative officers toward an industrial arts program.
7. Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).
8. Kinds of industrial arts equipment present.

9. Proportion of drop-outs that go into industries, service trades, professions, business, and farms.

10. Kinds of industries present in the community.

11. Financial prospects for hiring industrial arts teaching personnel.

12. Leisure time activities of the students of the community.

13. Culture of the community (whether the community is progressive and dynamic or static and opposed to change).

According to the data obtained, the following conclusions also appear to be justified:

1. The industrial arts instructors from the state of Michigan considered the community factors to be of greater importance in determining the instructional areas of an industrial arts program than did the jury of experts.

2. The community factors selected for use in this study are being considered in an order of importance acceptable to the industrial arts instructors from the state of Michigan.

3. In actual practice the significance of the community factors selected for use in this study is not being considered to the degree desired by the industrial arts instructors from the state of Michigan.

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ACKNOWLEDGMENT

The initial inspiration for this study occurred during a conference with Mr. Howard H. Gerrish concerning the problems currently confronting industrial arts education. Mr. Gerrish was formerly an industrial arts instructor in the public school system of Algonac, Michigan, where he carried out a rather extensive boat-building program. Indications were that certain factors peculiar to that community made such a program very feasible.

Further investigation revealed that many outstanding differences relative to instructional areas prevalent in the industrial arts programs offered throughout the state of Michigan could be associated with some influential factor or factors that existed within the individual communities. The task that evolved was to discover just what community factors should be considered essential in determining the instructional areas offered in an industrial arts program. For his part in formulating this project, I am indebted to Mr. Howard H. Gerrish.

The writer wishes to express deep and sincere appreciation to Dr. Frank W. Dalton, who, as advisor and director of this study, has given continued understanding, encouragement, and intelligent direction. To him special

gratitude is due. His many fine qualities shall always remain an inspiration.

To other members of the doctoral committee, Dr. Stanley E. Dimond, Dr. C. Robert Hutchcroft, Dr. Howard R. Jones, Dr. H. Glenn Ludlow, and Dr. Richard Weaver, for their counsel and advice, the writer is extremely grateful.

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This study would not have been possible without the fine cooperation received from the persons who served as members of the jury of experts selected from the field of industrial arts education, and from the participating industrial arts instructors in the state of Michigan.

CHAPTER I

INTRODUCTION

Some Present Day Aspects of Industrial Arts Education

We are living in an era when industrial and technological development has a tendency to outstrip public education and social understanding. With this very great expansion has come some unusual opportunities for an expanded and extended industrial arts program. The degree of expansion and extension is dependent upon the degree of alertness displayed toward such potentialities.

Industrial arts education in recent years has grown and multiplied at a rapid rate and, in general, the expansion has been accepted as a forward step toward the education of American youth. This progress is a direct result of certain tendencies and influences without the school and is naturally of a liberal and comprehensive nature, retaining much of the basic concepts of mechanical skill and information. There is, however, a definite tendency toward new materials of expression which necessitate new processes and techniques and a consequent new development of skills and information.

For the purposes of this study, it is assumed that all the needs of youth are not being adequately met

in today's industrial arts programs because certain community factors are not being appropriately evaluated. Since an important phase of the planning and performance of an industrial arts program is the selection of instructional areas, this study proposes to ascertain those community factors that should be included in the criteria used to determine the instructional areas and to determine the degree of significance each should possess.

Due to the rapid development of technology and the speedy industrialization of American society, there is a need for concentrated effort on the part of educational leaders to arrive at a common understanding regarding certain basic criteria to be used in determining desirable approaches necessary in industrial arts. This has been accomplished, to a certain extent, in some aspects of the subject and a degree of consistency and stability has been realized. A notable example can be seen by studying the objectives presented by various individuals and organizations.

Struck lists nine objectives in industrial arts education.

1. Exploration
2. General guidance
3. Household mechanics
4. Avocations, hobbies
5. Social habits and insights
6. Consumer's knowledges and appreciations
7. A degree of skill
8. Correlation or integration
9. Vocational purposes (for from 0 to 16 percent)[1]

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[1]F. Theodore Struck, Creative Teaching. New York: John Wiley and Sons, Inc., 1938, p. 16.

Newkirk, stating that the industrial arts content is basically for the purposes of general education, has set down eight objectives.

1. Self-expression through planning and building useful projects with tools and materials typical of modern industry.
2. Exploring aptitudes and interests in industrial work.
3. An understanding of industry, its workers, and processes.
4. Reading and making working drawings for personal use.
5. Choosing wisely the industrial products that are needed for modern living
6. Adjusting and making minor repairs on the industrial products used around the home and community
7. Providing craft experiences suitable for hobby interests
8. Giving social experiences that will develop understanding and ability to work effectively with others[2]

Somewhat consistent with the others, the American Vocational Association suggests the following list of objectives:

1. Interest in industry
2. Appreciation and use
3. Self-realization and initiative
4. Cooperative attitudes
5. Health and safety
6. Interest in achievement
7. Orderly performance
8. Drawing and design
9. Shop skills and knowledge[3]

These lists appear representative of the many offered. By carefully studying the various lists one can readily see that, although they are worded differently, a

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[2]Louis V. Newkirk, Organizing and Teaching the General Shop. Peoria, Illinois: Charles A. Bennett Co., Inc., 1947. p. 44.

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

striking degree of similarity exists, making it apparent that a considerable degree of agreement has been reached with regard to the objectives of industrial arts education.

Certain other aspects also show resemblances of continuity. The methods and procedures used in teaching industrial arts vary from school to school and community to community. From available literature a long list of teaching methods can be obtained, but in the final analysis, they can be grouped in a very few well-known categories. A typical list of such caregories is offered by Ericson.

1. The demonstration or showing method
2. The lecture or telling method
3. Printed instruction or book method
4. Discussion or conference method
5. Discovery or problem solving approach[4]

The basic elements of two or more of the methods are often combined to obtain effective results and the frequency with which each is used depends upon many factors and often varies considerably from one locality to another. These methods are usually employed in either the Unit Shop or the General Shop organization. The terms "Unit Shop" and "General Shop" are defined on page 27. Each organization has advantages over the other under certain condi-

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[4]Emanuel E. Ericson, Teaching the Industrial Arts. Peoria, Illinois: The Manual Arts Press, 1946. p. 45.

tions. The Unit Shop organization is more often found in the larger school systems whereas the General Shop organization is representative of the smaller school systems and of the junior high schools of the larger systems.

Contrasting with these positive aspects of industrial arts education, little progress can be noted in teacher-trainee selection. However, the upgrading and professionalization of industrial arts instructors has advanced significantly. In the majority of instances a degree is a prerequisite of employment and advanced education is highly desirable. An article written by DeWitt Hunt indicates the extreme desirability now prevalent to obtain advanced degrees.

> The young man preparing to be an industrial arts teacher or the teacher with a few years of experience must look forward to earning at least one advanced degree. The master's degree is almost a universal requirement for the active teacher. The salary differential as well as the opportunities for promotion make it obligatory for the young teacher to plan for securing this degree. Social and professional approval are by-products of the advanced degree.[5]

Mays also states, "... graduate degrees are now desired by those preparing themselves for high and elementary school teaching."[6] Present day enrollments in the various colleges and universities throughout the country

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[5]DeWitt Hunt, "The Master's Degree for Industrial-Arts Teachers," Industrial Arts and Vocational Education, XXXIX (January, 1950), p. 10.

[6]Arthur B. Mays, "The Problem of Graduate Study in Industrial Education," Industrial Arts and Vocational Education, XXXVII (May, 1948), p. 179.

bear out this fact.

Although many aspects of industrial arts education are coming into the focus of agreement, other aspects are still in a state of fomentation. Probably the greatest controversy rages about the philosophical and psychological aspects of the subject. Having passed through the various stages of faculty psychology, mental discipline, vocational inspiration, and the pacification of non-academically inclined students, it is now in the throes of the introduction of another concept commonly referred to as behavior change. It is based upon the premise that unless the industrial arts education results in a behavior change on the part of the student, no learning has taken place.

While books, journals, and convention speeches continue to expound this new concept, confusion still reigns in the field. Wilber points out that in some schools the projects are all assigned and that the instructor has a perfectly finished model of each in his display case for use in introducing the project to the class, while in others the first two or three projects are assigned and then the student is given a freedom of choice from a list of approved projects, for which complete plans are available. He states that still a third philosophy prevails in which the students are allowed a free choice of what to make and for which the teacher spends considerable time helping them prepare and work out their designs.[7]

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[7] Gordon O. Wilber, "Alvin in Wonderland," Industrial Arts and Vocational Education, XXXIX (November, 1950), pp. 342-343.

DePuy cites the fact that although many industrial arts instructors can state the objectives for their department, they do not know how to organize and conduct a program that will attain these objectives.[8]

There is also evidence indicating confusion in the area of grades and marks given in industrial arts courses. Wilber notes that grades given are determined with considerable inadequacy.

> There has been little in the way of standard practice in arriving at grades for industrial arts students. In general, marks have been determined either by an estimate by the teacher or by grades assigned to finished projects or to tests on information.[9]

Professor Johnsen of Kent State University feels that grading is done too subjectively because the wrong basis is used. This occurs when the instructor uses the projects as a means to an end.[10]

Physical facilities present another facet of industrial arts education. The housing and equipment aspects are being brought into prominence daily by the tremendous building program that is being undertaken throughout the country. The type and amount of housing and equipment does, of necessity, depend upon many factors. The facilities

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[8]George F. DePuy, "An Investigation of Trends in Industrial Arts Which Have Occurred During the Period from 1914 to 1941," (Unpublished Master's Thesis, University of Michigan, 1941), p. 115.

[9]Gordon O. Wilber, Industrial Arts in General Education, Scranton, Pennsylvania: International Textbook Company, 1948, p. 311.

[10]M. O. Johnsen, "A Method in Grading Shop Projects in Metalwork," Industrial Arts and Vocational Education, XXXIX, April, 1950, p. 154.

being produced are, in all appearances, the most modern in design and completeness. Certainly this is a gigantic stride forward from the oftentimes unsafe and unhealthful locations of yesteryear.

Need For The Study

An impressive fact of the times is change--a rapid, pervasive, bewildering change that has made living in the United States tremendously complicated. This change is of prime importance because it affects students, teachers, and society in general. The simple life of the pioneer has given way to an existence in a machine age, and on the eve of the atomic age the significance of such change is not apparent even to those who produced it or now have part in its direction. The schisms and social differences that a modern and growing economy based on industry and technology produces are so many and so varied and their effects upon man's life so strong and so extensive that they raise important problems for the whole range of social science.

> ...one of our educational problems is to continue to keep pace with society's demands. No more must we be content with giving out children a Nineteenth Century education. Their educational goals must be kept geared to the modern Twentieth Century and all its industrial might.[11]

Industrial arts education has given little evidence of being guided by those who understand and appreciate the evolution of society and American citizens have been dilatory

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[11]Donald L. Lippold, "Students See the Community at Work," School Shop, XIII (May, 1954), p. 12.

in sensing the maladjustment that exists between the industrial arts programs and life as it is actually being lived.

DePuy found that many administrators and industrial arts teachers have failed to consider the changes which have occurred in the industrial world during the last twenty-five years. "...courses and methods should be revised so that students will be better prepared to meet life situations when they leave school."[12]

In its position, the school could do much to remedy this situation by serving as a liaison agent between the community and the citizens of tomorrow.

> One of the agencies of our society which we have entrusted with the responsibility of passing on to succeeding generations their integration to these social groups toward better community living is the school. The school should rightfully be the agent to bring maturing students into contact with their own community, which makes up these social groups. This orientation should be done, as was stated, before these students leave the confines of the schools.[13]

During recent years many lay and educational leaders have proposed that the schools should play a much more significant role in our complex world than has been done heretofore. This can only be effectively accomplished, however, if a greatly increased number of citizens understand the proper role of education and participate in the continuing determination as is affected by the changing needs of society.

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[12]George F. DePuy, "An Investigation of Trends in Industrial Arts Which Have Occurred During the Period from 1914 to 1941," (Unpublished Master's Thesis, University of Michigan, 1941), p. 116.

[13]Donald L. Lippold, "Students See the Community at Work," School Shop, XIII (May, 1954), p. 12.

By attaining a semblance of continuity in objectives, industrial arts education made one of the greatest steps forward in its relatively short history. This brought an end to much of the floundering the subject experienced in its early years. In spite of the progress made, however, other aspects are still in need of further study and application. The present nation-wide attention being given to education makes the situation appropriate for even greater forward strides.

An aspect needing immediate attention lies within the realm of factors that are significant in determining what shall be included in an industrial arts program. Great differences exist in the reasons for areas of instruction offered and in the content covered within these areas. Certain differences are to be desired, but there should be valid reasons for the offerings of any course of instruction. It is at this point that many industrial arts programs cannot be logically defended. Bonser recognized this fact but, like so many other writers in the field, only alluded to the method of determining what shall be taught.

> In the industrial arts work, the need for adaptations to local conditions and requirements is an important consideration. By a study of community life, the superintendent can observe the dominant elements for determining the fields of emphasis that the work of his schools should select to give sufficient attention to the experience and backgrounds of students. What other schools in similar communities are doing will be suggestive, but one cannot take over the plans of another community bodily and expect them fully to fit his own. Adaptation to conditions and needs by constructive first-hand investigation and development of the work is necessary.[14]

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[14]Frederick G. Bonser, Industrial Arts for Public School Administrators, New York: Teachers College, Columbia University, 1930, pp. 59-60.

All too often the programs of instruction reflect the interests, knowledge, and desires of a small minority in the community--perhaps the superintendent, principal, or industrial arts instructor. If it is to provide instruction for the children of a community and consume funds provided by the citizens of the community, a broader representation would seem desirable.

Due to the lack of agreement as to what factors constitute a basis for planning an industrial arts program, considerable inadequacy prevails. Carver, commenting on this topic, indicates that there has been a general disregard for the future in industrial arts planning.

> In nearly every phase of shop planning much research is yet needed. Opinions and subjective judgment should be more and more replaced by science and facts.[15]

The Denver, Colorado, public schools had long permitted the instructors in each school to institute and modify their course offerings with the consent of their principals. Recently a reevaluation was undertaken to attain a greater degree of uniformity in the subject matter taught and the grade level at which it is offered. Three factors are listed as the basis for the instructional areas offered.

> It seemed that the first step towards uniformity of offerings in industrial arts was to decide upon the fields of activities which would be offered in the junior and senior high schools. Curriculum committees agreed that these fields should be General Woodworking, General Crafts, Graphic Arts, and General Metalworking. The decision was made because of existing facilities, equipment, and trained teacher personnel.[16]

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[15] Lowell L. Carver, "School Shop Planning Workshop," Industrial Arts and Vocational Education, XLIII (March, 1954), p. 82.

[16] Alan M. Lytle (editor), Industrial Arts Education in the Denver Public Schools. Denver: School District Number One, 1952, p. 65.

This is indeed an indication of progress, however, it seems questionable that such an important decision should be reached on the basis of only three factors.

In Indianapolis, Indiana, the industrial arts programs are greatly affected by physical facilities.

> All high schools in Indianapolis are comprehensive high schools. Industrial arts is a part of the curriculum of each one, but with variations due to building facilities.[17]

Ericson warns against allowing the physical facilities to regulate the scope of industrial arts programs.

> Admittedly adequate floor space is a basic factor in planning a shop building. But many inexperienced teachers and supervisors, and some with experience, fail to realize that it is only a starting point, and herein lies a danger which often leads into a tragedy in school shop construction. Unfortunately one need not travel far to find examples of lack of careful planning beyond this point.[18]

He proceeds to indicate that other community factors deserve consideration and asks the question "... has the community been made to feel a personal responsibility and sponsorship in the process?"[19]

Realizing that there are differences in communities, Ericson therefore suggests that community resources be drawn upon as a preliminary step.

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[17]Alfred P. Smith, "Industrial Education in Indianapolis High Schools," Industrial Arts and Vocational Education, XLIII (March, 1954), p. 103.

[18]Emanuel E. Ericson, "Community Co-operation in School Shop Planning," Industrial Arts and Vocational Education, XLIII (March, 1954), p. 71.

[19]Emanuel E. Ericson, "Community Co-operation in School Shop Planning," Industrial Arts and Vocational Education, XLIII (March, 1954), p. 71.

> At the outset, attention might be called to the fact that it is a more painstaking process to attempt to draw upon community resources than it does to sit down and select what might appear to be a suitable layout used in another community or make a list of equipment and supplies from memory or imagination.[20]

Better and happier living, individually or as a society, is possible only through better adjustment to the changing social and economic conditions of our time. One of the uppermost objectives of education must be the adaptation to a rapid-changing environment. As the tempo of life has increased, an increasingly larger burden of educational responsibility has been delegated to the schools. If industrial arts education is to share in this burden and contribute significantly toward the broad objectives of a democratic program of education it should therefore widen its goals and quicken its adjustments.

It is apparent that if education programs are to be representative of the times and of the people, a continual evaluation of certain community factors is necessary. When any industrial arts program is to be inaugurated, evaluated, or appraised, certain basic criteria, consisting of appropriately assessed community factors should be used. In this manner the instructional areas could be more readily ascertained which would, in turn, affect some of the other aspects of the subject previously discussed in this chapter.

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[20] Ibid., p. 72.

Related Studies and Literature

A considerable quantity of literature dealing with factors used to determine instructional areas and course content can be found. The greater portion of it appears in the form of articles published in professional books, magazines, and journals, and is primarily based on opinions or assumptions.

This study seeks to investigate those community factors that should be influential in determining the instructional areas offered in an industrial arts program. A search of literature in this area revealed no scientific approach to the problem. There has been, however, an impressive attempt to assemble a group of factors useful in the evaluation of an industrial arts program. This is presented in the publication Evaluative Criteria which was produced as part of the Cooperative Study of Secondary School Standards.

Having felt a need to (1) determine the characteristics of a good secondary school, (2) find practical means and methods of evaluating the effectiveness of a school in terms of its objectives, (3) determine the means and processes by which a good school develops into a better one, and (4) devise ways by which regional associations can stimulate and assist secondary schools to continuous growth, a General Committee in charge of the Cooperative Study was organized. This occurred at a meeting of the representatives of the six regional associations of colleges and secondary schools in August, 1933.

Work was begun on the project in 1934 when O. I. Frederick and M. L. Allstetter were employed to construct bibliographies and to abstract significant research studies and other materials. For this task contributions of voluntary assistance in abstracting materials in specific fields was given by professors and graduate students at several colleges and universities throughout the country. In this manner approximately twenty-five hundred abstracts of studies and reports were assembled to form the basis for determining the criteria to be used in evaluating secondary school programs.

Evaluative Criteria was mimeographed in its first edition July, 1935.[21] Copies were submitted for critical appraisal to the members of the Cooperative Study, graduate students in education, and to faculty members at a number of educational institutions. The central staff of the Cooperative Study made a careful examination of the appraisals and, using them as a basis, introduced certain organizational changes in the material. This revision was consequently published in a mimeographed form December, 1935.[22]

Through the efforts of some five hundred persons

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[21] Evaluative Criteria. First Edition. Washington: Cooperative Study of Secondary School Standards, (July, 1935), Pp. 217.

[22] Ibid. Second Edition (December, 1935), Pp. 100.

in the form of national leaders in secondary education, active principals of secondary schools in every state, specialists in secondary education in state departments of public instruction, professors of education in leading universities, groups of graduate students in education, school librarians, and classroom teachers in principle instructional fields, a critical evaluation of the first two editions were made. This group made recommendations that changed both the form and content of the next edition which was published April, 1936.[23]

When members of the Cooperative Study met in Washington in May, 1936, they approved the general content of the third edition; however, some suggestions then made resulted in the publication of the fourth edition.[24]

During the academic year 1936-37, an attempt was made to test the materials assembled in the fourth edition. By using the staffs of some two hundred experimental schools, it was used extensively to evaluate the educational programs they had in operation. From this experiment a number of adjustments in the form of the addition as well as the elimination of certain items, and the rephrasing of others, was found to be desirable. Many changes were also recommended in the general layout of the publication. In October, 1938, the fifth edition, incorporating the recommended changes, was published.[25]

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[23] Ibid., Third Edition (April, 1936). Pp. 129.

[24] Ibid., Fourth Edition (September, 1936). Pp. 132.

[25] Ibid., Fifth Edition (1938). Pp. 132

Ten thousand copies of the revised edition were distributed throughout the country during the school year 1938-39. Such extensive use resulted in the suggestion of several modifications and improvements for the utilization of the criteria as a means of evaluating secondary schools. This was promptly done by means of a new edition.[26]

Following World War II the services of a research staff was secured by the Cooperative Study to analyze the recommendations received from users of the 1940 edition of Evaluative Criteria. When the recommendations were assembled in an appropriate form, they were submitted to a group of approximately 150 secondary school specialists and consultants for further appraisal. In 1949 the recommendations for revision were submitted to the General Committee of the Cooperative Study for final review and approval. Thus, the culmination of seventeen years of intensive work involving hundreds of people is represented in the latest edition of Evaluative Criteria.[27] It symbolizes the recognition of a need by school personnel for an appropriate means to evaluate educational programs.

Although Evaluative Criteria has established certain guiding principles useful in the evaluation of industrial arts programs, enlargement and clarification of the criteria presented appears to be in order. The attention

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[26] Evaluative Criteria. Washington: Cooperative Study of Secondary School Standards, 1940. Pp. 175.

[27] Evaluative Criteria. Washington: Cooperative Study of Secondary School Standards, 1950. Pp. 305.

given to the community and its role in influencing the instructional areas is extremely vague and relatively incomplete. It notes such community factors as "home-workshop," "out-of-school activities of the pupils," and "hobby and craft activities."[28] Using generalities, such as "adequate," "satisfactory," and "a variety of" to describe supplies and equipment gives further evidence of incompleteness.[29]

In spite of the fact that several important community factors are presented in Evaluative Criteria, according to leaders in the field, in discussions previously presented in this chapter, a much greater range should be considered. More specific terminology with regard to quantitative measurements seems desirable. This concludes, therefore, that the assignment still remains to complete the list of community factors and determine the degree of significance that each should bear in determining the instructional areas of an industrial arts program.

The Problem

The purpose of this study is to define the community factors that should be used as criteria in determining the instructional areas of an industrial arts

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[28] Ibid., p. 128.

[29] Ibid., p. 127.

program. It shall further be the purpose of this investigation to determine to what degree these community factors are being used in this capacity in the state of Michigan.

Growing out of the major objective of this study are certain secondary aims directed toward practical application of the results. It is hoped that this study will produce a practical list of community factors, arranged in order of importance, that are to be considered as dominating determinants of instructional areas in the establishment or evaluation of an industrial arts program.

The Method of Investigation

The first step in the procedure used in this investigation was to make a survey of literature related to the subject and compile a bibliography of available materials. This was done through the facilities of the General Library of the University of Michigan, the Education Library of the School of Education of the University of Michigan, the library of the Department of Vocational Education and Practical Arts of the School of Education of the University of Michigan, the United States Office of Education, and the Office of Vocational Education of the Michigan Department of Public Instruction.

Other references were found through examination of indices of certain education journals, professional books, pamphlets, catalogs, articles in periodicals, unpublished dissertations, and special reports. Various

education monographs were consulted in order to discover which dealt with some aspects of the problem under investigation. Additional sources were the bibliographies which accompanied many of the discussions encountered in the reading.

The items of the bibliography thus obtained were carefully examined. Each was read and briefed, and card notations were made concerning the nature of the study or problem discussed. the method of investigation, and conclusions reached.

After each of the items had been examined, the data were organized in order to ascertain what generalizations might be made and how they could be utilized for most effective presentation. Since the basis of this study is the community factors used to determine the instructional areas of an industrial arts program, a list of such factors was compiled from statements, inferences, and allusions encountered in the readings.

The next step in carrying out the investigation was to submit the acquired list of community factors to a pilot committee composed of industrial arts instructors who are presently pursuing graduate studies on a part-time basis. They were instructed to make recommendations concerning the comprehensiveness of the list, the appropriateness of the items, and the general construction of a questionnaire format.

A revised list, consisting of fifty community factors, was then presented to a jury of experts selected from the field of industrial arts education. The following criteria served as a basis for the selection of the jury of experts:

1. Doctoral degree.
2. Presently active in industrial arts education.
3. Contributed to the field of industrial arts education by published books or articles.
4. Presently holding a prominent position.
5. Listed in Who's Who in American Education[30] or Who's Who in Industrial Arts Teacher Education.[31]
6. A United States geographical distribution was also considered.

The use of judgments rendered by a jury of experts was considered acceptable from evidence compiled by Oren O. Keeslar.

> ...group judgments are both reliable and valid within the frame of reference set up for them, providing (1) that the judges be well-trained and experienced, i.e., experts in their fields of specialization, and, (2) that the criteria in terms of which the judgments are to be made be clearly and concisely stated for the purpose.[32]

Further evidence marshaled by Keeslar establishes that the average of the ratings made by a small number of experts is very similar to the average of the ratings made

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[30] Robert C. Cook (Editor), Who's Who in American Education. Nashville, Tennessee: Who's Who in American Education, Inc., 1954. Pp. 1406.

[31] Walter R. Williams and Roy F. Bergengren, Who's Who in Industrial Arts Teacher Education. American Council on Industrial Arts Teacher Education. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1954. Pp. 214.

[32] Oren O. Keeslar, "Contributions of Instructional Films to the Teaching of High School Science" (Unpublished Doctor's Dissertation, University of Michigan, 1945). P. 115.

by a greater number of experts provided that the criteria in terms of which the judgments are to be made are clearly and concisely stated.[33,34,35,36,37]

The jury was asked to rate each community factor on a five-point rating scale according to the significance they believed each factor should possess in determining the instructional areas of an industrial arts program. This arrangement permitted each factor to be assessed a definite numerical value. Provisions were also made for the jury to add any additional community factors that they deemed essential.

When the information forms had been completed and returned by the jury of experts, they were again presented to the pilot committee to be used as a basis in formulating the questionnaire that was to later be submitted

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[33]Fred P. Frutchey, "Measuring the Ability to Apply Chemical Principles," Educational Research Bulletin (Ohio State University) XII (December 13, 1933). Pp. 255-260

[34]Willard C. Olson and Muriel M. Wilkinson, "The Measurement of Child Behavior in Terms of Its Social Stimulus Value," Journal of Experimental Education, I (1932), pp. 92-95.

[35]Harold H. Anderson, "Domination and Integration in Social Behavior of Young Children in an Experimental Play Situation," Genetic Psychology Monographs, XIX (August, 1937), pp. 343-408.

[36]Margaret Nesbitt, "Adult Child Relationships, Student Child Relationships in the Nursery School," (Unpublished Doctor's Dissertation, University of Michigan, 1942), pp. xii-204.

[37]Ralph W. Tyler, "Ability to Use the Scientific Method," Educational Research Bulletin, (Ohio State University) XI (January 6, 1932), pp. 1-9.

to a sampling of industrial arts instructors in the state of Michigan. Using information received from the jury of experts, two additional community factors were added to the original list of fifty, thus making a total of fifty-two community factors to be referred to the sampling of industrial arts instructors.

A tentative instrument was constructed and then subjected to trial, with a group of industrial arts instructors, as a check to determine its usability. This resulted in a few minor revisions that prepared it for printing in its final form.

The questionnaire containing a list of fifty-two community factors was submitted to a complete list of industrial arts instructors obtained from a random sampling of the twelve-grade school districts in the state of Michigan. In order to obtain the names of instructors, a letter was dispatched to the superintendent of each school district selected requesting the names and permission to contact them. A follow-up message was sent to those superintendents who did not respond to the original request, urging them to comply.

Using a five-point rating scale, the industrial arts instructors were asked (1) to evaluate each community factor according to the significance they believed it should possess in determining the instructional areas of their industrial arts programs, and (2) to evaluate each community factor according to the significance they believed each actually possessed in determining the instructional areas of their industrial arts programs.

They were asked to further specify, by means of a check list, the basis of their judgment in determining the ratings they had given each factor in answer to the second question. Two follow-up requests were used in an effort to obtain a maximum return.

After the information forms had been returned, interviews were arranged with some of the industrial arts instructors who had supplied the data in order to substantiate the information that they had given.

Computations were made to assess each community factor with an appropriate numerical value. Three correlations were then made. The assessed value given each community factor by the jury of experts was compared with that given by the industrial arts instructors of the state of Michigan in regard to how significant they believed each factor should be in determining the instructional areas of an industrial arts program. A second correlation was made by comparing the value given each factor by the jury of experts with that given as used in actual practice by the industrial arts instructors of the state of Michigan. Then the value given each community factor by the industrial arts instructors of the state of Michigan with regard as to how significant the factor should be was compared with the significance it possesses in actual practice in evaluating their industrial arts programs.

Delimitations of the Study

The first portion of this study dealing with the identification of the community factors that should be used to determine the instructional areas of an industrial arts program is limited to the continental United States and to consultation with experts in the field of industrial arts education residing within the continental limits of the United States and associated with American industrial arts education. The second phase of this study dealing with the opinions of industrial arts instructors is limited to those industrial arts instructors currently teaching in the twelve-grade public school districts located within the boundaries of the state of Michigan.

Summary

An important fact is that much progress has been made relative to certain aspects of industrial arts education. Significant advances can be noted in objectives, teaching methods, and the upgrading and professionalization of teachers. Other aspects, however, such as teacher-trainee selection, student evaluation, and course content do not appear to be as well defined.

This study proposes to investigate certain community factors and their importance in determining instructional areas of an industrial arts program. The work that can be found relative to this area of study appears to be

based on subjective judgment or as an added facet or by-product of a more comprehensive study. It is hoped that by consulting a group of specialists selected from the field of industrial arts education and by obtaining the reasoned opinions of a sampling of industrial arts teachers from the state of Michigan, a list of properly assessed community factors will be defined that should be included in the criteria used to determine the instructional areas of an industrial arts program.

Definition of Terms

For the purposes of this study the following definitions will apply to the terms used:

COMMUNITY The geographical area being served by a school district.

COMMUNITY FACTOR A constituent component or feature within a community which performs a function and exerts an influence upon the activities of that community.

INDUSTRIAL ARTS PROGRAM That part of general education dealing with socio-economic problems and occupational opportunities, involving experience with a wide range of materials, tools, processes, products, and occupations typical of an industrial society.

INSTRUCTIONAL AREA The phase of an industrial arts program that identifies the portion of industry being studied, such as woodworking, electricity, general metals, and auto mechanics.

UNIT SHOP A room or space designed and equipped to provide study and experiences within a single occupational area or a limited number of occupational areas that are very closely related.

GENERAL SHOP A room or space designed and equipped to provide study and experiences in two or more occupational areas simultaneously.

CHAPTER II

TECHNOLOGY AND SOCIAL CHANGE

This study is based on the assumption that certain community factors should be instrumental in formulating the type of industrial arts programs offered. The object of presenting this chapter is to indicate ways in which technological developments have been influential in changing life in industrial America. Such changes are reflected in the educational system, and should, therefore, be duly reckoned with. There are signs that reveal that the increasing rapidity of such change is threatening to completely outdistance the ability of the educational system to adjust itself.

Since industrial arts education is an integral part of general education, it too is being faced with such a problem. As a subject, the implications are even greater, for industrial arts is generally considered to be more intimately associated with industry and technology than most other subjects because its very foundation rests upon the resulting processes and products.

Environment Based on Traditional Concepts

Thousands of years ago, man began to construct dwellings and make clothing for protection against the elements. When he began thinking toward the future rather than just living from day to day, he fashioned containers and storage facilities to hold food and water for future use. This was the beginning of modern human culture--the time when man began to control his environment rather than just submit to it.

Gradually the primitive peoples determined that by organizing themselves into groups they could facilitate environmental control more adequately. Individual men and individual families began to live together, work together, and fight together, thus finding that this increased the security, protection, and welfare of the entire group.

> The primitive tribal organization of life reflected the fact that social groups were necessary for protection of men in the nomad state of wandering from place to place in search of food and security. Social organization was even more necessary when men began to settle down in the river valleys of the Tigris and Euphrates in Mesopotamia and of the Nile of Egypt. In these two centers human culture advanced enormously and became exceedingly complex as man perfected the use of metals and elaborated systems of written language.[1]

With the coming of such complexities, the tribal leader alone, who had been able to furnish guidance and leadership for the immediate future, was no longer competent.

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[1]R. Freeman Butts, A Cultural History of Education. New York: McGraw-Hill Book Company, Inc., 1947, p. 11.

It became necessary to foster long-range guidance leaders that could institute measures to control floods, plan effective warfare, and inspire cooperative tasks for the masses of people. The result was a well defined political, economic, and religious society centered about the fundamental needs of human maintenance. From this humble beginning technology reared its feeble head. People were united in cooperative tasks that resulted in the development of bodies of doctrine and methodology for getting an undertaking done.

Thus the simple hunting and agrarian life gave way to a more specialized phase of living which emphasized agriculture and stock raising. This developed into a social stratification dependent upon the amount of land owned. Trade and commerce developed and work with the hands was not considered menial. Specialized skills of artisanship gradually grew up in connection with shipbuilding, public buildings, aqueducts, roads, bridges, and weapon making. Dependency upon the skilled specialist continued to grow until the onset of a period in history when deterioration occurred. When this type of work was no longer encouraged or fostered, regression brought about a time when world civilization could no longer attain the achievements of the past.

After several centuries of stagnation, progress was once again inspired. The bud of achievement became a

full and beautiful bloom as great undertakings crowned the earth. Yet, in spite of these accomplishments, life remained predominantly agrarian and feudal. The bulk of the population tilled the soil which completely consumed their energies and resulted in only a subsistence-standard of living. The individual members of society were linked together through a series of status relationships, the rights and obligations of which placed a group responsibility for each. The peasant had certain rights and obligations by virtue of the estate to which he was born. The landlord also had rights and obligations, thus creating a division of labor.

Such a society was not free although it was secure. The individual was assigned to the division of labor that was specified by the status to which he belonged. If he was a peasant he would toil in the fields and work on the roads regardless of his capabilities or potential. His life was simple and as long as he met his obligations and did not over-extend his rights his position was secure. The prime purpose of his existence was service to those in the upper class. A possible parallel position exists today in the life of a beast of burden or an American household pet.

The old type of society was steeped in tradition and taboos and did not permit a forward look. There appeared to be no concept of genuine progress. Authority was based on age, so the people looked to the past rather

than to the future for inspiration. Christianity, being such a powerful force, is blamed by many for the suppression of rationality and the retardation of progressive developments.

> A large part of the history of the western world in the Christian era has been the gradual struggle of mankind to throw off the shackles of traditionalism.[2]

During the Middle Ages rational progress was not perceptible due to the number of authorities and traditions maintained by the church. However, in spite of such widespread control, the church was permeated with internal struggles and schisms which eventually led to the breakdown of its power and control. The culmination of the turmoil came in the sixteenth century when a revolt brought about a complete separation of the protesting members. Thus the universal authority of the western world was broken down into competing forces that proved to be a prime mover in the birth of an uncontrollable quest for greater things.

Trade and commerce were stimulated to a growth heretofore unknown. As this commercial expansion took place, man no longer depended entirely upon authority for answers to his questions. Although tradition still remained a very powerful influence, man began to exercise his power of rationality for decisions had to be made in increasing

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[2]Karl DeSchweinitz and Kenneth W. Thompson, Man and Modern Society. New York: Henry Holt and Company, 1953, p. 246.

numbers by individuals whose profit or loss depended upon such decisions.

> The Renaissance, the Protestant Reformation, and expanding commercialism loosened the fetters of traditional society and made society more susceptible to change and new ideas.[3]

Such spirit made way for the rational expansion of man's concepts and the development of the scientific. The rapid growth of the inductive and deductive methods that followed did much to destroy the presuppositions that had been held by society.

With the rise of the scientific method came the belief in individuality and the destruction of the traditional methods of ordering society. This new concept brought forth the idea that if individuals were given appropriate knowledge, they could adjust means to ends and therefore bring about greater good for society as a whole.

Impact of the Machine

The evolution of the belief in individual rationality sired a social environment more conducive to change. People were freed to the extent that they were encouraged to try new and different ways of doing things. This attitude manifested itself in a tremendous increase in mechanical inventions --a drama referred to as the industrial revolution.

Actually two industrial revolutions have occurred

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[3]Ibid., p. 248.

in modern times and the birth of a third seems in the making. The first appeared with the invention of machines to which mechanical power could be applied in the production of consumer goods. The second industrial revolution actually took place within the realm of the first. It came with the inception of the technique known as mass-production, and involved the standardization of parts so that they were interchangeable and could be put together on an assembly line system.

The revolution in industry also sparked a revolution in the relationship of man to his environment. It brought about the rise of the factory system and the big business firm, and from it emerged the urban community and great systems of ideas relative to democracy, nationalism, and humanitarianism. Man could no longer realize the individuality he once knew, but had to plan a life in terms of his role as a dependent member of an industrialized society.

As the effects of industry and technology began to exert an influence, the activities of life became geared to the pulse of a mechanized environment. The origin of energy to produce was changed from that of man and beast to that of machinery, and resulted in the repeated multiplication of man's power to produce by means of the utilization of the energies of water and coal. Along with this growth in technology came expanded volumes of equipment and materials. The result was a commodity hunger that

spurred industrialization on with even greater fervor. As man's knowledge increased through experience and experimentation, new tools became available for production that, in turn, produced far-reaching social changes.

Using scientific principles centered about the controlled efficiency of the machine, man discovered the means of quantity production through assembly line methods. This, of course, required a degree of standardization in the conversion of resources into products for human use that resulted in the loss to some degree of individual creativeness and design with respect to the product, how much, we will probably never know.

The worker also experienced a degree of standardization and regimentation. Compared with the individual producer in the handicraft or agricultural society, the production employee found his work simplified and regulated. Instead of working the days or hours he wished in whatever way he desired and producing the commodity he chose, the laborer was required to be in attendance at the mill or the mine every day at a prescribed hour and to work at the task assigned to him for a fixed working period.

From the quantity production methods, and the more organized production which evolved, poured a tremendous volume of products that, at first, appeared to improve the conditions for the wage earners. However, due to intense economic competition, the opposite happened. The struggle manifested itself in such a manner that prices were reduced

and wages repeatedly cut. At the same time, the working hours were progressively lengthened and safety and sanitation were all but forgotten. The tragic result was that the earnings of an entire family,- man, wife, and children of a very young age, were required to purchase the bare necessities of life.

Although exploitation of the human resource occurred and did reach an appalling level, gradual rectification of the many evils produced by the machine were accomplished through the forces of law and labor. The net result was a considerable betterment to all mankind. The human race as a whole was lifted from a condition of continual and strenuous struggle for the most meager living essentials to a high degree of material comfort.

The welfare of the worker is now considered to be an end in itself, not conceived merely for the benefit and profits of the upper classes. In the United States, work, education, leisure, and culture have been acclaimed the birthright to all and not merely for the favored few. This would not be possible except for the progress of technology that has enabled man to produce a surplus over and above what he consumes.

With the collapse of the feudal and military basis of civilization, new classes of people and new economic interests have arisen. Manners and customs have been transformed in an attempt to keep pace with the forward surge in

living, thus drawing the entire world nearer together so that both the social and industrial life are forced to integrate. Countries and races no longer receive status merely by the art and culture they have enjoyed, but rather by the industrial and technological capacities and the scientific skills they are able to muster.

The changes forged by the rapid transformation in the technological bases of society continue to make themselves felt. Man lives in a world of specialization that excludes him from a range of knowledge that is much greater than that which is afforded by his occupation. His contributions are all but lost in the complexities of industrial organization and efficiency. Even his income is a poor register of his accomplishments because his entire life is surrounded by dependencies on other beings and circumstances.

As industry and technology have progressed, man has become farther removed from the institutions that have been established throughout the years. His employer is oftttimes known to him only by reputation and his political obligations are discharged by way of a representative. The home, once the focal point of all his activities, has become, to a large degree, merely a way station. Yet, in spite of these negative aspects, technology has provided a much higher standard of living for the ever increasing numbers. It has brought vastly greater amounts of material wealth to many more people than was previously considered possible.

A civilization based on technology, science, invention, and expanding markets must, of necessity, change very rapidly. By destroying the restraints on movement that were implicit to the feudalistic society, mechanization provided unparalleled mobility in both the social structure and the economic markets of the world. For a period of time, man was free to seek employment in the markets of organized labor and at the same time had the opportunity to raise his social status by successfully producing different or unique products. The new era welcomed changes and new ideas with the same ardor that the traditional societies had opposed them.

However, as maturity began to take effect and establish a degree of stability in the growing economy, certain obstructing mechanisms appeared that interfered with some aspects of the mobility that had been prevalent. The versatility once enjoyed by a human being has all but vanished in the presence of the specialist. The handyman no longer possesses the abilities to meet the requirements demanded by today's society. Processes have been subdivided in such a manner that the worker can be familiar with only an infinitesmal part of the overall operation. Refinement and exactness represent the order of the day.

A rather unique feature of the class structure of our democratic society is the opinions expressed and the influences exerted by certain groups. The laborer, the farmer, and the business man all belong to organizations

that are very highly organized and that relentlessly pursue their ends. Sometimes the goals of such organizations are diametrically opposed, and, being such an intricate part of the society to which they belong, set up tensions that permeate the entire structure. Frequently such tensions are expressed in the forms of war, revolution, crime, and delinquency.

Thus, considered with respect to its intrinsic nature, a society based on technology presents certain basic characteristics. Founded primarily on power-driven machines, it affords the possibility of indefinite expansion of the productive capacities of man. The refinement and control of the basic sciences such as chemistry, physics, biology, and psychology, that serve technology have all but eliminated the crude invention. Continuous probing in the form of scientific research forces the creation of new materials, methods, and modes of life which, in turn, stimulate and endow mightier and more involved research. These forces generate within the society an acquisitive passion for the newest and latest products of science and technology and create an obsolescence of commodities before the public has had sufficient time to become acquainted and accustomed to them. Beard indicates the dynamic aspects of the situation and hints at the futility that is confronted when searching for direction.

> The order of steam is hardly established before electricity invades it; electricity hardly gains a fair

> start before the internal combustion engine overtakes it. There has never been anywhere in the world an order comparable with it, and all analogies drawn from the middle ages, classical antiquity, and the Orient are utterly inapplicable to its potentialities, offering no revelations as to its future.[4]

Men live today that have witnessed the complete transition from the horse-powered age to the atomic-powered age. The turbulence currently in progress on all sides of mankind places the human in an extremely crucial position, for he alone is responsible for the outcomes.

Educational Implications

Probably the greatest problem today is how to bring educational, economic, and social values into harmonious accord with the present industrial situation. There is recognized conflict between the ideals and customs that were established under conditions that existed one or two generations ago and the newer ones created by changing economic and social situations. The sense of values that was presented to the student a generation ago is no longer appropriate, and time alone cannot suffice for the constant reevaluations that are necessary. Discussing the role technology has played in this social evolution, Edwards and Richey note the need man has felt for adjustment.

> As the consequences of technological change were woven into the whole fabric of social relationships, old mores began to lose their sanctions and long-established institutions began to exhibit the need of modification.

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[4] Charles A. Beard, Whither Mankind. New York: Longmans, Green and Company, 1928. p. 15.

> Science and invention, translated into technology, had come to be the great disturbers of the ways of men. It was no longer possible to rely on the processes of automatic adjustment; more and more, men were forced to cultivate the spirit of contrivance and experimentation in the whole area of social relations, whether of economy, government, or ethics.[5]

It is not likely that the function of education in today's mode of living could have been foreseen by those in the past who developed the classical tradition and it appears to be difficult for those to grasp who are now directing it. American society, because of its industrial and technological background, is more like an assemblage of parts rather than a homogeneous whole. Certain variations in culture exist because of differences in the industrial bases of the communities. Dozens of factors, such as topography, geographic location, and available resources, are governing agents that determine the degree of industrialization that takes place.

The education of the old agrarian societies gained continuity largely by unchallenged tradition and custom. Since living was a relatively static function, the past was more influential than the present or future in determining the paths to be followed by the individual. Instruction consisted of drill in the established system of reasoning and rationalization. Such treatment for today's student would be irrevelant, to say the least, and would more than

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[5]Newton Edwards and Herman G. Richey, The School in the American Social Order, New York: Houghton Mifflin Company, 1947, p. 718.

likely result in complete maladjustment, for he lives in the mechanical world of industry.

In order to intelligently participate in such an environment, the pupil of today must be given sufficient opportunities to understand the role of the mechanical creatures that surround him. Undoubtedly he could exist without such knowledge, but only as an autonomic servant of the machine rather than being served by it.

Living today is not entirely dependent upon the deep roots of the past, and consequently the rapidity of change in environment is an incessant challenge to education. As new instruments are devised to control the forces of nature and are placed at the disposal of society, a continual reappraisal of the many aspects of living is required to give a better understanding of human values. Men are forced to live in the present and think in terms of the future. No longer can they afford to base behavior in a modern world solely on the glories and traditions of a past one. Reality and change are the concomitant variables of life itself.

This does not necessarily infer that the traditional philosophies of the past must be abandoned. They too, contribute certain principles that cannot be overlooked. A few generations ago knowledge was limited and near at hand for it was wisdom of the type inherent in the mores. Today reevaluations are in order because the focal point of knowledge has changed. Never before has knowledge been

so imperative, but it must continually be revised and restated. New situations compounded with new conditions must be met in such a way that the basic human interests for which men have always struggled are not lost but rather enriched in their objectives. Modern man is required to be equipped with such insight and intellect that will permit him to behave adequately in a world where science and industry have supplanted personal explanations and relationships. In this respect, education cannot afford to forget the past as is proposed by some progressives or to ignore the present and future as is advocated by some classicists. A blending of both appears necessary in such a manner as to furnish flexibility so adaptation can be achieved to the ever-changing environment.

In conclusion, it may be stated that the many striking and important social and industrial changes which have occurred during the past few decades have created new demands upon our educational system. The present belief that education is a life-long process and goes on in all the aspects of life's situations has become increasingly more apparent. Such agencies as the home, church, store, shop, and society in general are extremely instrumental in supplementing the task of the school. Because of their key role, attention should be paid to the functions which they perform at the time under consideration. Presently they, too, are finding it difficult to keep abreast of the times.

Being designed as a time and labor-saving device

for the dissemination of knowledge, the school also has been assigned the duty of forming the character and developing the whole individual for his deserving position as a democratic member of society. It is supposed to present to the student the experiences of the past generations and show the significance this bears in terms of his daily activities. In addition, it is to arouse any desires for further education, formal or otherwise, and should attempt to fill the deficiencies on the part of the other agencies that aid in human development. In short, the function of the school is to prepare the student physically, mentally, and emotionally for the life he is expected to live.

Over the years this responsibility has become increasingly more difficult because the influences which bear upon the life of an individual have broadened in scope. The entire world has been drawn more closely together. The exchange of people, ideas, and products occurs among the most distant reaches of the globe in a very efficient, prompt and regular manner. On the home front the occupations, modes of life, and the very basic characteristics of the home have changed in such a manner as to produce restrictive views with regard to action and thought. The individual being has been divorced from the stream of great world thought and action in order that he can maintain himself within the comparatively very narrow confines of his life. Although modern communication, transportation, and the involvement

in world affairs demand broader and more liberal views of the world in which one lives, the specialization and subdivision of occupations produces a counteracting and restricting force. The daily work and home environment, especially in the urban and metropolitan areas, tend to contract and isolate the ideals of community spirit at the very time when they are most urgently needed.

Thus the handicraft form of industry that gave the worker a relatively broad outlook has given way to the division of labor which tends to narrow his vision. As specialization increases and the subdivisions become more and more minute, the production of goods requires more and more cooperation of an increasing number of individuals. Each creates but a small cog in a great industrial wheel and consequently sees only an infinitesmal portion of the entire operation necessary to make the completed article. Since the machine aims at making a uniform and interchangeable product, the workman becomes an automaton tied to a rigid and monotonous schedule of routine work. Such forces tend to make the individual struggle blindly on without recognizing that he is actually an integral and necessary part in the operation of an industrial society.

The school has been assigned the task of demonstrating to the individual members of such a society that they are a wanted and needed unit in such an organization. To meet this obligation it has expanded its curriculum in many directions so as to cover more than mere mental training and discipline. Even with the addition of the many

different subject areas, the school encounters a considerable number of problems in meeting its assumed goal, for it finds difficulty in maintaining a proper level amidst the changing conditions created by the ever-quickening pace of living that has been brought about by the great advances in technology and industrialization.

Summary

The community of today is basically different from the community of 50 or 100 years ago. The pattern of living which industrialization has created has been a prime mover in this respect. Such phenomena as age of employment, housing conditions, leisure-time activities, transportation, and communication needs offer ample proof of such change. Attempts to adjust to the needs of this type of society confront the school systems with a multiplicity of problems. It seems questionable that such changes in culture have been matched by appropriate changes in the instructional areas offered in the industrial arts programs of present day education.

CHAPTER III

THE CHANGING CONCEPTS OF INDUSTRIAL ARTS EDUCATION

A study that is based on the influence that certain community factors should have in determining the instructional areas of an industrial arts program creates a need to understand the various forces prevalent in the field today. In order to understand the forces exerting an influence on industrial arts education today, it seems desirable to review those that have been effective in the past and the degree to which they have changed the concept of such training.

A New Concept of Knowledge Transmission

Industrial arts education received its early impetus during the first part of the seventeenth century. The advance of technology, change in culture and rise in living standards combined to exert a profound influence on the prevailing customs, instructional methods and the texts of education of that time. John Amos Comenius, an ardent Moravian bishop, believed that children should be educated for living. Butts, referring to the proposals advanced by the educational leaders of the Reformation period, lists Comenius with those who wished to broaden and liberalize education.

> Perhaps the most democratic proposals of all were stated by the Moravian leader, Comenius, who urged the establishment of a complete "ladder" system of schools reaching from the lowest levels to the university. Despite the strength of the aristocratic conception in practice, the democratic conception was being stated in theory here and there in preparation, as it were, for the realization of the democratic ideal that was achieved in the late eighteenth and nineteenth centuries.[1]

Comenius was vigorously opposed to the Latin schools that were the vogue of the time, for they busied the pupils with memorization of collections of Latin words, the meaning of which was of little consequence. He advanced the idea that knowledge should be acquired in the "natural order" and that instruction in words and things should go together in order that the words might convey meaning. It was an attempt to apply the methods of science, as he understood them, to educational theory, curriculum, and method. This meant that all instruction should be graded and arranged to follow in logical sequence as revealed in the child's development. By viewing the school as the manufactory of society that shaped children into human beings, he believed the aims of education were wider than merely religious; for children must be taught to live not merely for the church and for the school, but for all life.

The belief that throughout all teaching the child should be approached through appeals to his sense experience led Comenius to write several profusely illustrated textbooks. The Orbis Pictus Sensualium (The World of Sensible Things Pictured) was the first picture book written for children

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[1]R. Freeman Butts, A Cultural History of Education, New York: McGraw-Hill Book Company, Inc., 1947, p. 257.

and is perhaps the most widely known of his works. It was first published in Nuremburg in 1657 and consisted of pictures of objects with their names and some informative text in Latin and the vernacular in parallel columns below the pictures. From this revolutionary idea of illustrated writing conceived by the "father of modern pedagogy" came the realization that if symbols in the form of pictures could be used to give significance to otherwise meaningless material, the essence of reality could be brought a step closer by the objects themselves or even by their construction.

The well known educational naturalist Jean Jacques Rousseau advocated the use of the object itself whenever possible.

> As a general rule--never substitute the symbol for the thing signified, unless it is impossible to show the thing itself; for the child's attention is so taken up with the symbol that he will forget what it signifies.[2]

Rousseau believed profoundly that education came best through experience and he would therefore have everything possible taught by actions. He thought that the pupil would learn more from one hour of handwork than he would retain from a whole day of verbal instruction. Considering labor a duty for both rich and poor he would have students taught the simple manual arts such as agriculture, carpentry, and smithing. They would also learn a trade, not that they would likely earn a living by it, but because it would be a vital part of the process of education. In manual activ-

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[2]Jean Jacques Rousseau, Emile, translated by Barbara Foxley. London: J. M. Dent & Sons Ltd., 1911. p. 133

ities and tool processes Rousseau saw utilitarian and spiritual values as well as educational values leading to planning, reflection, and insight.

While discussing the observations and experiences of students on field trips to see the various laborers and tradesmen, Rousseau described a very interesting parallel to the modern day exploratory concepts of industrial arts education.

> Reader, do not stay to watch the bodily exercises and manual skill of our pupil, but consider the bent we are giving to his childish curiosity; consider his common sense, his inventive spirit, his foresight; consider what a head he will have on his shoulders. He will want to know all about everything he sees or does, to learn the why and whereof of it; from tool to tool he will go back to the first beginning, taking nothing for granted; he will decline to learn anything that requires previous knowledge which he has not acquired. If he sees a spring made he will want to know how they got the steel from the mine; if he sees the pieces of a chest put together, he will want to know how the tree was cut down; when at work he will say of each tool, "If I had not got this, how could I make one like it, or how could I get along without it?"[3]

Like so many of his predecessors Rousseau did not put his theory into practice. However, his recognition of the fact that the manual arts could be used as a means of mental training created another link in the chain of events and prepared the way for the educational methods of those who followed. He became the inspiration of those educational reformers who reduced his vagaries to practicable procedure. From the fundamental idea in educational thought that education is a natural process, starting from natural instincts

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[3]Jean Jacques Rousseau, Emile, translated by Barbara Foxley. London: J. M. Dent & Sons, Ltd., 1911, p. 151.

and tendencies to action, guided by principles derived from the study of the child mind in development and the adult mind in its functionings, comes the psychological tendency in education. Rousseau's teachings based on the educational principles of naturalism had a direct influence on the work of such men as Basedow, Pestalozzi, Fellenberg, and Froebel.

Tradition, especially in the field of education, presents a formidable barrier to change and it remained for the noted Swiss reformer Johann Heinrich Pestalozzi to advance the next sizeable step. Impressed by the writings of Rousseau and the theory of sense realism, he based his instruction on the object method and insisted that the mind formed ideas through sense perception, through the observation and handling of objects themselves or well-made models. Thus contending that the child develops mentally through impressions and experiences and not through words, Pestalozzi grasped the principles which Rousseau had used in a negative way in attacking the existing forms of education and made them positive and concrete. In his school at Yverdon, Switzerland, his emphasis upon the practical activities of children, starting with motor skills and leading to vocational competence in farming, trade, and industry, attracted those who were dissatisfied with the exclusively literary and linguistic schools of the day. The "object teaching" method which he enunciated had considerable influence in promoting active learning in both Europe and the United States.

The educational legacy left by Pestalozzi was acquired by his foremost pupil and co-worker, Friedrich

Wilhelm Augustus Froebel. Contending that children are creative rather than receptive, Froebel developed Pestalozzi's theory of organic growth into the doctrine of self activity and made this the very nucleus of his educational theory. He believed the process of education must involve motor activity or it would be relatively unproductive.

Feeling, as he did, that the materials of instruction necessary to insure the proper growth and development of the child's mind and nature must be a real part of the life which the child knows and that it must come within the realm of its experience, Froebel held that the influence of the school must make itself known during the time of life in which the child lives and must be presented by way of the child's own activities. In pursuance of these theories he provided the necessary opportunities in the kindergarten for the pupils to engage in play, music, nature studies, and various kinds of handwork.

> ...the making of simple wooden utensils; the weaving and binding of mats for the table and floor; the binding of books and the ruling of slates and practice paper, ...the care of the garden, ...the care of pigeons, chickens, ducks, etc., ...the use of pasteboard in the making of stars, wheels, boxes, napkin rings, card baskets, lamp shades, etc., ...the whittling of boats, windmills, waterwheels, etc., the making of chains and baskets from flexible wire; modeling with clay; drawing and painting, and many other things.[4]

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[4]Friedrich Froebel, The Education of Man, translated by W. N. Hailmann. New York: D. Appleton and Company, 1897, p. 39.

His belief that development must come from within in the form of self activity and that motor expression and social participation are the means by which it is accomplished are accepted principles which are considered fundamental by today's foremost educators.

Although the educational doctrines of these democratic pioneers permeated the entire western world and had a profound influence on the educational practices that followed, constructive handwork still was not acceptable in the upper grade classes.

Manual Training in the United States

In the United States, during the second quarter of the nineteenth century, certain types of manual training were injected into the curriculum of some Eastern elementary schools. Grammar schools were known to have offered sewing and knitting to girls during the regular instruction hours and drawing was listed as a regular subject for boys. By 1864 drawing was a required study in the Boston schools. A few years later, cities and towns were permitted to establish and maintain industrial schools providing they did not interfere with public school attendance and that they would be supported by special appropriation.

In 1871, a system of woodwork instruction was inaugurated in the chapel of the Hollis Street Church of Boston. Using chisels, jig saws, and a lathe, boys from twelve

to sixteen years of age made such items as match boxes and checkerboards. Emphasis was not on skill or the making of any object for trade or commerce but rather an attempt to facilitate the better use of leisure time. In time this operation came to be known as The Whittling School.

Influence of the Russian System

Originating in Russia and spreading throughout the world, a decisive step was taken when an adequate teaching analysis of tool processes and construction methods was made. This permitted the tool processes and construction methods to be broken down into elements that could be arranged in a logical sequential order and therefore made it possible to facilitate education of the various manual arts.

Referring to this system of training, Bennett states that it was an important turning point whether one thinks of manual arts as being taught for vocational or for general education purposes.[5] Prior to such a system of analysis, progress in teaching the manual arts was a slow process for it was based on the traditional apprenticeship training of imitation. After the inauguration of the analysis of tool processes and construction methods, progress was rapid, for one could master the elements of the art, one or a few at a time, in a series of progressive steps. Once proven possible and practicable, it was then realized

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[5]Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917. Peoria, Illinois: The Manual Arts Press, 1937, p. 13.

that these arts could be taught in the schools in much the same manner and using techniques similar to those employed in the teaching of other school subjects.

Although there were traces of the analysis of certain phases of manual arts in the early part of the nineteenth century, the crystallization and actual use of such a method was not attained until after the reorganization of the City of Moscow School of Trades and Industries and the establishment of the Imperial Technical School in 1868. The actual purpose of the Imperial Technical School did not fit into the scheme of general education for students on the elementary or secondary level. It was a course of instruction six years in length to train college grade students in the fields of civil engineering, mechanical engineering, drafting, foremanship, and chemistry. The role it played as a stepping stone for the development of industrial arts education in the United States, however, is of utmost importance.

Organized under the leadership of its director M. Victor Della Vos, it was hoped that foremost among its accomplishments, the Moscow school would train mechanics in a shorter length of time, that a greater number of pupils could be trained, a higher degree of efficiency in handwork developed, and the progress of pupils measured.

There were separate shops for the various trades, each with tools for general as well as for individual use. The courses were so organized that the student proceeded through a series of exercises arranged in order from simple to complex. One model had to be completed before another

was begun. Notebooks were kept and charts, illustrative materials, tools, and shop rules were on constant display. Sketches of the models and procedural steps were compiled by each student for each model. Phases of this system permeated the industrial arts programs of America and evidence of its impact can still be found today. Discussing the Russian system, Friese made the following statement:

> ...the former was a system of fundamental tool instruction based upon the application of the methods of formal discipline or transfer of training, to give instruction in handwork. It was wholly vocational in its objective. It was characterized by an analysis of the trade to secure the fundamentals, by organization of subject matter and methods of instruction. Mental power and individual efficiency were striven for. Instruction was given through a system of models, many of which were abstract in their application and of no intrinsic worth.[6]

In 1870, the Imperial Technical School displayed its teaching method at the Exhibition of Manufacturers in St. Petersburg and again in 1873 at Vienna. Having aroused considerable interest, it was then exhibited at the Centennial Exposition held at Philadelphia in 1876 and was thus introduced to the United States.

Under the guidance of Dr. John Daniel Runkle, the Massachusetts Institute of Technology made elaborate plans for taking advantage of this exposition. Camping equipment was borrowed from the National Guard Armories of the Commonwealth of Massachusetts, and the University of Pennsylvania granted permission to use its campus for the encampment. In June of 1876, a party of 370 persons, consisting of faculty members, graduates, former students, undergraduates, and a

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[6]John F. Friese, Exploring the Manual Arts. New York: The Century Company, 1926. p. 12.

few women, attended the exposition for seventeen days and compiled a great quantity of material and information. This served not only as a basis for the instruction in the engineering shops of the Massachusetts Institute of Technology, but also dominated instructional methods used in the newly established school of Mechanic Arts. The School of Mechanic Arts was that part of the Massachusetts Institute of Technology giving instruction on a secondary grade level for those who wished to follow industrial pursuits rather than become scientific engineers.

Within a few years the School of Mechanic Arts was felt to be a vital part of education for those students intending to follow an industrial trade.

> ...it is evident that Dr. Runkle and his associates, through their experiences in the School of Mechanic Arts, had become convinced that a course of intensive training on the Russian plan should precede apprenticeship or employment in a productive shop. This was far more economical educationally than to begin by working in a shop organized on a productive basis.[7]

Another interested observer of the Russian exhibit at the Centennial Exposition was Dr. Calvin Milton Woodward of Washington University at St. Louis. He immediately conceived the idea that manual arts training should not be reserved for only those capable of enrolling in an engineering college, but should be a part of the education of all boys.

> His plans for making this idea effective resulted in the organization of a new type of high school in which

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[7]Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917. Peoria, Illinois: The Manual Arts Press, 1937. p. 336.

> organized instruction in shopwork and drafting should have a place just as important as those of other subjects.[8]

Thus through the influence of Dr. Woodward the Manual Training School of Washington University was established on June 6, 1879. It opened in a new building on the corner of 18th Street and Washington Avenue on September 6, 1880 with an enrollment of approximately fifty students.

This school proved to be a new discovery in the realm of American education and served as a model for many that followed. From it, Professor Woodward envisioned the mechanic arts analyzed, pedagogically organized, and taught under guidance of the same principles underlying the methods used in the teaching of mathematics, sciences, and the languages. As such, the mechanic arts were to be part of general education and not used specifically to teach trades. The projects produced would not be constructed for their commercial value, and therefore the classes were to be supported in the same manner as the traditionally accepted academic subjects.

Although this dream was not fulfilled completely, it was indeed a forward step in the history of industrial arts education and earned Dr. Woodward the often referred to title, Father of Manual Training in the United States.

Discussing the establishment of the St. Louis Manual Training School, Friese notes the long years of

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[8]William T. Bawden, Leaders in Industrial Education, Milwaukee: Bruce Publishing Company, 1950, p. 10.

tireless effort put forth by Dr. Woodward in such an accomplishment.

> In St. Louis there had been developing slowly since 1857 a plan for handwork instruction in secondary preparatory schools associated with Washington University. These experiments culminated in 1870 in the organization of the St. Louis Manual Training School of Washington University. Calvin M. Woodward had been associated with previous experiments and was the real founder of the school, funds for which were provided by public-spirited individuals. ...Woodward advocated the introduction of handwork instruction as a part of the education for all boys regardless of their educational aims. ...The school he established in 1879, however, was not organized for the purpose of giving handwork as part of cultural education. He could not have secured the funds for its establishment on any such basis. The instruction in tool processes was, like the Russian, an application of the theory of formal discipline to trade instruction. ...it was only under the cloak of formal discipline that educational handwork could have secured a place in our education at that time.[9]

Dalton gives considerable credit to this institution for the initial growth and rapid spread of the manual training movement.

> The spread of the manual training movement was fostered by well-organized demonstration in the St. Louis schools, the continued agitation of the question of the education-handwork by the press and on the platform by Runkle, Woodward and others. By 1885 Manual Training schools were established in Chicago, Philadelphia, Cleveland, Toledo, and Baltimore, in the majority of cases by private means.[10]

The period of time from 1880 to 1890 can be described as a period of marked progress and heated controversy

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[9] John F. Friese, Exploring the Manual Arts, New York: The Century Company, 1926, pp. 13-14.

[10] Frank W. Dalton, The Development of Industrial Education in Michigan. Ann Arbor, Michigan: The Michigan Industrial Education Society, 1940, p. 9.

concerning the place and value of manual training in the public school systems. It was a popular success as evidenced by the rapid increase in enrollment and it filled a recognized gap in the American educational system. However, it aroused the highly active opposition of some of the more conservative leaders in the field of education who did not recognize the value of such training and who feared a breakdown in the then prevailing academic standards.

In spite of the continued assault by some members of the profession, a progressive-minded educator and philosopher named Dr. Felix Adler clearly recognized the concept of the philosophy underlying this movement.

> The salient features of the new experiment is that it introduces what may be called the creative method into school education. The system of teaching by object lessons has long been familiar to educators. It is proposed to improve upon this system by giving lessons in the production of objects. This step forward taken by Pestalozzi, when he summoned teachers to desist from the vain work of teaching the names of things, and to lead their pupils rather to a first-hand observation of things marked a new epoch in the science of pedagogy. At present, still another step must be taken, viz., from the mere observation to the production of things as a means of acquiring knowledge; and the taking of this step will mark another epoch in pedagogy. Froebel began to apply the principle of the creative method in his Kindergarten. But the kindergarten system covers only three years of the child's life;[11]

The Introduction of Educational Sloyd

In the year 1889 a school was established in Boston that is credited with introducing Swedish Sloyd into the

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[11]Felix Adler, Princeton Review, March, 1883, quoted in Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917, p. 417. Peoria, Illinois: The Manual Arts Press, 1937.

American system of Manual Training and thereby initiated another phase of development. Originally instituted in Sweden as an attempt to check the rapid exodus of the rural population from the farms and to revive the rapidly disappearing industries carried on in the home, it was based on the construction of small articles to be used in connection with the daily routine of a rural family. This concept of making utilitarian articles was granted Swedish government financial support in the year 1872. At this same time, a privately managed sloyd school was established on the estate of August Abrahamson at Näas, which was ultimately credited with the birth of educational sloyd.

Within a few years, a nephew of Abrahamson, Otto Salomon, made a scientific study of sloyd and developed it as a means in education. This resulted in attracting progressive teachers from every country in the world to the school at Näas, thus spreading the concept far and wide. The three outstanding characteristics of the system were (1) making of useful objects, (2) an analysis of processes, and (3) educational method.[12]

Educational sloyd was introduced into the Boston schools by Gustaf Larsson of Sweden. He came to Boston in 1886 and shortly thereafter established a training school for teachers. Until this time, manual training in the United States was rather crude and abstract, being based on the Russian system. With the injection of sloyd, the manual training being offered took on new character and meaning. Not only were the objects constructed for educational purposes, but these articles had the additional value

[12]Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917. Peoria, Illinois: The Manual Arts Press, 1937. p. 64.

of actual use in the home. The types of articles made and the progression of processes involved can be ascertained by examining a sampling of the list of models used by Larsson in the course of his instruction.

Name of Model	Kind of Wood	New Exercises
Brush handle	(Birch)	Long cut, Cross cut
Flower stick	(Pine)	Oblique cut, Convex cut
Key rack	(Alder or Pine)	Boring with bradawl, Screwing in hooks and screw eyes
Butter pat	(Birch)	Curve sawing, Concave cut
Chopping board	(White or Red Pine)	End planing
Flowerpot stand	(Pine)	Nailing, Setting nails
Pen tray	(Birch or Alder)	Scooping out, Smoothing with spoon iron
Axe handle	(Birch)	Chopping, Shaping with drawknife
Bootjack	(Birch and Pine, or Alder and Pine)	Single dovetailing
Set squares	(Beech or Birch)	Fastening with wooden pegs for planing thin wood
Pen box	(Birch)	Cutting small groove
Drawing board	(Pine)	No new exercise
Picture frame	(Beech, Oak and Pine)	Half lapping, Beveling with chisel
Table	(Pine)	Up-and-down sawing, Concealed tenoning, Blocking[13]

In the early days of his teaching, Larsson adhered

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[13]From a list of 42 models listed by Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917, Peoria, Illinois: The Manual Arts Press, 1937, pp. 72-82.

strictly to the Swedish models, but later his work became more flexible when it was established that just because an article was useful in a Swedish home did not necessarily make it so in an American home. Since mechanical drawing was so firmly entrenched in the American educational system, it was also incorporated into the American Sloyd although it was not taught as such in Sweden. A study of the models used in the American Sloyd reveals that several new tool processes were included that had not previously been used in Swedish Sloyd. The most outstanding of these were whittling, coping saw work, and wood turning.

Leaders involved in the manual training development such as Salomon, Woodward, Runkle, and Larsson thought of manual training as being altogether separate from the manual labor movement. Manual training was considered something entirely new in the way of general education, whereas the manual labor movement had been under way for considerable time and carried with it a certain vocational connotation. Manual training, as then conceived, was based on the seventeenth century notion of faculty psychology.

In accordance with such a concept of carry-over or transfer of training, the belief was that the exercises encountered in manual training would have broad applications in real life. This, of course, has been denied by the educational psychologists of today.

The Arts and Crafts Component

Another major change in the concept of manual training in the United States occurred in the very last years of the nineteenth century. It can be directly attrib-

uted to what came to be known as the Arts and Crafts Movement. Originating in England from the teachings of Thomas Carlyle and John Ruskin, the Arts and Crafts Movement was a revolt against the factory system and mass production. They attacked the process of mechanical duplication, insincerity in art, and the use of meaningless ornament, stating that art was not something superimposed, but rather within the proportions and structure of the object itself. Ruskin felt that art in its best form came from the creative effort of a single individual and therefore the craftsman had to also be the designer of the article.

As a result of this reaction, a group of artists and craftsmen under the leadership of William Morris opened a business establishment to produce articles of better design. Through the use of exhibitions the popularity of objects of this nature grew and the demand increased. It was quickly adopted by the manual training teachers.

Manual training in the United States experienced a period of some years that reflected the influence of the Arts and Crafts Movement. The transfer was not accomplished without negative aspects, however.

> Manual training teachers adopted the form without the spirit--the idea without the inspiration or guiding principles. The machine was proclaimed the basest of all devilish inventions, and anything "handmade" was looked upon as the acme of correctness and refinement, while tool marks, inaccuracy, and general crudeness were evidence of genuineness and superiority. Homes were filled with massive, straight-lined, ill-proportioned "mission" furniture made in violation of almost every principle of Ruskin and Morris.[14]

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[14]Samuel J. Vaughn and Arthur B. Mays, Content and Methods of the Industrial Arts, New York: The Century Co., 1924, p. 36.

In spite of these criticisms the Arts and Crafts Movement did prove fruitful in several ways. In many cases it required originality in thought and planning, provided variety in the articles produced, and gave some thought to proportion and design. It was also instrumental in changing the term manual training to manual arts.

Actually, the term manual arts had been first used in 1893 at the Teachers College, New York City, to designate a building to be used for art and manual training. It was named the Macy Manual Arts Building. The term was soon used in the New York City public schools. The Arts and Crafts Movement stimulated the formation of the Society of Arts and Crafts in Boston which was organized for the purpose of promoting artistic work in all phases of handicraft.

Although much of the instruction in school shop work was carried on by teachers who had not been broadly educated and were weak in the teaching of related subject matter because they had no conception of the possibilities of correlation with other subjects, there were exceptions. Ira S. Griffith, a literary college graduate and a practical carpenter was one of these. He was an enthusiastic believer in the possibilities of manual training and an outstanding teacher of boys. His constant aim was to balance the thought element in training with the skill element for he believed the psychologists had overemphasized the former while the Russian and Sloyd systems had overemphasized the latter. In the course of establishing a program at Oak Park, Illinois, Griffith felt the need for a textbook. Since there was none available at that time, he wrote one, Essentials of

Woodworking. For projects he selected small pieces of furniture that were well designed and in harmony with the prevailing tastes of the time. The program devoted a considerable amount of time to planning and drawing.

> He orgganized his course of instruction by arranging problems in groups. It included the making of working drawings and the study of and reporting on definite related information assignments. After experimenting, he concluded that he could secure best results in the year's work by having the pupils devote the first twelve weeks entirely to making drawings which they would use during the remainder of the year. Care was taken by him to have the pupils work on well-designing what they did. This included especially the study of proportion and designing of contours and of surface decoration.[15]

The Industrial Arts

The period known as the manual arts phase of shopwork displayed a great improvement over the old manual training programs, but it was shortly overshadowed by another movement that got under way which was to have a pronounced effect on its destiny. By fusing the psychological ideology of Dr. G. Stanley Hall with the methodology proposed by Johann Friedrich Herbart, some of the more progressive educational leaders looked upon manual instruction as a convenient and effective means of teaching the traditional school subjects. They felt that the sequence of manipulative processes of the manual work must give way to the needs of the subject.

John Dewey in School and Society placed industrial occupations at the very center of the elementary school

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[15]Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917, Peoria, Illinois: The Manual Arts Press, 1937, p. 445.

curriculum. He reasoned that the industrial occupations could be made so broad and rich in related subject matter that they would very readily become the basis for instruction in other subjects. Recommending that the occupations selected should be real in school life rather than those that were typical of adult life, he believed that the school itself could be made a genuine form of active community life instead of a place set apart in which to learn lessons.

> Aside from the fact that active occupations represent things to do, not studies, their educational significance consists in the fact that they may typify social situations. Man's fundamental common concerns center about food, clothing, shelter, household furnishings, and the appliances connected with production, exchange, and consumption. Representing both the necessities of life and the adornments with which the necessities have been clothed, they tap instincts at a deep level; they are saturated with facts and principles having a social quality.[16]

Although challenged by many, Dewey's philosophy almost immediately attracted the attention of nearly every forward-looking educator in the country. One of those in the field of manual arts who provided a quick reaction to this concept was Professor Charles R. Richards of Columbia University.

> The problem of the elementary school today is, I conceive, to make the life of the school more real; more an epitome of the kind of thinking, feeling, and doing that one obtains in real life; more a reflection of the actual life outside the school walls. ...Accuracy and precision have commonly been referred to as the essential qualities of all educative handwork, but accuracy is natural only when its necessity if appreciated by the worker, and this will be the case only to the degree that the need for accuracy is perceived to be an inherent condition of success in the task and

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[16] John Dewey, Democracy and Education. New York: The MacMillan Company, 1916, p. 234.

> not as a quality imposed from without. ...On the side of the pupil, handwork is a medium of expression in terms of form, color, and material; in its relation to social life, it is essentially a means of interpreting art and industry.[17]

A few years thereafter, Richards proposed that the term "industrial arts", being more fitting and descriptive of the type of programs being offered, be used. He felt that the courses should bear an intimate and definite relationship to the industrial society of which the American people are a part.

> We are rapidly leaving behind the purely disciplinary thought of manual training. ...now we are beginning to see that the scope of this work is nothing short of the elements of the industries fundamental to modern civilization. ...In hope of enlisting consideration and discussion the writer proposes the term suggested above: Industrial Arts. Such a term indicates a definite field of subject matter. The word Art is inclusive of both the technical and aesthetic elements, and the qualifying word points specifically and comprehensively to the special field of our material.[18]

The feeling became quite general that school shop work should provide a reservoir of information and experience relating to materials, processes, problems, and manufacturing methods encountered in certain fundamental industries. Thus the term "industrial arts" grew in popularity and gradually supplanted the terms "manual training" and "manual arts." Discussing this evolution, Bennett makes the following comment:

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[17]Charles R. Richards, "Handwork in the Primary School," Manual Training Magazine, III (April 1901), pp.2-9.

[18]Charles R. Richards, "A New Name," Manual Training Magazine, VI (October 1904), pp. 32-33.

> While the term "industrial arts" was first used to designate work that developed as a reaction against the formalized courses inherited from Froebel, the term has become so popular in the United States of America that it is coming to include all instruction in handicrafts for general education purposes, whether formalized or not. Its meaning is essentially the same as the term "manual arts," though its connotations are different. In the term "industrial arts," the "industrial" is emphasized; while, in manual arts, the "arts" is historically the distinctive word and, in the term manual training, "manual" is the important word.[19]

Making use of the social philosophy of Dewey, Dr. Frederick Gordon Bonser of Columbia University contributed an article to School Arts Magazine in 1913 that expanded the conception of industrial arts in the elementary school. He stated that in developing such a program definite units typical of important industries must be selected and graded in such a sequence that simple phases are developed in lower grades and the more complex phases as the student proceeds into higher grades.[20]

The one factor that undoubtedly was responsible for the extent and quality of Bonser's influence on the trend of events was the crystalization of his ideas into a popular definition of industrial arts.

> The industrial arts are those occupations by which changes are made in the forms of materials to increase their values for human usage. As a subject for educative purposes, industrial arts is a study of the changes made by man in the forms of materials to increase their values, and of the problems

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[19]Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917. Peoria, Illinois: The Manual Arts Press, 1937, p. 455.

[20]William T. Bawden, Leaders in Industrial Education, Milwaukee: Bruce Publishing Company, 1950, p. 41.

of life related to these changes.[21]

With time and experience came modifications in points of view and corresponding changes in aims and objectives. The National Vocational Education Act of 1917 provided a greater degree of differentiation between general industrial education of the manual training type and specific industrial education with vocational competency as an objective. Training given for the purposes of general education was expressed in the terms of newer theories and beliefs in education. Gradually it emerged from a special subject to one considered more fundamental and one that was required of the junior high school level. Its very name experienced a change in many states to that of industrial arts education. The term is coming into greater use to designate the enriched, enlarged, broadened, and modernized version of manual training.

Currently industrial arts education is based on its role in the field of general education. As such it must state its purposes and proceedings in terms of their relation to both the present work and future ambitions of the individual in the world of industry. It must be justified as either a means of pursuance of other technical courses of more advanced grade, or in the understanding and appreciation of the general phases of the industrial world and its products as they touch the lives of citizens in general.

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[21]Frederick G. Bonser and Lois C. Mossman, Industrial Arts for Elementary Schools. New York: The Macmillan Company, 1923, p. 5.

As an integral part of such a program, it must satisfy the aims that are basic to general education. Wilber lists these as (1) to transmit a way of life, (2) to improve and reconstruct that way of life, and (3) to meet the needs of individuals in the basic aspects of living.[22] To attain these aims certain objectives, such as those discussed in Chapter I, have been formulated in the field of industrial arts education, the effectiveness of which can be analyzed in terms of behavior change. The fundamentals of this concept are based on the premise that if learning has taken place, the student's behavior will be different from that with which he started.

Summary

Industrial arts as a form of public education was a matter of relatively slow growth. Beginning with the revolutionary concept of a new method in the transmission of knowledge conceived by Comenius, the underlying thought and philosophy dates back through the times of Froebel, Pestalozzi, and Rousseau.

The initial impulses that introduced manual training into the United States came from Russia where Della Vos developed a series of manual exercises at the Imperial Technical School of Moscow, and from Sweden where Otto Saloman had developed the underlying psychology, method, and the techniques of teaching sloyd by way of a series of one

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[22] Gordon O. Wilber, Industrial Arts in General Education. Scranton, Pennsylvania: International Textbook Company, 1954, p. 3.

hundred projects. This introduction was accomplished through the Centennial Exposition held at Philadelphia in 1876. At the time, such a change in education was considered a radical move in that handwork in formal education was generally unknown and industrial inefficiency on the part of school trained individuals was the rule rather than the exception.

Manual training was heralded by some as a panacea that would develop the faculties through instruction based on handwork and as an aid in meeting the rapidly changing demands of a machine age. Originally introduced as a form of disciplinary activity, it was successively elevated to the rank of a school study, looked upon as a non-producer of efficient-thinking workers, convicted of being decidedly lacking in content value and therefore below the status of a school subject, and finally as a subject dealing with industry as an organized body of human experience. Formerly operated as a highly regimented activity in an autocratic atmosphere, using one or two easily worked and easily obtained materials, it has evolved as a subject centered about the interests of the child, using any and all materials available, and as a means of securing desirable behavior change in the student as an individual and as a member of a group. It is also assumed that interest gained by manipulative work has the ability to enhance learning in other areas of education.

This brief historical and philosophical review has been presented with the hope that it would indicate,

to some degree, the forces and events instrumental in forging the concepts of industrial arts education. Confirmation and acceptance as a regular school subject has been a slow and stormy process. Constant appraisal and re-evaluation is necessary if it is to maintain a position as an equal in our school curriculum with other subjects. A list of appropriately assessed community factors that could be included in the criteria used to determine the instructional areas of an industrial arts program would seem to be a valuable asset in this respect.

CHAPTER IV

PRESENTATION OF DATA

The Community Factors

From the various sources indicated in Chapter I, a total of 71 possible community factors used to determine instructional areas in industrial arts programs were assembled. These were then submitted to the pilot committee for appropriate editing. The pilot committee[1] was made up of industrial arts instructors who were enrolled in an educational research class. They were engaged in the pursuit of graduate work at the University of Michigan on a part-time basis. While two members of the pilot committee represent the smaller type school systems that are more prevalent in the state of Michigan, the third is employed by a large school system located in a sizeable city in the state of Michigan.

Considerable time and effort was consumed in the editing and organizing operation, which ultimately produced the questionnaire that was submitted to the jury of experts on industrial arts education. Of the 71 original community factors, 21 were eliminated because they were considered duplications of others or were not considered to be within the realm of community factors. Therefore, the following 50

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[1]The names, positions, and addresses of the members of the pilot committee are listed in the Appendix, p. 139.

community factors listed in Table I formed the basis of the questionnaire.

TABLE I

COMMUNITY FACTORS AS APPROVED BY THE PILOT COMMITTEE

1. Number of people inhabiting the community.
2. Percentage of foreign-born persons in the community.
3. Percentage of non-whites in the community.
4. Ratio of persons in the upper, middle, and lower class status.
5. Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).
6. Culture of the community (whether the community is progressive and dynamic or static and opposed to change).
7. Sex ratio (as affects birth rate, death rate, and marriage rate).
8. Population age trend (whether average is rising or falling).
9. Number of industries present in the community.
10. Kinds of industries present in the community.
11. Sizes of the industries present in the community.
12. Raw materials used or created in the community.
13. Business enterprises present in the community.
14. Assessed valuation of the community.
15. Area of the community.
16. Geographic location of the community.
17. Existing industrial arts space available.
18. Kinds of industrial arts equipment present.
19. Amounts of industrial arts equipment present.

TABLE I (cont'd)

20.	Financial prospects for industrial arts space.
21.	Financial prospects for industrial arts equipment.
22.	Financial ability to obtain desired materials and supplies for the industrial arts program.
23.	Training possessed by the industrial arts teaching personnel.
24.	Financial prospects for hiring industrial arts teaching personnel.
25.	Attractiveness of the community for hiring and retaining industrial arts teaching personnel.
26.	Public transportation facilities serving the community.
27.	Transportation facilities serving the school.
28.	Proportion of graduates that go into industries, service trades, professions, business, and farms.
29.	Proportion of drop-outs that go into industries, service trades, professions, business, and farms.
30.	Proportion of pupils that leave the community after completing their education (graduates and drop-outs).
31.	Number of industrial arts students per class.
32.	Probable number of students to be enrolled in industrial arts in the immediate future.
33.	Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).
34.	Number of girls enrolled in industrial arts.
35.	Leisure time activities of the students of the community.
36.	Leisure time activities of the adults of the community.
37.	Reading habits of the students of the community.
38.	Reading habits of the adults of the community.

TABLE I (cont'd)

39.	Hobbies of the students of the community.
40.	Hobbies of the adults of the community.
41.	Recreational pursuits of the students of the community.
42.	Recreational pursuits of the adults of the community.
43.	Occupations of the adults of the community.
44.	Dominant dwelling type of the community (apartments or homes).
45.	Attitude of the other teachers toward an industrial arts program.
46.	Attitude of the citizens of the community toward an industrial arts program.
47.	Attitude of the school board toward an industrial arts program.
48.	Attitude of the school administrative officers toward an industrial arts program.
49.	Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).
50.	Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.")

At one point, consideration was given to the use of category headings for the community factors such as, sociological, psychological, physiological, technological, and economic. The pilot committee advised, however, that a possible bias could result from such divisions; so this design was abandoned.

Response of the Jury of Experts

Using the criteria presented in Chapter I, a total of 13 men were invited to serve as members of the jury of experts on industrial arts education. Of the 13 men contacted, 12 agreed to serve. The one who declined was on leave-of-absence in Asia.

The men who served on the jury of experts[2] are representative of the nation's most outstanding and influential persons that are engaged in industrial arts education today. Not only do they hold prominent positions, but their names command attention for the outstanding qualities of leadership and ability wherever they appear. Numerous books and articles on industrial arts education have been written by them, and they have been prominent in national meetings and conventions.

The data presented here is based on information received from the jury of experts in response to the questionnaire submitted to them. For each community factor the juror was requested to indicate the degree of significance he believed it should possess in determining the instructional areas of an industrial arts program. A five-point rating scale, using the headings VERY HIGH, HIGH, MODERATE, LITTLE, VERY LITTLE OR NONE, was provided. For ease in computation these were assessed numerical values ranging from 5 for VERY HIGH to 1 for VERY LITTLE OR NONE. Results calculated from the values are given in Tables II,

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[2]Names, positions, and addresses of the members of the jury of experts are listed in the Appendix, p. 138.

III, and IV. In the compilation of the information presented in them, various symbols and formulas were used. These are explained in the following paragraphs.

By dividing the list of community factors into three groups ranked according to the mean value assessed each community factor, it appears that a somewhat better perspective can be obtained as to the significance the jury of experts believes each community factor should possess in determining the instructional areas of an industrial arts program. The ranges of such groups were arbitrarily established after careful examination of the assembled data indicated such divisions seemed appropriate.

In the following three Tables, II, III, and IV, the first column under the heading No. lists the numerical order in which the community factor appeared on the original questionnaire.

The second column under the heading COMMUNITY FACTOR lists the actual community factor.

In the third column, N is used to represent the number of jurors rating the particular community factor.

The fourth column under the heading M gives the mean value assessed each factor by the jury of experts based on the five-point rating scale. In order to determine the mean value, the formula $M = \frac{\Sigma X}{N}$ was employed. ΣX indicates the sum of the numerical values given the community factor by the jury of experts. N is the number of jurors doing the rating.

The symbol SD, used in the fifth column of Tables II, III, and IV, represents standard deviation and is used

here to indicate the degree of variability in the values given each community factor by the jury of experts. It was selected because it takes into account the size of every value in a distribution, it is frequently used in educational computations and therefore more likely to be understood, it is a function of many other statistical formulas which would permit it to be used in further applications, and it is a statistic that can very well be applied to the information presented.

One standard deviation on each side of the mean value in a normal distribution determines the numerical distance that includes approximately 68 percent of the responses. Two standard deviations on each side of the mean value determines the numerical distance that includes approximately 95 percent of the responses. Thus, a low standard deviation value signifies considerable agreement as to the mean value assessed a particular community factor by the jury of experts, whereas a high standard deviation value indicates a rather diverse range of opinions.

The formula $SD = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N}}$ was used in computing the standard deviation values.[3] The symbol X represents the numerical value given the community factor by the juror and N indicates the number of jurors doing the rating.

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[3]James E. Wert, Charles O. Neidt, and J. Stanley Ahmann, Statistical Methods in Educational and Psychological Research. New York: Appleton-Century-Crofts, Inc., 1954, p. 57.

It is apparent from the information presented in Tables II, III, and IV, that considerable agreement was reached by the jury of experts in assessing values to the majority of community factors. In certain instances, however, as indicated by the higher standard deviation readings, a relatively diverse series of values was obtained.

Table II lists, in rank order, those community factors that the jury of experts have assessed a relatively greater significance value in determining the instructional areas of an industrial arts program. Based on information previously presented, the greater significance values have been arbitrarily set to include the mean value 3.50 and above.

TABLE II

COMMUNITY FACTORS THAT SHOULD POSSESS GREATER SIGNIFICANCE VALUES AS RATED BY THE JURY OF EXPERTS

No.	COMMUNITY FACTORS	N	M	SD
21.	Financial prospects for industrial arts equipment.	12	4.08	.64
20.	Financial prospects for industrial arts space.	12	4.00	.57
22.	Financial ability to obtain desired materials and supplies for the industrial arts program.	12	3.92	.86
45.	Attitude of the other teachers toward an industrial arts program.	12	3.92	1.27
29.	Proportion of drop-outs that go into industries, service trades, professions, business, and farms.	12	3.83	1.07
35.	Leisure time activities of the students of the community	12	3.83	1.18

TABLE II (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
36.	Leisure time activities of the adults of the community.	12	3.83	1.18
23.	Training possessed by the industrial arts teaching personnel now employed.	12	3.75	1.02
47.	Attitude of the school board toward an industrial arts program.	12	3.75	1.10
42.	Recreational pursuits of the adults of the community.	12	3.75	1.16
10.	Kinds of industries present in the community	12	3.67	1.02
18.	Kinds of industrial arts equipment present.	12	3.67	.75
24.	Financial prospects for hiring industrial arts teaching personnel.	12	3.67	.94
41.	Recreational pursuits of the students of the community.	12	3.67	1.03
33.	Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).	12	3.58	.95
40.	Hobbies of the adults of the community.	12	3.58	1.12
48.	Attitude of the school administrative officers toward an industrial arts program.	12	3.58	1.12
49.	Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).	11	3.54	1.16
6.	Culture of the community (whether the community is progressive and dynamic or static and opposed to change).	12	3.50	1.03

TABLE II (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
28.	Proportion of graduates that go into industries, service trades, professions, business, and farms.	12	3.50	.96
32.	Probable number of students to be enrolled in industrial arts in the immediate future.	12	3.50	1.08
39.	Hobbies of the students of the community.	12	3.50	1.20
46.	Attitude of the citizens of the community toward an industrial arts program.	12	3.50	1.04
	Average Mean Value 3.70			
	Average Standard Deviation 1.02			

Table II accounts for 23 community factors or 46 percent of the total number. It is apparent from the differences in standard deviation readings, however, that not all 23 have been unequivocally and unanimously accepted as belonging in such a category.

The average standard deviation for the entire 50 community factors is .99. By permitting a tolerance of ±.10, divisions could be arranged that would permit a reasonable indication of the degree of definiteness reached by the jury of experts with respect as to the values granted the factors in each category. Using such a system, those community factors in each of the three Tables, II, III,

and IV, possessing standard deviation scores between .89 and 1.09 could be assumed to be rated with reasonable definiteness. Those possessing standard deviation readings below .89 would be very definitely located in such a category, while those with standard deviation readings above 1.09 would be less definitely located.

From the data presented in Table II, it then appears that certain of the community factors have been very definitely rated as bearing sufficient importance as to be placed in the category of greater significance. The following factors, representing 8 percent of the total, are so rated:

Financial prospects for industrial arts equipment.

Financial prospects for industrial arts space.

Financial ability to obtain desired materials and supplies for the industrial arts program.

Kinds of industrial arts equipment present.

There are some community factors in the category of greater significance, however, which have been granted a rather high significance rating by the jury of experts, but have obtained it over a considerable range of assessed individual values. The following, accounting for 18 percent of the total number, are rated in such a manner:

Attitude of the other teachers toward an industrial arts program.

Leisure time activities of the students of the community.

Leisure time activities of the adults of the community.

Attitude of the school board toward an industrial arts program.

Recreational pursuits of the adults of the community.

Hobbies of the adults of the community.

Attitude of the school administrative officers toward an industrial arts program.

Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).

Hobbies of the students of the community.

Based likewise on the standard deviation scores, the remaining community factors listed in Table II could be considered as being reasonably well located in the category of greater significance. They comprise 20 percent of the total number and are listed below:

Proportion of drop-outs that go into industries, service trades, professions, business, and farms.

Training possessed by the industrial arts teaching personnel now employed.

Recreational pursuits of the students of the community.

Financial prospects for hiring industrial arts teaching personnel.

Kinds of industries present in the community.

Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).

Attitude of the citizens of the community toward an industrial arts program.

Probable number of students to be enrolled in industrial arts in the immediate future.

Proportion of graduates that go into industries, service trades, professions, business, and farms.

Culture of the community (whether the community is progressive and dynamic or static and opposed to change).

Table III is constructed and arranged in exactly the same manner as Table II except that it contains those community factors possessing moderate significance values. The range of such a category as previously explained has been arbitrarily set to include those mean values from 2.50 through 3.49.

TABLE III

COMMUNITY FACTORS THAT SHOULD POSSESS MODERATE SIGNIFICANCE VALUES AS RATED BY THE JURY OF EXPERTS

No.	COMMUNITY FACTORS	N	M	SD
25.	Attractiveness of the community for hiring and retaining industrial arts personnel.	12	3.42	1.19
19.	Amounts of industrial arts equipment present.	12	3.42	.76
12.	Raw materials used or created in the community.	12	3.42	1.04
9.	Number of industries present in the community.	12	3.33	.94
17.	Existing industrial arts space available.	12	3.33	.75
14.	Assessed valuation of the community.	12	3.17	1.06
43.	Occupations of the adults of the community.	12	3.17	1.02
38.	Reading habits of the adults of the community.	12	3.08	.95
37.	Reading habits of the students of the community	12	3.08	1.20
34.	Number of girls enrolled in industrial arts.	12	3.08	1.19

TABLE III (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
13.	Business enterprises present in the community.	12	3.08	.87
31.	Number of industrial arts students per class.	12	3.00	.91
1.	Number of people inhabiting the community.	12	2.93	1.09
50.	Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").	12	2.92	1.04
30.	Proportion of pupils that leave the community after completing their education (graduates and drop-outs).	12	2.83	1.11
11.	Sizes of the industries present in the community.	12	2.83	.89
27.	Transportation facilities serving the school.	12	2.67	.94
44.	Dominant dwelling type of the community (apartments or homes).	12	2.67	.94
15.	Area of the community.	12	2.51	1.04
16.	Geographic location of the community.	12	2.51	1.03
4.	Ratio of persons in the upper, middle, and lower class status.	12	2.50	.92
5.	Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).	12	2.50	1.19
26.	Public transportation facilities serving the community.	12	2.50	.76

Average Mean Value 2.95

Average Standard Deviation .99

According to the data assembled in Table III, a total of 23 community factors representing 46 percent of the total number, rests within the category of moderate significance. Of this group, the following 5 community factors, accounting for 10 percent of the total number, possess standard deviation scores that indicate a very definite point of view on the part of the jury of experts with regard to the significance value they possess:

Amounts of industrial arts equipment present.

Existing industrial arts space available.

Business enterprises present in the community.

Sizes of the industries present in the community.

Public transportation facilities serving the community.

The relatively large standard deviation readings for the community factors listed below indicate rather diverse opinions as to their significance values, thus placing them in the category of moderate significance with less definiteness. This group accounts for 10 percent of the total number of community factors:

Attractiveness of the community for hiring and retaining industrial arts teaching personnel.

Reading habits of the students of the community.

Number of girls enrolled in industrial arts.

Proportion of pupils that leave the community after completing their education (graduates and drop-outs).

Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).

Those community factors that are located in the moderate significance category with reasonable definiteness comprise 26 percent of the total number. The following 13 compose such a group:

Raw materials used or created in the community.

Number of industries present in the community.

Assessed valuation of the community.

Occupations of the adults of the community.

Reading habits of the adults of the community.

Number of industrial arts students per class.

Number of people inhabiting the community.

Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").

The small group of community factors listed in Table IV constitute those with significance value ratings below 2.50. The Table is organized and constructed in exactly the same manner as Tables II and III.

The 4 community factors listed in Table IV make up 8 percent of the total number. From the low mean values and the low standard deviation readings they have been accorded, it is apparent that two of them are very definitely located in the low significance category. They are:

Percentage of non-whites in the community.

Sex ratio (as affects birth rate, death rate, and marriage rate).

TABLE IV

COMMUNITY FACTORS THAT SHOULD POSSESS LOW SIGNIFICANCE VALUES AS RATED BY THE JURY OF EXPERTS

No.	COMMUNITY FACTORS	N	M	SD
8.	Population age trend (whether average age is rising or falling).	12	2.08	.91
2.	Percentage of foreign-born persons in the community.	12	2.00	.91
3.	Percentage of non-whites in the community.	11	1.91	.74
7.	Sex ratio (as affects birth rate, death rate, and marriage rate).	12	1.67	.75
	Average Mean Value 1.91			
	Average Standard Deviation .83			

The remaining two community factors of Table IV, which are listed below, although rated with reasonable definiteness, have barely managed to acquire such a rating.

Population age trend (whether average age is rising or falling).

Percentage of foreign-born persons in the community.

The letter[4] which accompanied the questionnaire to the jury of experts contained a request for any additional community factors deemed essential in determining the instructional areas of an industrial arts program. The resulting responses contained a total of five possible

[4]A copy of the letter which accompanied the questionnaire to the jury of experts is located in the Appendix, p. 140.

additional community factors. These were presented to the pilot committee for appraisal and evaluation. Of the five suggested, the following two were adjudged relevant to this study and consequently included in the list of community factors that were submitted to the industrial arts instructors selected from the state of Michigan:

> Meaning of industrial arts in general education as understood by the community.
>
> Meaning of industrial arts in general education as understood by the school personnel.

Response of the Industrial Arts Instructors

During the process, described in Chapter I, used to obtain a roster representing the industrial arts instructors of the state of Michigan, the superintendents of a random sampling consisting of 180 school districts were contacted. Each was sent a form letter[5] asking for the names of industrial arts instructors employed in the particular school system and requesting permission to contact them.

Of the 180 requests that were mailed, 169 responded favorably by listing the names of the industrial arts instructors and granting permission to contact them. Replies were received from 4 others who stated that there was no industrial arts program currently in operation. This represents a total return of 96 percent.

A check of the 169 responding school districts revealed that 12 (approximately 7 percent) were Class A, 35 (approximately 21 percent) were Class B, 71 (approx-

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[5]A copy of the letter to superintendents is located in the Appendix, p.146.

imately 42 percent) were Class C, 47 (approximately 28 percent) were Class D, and 4 (approximately 2 percent) were Class E.[6] In the entire state of Michigan approximately 8 percent of the schools are Class A, 26 percent Class B, 38 percent Class C, 25 percent Class D, and 3 percent Class E.[7] The sampling, therefore, represents a reasonable parallel to the total distribution of the various classifications in the state of Michigan.

From the 169 school districts, the names of 341 instructors were acquired. Each instructor was then mailed a copy of the questionnaire.[8]

The questionnaire designed to be sent to the industrial arts instructors of the state of Michigan contained a total of 52 community factors that were to be rated. Of this number, 50 were identical with those previously submitted to the jury of experts, while the remaining 2 represented the additional community factors suggested by the jury.

For each community factor, the industrial arts instructor was requested to make two separate ratings on five-point scales. The first rating was to be made to indicate the degree of significance he believed the community factor should possess in determining the instructional areas of an industrial arts program. The second rating

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[6] School classifications are described in detail on page 96.

[7] Michigan High School Athletic Association Bulletin, XXXI (November, 1954), pp. 195-200.

[8] A copy of the questionnaire to industrial arts instructors is located in the Appendix, p. 150.

was to be made to indicate the degree of significance he believed the community factor actually possessed in determining the instructional areas of the industrial arts program currently in effect in the particular school system that employed him.

The five-point rating scales that were provided used the headings VERY HIGHLY SIGNIFICANT, HIGHLY SIGNIFICANT, MODERATELY SIGNIFICANT, OF LITTLE SIGNIFICANCE, and OF VERY LITTLE OR NO SIGNIFICANCE. To aid in computing the data, these were assessed numerical values ranging from 5 for VERY HIGHLY SIGNIFICANT to 1 for OF VERY LITTLE OR NO SIGNIFICANCE. Results calculated from these values are given in the Tables that follow.

A means was also provided for the industrial arts instructor to indicate how he determined the degree of significance the community factor actually possessed in determining the instructional areas of the industrial arts program currently in effect in the particular school system that employed him. The headings, RESEARCH OR DATA, OPINIONS OF COMMITTEES OR GROUPS, OPINIONS RECEIVED FROM INDIVIDUALS, YOUR OPINION, and FACTOR DOES NOT EXIST HERE, were provided for this purpose.

The questionnaire, containing a letter of introduction and complete instructions, was sent to each instructor whose name had been obtained. Two follow-up letters were also used to secure a greater number of responses.

Of the 341 instructors who were mailed the questionnaire, 218 responded by completing it. This represents a return of 64 percent.

To the extent that information was available or could be acquired, there appeared to be no reason to indicate that the industrial arts instructors who did not respond to the questionnaire represented a group different from those that did respond. Relative to geographic location, they were scattered throughout the state of Michigan in such a manner that a significant pattern could not be found. Of the 123 who did not reply, 47 represented Class A schools, 39 represented Class B schools, 23 represented Class C schools, 13 represented Class D schools, and 1 was located in a Class E school. Computed in percentages, there is a close parallel between the school classifications represented by the instructors that did respond and those that did not.

Two responses received had to be eliminated from the data because they were not answered by industrial arts instructors. Four others were also eliminated due to a misinterpretation of the instructions that were provided for use in completing the questionnaire. The data presented here is therefore based upon information received from 212 industrial arts instructors in the state of Michigan in response to the questionnaire submitted to them.

According to the information received from these

industrial arts instructors, a great range of teaching experience is represented in this study. The minimum amount of teaching experience recorded was 1/2 year, while the maximum was 47 years. The average number of years taught by members of the entire group amounted to 9.88 years.

Not all of this teaching experience, however, was in the industrial arts field. It is apparent that some of the instructors had taught in other fields at some time during the course of their teaching careers. Although the range of teaching experience in the industrial arts field is the same as that for the total teaching experience of these industrial arts instructors (1/2 year minimum to a maximum of 47 years), the average number of years of teaching in the industrial arts field is somewhat less. According to the information obtained, the average number of years taught in the industrial arts field by members of this group amounted to 8.92 years.

In response to the question, IS THERE A CURRICULUM COMMITTEE IN YOUR SCHOOL?, 208 replies were received. Of that number, 104 indicated that there was a curriculum committee in the school system in which they taught, 104 indicated that there was none, and 4 did not respond to the question. On the basis of this information it appears probable that 50 percent of the industrial arts instructors involved in this study were employed by school systems that had the services of curriculum committees available.

An attempt was also made to determine whether the

industrial arts instructor was a member of the curriculum committee if such a committee existed. Of the 104 that indicated the presence of a curriculum committee, 36 replied that they were members. Thus, it appears that where curriculum committees were present, 35 percent contained representatives of the industrial arts field.

In order to get an estimation of the size of the schools that employed the industrial arts instructors cooperating in this study, the respondent was asked to indicate a classification of the school. Five possible classifications were furnished for the instructor to check. They included CLASS A, CLASS B, CLASS C, CLASS D, and OTHER.

Such school classifications are widely used in the state of Michigan and often appear in various articles and reports in reference to the schools. Although they are primarily designated as athletic classifications, they are based upon the number of students enrolled in the 9th to the 12th grades inclusive, and thus can serve as an indication of size of the school system.

Schools which are designated as Class A include those with an enrollment of 800 or more in the upper four grades. The enrollment range of Class B schools is 325 to 799, and that for Class C schools is 150 to 324. In the lower peninsula of Michigan, those with less than 150 students in the upper four grades are given a Class D status. Since there are no schools meeting the Class A requirements

in the upper peninsula of Michigan and no schools in the lower peninsula of Michigan falling below the Class D enrollment requirement, the Class E schools exist in the upper peninsula only. They are those schools with an enrollment of less than 75 in the 9th to the 12th grades inclusive.[9]

Table V indicates the number of industrial arts instructors reporting from each of the various school classifications. The first column, under the heading SCHOOL CLASSIFICATION, refers to the type of classifications described in the preceding paragraphs.

The second column, under the heading NUMBER OF INSTRUCTORS, indicates the number of teachers reporting from each of the various school classifications.

The third column, with the heading PERCENTAGE OF THE TOTAL, gives the percentage of the total number of instructors reporting from each of the school classifications. This was determined by using the formula $P = \frac{N}{\sum N}$ where:

P represents the percentage of the total number of instructors reporting.

N represents the number of instructors reporting from the particular school classification.

$\sum N$ represents the total number of instructors cooperating in this study.

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[9] Michigan High School Athletic Association Bulletin, XXXI, (November, 1954), pp. 195-200.

TABLE V

INDUSTRIAL ARTS INSTRUCTORS REPORTING FROM THE VARIOUS SCHOOL CLASSIFICATIONS

SCHOOL CLASSIFICATION	NUMBER OF INSTRUCTORS	PERCENTAGE OF THE TOTAL
CLASS A	75	35.4
CLASS B	61	28.8
CLASS C	45	21.2
CLASS D	26	12.3
CLASS E	3	1.4
NOT REPORTING	2	.9
TOTALS	212	100.0

The data presented in the following tables is based on information received from the instructors in the state of Michigan in response to the request to indicate the degree of significance they believed each community factor should possess in determining the instructional areas of an industrial arts program. The list of community factors has been divided into three categories which are listed in Tables VI, VII, and VIII. Table VI contains those community factors possessing greater significance values, Table VII those with moderate significance values, and Table VIII those with low significance values.

In the following three Tables (VI, VII, and VIII), the first column under the heading No. lists the numerical

order in which the community factor appeared on the questionnaire.

The second column under the heading COMMUNITY FACTOR lists the actual community factor.

In the third column, N is used to represent the number of instructors rating the particular community factor.

The fourth column, under the heading M, gives the mean value assessed each factor by the instructors. In order to determine the mean value, the formula $M = \frac{\Sigma X}{N}$ was employed. ΣX indicates the sum of the numerical values given the community factor by the instructors. N is the number of instructors doing the rating.

The symbol SD, used in the fifth column, represents standard deviation and serves as an indication of the degree of variability in the values given each community factor by the instructors in the state of Michigan. In computing the standard deviation values, the formula $SD = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N}}$ was used. The symbol X represents the numerical value given the community factor by the instructor and N indicates the number of instructors doing the rating.

Table VI lists, in rank order, those community factors that the industrial arts instructors have assessed relatively greater significance values in determining the instructional areas of an industrial arts program. The

greater significance values, as previously established in this chapter, have been arbitrarily set to include those community factors with a mean value of 3.50 and above.

TABLE VI

COMMUNITY FACTORS THAT SHOULD POSSESS GREATER SIGNIFICANCE VALUES AS RATED BY THE INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	N	M	SD
22.	Financial ability to obtain desired materials and supplies for the industrial arts program.	204	4.35	.77
48.	Attitude of the school administrative officers toward an industrial arts program.	206	4.31	.75
21.	Financial prospects for industrial arts equipment.	204	4.27	.93
47.	Attitude of the school board toward an industrial arts program.	209	4.25	.79
20.	Financial prospects for industrial arts space.	206	4.23	.77
23.	Training possessed by the industrial arts teaching personnel now employed.	212	4.20	.83
33.	Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).	204	4.18	.77
28.	Proportion of graduates that go into industries, service trades, professions, business, and farms.	206	4.17	.85
31.	Number of industrial arts students per class.	211	4.16	.90
32.	Probable number of students to be enrolled in industrial arts in the immediate future.	210	4.14	.80
18.	Kinds of industrial arts equipment present.	208	4.14	.92
19.	Amounts of industrial arts equipment present.	204	4.14	.89

TABLE VI (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
49.	Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).	200	4.08	.79
17.	Existing industrial arts space available.	208	4.08	.96
10.	Kinds of industries present in the community.	207	4.03	1.02
9.	Number of industries present in the community.	209	4.01	.99
46.	Attitude of the citizens of the community toward an industrial arts program.	210	4.01	.87
43.	Occupations of the adults of the community.	210	4.00	.84
52.	Meaning of industrial arts in general education as understood by the school personnel.	204	3.99	.80
24.	Financial prospects for hiring industrial arts teaching personnel.	210	3.91	1.00
29.	Proportion of drop-outs that go into industries, service trades, professions, business, and farms.	210	3.85	.99
51.	Meaning of industrial arts in general education as understood by the community.	206	3.83	.84
25.	Attractiveness of the community for hiring and retaining industrial arts teaching personnel.	211	3.76	1.10
16.	Geographic location of the community.	198	3.72	1.04
11.	Sizes of the industries present in the community.	208	3.70	1.04
6.	Culture of the community (whether the community is progressive and dynamic or static and opposed to change).	210	3.69	.98

TABLE VI (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
14.	Assessed valuation of the community.	206	3.65	1.11
39.	Hobbies of the students of the community.	209	3.62	.85
1.	Number of people inhabiting the community.	208	3.54	1.03
35.	Leisure time activities of the students of the community.	200	3.50	.92
	Average Mean Value 3.95			
	Average Standard Deviation .90			

Table VI contains 30 community factors or slightly less than 58 percent of the entire group. The relatively low standard deviation readings for the majority of them indicate considerable agreement as to the values they have been assessed.

The average standard deviation for the entire 52 community factors that represents this phase of the study is .98. By permitting a tolerance of $\pm$.10 (the same method used with the results received from the jury of experts), the degree of definiteness reached by the industrial arts instructors with respect to the values granted the factors in each category could be established. Using such a system, those community factors in each of the three Tables, VI, VII, and VIII, possessing standard deviation

scores between .88 and 1.08 inclusive would be rated with reasonable definiteness. Those possessing standard deviation readings below .88 would be very definitely located in such a category, while those with standard deviation readings above 1.08 would be less definitely located.

From the data presented in Table VI, it then appears that 14 community factors, representing slightly less than 27 percent of the total, are very definitely placed in the category of greater significance.

Financial ability to obtain desired materials and supplies for the industrial arts program.

Attitude of the school administrative officers toward an industrial arts program.

Attitude of the school board toward an industrial arts program.

Financial prospects for industrial arts space.

Training possessed by the industrial arts teaching personnel now employed.

Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).

Proportion of graduates that go into industries, service trades, professions, business, and farms.

Probable number of students to be enrolled in industrial arts in the immediate future.

Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).

Attitude of the citizens of the community toward an industrial arts program.

Occupations of the adults of the community.

Meaning of industrial arts in general education as understood by the school personnel.

Meaning of industrial arts in general education as understood by the community.

Hobbies of the students of the community.

Two of the community factors located in the category of greater significance have been granted a rather high significance rating by the industrial arts instructors, but have obtained such a rating over a considerable range of assessed individual values. They represent slightly less than 4 percent of the total number.

Attractiveness of the community for hiring and retaining industrial arts teaching personnel.

Assessed valuation of the community.

The remaining 14 community factors listed in Table VI, comprising somewhat less than 27 percent of the total, could be considered as being reasonably well located in the category of greater significance.

Financial prospects for industrial arts equipment.

Number of industrial arts students per class.

Kinds of industrial arts equipment present.

Amounts of industrial arts equipment present.

Existing industrial arts space available.

Kinds of industries present in the community.

Number of industries present in the community.

Financial prospects for hiring industrial arts teaching personnel.

Proportion of drop-outs that go into industries, service trades, professions, business, and farms.

Geographic location of the community.

Sizes of the industries present in the community.

Culture of the community (whether the community is progressive and dynamic or static and opposed to change).

Number of people inhabiting the community.

Leisure time activities of the students of the community.

Table VII is constructed and arranged on the same basis as Table VI except that it contains those community factors possessing moderate significance values. The range of such a category has been set to include the mean values from 2.50 through 3.49.

TABLE VII

COMMUNITY FACTORS THAT SHOULD POSSESS MODERATE SIGNIFICANCE VALUES AS RATED BY THE INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	N	M	SD
40.	Hobbies of the adults of the community.	196	3.47	1.01
13.	Business enterprises present in the community.	206	3.46	.98
30.	Proportion of pupils that leave the community after completing their education (graduates and drop-outs).	206	3.41	1.03
36.	Leisure time activities of the adults of the community.	207	3.41	1.02
15.	Area of the community.	198	3.37	1.12
41.	Recreational pursuits of the students of the community.	204	3.37	.95
50.	Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").	207	3.36	1.25

TABLE VII (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
42.	Recreational pursuits of the adults of the community.	202	3.27	.99
12.	Raw materials used or created in the community.	206	3.25	1.20
37.	Reading habits of the students of the community.	203	3.19	1.05
8.	Population age trend (whether average age is rising or falling).	192	3.18	1.35
5.	Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).	210	3.16	1.25
45.	Attitude of the other teachers toward an industrial arts program.	211	3.09	1.17
44.	Dominant dwelling type of the community (apartments or homes).	206	3.08	.95
4.	Ratio of persons in the upper, middle, and lower class status.	210	3.03	1.24
38.	Reading habits of the adults of the community.	197	3.02	1.04
27.	Transportation facilities serving the school.	205	3.00	1.11
26.	Public transportation facilities serving the community.	208	2.75	1.06
	Average Mean Value		3.22	
	Average Standard Deviation		1.10	

There are 18 community factors listed in Table VII that lie within the category of moderate significance. This

is a little less than 35 percent of the total number. The relatively high standard deviation readings possessed by many of them indicate a considerable spread of individual values assessed by the industrial arts instructors. There are no community factors in this group possessing standard deviation scores indicating that they were very definitely placed in this category.

Ten community factors do, however, possess standard deviation readings indicating a reasonable degree of definiteness in placing them in the category of moderate significance. They represent slightly more than 19 percent of the total number.

Hobbies of the adults of the community.

Business enterprises present in the community.

Proportion of pupils that leave the community after completing their education (graduates and drop-outs).

Leisure time activities of the adults of the community.

Recreational pursuits of the students of the community.

Recreational pursuits of the adults of the community.

Reading habits of the students of the community.

Dominant dwelling type of the community (apartments or homes).

Reading habits of the adults of the community.

Public transportation facilities serving the community.

The remaining 8 community factors listed in Table VII, representing approximately 15 percent of the total, possess standard deviation scores indicating a rather diverse range of opinions as to their significance values.

This places them in the category of moderate significance with less definiteness.

Area of the community.

Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").

Raw materials used or created in the community.

Population age trend (whether average age is rising or falling).

Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).

Attitude of the other teachers toward an industrial arts program.

Ratio of persons in the upper, middle, and lower class status.

Transportation facilities serving the community.

The small group of community factors listed in Table VIII constitute those with a significance value below 2.50. The Table is organized and constructed in exactly the same manner as Tables VI and VII.

The 4 community factors in Table VIII make up slightly less than 8 percent of the total number. Although their low mean values place them in the category of low significance, the relatively high standard deviation readings indicate that none are very definitely so placed, and only the following one is located there with reasonable definiteness:

Percentage of foreign-born persons in the community.

TABLE VIII

COMMUNITY FACTORS THAT SHOULD POSSESS LOW SIGNIFICANCE VALUES AS RATED BY THE INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	N	M	SD
34.	Number of girls enrolled in industrial arts.	196	2.41	1.20
7.	Sex ratio (as affects birth rate, death rate, and marriage rate).	194	2.32	1.14
2.	Percentage of foreign-born persons in the community.	212	2.21	1.07
3.	Percentage of non-whites in the community.	197	1.84	1.34
	Average Mean Value 2.19			
	Average Standard Deviation 1.19			

The remaining 3 community factors are placed in the category of low significance with less definiteness.

Number of girls enrolled in industrial arts.

Sex ratio (as affects birth rate, death rate, and marriage rate).

Percentage of non-whites in the community.

The following portion of this study, which includes Tables IX, X, and XI, contains data based on information received from the industrial arts instructors in the state of Michigan in response to the request to indicate the degree of significance each of the 52 community factors actually possesses in determining the instructional areas in industrial arts programs in their schools.

Table IX lists, in rank order, those community factors that the industrial arts instructors have granted relatively greater significance values as determinants in ascertaining the instructional areas offered in their particular industrial arts programs. The greater significance values have been established to include those community factors with a mean value of 3.50 and above.

TABLE IX

COMMUNITY FACTORS ACTUALLY POSSESSING GREATER SIGNIFICANCE VALUES AS RATED BY THE INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	N	M	SD
22.	Financial ability to obtain desired materials and supplies for the industrial arts program.	202	3.98	.93
20.	Financial prospects for industrial arts space.	205	3.95	.89
48.	Attitude of the school administrative officers toward an industrial arts program.	208	3.93	.83
23.	Training possessed by the industrial arts teaching personnel now employed.	206	3.84	.86
19.	Amounts of industrial arts equipment present.	199	3.82	.92
17.	Existing industrial arts space avail-available.	194	3.81	1.02
18.	Kinds of industrial arts equipment present.	202	3.81	.97
33.	Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).	199	3.81	.93

TABLE IX (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
47.	Attitude of the school board toward an industrial arts program.	208	3.79	.87
21.	Financial prospects for industrial arts equipment.	195	3.73	.97
28.	Proportion of graduates that go into industries, service trades, professions, business, and farms.	202	3.67	.94
31.	Number of industrial arts students per class.	206	3.59	1.01
49.	Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).	208	3.58	.92
46.	Attitude of the citizens of the community toward an industrial arts program.	209	3.56	.93
29.	Proportion of drop-outs that go into industries, service trades, professions, business, and farms.	201	3.50	1.10
	Average Mean Value 3.76			
	Average Standard Deviation .95			

There are 15 community factors in the category of greater significance. This represents slightly less than 29 percent of the total. The relatively low standard deviation readings for many of them indicate that these are the community factors that, in the opinion of the industrial arts instructors, exert considerable influence in determining the instructional areas offered in the industrial arts programs carried on in many of the schools represented.

The average standard deviation reading for the entire 52 community factors involved in this phase of the study is 1.05. By permitting a tolerance of $\pm$.10, as was done in the previous portions of this study to determine the degree of definiteness asserted by the industrial arts instructors, those community factors possessing standard deviation scores between .95 and 1.15 inclusive would be rated with reasonable definiteness. Those possessing standard deviation readings below .95 would be very definitely located in such a category, while those with standard deviation readings above 1.15 would be less definitely located.

According to the data presented in Table IX, 10 community factors, representing approximately 19 percent of the total number, are very definitely placed in the category of greater significance.

Financial ability to obtain desired materials and supplies for the industrial arts program.

Financial prospects for industrial arts space.

Attitude of the school administrative officers toward an industrial arts program.

Training possessed by the industrial arts teaching personnel now employed.

Amounts of industrial arts equipment present.

Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).

Attitude of the school board toward an industrial arts program.

Proportion of graduates that go into industries, service trades, professions, business, and farms.

Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).

Attitude of the citizens of the community toward an industrial arts program.

The remaining 5 community factors listed in Table IX, accounting for a little less than 10 percent of the total, could be considered as being located in the category of greater significance with reasonable definiteness.

Existing industrial arts space available.

Kinds of industrial arts equipment present.

Financial prospects for industrial arts equipment.

Number of industrial arts students per class.

Proportion of drop-outs that go into industries, service trades, professions, business, and farms.

The construction and arrangement of Table X is exactly the same as that of Table IX except it contains those community factors possessing moderate significance values. The range of this category includes the mean values from 2.50 through 3.49.

TABLE X

COMMUNITY FACTORS ACTUALLY POSSESSING MODERATE SIGNIFICANCE VALUES AS RATED BY THE INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	N	M	SD
10.	Kinds of industries present in the community.	207	3.49	1.16
9.	Number of industries present in the community.	206	3.48	1.17

TABLE X (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
6.	Culture of the community (whether the Community is progressive and dynamic or static and opposed to change).	204	3.46	1.02
24.	Financial prospects for hiring industrial arts teaching personnel.	206	3.45	1.09
14.	Assessed valuation of the community.	199	3.41	1.23
16.	Geographic location of the community.	198	3.41	1.14
25.	Attractiveness of the community for hiring and retaining industrial arts teaching personnel.	208	3.40	1.10
43.	Occupations of the adults of the community.	208	3.36	.99
52.	Meaning of industrial arts in general education as understood by the school personnel.	203	3.24	1.01
11.	Sizes of the industries present in the community.	206	3.20	1.11
51.	Meaning of industrial arts in general education as understood by the community.	206	3.16	.95
50.	Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else").	206	3.14	1.07
32.	Probable number of students to be enrolled in industrial arts in the immediate future.	205	3.13	1.07
1.	Number of people inhabiting the community.	206	3.12	.98
39.	Hobbies of the students of the community.	206	3.12	1.01
30.	Proportion of pupils that leave the community after completing their education (graduates and drop-outs).	208	3.11	1.02
45.	Attitude of the other teachers toward an industrial arts program.	207	3.06	1.19

TABLE X (cont'd)

No.	COMMUNITY FACTORS	N	M	SD
35.	Leisure time activities of the students of the community.	200	3.05	1.09
13.	Business enterprises present in the community.	206	2.99	1.08
41.	Recreational pursuits of the students of the community.	204	2.92	1.08
36.	Leisure time activities of the adults of the community.	203	2.89	1.17
12.	Raw materials used or created in the community.	207	2.83	1.14
40.	Hobbies of the adults of the community.	196	2.82	1.14
5.	Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).	204	2.80	1.20
27.	Transportation facilities serving the school.	201	2.76	1.17
15.	Area of the community.	194	2.74	1.25
42.	Recreational pursuits of the adults of the community.	200	2.73	1.09
4.	Ratio of persons in the upper, middle, and lower class status.	209	2.67	1.24
37.	Reading habits of the students of the community.	201	2.67	1.04
44.	Dominant dwelling type of the community (apartments or homes).	206	2.67	1.08

Average Mean Value 3.08

Average Standard Deviation 1.10

According to the data presented in Table X, 30 community factors have been assessed mean values that place them in the category of moderate significance. This represents nearly 58 percent of the total number.

Using the standard deviation scores as a basis, none of the community factors listed in Table X have been very definitely placed in such a category. There have been however, 21 community factors, representing approximately 40 percent of the total, that have been placed in the category of moderate significance with reasonable definiteness.

Culture of the community (whether the community is progressive and dynamic or static and opposed to change).

Financial prospects for hiring industrial arts teaching personnel.

Geographic location of the community.

Attractiveness of the community for hiring and retaining industrial arts teaching personnel.

Occupations of the adults of the community.

Meaning of industrial arts in general education as understood by the school personnel.

Sizes of the industries present in the community.

Meaning of industrial arts in general education as understood by the community.

Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else").

Probable number of students to be enrolled in industrial arts in the immediate future.

Number of people inhabiting the community.

Hobbies of the students of the community.

Proportion of pupils that leave the community after completing their education (graduates and drop-outs).

Leisure time activities of the students of the community.

Business enterprises present in the community.

Recreational pursuits of the students of the community.

Raw materials used or created in the community.

Hobbies of the adults of the community.

Recreational pursuits of the adults of the community.

Reading habits of the students of the community.

Dominant dwelling type of the community (apartments or homes).

The remaining 9 community factors of Table X, slightly more than 17 percent of the total, are in the category of moderate significance with less definiteness. They are the following:

Kinds of industries present in the community.

Number of industries present in the community.

Assessed valuation of the community.

Attitude of the other teachers toward an industrial arts program.

Leisure time activities of the adults of the community.

Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).

Transportation facilities serving the school.

Area of the community.

Ratio of persons in the upper, middle, and lower class status.

The community factors listed in Table XI constitute those with low significance values. They have been granted mean values below 2.50.

TABLE XI

COMMUNITY FACTORS ACTUALLY POSSESSING LOW SIGNIFICANCE VALUES AS RATED BY THE INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	N	M	SD
38.	Reading habits of the adults of the community.	195	2.47	1.00
26.	Public transportation facilities serving the community.	204	2.46	1.15
8.	Population age trend (whether average age is rising or falling).	191	2.36	1.20
7.	Sex ratio (as affects birth rate, death rate, and marriage rate).	195	2.06	1.04
34.	Number of girls enrolled in industrial arts.	191	1.83	1.00
2.	Percentage of foreign-born persons in the community.	206	1.80	.83
3.	Percentage of non-whites in the community.	195	1.55	.94
	Average Mean Value 2.08			
	Average Standard Deviation 1.02			

The 7 community factors listed in Table XI constitute those possessing the relatively low significance values assessed by the industrial arts instructors from the state of Michigan. They represent about 13 percent of the total number.

Two of the community factors, accounting for approximately 4 percent of the total, have standard deviation scores which very definitely place them in the category of low significance.

Percentage of foreign-born persons in the community.

percentage of non-whites in the community.

The remaining 5 community factors, slightly less than 10 percent of the total, possess standard deviation readings that place them in the category of low significance with reasonable definiteness.

Reading habits of the adults of the community.

Public transportation facilities serving the community.

Population age trend (whether average age is rising or falling).

Sex ratio (as affects birth rate, death rate, and marriage rate).

Number of girls enrolled in industrial arts.

Rank Order Relationship

In view of the fact that one of the possible outcomes of this study is a selected list of community factors that bear sufficient significance as to be worthy of prime consideration in the inauguration or evaluation of an industrial arts program, it was considered reasonable to assume that some means of statistical treatment relative to rank orders granted the community factors by the jury of experts and the industrial arts instructors of the state of Michigan would be desirable. For such a purpose, the Spearman rank-difference coefficient of correlation was selected.

The Spearman rank-difference method was chosen because it deals directly with rank order, it is probably the most commonly known and commonly employed procedure applied to regular data in place of the product moment method, it is convenient to apply when the data are in terms of rank orders, and the rank difference method coefficient is prac-

tically equivalent to the Pearson product moment numerically.[10]

Table XII is presented to serve as an indication of the various relationships in the rank orders granted the list of community factors by the jury of experts and the industrial arts instructors. The first column under the heading No. lists the numerical order given the community factor in the questionnaires submitted to the jury of experts and the industrial arts instructors of the state of Michigan.

The second column under the heading COMMUNITY FACTORS lists the actual community factors.

The third column of Table XII, under the heading R_1 lists the rank orders given the community factors by the jury of experts selected from the field of industrial arts education in response to the request to indicate the degree of significance they believed each factor should possess in determining the instructional areas of an industrial arts program. The ranks range in number from 1 to 50 because 50 community factors were submitted to the jury for consideration.

The fourth column, under the heading R_2, lists the rank orders given the community factors by the industrial arts instructors of the state of Michigan in response to the request to indicate the degree of significance they

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[10] J. P. Guilford, Fundamental Statistics in Psychology and Education. New York: McGraw-Hill Book Company, Inc., 1950. Pp. 310-313.

believed each factor should possess in determining the instructional areas of an industrial arts program. This ranking ranges from 1 to 52, since 52 community factors were submitted to the industrial arts instructors for evaluation.

The fifth column, under the heading R_3, lists the rank orders granted the community factors by the industrial arts instructors of the state of Michigan in response to the request to indicate the degree of significance each community factor actually possessed in determining the instructional areas of the industrial arts programs currently in operation in their school systems. The ranks also range in number from 1 to 52.

Since, in some instances, more than one community factor was given the same assessed value by a rating group, certain adjustments were made to compensate for such a situation. In Table XII, the ranks assigned to the community factors in such duplications was determined by averaging the ranks of those positions involved.[11]

In computing the rank-difference coefficient of correlation, however, a more accurate method of handling such duplications was desired. Since it involved only those figures which lie two or more places to the right of the decimal, it was not considered essential to be used in the rank orders shown in Table XII. The formula $R_c = \sqrt{M_r^2 + \frac{N^2 - 1}{12}}$ was used to compensate for duplications

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[11]John G. Peatman, Descriptive and Sampling Statistics. New York: Harper and Brothers Publishers, 1947. P. 256.

in rank in determining the rank-difference coefficient of correlation where:[12]

R_c represents corrected rank

M_r represents the mean of the ranks duplicated

N represents the number duplicated

To compute the Spearman rank-difference coefficient of correlation, the formula $C = 1 - \frac{6 \Sigma D^2}{N(N^2 - 1)}$ was used where:[13]

C represents the rank difference coefficient of correlation

ΣD^2 represents the sum of the squares of the differences between the ranks given each community factor by the two groups of raters

N represents the number of community factors being correlated.

TABLE XII

RANK ORDERS OF COMMUNITY FACTORS BY THE JURY OF EXPERTS AND INDUSTRIAL ARTS INSTRUCTORS

No.	COMMUNITY FACTORS	R_1	R_2	R_3
1.	Number of people inhabiting the community.	36	29	29.5
2.	Percentage of foreign-born persons in the community.	48	51	51
3.	Percentage of non-whites in the community.	49	52	52

[12] J. P. Guilford, Fundamental Statistics in Psychology and Education. New York: McGraw-Hill Book Company, Inc., 1950, p. 313.

[13] Ibid., p. 313.

TABLE XII (cont'd)

No.	COMMUNITY FACTORS	R_1	R_2	R_3
4.	Ratio of persons in the upper, middle, and lower class status.	45	45	44
5.	Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).	45	42	39
6.	Culture of the community (whether the community is progressive and dynamic or static and opposed to change).	21	26	18
7.	Sex ratio (as affects birth rate, death rate, and marriage rate).	50	50	49
8.	Population age trend (whether average age is rising or falling).	47	41	48
9.	Number of industries present in the community.	27.5	16.5	17
10.	Kinds of industries present in the community.	12.5	15	16
11.	Sizes of industries present in the community.	38.5	25	25
12.	Raw materials used or created in the community.	25	39	37
13.	Business enterprises present in the community.	32.5	32	34
14.	Assessed valuation of the community.	29.5	27	20.5
15.	Area of the community.	42.5	35.5	41
16.	Geographic location of the community.	42.5	24	20.5
17.	Existing industrial arts space available.	27.5	13.5	7
18.	Kinds of industrial arts equipment present	12.5	11	7
19.	Amounts of industrial arts equipment present.	25	11	5

TABLE XII (cont'd)

No.	COMMUNITY FACTORS	R_1	R_2	R_3
20.	Financial prospects for industrial arts space.	2	5	2
21.	Financial prospects for industrial arts equipment.	1	3	10
22.	Financial ability to obtain desired materials and supplies for the industrial arts program.	3	1	1
23.	Training possessed by the industrial arts teaching personnel now employed.	9	6	4
24.	Financial prospects for hiring industrial arts teaching personnel.	12.5	20	19
25.	Attractiveness of the community for hiring and retaining industrial arts teaching personnel.	25	23	22
26.	Public transportation facilities serving the community.	45	48	47
27.	Transportation facilities serving the school.	40.5	47	40
28.	Proportion of graduates that go into industries, service trades, professions, business, and farms.	21	8	11
29.	Proportion of drop-outs that go into industries, service trades, professions, business, and farms.	6	21	15
30.	Proportion of pupils that leave the community after completing their education (graduates and drop-outs).	38.5	33.5	31
31.	Number of industrial arts students per class.	35	9	12
32.	Probable number of students to be enrolled in industrial arts in the immediate future.	21	11	28
33.	Probable number of students to be enrolled in industrial arts in the foreseeable future (Long range planning).	16	7	7

TABLE XII (cont'd)

No.	COMMUNITY FACTORS	R_1	R_2	R_3
34.	Number of girls enrolled in industrial arts.	32.5	49	50
35.	Leisure time activities of the students of the community.	6	30	33
36.	Leisure time activities of the adults of the community.	6	33.5	36
37.	Reading habits of the students of the community.	32.5	40	44
38.	Reading habits of the adults of the community.	32.5	46	46
39.	Hobbies of the students of the community.	21	28	29.5
40.	Hobbies of the adults of the community.	16	31	38
41.	Recreational pursuits of the students of the community.	12.5	35.5	35
42.	Recreational pursuits of the adults of the community.	9	38	42
43.	Occupations of the adults of the community.	25.9	18	23
44.	Dominant dwelling types of the community (apartments or homes).	40.5	44	44
45.	Attitude of the other teachers toward an industrial arts program.	4	43	32
46.	Attitude of the citizens of the community toward an industrial arts program.	21	16.5	14
47.	Attitude of the school board toward an industrial arts program.	9	4	9
48.	Attitude of the school administrative officers toward an industrial arts program.	16	2	3

TABLE XII (cont'd)

No.	COMMUNITY FACTORS	R_1	R_2	R_3
49.	Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).	18	13.5	13
50.	Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").	37	37	27
51.	Meaning of industrial arts in general education as understood by the community.		22	26
52.	Meaning of industrial arts in general education as understood by the school personnel.		19	24

Rank-difference coefficient of correlation between:

R_1 and R_2 .632

R_1 and R_3 .663

R_2 and R_3 .949

According to the data presented in Table XII, there appears to be moderate agreement as to the rank order each of the community factors have been given by the jury of experts selected from the field of industrial arts education and the industrial arts instructors from the state of Michigan.

An even greater degree of agreement is indicated by the high correlation that exists between the rank orders given the community factors by the industrial arts instructors relative to how significant they believe the factors should be and how significant they actually are in determining the instructional areas of their industrial arts programs. A possible explanation of the few outstanding discrepancies that do appear exists in the form of letters or annotations which accompanied the returned questionnaires, and oral comments given by the industrial arts instructors when interviewed.

Several instructors indicated that the long range planning being carried on for the expansion of industrial arts was being given appropriate attention, but that "no thought is given to conditions existing this year or next."

Some mention was also made regarding the attitude of other teachers toward the industrial arts programs. The indication being that some teachers outside the field of industrial arts thought of industrial arts as "an inferior subject," "non-academic," or "a dumping ground."

One industrial arts instructor explained that such a philosophic disagreement existed between the school superintendent and school board members that the entire school program was suffering.

One column of the questionnaire that was submitted to the industrial arts instructors from the state of Michigan requested that they indicate the basis of judgment used in ascertaining how the community factors were actually considered in their school programs. It appears that this portion of the questionnaire contributed very little toward the results of this study. The overwhelming majority of responses were based upon the opinions of the individuals supplying the information. The notable exceptions involved two community factors, namely, "Percentage of foreign-born persons in the community," and "Percentage of non-whites in the community." In several communities these community factors did not exist. This did not disturb the assessed values granted these two community factors because in all involved cases the respondent indicated that the particular community factors should be of very little or no significance, and in his particular community, since they did not exist, were actually of very little or no significance.

CHAPTER V

IMPLICATIONS OF THE STUDY

Summary

Industrial arts, in its relatively short but oftimes uncertain life, has left an indelible impression in the field of education. When one realizes the extent to which the human race uses material commodities in daily life and the amount of effort consumed in producing and distributing such commodities, appreciation for industrial arts as a school subject becomes increasingly apparent.

In this, the final chapter of the study, attention will be given to a summary and conclusions. They are based upon information thus far presented.

This study was designed to ascertain what community factors should be used as criteria in determining the instructional areas of an industrial arts program, also, to determine if the community factors were being used in this capacity in the state of Michigan. It originated because indications were that certain factors peculiar to some communities had a direct influence upon the areas of instruction offered in the corresponding industrial arts programs.

In Chapter I some of the present day aspects of industrial arts education are presented. It was designed to direct the reader toward an understanding of the basic philosophies and problems currently confronting the field. Following this is the reasoning which establishes the need for a study such as this and an elaboration of the suggested procedure to be followed in its execution.

The information presented in Chapter II is offered to indicate ways which technological developments have been instrumental in changing life in industrial America. The ever increasing rapidity of change challenges education to adjust itself accordingly. The implications for industrial arts education appears even greater than for most subjects since it is based upon the various processes and products of technology and industry.

In order to understand the forces exerting an influence on industrial arts education today, it seems reasonable to assume that a necessary prerequisite would be a review of those which have been effective in the past. Chapter III was designed to indicate the various phases of growth experienced by industrial arts education and the underlying movements which influenced its development.

Chapter IV presents data based on information acquired from the various participants of the study. It is based partially upon information obtained from a jury of experts composed of 12 men who are well established and well known in the field of industrial arts education.

The remainder of data was secured from 212 instructors currently teaching industrial arts in the state of Michigan. Their teaching experience ranges from 1/2 year to 47 years, and the sizes of the school systems they represent ranges from Class A through Class E.

Conclusions

Assuming the techniques employed in this study are acceptable and the results thus obtained considered appropriate, certain conclusions appear justified.

According to the data previously presented, there are certain community factors that, in the opinions of both the jury of experts selected from the field of industrial arts education and the industrial arts instructors from the state of Michigan, should be highly significant in determining the instructional areas of an industrial arts program. The following 13 community factors, listed in order of significance, comprise this group:

Financial prospects for industrial arts equipment.

Financial ability to obtain desired materials and supplies for the industrial arts program.

Financial prospects for industrial arts space.

Attitude of the school board toward an industrial arts program.

Training possessed by the industrial arts teaching personnel now employed.

Attitude of the school administrative officers toward an industrial arts program.

Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).

Kinds of industrial arts equipment present.

Proportion of drop-outs that go into industries, service trades, professions, business, and farms.

Kinds of industries present in the community.

Financial prospects for hiring industrial arts teaching personnel.

Leisure time activities of the students of the community.

Culture of the community (whether the community is progressive and dynamic or static and opposed to change).

Another group of community factors should, in the opinions of both the jury of experts selected from the field of industrial arts education and the industrial arts instructors from the state of Michigan, possess a moderate degree of significance in determining the instructional areas of an industrial arts program. They are the following 11 community factors which are listed in their order of significance:

Raw materials used or created in the community.

Business enterprises present in the community.

Proportion of pupils that leave the community after completing their education (graduates and drop-outs).

Reading habits of the students of the community.

Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").

Reading habits of the adults of the community.

Dominant dwelling type of the community (apartments or homes).

Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).

Transportation facilities serving the school.

Ratio of persons in the upper, middle, and lower class status.

Public transportation facilities serving the community.

Some of the community factors that were selected for use in this study appear to be of little value in determining the instructional areas of an industrial arts program. Both the jury of experts selected from the field of industrial arts education and the industrial arts instructors from the state of Michigan have indicated that the following 3 community factors possess very little significance in this respect:

Percentage of non-whites in the community.

Percentage of foreign-born persons in the community.

Sex ratio (as affects birth rate, death rate, and marriage rate).

Of the remaining 25 community factors which were selected for use in this study, there appears to be a difference of opinion between the jury of experts selected from the field of industrial arts education and the industrial arts instructors from the state of Michigan as to the significance rating they should possess in determining the instructional areas of an industrial arts program. Since they have been rated as being significant to some degree by either the jury of experts or the industrial arts instructors, or by both groups, they apparently can

not be overlooked in the process of inaugurating or evaluating an industrial arts program. Thus, for the following community factors further study seems warranted:

Number of people inhabiting the community.

Population age trend (whether the average age is rising or falling).

Number of industries present in the community.

Sizes of industries present in the community.

Assessed valuation of the community.

Area of the community.

Geographic location of the community.

Existing industrial arts space available.

Amounts of industrial arts equipment present.

Attractiveness of the community for hiring and retaining industrial arts teaching personnel.

Proportion of graduates that go into industries, service trades, professions, business, and farms.

Number of industrial arts students per class.

Probable number of students to be enrolled in industrial arts in the immediate future.

Number of girls enrolled in industrial arts.

Leisure time activities of the adults of the community.

Hobbies of the students of the community.

Hobbies of the adults of the community.

Recreational pursuits of the students of the community.

Recreational pursuits of the adults of the community.

Occupations of the adults of the community.

Attitude of other teachers toward an industrial arts program.

Attitude of the citizens of the community toward an industrial arts program.

Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).

Meaning of industrial arts in general education as understood by the community.

Meaning of industrial arts in general education as understood by the school personnel.

The over-all rank-difference coefficient of correlation between the opinions of the jury of experts selected from the field of industrial arts education and the opinions of the industrial arts instructors from the state of Michigan relative to how significant the community factors should be in determining the instructional areas of an industrial arts program is .63. This seems to indicate a moderate degree of agreement as to the rank order granted the community factors by the two groups of participants.

By comparing the average of the mean values assessed the group of community factors in this respect by these two groups of participants, another possible aspect of the study is revealed. The average value granted the list of community factors by the jury of experts amounts to 3.21, whereas the industrial arts instructors granted them an average value of 3.58. This would seem to indicate that the industrial arts instructors consider the community factors to be of greater importance in determining the instructional areas of an industrial arts program than the jury of experts.

According to the high rank-difference coefficient of correlation obtained, it appears that, in general, the community factors selected for use in this study are being considered in an order acceptable to the industrial arts instructors from the state of Michigan relative to determining the instructional areas offered in the industrial arts programs. A coefficient of .95 was obtained when the rank orders were compared between the significance the industrial arts instructors believed the community factors should possess in determining the instructional areas of an industrial acts program and the significance they actually possessed in determining the instructional areas offered in the industrial arts programs of the school systems which employed the participating industrial arts instructors.

However, when the average of the mean values granted the community factors in this respect are compared, a greater difference is bared. The average value granted the community factors by the industrial arts instructors relative to how significant the community factors should be in determining the instructional areas of an industrial arts program is 3.58, whereas in the actual practice of determining the instructional areas of an industrial arts program, the industrial arts instructors granted them an average value of 3.14. Thus, it appears that in actual practice the significance of the community factors selected for use in this study is not being considered to the

degree desired by the industrial arts instructors from the state of Michigan.

From the various aspects of industrial arts education encountered in this study it would seem desirable to continually evaluate each industrial arts program. The evidence assembled in this report indicates that certain community factors should receive prime consideration in this respect. Therefore, in the process of inaugurating or evaluating an industrial arts program, it is suggested that the community factors elaborated in this report be included in the criteria used to determine the instructional areas of such an industrial arts program.

JURY OF EXPERTS SELECTED FROM THE FIELD OF INDUSTRIAL ARTS EDUCATION

Feier, John L.	Head, Department of Industrial Arts Western Michigan College of Education Kalamazoo, Michigan
Fryklund, Verne C.	President Stout Institute Menominie, Wisconsin
Groneman, Chris H.	Head, Industrial Education Department A & M College of Texas College Station, Texas
Hornbake, R. Lee	Professor of Industrial Education University of Maryland College Park, Maryland
Hutchcroft, C. R.	Associate Professor of Education University of Michigan Ann Arbor, Michigan
London, H. H.	Professor of Industrial Arts University of Missouri Columbia, Missouri
Meyer, Harvey K.	Professor of Industrial Arts University of Florida Gainesville, Florida
Schmidt, Fred	Head, Department of Industrial Arts Ball State Teachers College Muncie, Indiana
Seefeld, Kermit A.	Assistant Professor University of California Santa Barbara, California.
Silvius, G. Harold	Chairman, Industrial Education Wayne University Detroit, Michigan
Warner, William E.	Professor of Education Ohio State University Columbus, Ohio
Wilber, Gordon O.	Director of Industrial Arts Education State University of New York State Teachers College Oswego, New York

MEMBERS OF THE PILOT COMMITTEE

Mr. L. D. Gieseler	Industrial Arts Instructor and Administrative Assistant Jackson Public Schools Jackson, Michigan
Mr. Robert M. Hammer	Industrial Arts Instructor Huron Valley Schools Milford, Michigan
Mr. P. R. Hocking	Industrial Arts Instructor Huron Valley Schools Milford, Michigan

INITIAL LETTER TO THE JURY OF EXPERTS

Dear Sir:

A study is being made relative to certain community factors and their influence in determining the areas of instruction offered in industrial arts programs. I wish to solicit your services in this project to the extent of serving as a member of a jury of experts selected from the field of industrial arts education.

If you agree to serve you will be asked to rate a list of community factors by means of a check list. The time required is approximately 15 minutes.

In return for your services I shall be pleased to send you a copy of the results of the study when it is completed.

Sincerely yours,

Frank J. Irgang

SECOND LETTER TO THE JURY OF EXPERTS

Dear Sir:

I wish to express my appreciation for your willingness to serve as a member of the jury of experts selected from the field of industrial arts education.

For the purposes of this study it is assumed that certain community factors vary from community to community and are reflected in the industrial arts programs offered. This study seeks to investigate these factors as determinants of instructional areas in industrial arts programs.

The enclosed list of factors has been compiled by reviewing approximately two hundred professional books, pamphlets, catalogs, articles in periodicals, unpublished dissertations and special reports. This phase of the study deals with an evaluation of each factor by means of a rating scale. Space has been provided on the last page of the enclosed form for any additional community factors that you deem essential. Will you please complete the form and return it in the envelope provided?

Once again I wish to thank you for your assistance.

Sincerely yours,

Frank J. Irgang

DEFINITIONS:

COMMUNITY The geographical area being served by a school district.

COMMUNITY FACTOR An element or circumstance within a community which plays a role in and exerts an influence on the activities of that community.

INDUSTRIAL ARTS PROGRAM That part of general education dealing with socio-economic problems and occupational opportunities, involving experience with a wide range of materials, tools, processes, products, and occupations typical of an industrial society.

INSTRUCTIONAL AREA The phase of an industrial arts program that identifies the portion of industry being studied such as woodworking, electricity, general metals, auto mechanics, etc.

INSTRUCTIONS:

For each factor you are to place a check /✓/ in the appropriate column at the right.

In your opinion HOW SHOULD THE FACTOR BE CONSIDERED IN DETERMINING THE INSTRUCTIONAL AREAS OF A SCHOOL'S INDUSTRIAL ARTS PROGRAM?

COMMUNITY FACTORS	DEGREE OF SIGNIFICANCE				
	Very high	High	Moderate	Little	Very little or none
1. Number of people inhabiting the community.					
2. Percentage of foreign-born persons in the community.					
3. Percentage of non-whites in the community.					
4. Ratio of persons in the upper, middle, and lower class status.					
5. Social rapport of the community (whether friction is created by special interest groups or whether the community is united for the common good).					
6. Culture of the community (whether the community is progressive and dynamic or static and opposed to change.					
7. Sex ratio (as affects birth rate, death rate, and marriage rate).					
8. Population age trend (whether average age is rising or falling).					

COMMUNITY FACTORS	DEGREE OF SIGNIFICANCE				
	Very high	High	Moderate	Little	Very little or none
9. Number of industries present in the community.					
10. Kinds of industries present in the community.					
11. Sizes of the industries present in the community.					
12. Raw materials used or created in the community.					
13. Business enterprises present in the community.					
14. Assessed valuation of the community.					
15. Area of the community.					
16. Geographic location of the community.					
17. Existing industrial arts space available.					
18. Kinds of industrial arts equipment present.					
19. Amounts of industrial arts equipment present.					
20. Financial prospects for industrial arts space.					
21. Financial prospects for industrial arts equipment.					
22. Financial ability to obtain desired materials and supplies for the industrial arts program.					
23. Training possessed by the industrial arts teaching personnel now employed.					
24. Financial prospects for hiring industrial arts teaching personnel.					
25. Attractiveness of the community for hiring and retaining industrial arts teaching personnel.					

COMMUNITY FACTORS	DEGREE OF SIGNIFICANCE				
	Very high	High	Moderate	Little	Very little or none
26. Public transportation facilities serving the community.					
27. Transportation facilities serving the school.					
28. Proportion of graduates that go into industries, service trades, professions, business, and farms.					
29. Proportion of drop-outs that go into industries, service trades, professions, business, and farms.					
30. Proportion of pupils that leave the community after completing their education (graduates and drop-outs).					
31. Number of industrial arts students per class.					
32. Probable number of students to be enrolled in industrial arts in the immediate future.					
33. Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).					
34. Number of girls enrolled in industrial arts.					
35. Leisure time activities of the students of the community.					
36. Leisure time activities of the adults of the community.					
37. Reading habits of the students of the community.					
38. Reading habits of the adults of the community.					
39. Hobbies of the students of the community.					
40. Hobbies of the adults of the community.					
41. Recreational pursuits of the students of the community.					
42. Recreational pursuits of the adults of the community.					

COMMUNITY FACTORS	DEGREE OF SIGNIFICANCE				
	Very high	High	Moderate	Little	Very little or none
43. Occupations of the adults of the community.					
44. Dominant dwelling type of the community (apartments or homes).					
45. Attitude of the other teachers toward an industrial arts program.					
46. Attitude of the citizens of the community toward an industrial arts program.					
47. Attitude of the school board toward an industrial arts program.					
48. Attitude of the school administrative officers toward an industrial arts program.					
49. Whether the industrial arts courses are taken for vocational or for general education purposes (even though the program is designated as industrial arts)					
50. Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.").					

INITIAL LETTER TO THE SCHOOL SUPERINTENDENTS

Dear Sir:

A survey is being made relative to certain community factors and their significance in determining the areas of instruction offered in the industrial arts programs of the state of Michigan. Information directly from industrial arts instructors who are actually in the field is of vital importance to this study.

Your community and school system represents the type qualified to participate in this survey. With your consent a check list taking approximately twenty minutes to complete will be sent to each industrial arts instructor in your school system. The results of this study, when completed, can be made available to you.

Your assistance will be greatly appreciated.

Sincerely yours,

Frank J. Irgang

Your Name_____ Name of school_____

Address_____

Names of industrial arts instructors employed by the above school system	School (if different than above)
_____	_____
_____	_____
_____	_____

Names of industrial arts instructors employed by the above school system	School (if different than above)

FIRST FOLLOW-UP LETTER TO THE SCHOOL SUPERINTENDENTS

Dear Sir:

Recently you were mailed a form letter requesting the names of the industrial arts teachers employed in your school system. Approximately 90% of the Superintendents contacted have replied. The roster is about to be compiled and I would like very much to be able to include your school in this survey.

I appreciate, of course, the number of items which press for your attention and do not wish to impose unduly. However, I am most anxious to include your response in the total tabulation.

Sincerely yours,

Frank J. Irgang

SECOND FOLLOW-UP LETTER TO THE SCHOOL SUPERINTENDENTS

Dear Sir:

A recent check of the school systems replying to the letter requesting the names of industrial arts instructors indicates that this information has not been received from you. Since your school was one selected to contribute to the study, I hope that you will find the opportunity to comply with this request.

At present the roster is being compiled. An early reply would be appreciated.

Sincerely,

Frank J. Irgang

SCHOOL OF EDUCATION
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

January, 1955

Dear Sir:

A study is being made relative to certain community factors and their influence as determinants of instructional areas in industrial arts programs. Information directly from industrial arts instructors who are actually in the field is of vital importance to this study.

You represent the type of industrial arts instructor that is capable and qualified to contribute your reasoned opinions. You may be certain that your name and the name of your school shall be held in strictest confidence.

Will you please fill in the following information form and return it in the envelope provided? It should take you approximately twenty minutes.

Your assistance will be greatly appreciated.

Sincerely yours,

Frank J. Irgang

Frank J. Irgang

Name of person completing information form _____ _____

School _____ School address _____

Number of years of teaching experience _____ Of teaching industrial arts _____

Do you teach Unit Shop? ☐ General Shop? ☐ (check one or both)

Do you teach Junior High? ☐ Senior High? ☐ Other _____

Is there a curriculum committee in your school? _____ Are you a member? _____

Classification of school Class A ☐ Class B ☐ Class C ☐

Class D ☐ Other _____

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INSTRUCTIONAL AREA The phase of an industrial arts program that identifies the portion of industry being studied such as woodworking, electricity, general metals, auto mechanics, etc.

INSTRUCTIONS:

The following is a list of community factors.

For each factor you are to place three checks ☑ in the appropriate columns at the right.

The first check is to be placed in the appropriate column under the heading HOW SHOULD THIS FACTOR BE CONSIDERED IN DETERMINING THE INSTRUCTIONAL AREAS IN THIS SCHOOL'S INDUSTRIAL ARTS PROGRAM.

The second check is to be placed in the appropriate column under the heading HOW IS THIS FACTOR ACTUALLY CONSIDERED IN DETERMINING THE INSTRUCTIONAL AREAS IN THIS SCHOOL'S INDUSTRIAL ARTS PROGRAM.

The third check is to be placed in the appropriate column under the heading BASIS OF JUDGMENT IN ASCERTAINING HOW THE FACTOR IS ACTUALLY CONSIDERED. This check is used to indicate how you determined the placing of the second check.

COMMUNITY FACTORS	How Should This Factor Be Considered in Determining The Instructional Areas in This School's Industrial Arts Program					How is This Factor Actually Considered in Determining The Instructional Areas in This School's Industrial Arts Program					Basis of Judgment in Ascertaining How the Factor is Actually Considered				
	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	research or data	opinions of committees or groups	opinions received from individuals	your opinion	factor does not exist here
1. Number of people inhabiting the community.															
2. Percentage of foreign-born persons in the community.															
3. Percentage of non-whites in the community.															
4. Ratio of persons in the upper, middle, and lower class status.															
5. Social rapport of the community (whether friction is created by special interest groups and pressure groups or whether the community is united for the common good).															
6. Culture of the community (whether the community is progressive and dynamic or static and opposed to change.															
7. Sex ratio (as affects birth rate, death rate, and marriage rate).															
8. Population age trend (whether average age is rising or falling).															
9. Number of industries present in the community.															
10. Kinds of industries present in the community.															

COMMUNITY FACTORS	How Should This Factor Be Considered in Determining The Instructional Areas in This School's Industrial Arts Program					How is This Factor Actually Considered in Determining The Instructional Areas in This School's Industrial Arts Program					Basis of Judgment in Ascertaining How the Factor in Actually Considered				
	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	research or data	opinions of committees or groups	opinions received from individuals	your opinion	factor does not exist here
11. Sizes of the industries present in the community.															
12. Raw materials used or created in the community.															
13. Business enterprises present in the community.															
14. Assessed valuation of the community.															
15. Area of the community.															
16. Geographic location of the community.															
17. Existing industrial arts space available.															
18. Kinds of industrial arts equipment present.															
19. Amounts of industrial arts equipment present.															
20. Financial prospects for industrial arts space.															
21. Financial prospects for industrial arts equipment.															
22. Financial ability to obtain desired materials and supplies for the industrial arts program.															

COMMUNITY FACTORS	How Should This Factor Be Considered in Determining The Instructional Areas in This School's Industrial Arts Program					How is This Factor Actually Considered in Determining The Instructional Areas in This School's Industrial Arts Program					Basis of Judgment in Ascertaining How the Factor is Actually Considered				
	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	research or data	opinions of committees or groups	opinions received from individuals	your opinion	factor does not exist here
23. Training possessed by the industrial arts teaching personnel now employed.															
24. Financial prospects for hiring industrial arts teaching personnel.															
25. Attractiveness of the community for hiring and retaining industrial arts teaching personnel.															
26. Public transportation facilities serving the community.															
27. Transportation facilities serving the school.															
28. Proportion of graduates that go into industries, service trades, professions, business, and farms.															
29. Proportion of drop-outs that go into industries, service trades, professions, business, and farms.															
30. Proportion of pupils that leave the community after completing their education (graduates and drop-outs).															
31. Number of industrial arts students per class.															
32. Probably number of students to be enrolled in industrial arts in the immediate future.															

COMMUNITY FACTORS	How Should This Factor Be Considered in Determining The Instructional Areas in This School's Industrial Arts Program					How is This Factor Actually Considered in Determining The Instructional Areas in This School's Industrial Arts Program					Basis of Judgment in Ascertaining How the Factor is Actually Considered				
	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	research or data	opinions of committees or groups	opinions received from individuals	your opinion	factor does not exist here
33. Probable number of students to be enrolled in industrial arts in the foreseeable future (long range planning).															
34. Number of girls enrolled in industrial arts.															
35. Leisure time activities of the students of the community.															
36. Leisure time activities of the adults of the community.															
37. Reading habits of the students of the community.															
38. Reading habits of the adults of the community.															
39. Hobbies of the students of the community.															
40. Hobbies of the adults of the community.															
41. Recreational pursuits of the students of the community.															
42. Recreational pursuits of the adults of the community.															
43. Occupations of the adults of the community.															

COMMUNITY FACTORS	How Should This Factor Be Considered in Determining The Instructional Areas in This School's Industrial Arts Program					How is This Factor Actually Considered in Determining The Instructional Areas in This School's Industrial Arts Program					Basis of Judgment in Ascertaining How the Factor is Actually Considered				
	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	very highly significant	highly significant	moderately significant	of little significance	of very little or no significance	research or data	opinions of committees or groups	opinions received from individuals	your opinion	factor does not exist here
44. Dominant dwelling type of the community (apartments or homes).															
45. Attitude of the other teachers toward an industrial arts program.															
46. Attitude of the citizens of the community toward an industrial arts program.															
47. Attitude of the school board toward an industrial arts program.															
48. Attitude of the school administrative officers toward an industrial arts program.															
49. Whether the industrial arts courses are taken for vocational or for general educational purposes (even though the program is designated as industrial arts).															
50. Whether the industrial arts courses are taken by students because no other course appears suitable for that student ("He doesn't fit anywhere else.")															
51. Meaning of industrial arts in general education as understood by the community															
52. Meaning of industrial arts in general education as understood by the school personnel.															

FIRST FOLLOW-UP LETTER TO THE INDUSTRIAL ARTS INSTRUCTORS

Dear Colleague:

Recently you were mailed an information form relative to the role certain community factors play in determining what is taught in industrial arts programs. At the present time the majority of the forms have been returned.

I appreciate the number of items which press for your attention and do not wish to impose unduly. However, I am most anxious to have your report included in the study. May I hear from you at your earliest convenience?

Sincerely,

Frank J. Irgang

SECOND FOLLOW-UP LETTER TO THE INDUSTRIAL ARTS INSTRUCTORS

Dear Colleague:

A response to the recent information form relative to community factors as determinants of instructional areas of industrial arts programs has not been received from you. Since your school was one selected to contribute to this study, I hope that you will find it possible to complete the information form and return it.

The data is about to be tabulated and I would appreciate having the opportunity to include your reply in the results.

Sincerely,

Frank J. Irgang

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