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YEARBOOK 3 1954

Leadership • Graduate Selection • Textbook Analysis

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Graduate Selection • Textbook Analysis
Leadership in Industrial Arts Teacher Education

Some Components of Current Leadership

By Roy F. Bergengren, Jr., Ed.D.
Assistant Professor, Industrial Arts and Vocational Education
University of Florida
Gainesville, Florida

Techniques of Selection and Guidance of Graduate Students

By George F. Henry, Ed.D.
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An Analysis of Textbook Emphases

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YEARBOOK 3 1954

American Council on Industrial Arts Teacher Education

PREFACE

The key word in this volume is "three." Yearbook III deals with three subjects provided by three authors.

The first of these studies, by Dr. Roy F. Bergengren, Jr., is concerned with certain elements of leadership in industrial arts teacher education. The most significant portion of this study is contributed by outstanding leaders in the profession who discuss vital professional problems and possible avenues of solution. The leaders are not named in the report. Experience has already indicated the danger of attempting to attribute any of the various contributions to a particular individual. Therefore, the reader is counseled to avoid such attempts.

The second study, by Dr. George F. Henry, is a detailed status survey of techniques used in the selection and guidance of graduate students. A review is made of procedures presently employed in the sixty-six institutions of the Nation which offer graduate work in the area of industrial arts teacher education. Concluding recommendations should be of great value to all possessing responsibilities which include graduate instruction.

Lastly, Dr. Talmage B. Young presents a study which concerns the industrial arts textbook—its appraisal and function. A number of startling conclusions have been drawn and much value should be derived from a careful perusal of this work.

Inevitably, controversial points are raised in any professional study authored by a single individual. The problems considered in Yearbook III provide no exception. However, it is believed that live issues such as these need to be brought into the open in order to be resolved. Controversial issues treated professionally in order to generate light rather than heat should, indeed, result in real progress to all concerned. Opinions expressed by the authors are their own and should not be interpreted as a reflection of the views of either the American Council on Industrial Arts Teacher Education membership or those of the Publisher.

Walter R. Williams, Jr.
Editor-in-Chief, Yearbook Series

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AMERICAN COUNCIL ON INDUSTRIAL ARTS TEACHER EDUCATION

A division of the American Industrial Arts Association and the National Education Association. Memberships at $5.00 are invited of all interested Industrial Arts teacher educators and include a copy of the annual yearbook as well as membership in the American Industrial Arts Association.

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FOREWORD

The American Council on Industrial Arts Teacher Education takes this opportunity to thank all who have participated in the production of Yearbook III. Particular mention should be made of Roy F. Bergengren, Jr., George F. Henry, and Talmage B. Young, who served as authors of this volume.

Commendation is due the McKnight and McKnight Publishing Company which absorbs the entire cost of producing and distributing yearbooks, copies of which are provided all members of the Council on a complimentary basis. In addition, annual profits received from the sale of these volumes will be forwarded to the Council treasury by the Publishers, who have also agreed to absorb any annual loss which may arise. The McKnight and McKnight Publishing Company continues to earn the sincere respect of the profession which it has so warmly supported.

The administrative staff also acknowledges the contributions of the Publications Committee consisting of Walter R. Williams, Jr., Chairman, University of Florida, Gainesville; John L. Feirer, Michigan College of Education, Kalamazoo; DeWitt Hunt, Oklahoma A and M College, Stillwater; and Bernard S. Proctor, Hampton Institute, Hampton, Virginia. Mention should also be made of the assistance of Mrs. Betty B. Jones for her unselfish service in the preparation of the materials.

Gerald Baysinger
President, American Council on
Industrial Arts Teacher Education

Los Angeles, California
March 23, 1954

Some Components of Current Leadership

By Roy F. Bergengren, Jr., Ed.D.
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CHAPTER I

Introduction

In this day of big government, big industry, and big labor it is hardly surprising that "complexity" has become a household word among contemporary thinkers. The complicated structure of modern life is being built with the tools of rapidly advancing physical science and of the materials of mushrooming organization.

It is hardly possible to exaggerate how much associated group action there has to be in the modern world. In at least three quarters of his waking hours every adult now lives and moves and has his being in a succession of group efforts.

It is hard for us to realize what a relatively new fact this is—one imposing new challenges as the size and number of modern organizations continue to grow. The vital problem is *how to make group activity a happy and satisfying experience for people.* On every side people are coming to recognize that one crucial factor in the solution of this problem is the quality of leadership displayed within the groups they join.[1]

It is this very problem of growing complexity that has brought a conflict of standards to modern man. The speed with which science has conquered an expanding segment of the physical realm leaves in its wake a baffling contradiction between the old and the new in the moral realm.

The symbolism of the past, in which men found purpose and security, has been largely retained; but its roots have been starved by a new climate of modern science and social structure.

Moral crises in civilization are less often the consequence of right against wrong or truth against error than they are of right against right and truth against truth. The present crisis of freedom and order in Western society—and all that is implied in the problem of leadership—would be easier to resolve were it plainly the outcome of antagonistic forces of good and evil. But who can doubt that the present premonitions of disaster and the whole tragic sense of life so evident in modern literature arise from a cultural condition in which we see the things we value destroyed or weakened by elements we also value. . . . Conflicts between these values in the modern Western world symbolize our deepest social conflicts and make difficult the perspective of leadership.[2]

[1] Ordway Tead, *The Art of Leadership,* p. 6. New York: Whittlesey House, McGraw-Hill Book Co., 1935.

This is a world crying out for leadership—a leadership which will focus with society upon a system of social values. For the ever-growing chain of organization has demanded a new accent on group perspective.

It is no accident that social scientists today are concerned primarily with investigations of inter-personal relations, group dynamics, status, and leadership. These are symptons of the times. Only a few years ago, the individual formed the core for research which today centers upon the myriad relationships of human organization. Within these relationships, man seeks the answer to the problem of security for himself as well as for his group.

> The interest in leadership, so pronounced at the present time, is a manifestation of the same intellectual pattern that contains the interest in problems of association and disassociation. And beneath this total pattern of ideas lie the psychologically and morally baffling institutional circumstances in which more and more individuals find themselves in contemporary society. These circumstances are in a real sense the very materials of the practical problem of leadership. It is important to remind ourselves continuously that leadership is inseparable from specific, environing conditions.[3]

It is already evident that leadership is, *per se,* an elusive term, subject to a variety of definition dependent upon an infinite number of elements of personal and social structure. It can not be neatly circumscribed, nor is it at this stage subject to fixed analysis. A study of leadership is immediately confronted with all of the intricate obstacles faced by the general fields of psychology, sociology, and even of philosophy.

Leadership itself may be "good" or "bad", depending upon the social consequences of the process and/or the opinion of the evaluator. It may be democratic or autocratic, introverted or extroverted, direct or indirect. From another viewpoint, the terms "bad", "autocratic", "introverted", and "indirect", can not be applied to leadership. Any category of leadership may be broken down into numerous sub-categories, and none is mutually exclusive.

Furthermore, leadership is not simply a quality possessed by a particular individual. It is the sum of many qualities within and without the individual and includes the all-important aspect, often overlooked in the past, of interaction between individuals and groups. Leadership may not escape its environment.

It is self-evident that leadership is of tremendous importance to

[2]Robert A. Nisbet, "Leadership and Social Crisis", *Studies in Leadership,* p. 702. Edited by Alvin W. Gouldner. New York: Harper & Bros., 1950.

[3]*Ibid.,* p. 709.

social organization, but it is equally obvious that a whole study of leadership is as broad and complex as a study of the human race. Be that as it may, the subject is demanding increased attention in all major fields of research for the simple reason that success in any endeavor is closely allied to the quality of leadership it enjoys.

General Definitions

As would be expected, there are almost as many definitions of leadership as there are students of the subject. Many definitions, however, are strikingly similar. Where once the accent was placed upon the qualities and personality traits of the leader, the trend today appears to emphasize situation and process. It will be sufficient here to mention only a few general definitions.

According to Bogardus:

> Leadership is personality in action under group conditions. It includes dominant personality traits of one person and receptive personality traits of many persons. It is interaction between specific traits of one person and other traits of the many, in such a way that the course of action is changed by the one.[4]

A year later (1935), Pigors defined leadership as "a process of mutual stimulation which, by successful interplay of relevant individual differences, controls human energy in the pursuit of a common cause."[5]

In the same year, Tead wrote:

> Leadership is the activity of influencing people to cooperate toward some goal which they come to find desirable. . . .The unique emphasis in the idea here advanced is upon *the satisfaction and sense of self-fulfillment* secured by the followers of the true leader. Today, a psychologically and democratically adequate idea of leadership centers as much attention upon the results *within the led* as on the attributes or tangible methods of the leader.[6]

Gibb wrote in 1947:

> Viewed in relation to the individual, leadership is not an attribute of personality but a quality of his role within a particular or specified social system. Viewed in relation to the group, leadership is a quality of its structure.[7]

[4]Emory S. Bogardus, *Leaders and Leadership*, p. 3. New York: D. Appleton-Century Co., Inc., 1934.

[5]Paul Pigors, *Leadership or Domination*, p. 6. Boston: Houghton Mifflin Co., 1935.

[6]Tead, *op. cit.*, p. 20.

[7]C. A. Gibb, "The Principles and Traits of Leadership", *Journal of Abnormal and Social Psychology.* XLII (July, 1947), 267.

Hemphill wrote in 1949:

The two assumptions—that leadership is the behavior of an individual directing group activities and that adequacy of leadership is an evaluation of the correspondence between the individual's behavior and the behavior demanded by the situation—seem to be implied in the many criteria selected by investigators in the study of leadership. This view of leadership is broad in scope, bringing into consideration the group situation, the behavior of the leader, and a judgement of leadership adequacy. It is also solidly rooted in a concrete behavior rather than abstract constructs.[8]

Finally, Gouldner inferred a definition when he wrote in 1950:

A leader will . . . be considered as any individual whose behavior stimulates patterning of the behavior in some group. By emitting some stimuli, he facilitates group action toward a goal or goals, whether the stimuli are verbal, written, or gestural. Whether they are rational, nonrational, or irrational in content is also irrelevant in this context. Whether these stimuli pertain to goals or to means, cluster about executive or perceptive operations, is a secondary consideration, so long as they result in the structuring of group behavior.[9]

If we accept the premise that leadership is more inclusive than "good leadership" or "democratic leadership", and if it be true that leadership can not be isolated from the group in which it functions, then it would appear that the last definition is the most comprehensive.

It is interesting to note that two men, writing fifteen years apart, agree on a specific classification of leadership. Tead stated:

The leader is an artist—an artist working in a medium which is at once complex and universal. His material is people. And just as the task of the artist is one of organization of ideas or materials if any work of art is to be achieved, so with leadership the bringing of human desire and energy into organized relations becomes a work of high artistry.

Indeed this is more than verbal analogy. The technical deftness, the new insight, the devotion to a vision, the effort at communication—these are all attributes of the artist which the leader should have. His task of influencing others—looking at the problem first from his point of view—should be gone at with artistic economy, precision, and skill.[10]

Fifteen years later, Gouldner observed:

In leadership there is something of the same combination of imagination and experience that goes into the creative process; leadership indeed is one

[8]John K. Hemphill, *Situational Factors in Leadership*, p. 5. Columbus: The Bureau of Educational Research, Ohio State University, 1949.

[9]Alvin W. Gouldner, *Studies in Leadership*, p. 17. New York: Harper & Bros., 1950.

[10]Tead, *op cit.*, p. 33.

manifestation of the creative proclivity. To draw organization out of the raw materials of life is as much the objective of the leader as it is of the artist.[11]

It would be difficult, if not impossible, to refute this claim for the creative element in leadership, especially with reference to democratic leadership. The problem immediately arises: there are limits to the application of scientific method in the study of leadership. This question will be treated at greater length later in the study.

The Problem

It may be seen at the outset that no single study could hope to consider all of the ramifications of so broad a subject as leadership. Indeed it would be impossible to include all phases of leadership in a particular profession within the space and time allotted here.

This study will be concerned with specific components, or elements, of contemporary leadership in industrial arts teacher education. The birth of this infant among nationally organized professions illustrates the mushrooming quality of modern organization. In 1950, the American Council on Industrial Arts Teacher Education was organized as an offshoot of the American Industrial Arts Association, itself a child of the National Education Association.

The council was the result of a long felt need. It was evident to many of the teacher educators of the American Industrial Arts Association that they were faced with many professional problems which could not be resolved within the framework of the association. Like every other organization, the council will succeed as an instrument of professional growth in direct ratio to the quality of the leadership it enjoys.

> Only competent leaders can correct the tendencies which functionalism and division of labor create. Only the leader can keep the group committed to that unity of aim which alone produces the best results.
>
> In other words, faced as we are by a new kind of world—one in which organized action is the typical channel and area of personal effort—organizations require more than to be administered. They need to be led because the human relations of the leader are far more normal and necessary to personal responsiveness than the orders of the commander or the routine contacts of the executive.[12]

There had been little cohesive action among industrial arts teacher educators prior to the organization of the council. True, they have long been active in the work of the American Industrial Arts Associa-

[11] Gouldner, *op. cit.*, p. 709.

[12] Tead, *op. cit.*, p. 9.

tion and of the Industrial Arts Section of the American Vocational Association, but those organizations are concerned primarily with specific problems of the public school program. Contacts among teacher educators had been limited to publications by individuals and to informal associations not exclusively applicable to the teacher education phase of industrial arts.

A number of central problems which required attention on a national scale were revealed in an informal survey of the profession shortly before the council was organized. These fell into three main categories: philosophy, curriculum, and personnel.

The survey indicated, for example, a definite disagreement concerning the basic question: What is industrial arts? There was considerable difference of viewpoint on the relationship of industrial arts to general education and to vocational education. This problem deals with fundamentals of philosophy and alone warrants continuous study by a strong, nationally-organized profession.

Curriculum problems raised by the survey included the questions of uniform standards for industrial arts teacher education, the general structure of student teaching, and the direction for curriculum improvement. Among the problems of personnel were student recruitment and selection, the function of state and local supervision, and the development of leadership.

The sum of these problems represents the central objective of the council: the continuous improvement of industrial arts teacher education.

> To make for leadership, individual differences must not be so great as to preclude solidarity of purpose. The presence of a 'common cause' is basic for leadership. It is nonsense to talk of leadership in the abstract since no one can 'just lead' without having a goal. Leadership is always *in* some sphere of interest and *toward* some objective goal seen by leader and follower.[13]

Without able leadership, then, the council can not hope to make progress toward its central objective, or goal; and leadership must be developed in terms of the objective.

Purpose of the Study

It is the central purpose of this study to make an initial investigation of certain phases of leadership in industrial arts teacher education. The structural setting of the profession already has been set forth in Yearbook I of the council, *Inventory Analysis of Industrial Arts Teacher Education Facilities, Personnel, and Program,* edited by

[13]Pigors, *op. cit.*, p. 5.

Walter R. Williams, Jr., and Harvey K. Meyer and published in the spring of 1952. A more detailed picture of professional personnel was presented in Yearbook II, *Who's Who in Industrial Arts Teacher Education,* edited by Williams and Bergengren and published in April, 1953.

With the completion of these two studies, it would seem logical that the next step in an approach to the problem of leadership in industrial arts teacher education must be a study of the leaders, themselves. By what roads did present leaders approach recognition? Is there a general pattern of experience to support leadership? Are there common elements of formal education or of ideas? How do present leaders compare with the profession as a whole in such matters as experience in public school teaching, related work experience, and philosophy? Will a study of present leadership offer any clues to the development of future leaders? These are some of the questions this study will attempt to answer.

> Extensive and articulate concern with leadership is a phenomenon conditioned by modern democratic values. Typically, men and women of Western European society believe that leadership behavior may be learned, that one does not have to be "born to the purple" in order to lead. This, in contradiction to the feudal conception of leadership which held that leadership skills were the distilled product of generations of rule.[14]

This study will investigate current leadership in industrial arts teacher education through:

1. An identification of present leaders in the profession.
2. A study of criteria upon which a cross section of the profession bases a determination of leadership.
3. The collection, organization, and presentation of certain biographical and ideational data concerning selected leaders.

Limitations of the Study

This study represents a first step in its particular field; and as such, it will be approached within well-defined limits as generally outlined above. Leaders will be identified by members of the profession and studied in terms of biographical data contained in Yearbook II of the American Council on Industrial Arts Teacher Education and of their own ideas concerning major problems now facing the profession.

The study does not pretend to inquire into every phase of leadership in industrial arts teacher education. There will be no attempt to evaluate present leadership, to examine personality traits of the

[14]Gouldner, *op. cit.,* p. 4.

leaders, or to define the elements of "good" or "democratic" leadership. Additional studies must be made before a comprehensive view of the subject will be available, but professional progress in industrial arts teacher education will not await the completion of many years of research. What is done here may at least point the way.

> Many eminent and competent social scientists today eschew work with relevance for social problems, looking forward to an unspecified time when the careful accumulation of reliable, delimited studies will enable them to assume social responsibilities. Two questionable assumptions seem implicit in this point of view.
>
> 1. That the analysis of delimited leadership problems will some day facilitate the handling of the macroscopic problems faced on the action level. . . .
>
> 2. There seems to be an untested and optimistic premise that social scientists have an indefinite time at their disposal in which to perfect their researches and bring them, when fully formed, to practical uses.[15]

Previous Studies

So far as is known, no study which deals specifically with leadership in industrial arts teacher education has been published. There have been many studies pertaining to other specific fields, especially in various phases of industry and the armed forces. Tremendous impetus was given to the work by government-financed projects during World War II, when money and personnel were no object. To a large extent, these studies were devoted to the objective of attaining greater accuracy in the prediction of success in various aspects of military endeavor. In the past two decades, there have also been a number of important general studies of leadership, a few of which should be mentioned here.

In 1934, Bogardus attacked the problem primarily from the standpoint of the leader. He pointed out the relationship of leadership to inherited genius, to the social stimuli of opportunity and association, and to personality traits.

> Intelligence tears aside the veil of life: it climbs to the peaks of understanding; it opens the gate to personal advancement; it challenges darkness and storm; it leads the way over the rocks of ignorance and prejudice. Superior intellectual achievements give a person a prominence which sooner or later amounts to mental leadership.[16]

In discussing various principles and theories of leadership Bogardus qualifies the foregoing statement.

[15] *Ibid.*, p. 13.

[16] Bogardus, *op. cit.*, p. 138.

According to the marginal uniqueness principle of leadership, one person can do certain things that others cannot. Hence, to the extent that the one can do something important which others are interested in, he may become a leader in that important particular. Marginal uniquenesses create special opportunities to achieve and to lead.[17]

A person of ordinary ability can focalize his psychic energy in some one particular and achieve first rank. A high level of recognition will be reached—not by a stroke of genius but by plodding and perspiration.[18]

He also stresses the vital roles played by the situation and the group, stating that "the study of followership is an important avenue to understanding leadership. . . .The follower and the leader are inseparable."

Moreno, also in 1934, authored a report on his development and application of the sociometric technique. Jennings, who had collaborated in the Moreno study, extended the work in later years and reported, in 1950, on leadership and isolation in the population of a state school for delinquent girls.

The findings on leader-individuals likewise reveal wide individual differences in personality. Their reflection in *ways of behaving show leadership to be definable by a manner of interacting with others.*[19]

Individuals are propelled into positions of leadership through the response which greets their extraordinary capacity for inter-personal contribution in *specific situations.*[20]

Individuals who in this community appear as leaders may or may not be found to be leaders in another community of which they later become a part. . . .Nevertheless, it would appear that there are certain qualities in the personalities of the leaders which once these have become an integral part of the individuals's personality pattern (such a quality as freedom from self-concern sufficient to enable him to be concerned with matters affecting many others than himself) are likely to remain since they reflect a high level of emotional growth and maturity and thus may be expected to act favorably upon his future relationships with persons in other groups. . . .The "why" of leadership appears, however, not to reside in any personality trait considered singly, nor even in a constellation of related traits, but in the interpersonal contribution of which the individual becomes capable in a specific setting eliciting such contribution from him.[21]

[17]*Ibid.*, p. 204.

[18]*Ibid.*, p. 219.

[19]Helen Hall Jennings, *Leadership and Isolation*, p. 185. New York: Longmans, Green, and Co., 1950.

[20]*Ibid.*, p. 215.

[21]*Ibid.*, p. 204.

In a detailed review of studies dealing with individual characteristics in leadership, Stogdill concluded that, "qualities, characteristics, and skills required in a leader are determined to a large extent by the demands of the situation in which he is to function as a leader".[22]

Tead distinguished between "command" and "leadership".

Command is interested in getting some associated action which the commander wants to secure. It is an exercise of power *over* people.

Leadership is interested in how people can be brought to work together for a common end effectively and happily. It implies . . . the use and creation of power *with* people. The former is interested solely in the result. The latter is equally concerned about the process by which the result is attained.[23]

He further noted that "the remedy for that bureaucracy with which all organizations are threatened as they grow in size, lies to an appreciable degree in a recognition of the difference in function between the executive and the leader, and in the effort to extend the range and depth of the executive attitude and activity so that the personal influence of a leader is felt at every level."[24]

Pigors took much the same stand in differentiating "leadership" from "domination". He emphasized the importance of the "common cause" of leader and followers.

The leader liberates energy in followers by pointing out causes which give them an opportunity to express themselves and in the service of which their powers can develop.[25]

The leader voluntarily cooperates with others in serving the invisible leadership of the cause. He is a follower even as he leads.[26]

Gouldner takes issue with those who approach the study of leadership primarily from the standpoint of the personality traits of the leader.

Most trait studies, flowing from the empiricist tradition, have approached the study of personality atomistically, and with little regard for personality as an organized whole. . . .It is, in part, because of the lack of any theoreti-

[22]R. M. Stogdill, "Personal Factors Associated with Leadership: A Survey of the Literature", *Journal of Psychology*, XXV (January, 1948), 63.

[23]Tead, *op. cit.*, p. 12.

[24]*Ibid.*, p. 52.

[25]Pigors, *op. cit.*, p. 99.

[26]*Ibid.*, p. 103.

cal guide lines that the trait studies of leadership have produced relatively little convergence.[27]

That a leader is involved in a network of relationships with other individuals who, together with him, comprise a group, is a consideration the full implications of which elude these trait-analysts.[28]

The Council Yearbooks

Since Yearbooks I and II of the American Council on Industrial Arts Teacher Education set the stage for this study, it may be well to mention them again here. They present the environment of the profession and hence are significant in the consideration of leaders among industrial arts teacher educators.

Yearbook I listed facilities, personnel, and programs of 202 institutions of higher learning offering courses leading to certification in industrial arts. A synthesis of data, which precedes the directory of institutions, reveals that 1,018 individuals were employed as industrial arts teacher educators in the United States in the year 1951. Of these, 538 held professorial rank, 103 held the doctor's degree, 635 the master's degree, and 179 the bachelor's degree. Institutions offering a degree with a major in industrial arts numbered 183, of which sixty-nine offered a master's degree, and fourteen a doctor's degree.

Procedure

It would greatly facilitate the development of leadership in any field if the individual could be put to the test and, depending upon the results, be labelled "leader" or "follower".

It is doubtful that leadership selection can ever become as refined as the measurement of temperature or calories. "Leadership" is too complex and composite a quality to lend itself to fine numerical grading.[29]

It would appear that leaders may best be identified by the group which they lead, despite the fact, pointed out by Bogardus, that "often a real achievement is accomplished so quietly that it may receive no recognition at the time".

Leadership grows out of personal achievement, but personal achievement must be appreciated by the group before it becomes leadership. Appreciation is essential, and achievement is its natural prologue.[30]

[27]Gouldner, *op. cit.*, p. 25.

[28]*Ibid.*, p. 26.

[29]Gouldner, *op. cit.*, p. 641.

[30]Bogardus, *op. cit.*, p. 282.

Daniel solicited the opinions of administrators, supervisors, teachers, pupils, and patrons to identify outstanding teachers in South Carolina. The selected teachers were then asked for detailed information "about their education and experience, their activities as teachers in and out of school, and their reactions to community practices with respect to teachers."[31]

Hemphill's study of leadership situations was derived from a long questionnaire in which the follower was asked to identify the leader and to supply detailed information concerning the setting and the quality of leadership. The sociometric approach employed by Jennings was based on the same principle of follower-identification. The emphasis placed upon the group and the "common cause" by Tead, Pigors, and Gouldner points to the importance of the group in the identification of the leader.

This study proceeds, then, on the assumption that industrial arts teacher educators, themselves, are best qualified to identify the outstanding leaders in their own profession. A representative cross section of the profession was asked to name the leaders and to list criteria upon which their selections were based. This procedure will be described in detail in Chapter III.

The role of experience in the development of leadership is not to be denied. Bogardus states that "achievement is an excellent test of leadership because it is objective".[32]

Every modern definition of leadership stresses the intimate association of the leader with the group and states or implies a strong role for achievement or experience. Biographical data concerning the leaders in industrial arts teacher education will be compared with similar data for the entire profession in Chapter IV.

The vital part played by "causes" and "objectives" in the realm of leadership has already been defined.

> Indeed, today a critical scrutiny of objectives is one of the most crucial duties imposed upon many leaders. . . .
>
> If this question is to be frankly faced, the responsibility upon leaders—in the business, political, and educational worlds—is a real one. They have to bring to their examination of the objectives of their several organizations a degree of candor and scientific disinterestedness which has heretofore been all too rare.[33]

[31] J. Mct. Daniel, *Excellent Teachers, Their Qualities and Qualifications*, p. 7. Columbia, South Carolina: The Steering Committee of the investigation of Educational Qualifications of Teachers in South Carolina, 1944.

[32] Bogardus, *op. cit.*, p. 282.

[33] Tead, *op. cit.*, p. 53.

Leaders were asked to state in their own terms the most critical issues presently facing the profession and the approaches that should be taken toward resolving those issues. Replies will be examined in Chapter V.

The final chapter will contain summary and conclusions.

CHAPTER II

Yearbook II of the American Council on Industrial Arts Teacher Education

Soon after the organization of the American Council on Industrial Arts Teacher Education in 1950, the Executive Committee decided to publish an annual yearbook concerning professional matters as an important service to be rendered by the council to its membership. The problem of the subject for Yearbook I was one of the first to be faced by the council officers.

It was thought at the time that approximately one hundred and seventy institutions of higher learning were offering courses leading to certification in industrial arts. A limited directory of personnel in industrial arts teacher education had been published by the American Industrial Arts Association in 1948. Since the first programs were established at Oswego State Normal School, Oswego, New York, in 1880, and at New York College for the Training of Teachers (now Teachers College of Columbia University) in 1886, many institutions had inaugurated programs of various types in the general field of industrial arts teacher education.

This, then, was the extent of the picture in 1950. From a national standpoint, there had been no coordinated development and little exchange of information. It was a somewhat hit-or-miss, though rapid growth. The Executive Committee of the Council decided, therefore, that the task of Yearbook I was evident—to take stock of the present situation in industrial arts teacher education and to publish a report which would, in effect, present a national picture of the profession in terms of personnel, programs, and physical facilities. The committee believed that the report would facilitate and accelerate the organization of the profession on a national scale and would lay the foundation for future yearbooks, which might consider specific problems.

The original plan for Yearbook I included a directory of institutions, with a list of personnel and descriptions of programs and physical facilities for each institution, and a directory of personnel, with a brief biographical sketch for each teacher educator in the field of industrial arts. The editors soon found, however, that it was imprac-

tical to include all of this information in a single volume; hence, Yearbook I dealt with the inventory-analysis of facilities, personnel, and programs, while the biographical data concerning teacher educators was reserved for Yearbook II.

The Questionnaire

A questionnaire was devised in order to secure the data for Yearbook II. The form was entitled *Who's Who in American Industrial Arts Teacher Education.*

The questionnaire was circulated among the more than one thousand individuals revealed by Yearbook I to be teaching in the field of industrial arts education at two hundred colleges and universities in the United States.

Procedure

A list of institutions of higher learning offering courses leading to certification in industrial arts was compiled from *The 1948 Industrial Arts Teacher Education Directory.* This list was checked for accuracy with every state department of education in the nation.

On January 5, 1951, the council president addressed a letter to the department head of each of these institutions, stating the objectives of the yearbooks and requesting information. Enclosed with the letter was a copy of the *Who's Who* blank for each member of the faculty.

A number of follow-up requests were sent during the remainder of the year. About a month after the original mailing, a postcard reminder was sent to all department heads from whom no reply had been received. A second letter with duplicate copies of *Who's Who* blanks was mailed three weeks later. Individual letters were then sent to those teacher educators who had not returned the *Who's Who* blank, and another letter to department heads was sent on April 16.

In March, 1952, a letter was sent to all department heads requesting deletions and additions to the personal and professional data now on file. A final letter, along with a copy of the *Who's Who* blank, was sent in September, 1952, to all individual teacher educators from whom the council still had received no reply.

Complete replies were received from 844 of the 1,080 individuals known to be engaged half time or more in industrial arts teacher education. A key to abbreviations was composed and brief biographical sketches were prepared for each individual.

Analysis of Returns

James I. Paige analyzed the first five hundred returns of the Year-

book II questionnaire as a part of his master's thesis presented at the University of Florida in June, 1951. Since no significant changes were indicated by subsequent returns, data for this report will be derived from Paige's study.

Place of Birth

New York, Wisconsin, and Texas are the native states of about 23 per cent of the industrial arts teacher educators. Sixty-three per cent were born in the fifteen states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, and Wisconsin.

Seven states were not listed by a single individual, and less than five were born in each of twenty states. Twenty-five or more persons were born in each of seven states.

Approximately 2 per cent were foreign-born—four in Canada and one each in France, Denmark, England, and Sweden.

Table I on the following page reveals a percentage distribution of birthplace by areas in the following geographical arrangement:

East—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Delaware, New Jersey, District of Columbia, and Maryland.

Midwest—Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

South—Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, and Texas.

West—Montana, Washington, Oregon, Idaho, Wyoming, Colorado, Utah, Arizona, New Mexico, Nevada, and California.

TABLE I

TABLE SHOWING PERCENTAGE DISTRIBUTION OF BIRTHPLACE

Geographical Area	Percentage of Births
East	19
Midwest	48
South	24
West	7
Foreign	2
TOTAL	100

Family Status

Only 6 per cent of the industrial arts teacher educators were un-

married, while 17 per cent were married and childless. The number of children in the families of the remaining 27 per cent ranged from one to ten, with an average of 1.94.

Of the total number of individuals, 28 per cent had one child, and 32 per cent had two children. Only 17 per cent had more than two, 4 percent more than three, and 1 per cent more than four.

Table II indicates the distribution of children of married individuals.

TABLE II

TABLE SHOWING PERCENTAGE DISTRIBUTION OF CHILDREN

Number of Children	Percentage of Married Persons
0	18
1	30
2	34
3	14
More than 3	4
TOTAL	100

Age

The average age of industrial arts teacher educators was 41.9 years. The youngest was twenty-four, and two were sixty-eight years of age. About 8 per cent were more than sixty, and 70 per cent were between the ages of twenty-eight and forty-six. Table III indicates the age distribution of the profession.

TABLE III

TABLE SHOWING PERCENTAGE DISTRIBUTION OF AGE

Age Range in Years	Percentage of Individuals
20-29	7
30-39	38
40-49	31
50-59	16
60-69	8
TOTAL	100

Professional Preparation

Table IV indicates that about three of every four industrial arts teacher educators hold at least a master's degree. No degree was

reported by only 1.4 per cent. The bachelor's degree was held by 12.6 per cent and the doctor's degree by 11.6 per cent.

The average age at which the doctor's degree was awarded was 39.69 years, with a range of from twenty-eight to fifty-six years of age. Fifty-five per cent received the doctor's degree after age thirty-six, and nineteen per cent after age forty-five. It may be noted that of the few who hold no degree, most are in the upper age brackets and have had considerable industrial experience.

TABLE IV

TABLE SHOWING PERCENTAGE DISTRIBUTION OF DEGREES

Degree	Percentage
No Degree	1.4
Bachelor's Degree	12.6
Master's Degree	74.4
Doctor's Degree	11.6
TOTAL	100

College Teaching Experience

The educators averaged 9.8 years of experience in teaching industrial arts education on the college level. One individual reported forty-one years of experience, and about 10 per cent had more than twenty-five years in the profession. Table V reveals that five years or less experience was reported by 53 per cent.

TABLE V

TABLE SHOWING PERCENTAGE DISTRIBUTION OF COLLEGE TEACHING

Range of Years	Percentage
1-5	53
6-10	16
11-15	10
16-20	5
21-25	6
26-30	6
31-35	3
36-40	1
TOTAL	100

Public School Teaching Experience

It was somewhat startling to discover, as revealed in Table VI, that 21 per cent, or slightly more than one in every five, industrial arts teacher educators had no experience in teaching in the public schools. Seven per cent reported only one year, and 15 per cent reported two years or less experience in public school teaching.

The average number of years in the public schools was 7.4. Forty-three per cent reported more than five years of such experience, 20 per cent more than ten years, and 7 per cent more than twenty years.

TABLE VI

TABLE SHOWING PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHING

Range of Years	Percentage
0	21
1-5	36
6-10	23
11-15	13
16-20	5
21-25	2
TOTAL	100

Publications and Organizations

Twelve per cent of the industrial arts teacher educators have written one or more books; while 27 per cent, or more than one in four, have contributed at least one article to a professional periodical.

Of the professional organizations, Table VII indicates that 38 per cent reported membership in the American Vocational Association, and 34 per cent were members of the American Industrial Arts Association. The National Education Association accounted for 32 per cent, the American Council on Industrial Arts Teacher Education 24 per cent. Among the professional fraternities, 40 per cent were members of Epsilon Pi Tau, while 37 per cent were affiliated with Phi Delta Kappa.

More than fifty national professional organizations and twenty fraternities were listed. Among the organizations were:

National Vocational Guidance Association
American Association of Curriculum Development
American Designers Institute
American Society of Engineering Education

National Aviation Educational Council
American Welding Society
National Committee on Arts and Crafts
American Association of Supervisors of Student Teachers
International Graphic Arts Education Association
National Association for Printing Education
American Institute of Architects
National Committee on Accreditation of Industrial Arts Teacher Education
American Craftman's Education Council
American Education Research Association
National Association of Housing Officials
Society for the Advancement of American Education
American Society of Tool Engineers
American Society of Agricultural Engineers
American Geophysical Union
American Society of Metals
American Institute of Electrical Engineers
American Foundryman's Society
American Society of Aesthetics
National Art Education Association
National Technical Society
American Society of Mechanical Engineers
American Association of Occupational Therapy

TABLE VII

TABLE SHOWING PERCENTAGE REPRESENTATION IN NATIONAL ORGANIZATIONS

Organization	Percentage
American Vocational Association	38
American Industrial Arts Association	34
National Education Association	32
American Council on Industrial Arts Teacher Education	24
National Association of Industrial Teacher Educators	17
American Association of University Professors	15
Epsilon Pi Tau	40
Phi Delta Kappa	37
Iota Lamda Sigma	13
Kappa Delta Pi	9

Travel and Avocational Interests

Forty-seven per cent of the industrial arts teacher educators reported foreign travel, three-fourths during service in the armed forces. Travel ranged from brief visits across the borders to trips around the world. Nearly all reported extensive travel in the United States.

About 75 per cent listed avocational interests, most popular of which fell under the heading of outdoor sports. One individual was state chairman of the square dance; while another is former world's champion wild horse race rider. Among the most frequently mentioned hobbies were photography, model building, home workshop, gardening, civic affairs, cabinetmaking, Boy Scouts, church work, radio, home planning and maintenance, woodwork, music, boat building, travel, and crafts.

The "Typical" Individual

Based on the preceding data, the hypothetical typical industrial arts teacher educator is forty-two years old and is a native of New York. He holds a master's degree, has taught in the public schools for seven years, and has been teaching on the college level for ten years. He is a member of several national organizations, including the American Vocational Association, the American Industrial Arts Association, and Epsilon Pi Tau. He has written a few articles for professional journals and served overseas while in the armed forces. He is an ardent sports enthusiast, but he also spends considerable leisure time in his home workshop.

CHAPTER III

Identification of Leaders

Chapter I sought to establish the validity of the principle of identification of current leadership by the group in which the leadership is functioning. It was stated that this study "proceeds on the assumption that industrial arts teacher educators, themselves, are best qualified to identify the outstanding leaders in their own profession."

Indeed, for all practical purposes, this principle would seem to be self-evident. It is true that accomplishment which may result in leadership is not always immediately recognized; but in that case, the leadership element is delayed. It is not "current" leadership. Current leadership demands immediate recognition.

The Questionnaire

At the time that the questionnaire was devised, there were approximately one thousand known industrial arts teacher educators in the United States. About one hundred were members of the recently-organized American Council on Industrial Arts Teacher Education. There were two hundred institutions of higher learning known to be offering courses leading to certification in industrial arts.

It was decided to use the membership list of the council, adding a known industrial arts teacher educator for each institution not represented in the council, as the mailing list for the questionnaire. The combination resulted in a total list of 243 individual industrial arts teacher educators.

The questionnaire took the form of a simple letter requesting a "list of those whom you consider outstanding national leaders in industrial arts teacher education" and "broad reasons for your selections." Enclosed with the letter was a form with blanks for the names of individuals and institutions selected and general criteria for selection. Also attached was a self-addressed, stamped envelope.

No attempt was made to suggest the number of leaders who should be selected or the criteria upon which the selections should be based. Since it was the opinion of the members of the profession that was sought, it was believed that any such suggestion would invalidate the result.

The questionnaires were mailed on April 10, 1952, and no follow-up letters were sent.

Returns

Leaders were identified on the basis of 105 returns from thirty-seven states, as revealed in Table VIII. A few more returns were received after the deadline, but these were discarded. The study is based, then, on a return of approximately 43 per cent of the original mailing.

TABLE VIII

TABLE SHOWING DISTRIBUTION OF RETURNS BY STATES

State	Number of Returns
Alabama	2
Arizona	0
Arkansas	2
California	6
Colorado	3
Connecticut	1
Delaware	0
District of Columbia	0
Florida	3
Georgia	3
Idaho	0
Illinois	9
Indiana	1
Iowa	3
Kansas	3
Kentucky	1
Louisiana	2
Maine	1
Maryland	1
Massachusetts	0
Michigan	2
Minnesota	3
Mississippi	0
Missouri	5
Montana	1
Nebraska	1
Nevada	0
New Hampshire	1

New Jersey	1
New Mexico	1
New York	9
North Carolina	3
North Dakota	1
Ohio	4
Oklahoma	10
Oregon	1
Pennsylvania	1
Rhode Island	0
South Carolina	0
South Dakota	1
Tennessee	3
Texas	8
Utah	0
Vermont	0
Virginia	2
Washington	4
West Virginia	0
Wisconsin	1
Wyoming	1
TOTAL	105

Geographically, the returns were fairly representative of the national industrial arts teacher education program. It would seem unusual that Oklahoma should lead the states with ten returns, but this is accounted for by the fact that Oklahoma has fourteen institutions offering industrial arts education. New York, a much larger state in terms of population, has only six such institutions.

Table IX indicates the distribution of returns by areas of the United States, as apportioned in Table I. Here again, from the standpoint of population, it would seem that the returns are disproportionate.
tionate.

However, Table X on the following page reveals that 37 per cent of the returns were from the southern area, which accounts for 37 per cent of the industrial arts teacher education programs; that 17 per cent of the returns were from the western area, which accounts for 16 per cent of the programs; that 33 per cent of the returns were from the midwestern area, which accounts for 35 per cent of the programs; and that 14 per cent of the returns were from the eastern area, which accounts for 10 per cent of the programs.

TABLE IX

TABLE SHOWING DISTRIBUTION OF RETURNS BY AREAS

Area	Number of Returns	Percentage
East	15	14
Midwest	34	33
South	39	37
West	17	16
TOTALS	105	100

TABLE X

TABLE SHOWING DISTRIBUTION OF PROGRAMS BY AREAS

Area	Number of Programs	Percentage
East	20	10
Midwest	68	35
South	73	37
West	35	18
TOTALS	197	100

Leader Identification

Of the one hundred and five returns, seven individuals listed leaders but failed to list any criteria for selection. One listed criteria without names of leaders.

Two persons added complimentary notes concerning the proposed study, and two took the opposite view. One of the latter wrote: "It seems that your time should be worth something other than fooling with this, we all will have different men in mind, however, when you have found the outstanding man you haven't found much." The other wrote: "I am afraid you are off on the wrong track. Anything I would give you would be opinion and not fact."

A few individuals took the trouble to mention possible pitfalls of a leadership study. Illustrative of these was a letter which stated:

> Many individuals who are actually leaders frequently are omitted in studies such as yours, as well as in published reports. This comes about, I fear, through our well-known national tendency to fasten upon one or two factors and omit the others. We also over-emphasize one or two factors and thus distort a whole picture.

The illustrations of this which come to mind most easily are to be found in the way in which we often accept a synthetic reputation built up by self-publicizing, or the publicizing by a group, or by a professional worker in the field, in lieu of a deserved reputation on strictly professional grounds. In other cases, we have allowed the smooth-working effects of political cabals, whereby certain individuals get themselves elected to office and then perpetuate themselves in office, as an evidence of leadership in all aspects of the field. Sometimes those perennial office holders are leaders in other ways; but all too frequently they are not, or if they once were, their fine professional qualities are sacrificed in their scramble to continue in political office.

A total of 108 names were mentioned in the returns. However, fifty-five of these were mentioned once, most of them known only locally. Seventeen additional names were mentioned fewer than five times, leaving a total of thirty-six individuals who were mentioned five times or more.

Between the thirteenth and fourteenth individual, there was a definite break in the number of times mentioned from twenty-two to eighteen. Below the thirteenth individual, no similar break appeared. Hence it was decided that the first thirteen individuals, in point of number of times mentioned, might be considered the outstanding national leaders in industrial arts teacher education.

TABLE XI

TABLE SHOWING NUMBER OF TIMES MENTIONED

Leader Number	Times Mentioned	Rank
1	59	1
2	55	2
3	41	3.5
4	41	3.5
5	40	5
6	36	6
7	35	7
8	33	8
9	30	9
10	28	10
11	26	11
12	23	12
13	22	13

Table XI reveals the number of times mentioned and the rank of each of the selected leaders. The first leader was mentioned fifty-nine

times, or by more than half of those participating in the survey. It is interesting to note the five distinct groupings: leaders 3, 4, and 5 from forty-one to forty times; leaders 6, 7, and 8 from thirty-six to thirty-three times; 9, 10, and 11 from thirty to twenty-six times; and leaders 12 and 13 from twenty-three to twenty-two times.

Leader 13 was mentioned by about 21 per cent of those who returned the questionnaire. The drop after Number 13 was to 17 per cent.

Criteria for Selection

The 105 individuals who returned the questionnaire accounted for 425 listings as criteria for the selection of leaders. This is an average of about four criteria for each individual, but the number ranged from one to twelve.

Fifty-four separate criteria were identified. These fell into the following eleven catagories:

1. Personal and Professional Qualities
2. Publications
3. General Promotion of Industrial Arts Teacher Education
4. Professional Organization Activity
5. Status
6. Program Development
7. Philosophy
8. Leadership
9. Research
10. Experience
11. Education.

The following criteria were listed under "Personal and Professional Qualities":

Character
Ability to win respect
Personality
Enthusiasm
Willingness to cooperate
Ability to inspire
Scholarship
Professional competence
Teaching ability
Interest in students
Organizational ability
Craftsmanship
Administrative ability

These criteria are the result of consolidating ninety-five separate

listings. Exactly identical wording is used in relatively few cases. For example, the word "character" was listed only twice and "personality" appeared but three times; but there were a number of single listings which fell logically under these headings. Such criteria as "loyalty", "personal respectability and honor", and "unselfishness" were included under "character". "Personality" includes such expressions as "personality and poise", "good personality", and "qualities of personality".

Table XII reveals the number of listings for each criterion under the separate general headings. Other typical expressions under "Personal and Professional Qualities" were: "ability as a scholar", "served unselfishly", "willingness to render service to the profession", "pronounced personal and professional qualities", "enthusiasm for the profession", "loyalty to industrial arts," "professional spirit," "conscientious and inspiring teacher," and "ability to organize course work."

TABLE XII

TABLE SHOWING NUMBER OF LISTINGS FOR EACH CRITERION

Criterion	*Number of Listings*
Personal and Professional Qualities	
Character	5
Ability to win respect	22
Personality	6
Enthusiasm	3
Willingness to cooperate	2
Ability to inspire	2
Scholarship	5
Professional competence	13
Teaching ability	24
Interest in students	2
Organizational ability	2
Craftsmanship	3
Administrative ability	6
TOTAL	95

Publications	
Professional writing	24
Contributions to literature	11
Publications	19
Articles	6
Author	7
Books	7
Editor	2
TOTAL	76
General Promotion	
Promotion of industrial arts teacher education	8
Speaking and lecturing	12
Travel and visits	4
Special committee work	12
General contributions	14
Influence on the profession	4
Success of students	5
Professional relations	3
Development of national policies	11
TOTAL	73
Professional Organization Activity	
Active at meetings	8
Active in professional organizations	9
Contributed to local, state, and national programs	1
Active in local, state, and national organizations	4
Active in national organizations	17
Active in state and national organizations	7
Active in state organizations	1
TOTAL	47
Status	
Position held	20
Professional recognition	10
Community status	3
TOTAL	33
Program Development	
Developed strong program	18
Developed strong undergraduate program	2
Developed strong graduate program	6
TOTAL	26

Philosophy		
Evidence of sound philosophy		15
Development of new ideas		3
Progressive viewpoint		4
	TOTAL	22
Leadership		
General leadership		10
State leadership		2
Local leadership		1
National leadership		2
Fraternity leadership		2
	TOTAL	17
Research	TOTAL	13
Experience		
Length of service		3
Experience in the field		10
	TOTAL	13
Education		
Professional preparation		5
Degrees held		5
	TOTAL	10

These represent a total of seventy-six separate listings. Typical expressions were: "writings," "published materials," "quantity and quality of writing," "contributed to publications," "professional publications," "contributed to field by writing," "editor of a national journal," "author of valuable books," and "author of magazine articles."

Criteria included under the category of "Publications" were the following:

Professional writing
Contributions to literature
Publications
Articles
Author
Books
Editor

In the category of "General Promotion of Industrial Arts Teacher Education" were the following criteria:

Promotion of industrial arts teacher education speaking
Speaking and lecturing
Travel and visits
Special committee work
General contributions
Influence on the profession
Success of students
Professional relations
Development of national policies

Typical expressions of the seventy-three separate listings in this category were: "travel for speaking engagements," "views expressed in speeches," "promotes sound program of industrial arts," "work on accreditation procedures," "ability as a speaker," "travel and contacts to promote nationally," "willingness to visit schools," and "state and national promotion of industrial arts."

The category of "Professional Organization Activity" included the following criteria:

Active at meetings
Active in professional organizations
Contributed to local, state, and national programs
Active in local, state, and national organizations
Active in state and national organizations
Active in national organizations
Active in state organizations

Forty-seven listings were recorded in this category. Among the typical expressions were: "convention activities," "participated in professional meetings," "active in local, state, and national associations and programs," "participated in state and national organizations," "influential in national organizations," "contributed to conventions," and "participation in organizations."

The three criteria listed under the general category of "Status" were:

Position held
Professional recognition
Community status

The following are typical of the thirty-three separate listings in this category: "use of position (government)," "superior work in position," "present position," "honorary recognition," "citations," "recognition of associates," and "outstanding position held."

In the category of "Program Development," these criteria were

listed:

Developed strong program
Developed strong undergraduate program
Developed strong graduate program

Typical of the expressions in this category, among twenty-six listings, were: "built strong college program," "improved and expanded undergraduate program," "own program," "pilot program in general education," "quality of own local program," "head of graduate program," and "director of excellent programs."

The following criteria were listed under the general category of "Philosophy":

Evidence of sound philosophy
Development of new ideas
Progressive viewpoint

These are ample to illustrate the twenty-two listings in this category.

A separate category was devised under the general term, "Leadership," despite the fact that leadership can hardly be considered a criterion of leadership. The term appeared seventeen times under the five headings listed in Table XII.

"Research" was listed thirteen times, in nearly every case as the single word. "Experience" appeared three times as "length of service," and as "experience in the field" ten times. "Education" was listed only ten times, equally divided between "professional preparation" and "degrees held."

Table XIII reveals the percentage of listings in each general category. It would indicate a particularly strong emphasis by industrial arts teacher educators on personal and professional qualities in the identification of leadership. Contributions to professional literature, general promotion of industrial arts teacher education, and active participation in professional organizations are important factors. Status, program development, and philosophy enter into the picture; but it would appear that research, experience, and formal education are not considered outstanding factors in determining leadership.

TABLE XIII

TABLE SHOWING PERCENTAGE OF LISTINGS IN EACH CATEGORY

Category	Percentage
Personal and Professional Qualities	23
Publications	18
General Promotion	17
Professional Organization Activity	11
Status	8
Program Development	6
Philosophy	5
Leadership	4
Research	3
Experience	3
Education	2
TOTAL	100

CHAPTER IV

Some Apparent Biographical Relationships

It is the purpose here to summarize certain biographical data concerning the selected leaders, as gleaned from Yearbook II of the American Council on Industrial Arts Teacher Education, and to compare the data with that of the entire profession.

Leader 13, as listed in Table XI, will not be included in the remaining portion of this study, since data for this individual was not made available for Yearbook II.

Leader A

Leader A, Professor of Industrial Arts Education at a large eastern state college, was born in the 1890's in a midwestern state. He is married and has three children. He holds a diploma and two degrees from two midwestern insitutions and received his Master of Science degree in 1930. In eight years of experience in public school teaching, he held three separate positions. He has held positions at two institutions of higher learning in the past twenty-five years. With a total of thirty-three years of experience in education, Leader A has held his present position since 1944. He is the author of five volumes, co-author of two; and he has contributed to at least eight professional journals. He is a member of the American Vocational Association, American Industrial Arts Association, National Association of Industrial Teacher Educators, Mississippi Valley Industrial Arts Conference, his state vocational and education associations, Mountain Arts Association, National Committee on Accreditation of Industrial Arts, Phi Delta Kappa, and Iota Lamda Sigma. He is president of one organization and a department secretary of another. Area of specialty is curriculum and course making. He has travelled in the United States and Canada, and his principal avocational interest is the cultivation of various types of trees.

Leader B

Leader B is a high official of a midwestern college, well-known for its industrial arts program. He was born in the Midwest in the 1890's and is married and has two children. Holder of degrees from three midwestern institutions of higher learning, he received the

Ph.D. degree in 1933. He taught one year each in four different public schools and has held six positions in twenty-nine years in higher education. He accepted his present position in 1945. He has visited the Far East as a consultant; and served in the armed forces in World Wars I and II. He is the author of three volumes and co-author of four. He has contributed about seventy articles to a large number of professional magazines. Leader B is a member of the American Association for Advancement of Science, American Association for Advancement of Education, American Vocational Association, National Education Association, American Educational Research Association, American Association of Teacher Trainers in Vocational Education, Michigan Industrial Education Society, his state vocational and education associations, Mississippi Valley Industrial Arts Conference, Phi Delta Kappa, Epsilon Pi Tau, Mu Sigma Pi, and Iota Lamda Sigma. He is a life member of two organizations, life chairman of one, former president of one, laureate member of one fraternity and national honorary chairman of two. His area of specialty is administration.

Leader C

Born in an eastern state in 1912, Leader C is Professor of Industrial Education at a large eastern state university. He is married and has one child. He holds one degree from an eastern college and two from a midwestern state university, having received his Ph.D. degree in 1942. He also experienced a year of post-doctoral study. After teaching industrial arts in a high school for two years, he held three separate positions at institutions of higher learning. During World War II, he performed important supervisory work in an aircraft plant, and he has held his present position since 1945. He has contributed to three volumes and three professional magazines. He is a member of the American Vocational Association, American Industrial Arts Association, American Council on Industrial Arts Teacher Education, Horace Mann Society, John Dewey Society, Epsilon Pi Tau, Iota Lamda Sigma, Phi Delta Kappa, and Phi Sigma Pi. Area of specialty is industrial arts teacher education and travel has been limited to the United States. His avocational interests include various types of construction and the study of manufacturing industries.

Leader D

Leader D, Professor of Industrial Arts at a far-western state university, was born in Europe in the 1880's. He is married and has one child. Having received his bachelor's degree from a midwestern institution, he earned the Master of Arts degree at a western university.

He served as an industrial arts supervisor in a public school system for two years and has a total of thirty-three years as an industrial arts teacher educator at two institutions of higher learning. He has held three positions at the same institution in the past twenty-seven years and has held his present position since 1947. He is the author of three volumes, two of which have had especially wide circulation as texts, is the co-author of one volume, and has contributed to a large number of magazines and books. He is a life member of the American Vocational Association and a member of Phi Delta Kappa, Phi Sigma Pi, Pi Sigma Chi, and Epsilon Pi Tau. He is national counselor of one fraternity and trustee of another and holds an important committee chairmanship in the association. He has travelled in England and Sweden.

Leader E 

Leader E is Professor of Education and Head of the Department of Industrial Arts and Vocational Education at a southern state university. Born in 1909 in a midwestern state, he is married and has three children. He holds three degrees from a midwestern state university, where he received the Ph.D. degree in 1944. He also studied at four other institutions of higher learning in the South, Midwest, and Far West. He was associated with public school education for eight years, equally divided between two schools, and has held three positions at institutions of higher learning in the past thirteen years. He has also taught in summer camps, worked as a part-time construction contractor, raised citrus, and served as a consultant to national and state educational bodies. He is a member of the American Council on Industrial Arts Teacher Education, American Industrial Arts Association, his state industrial arts association, School and College Conference of the National Safety Council, American Vocational Association, Epsilon Pi Tau, Phi Delta Kappa, Kappa Delta Pi, and Kappa Pi. He has served as president of three of the organizations and vice-president of two, and as chairman of five important national committees. He is a laureate member and trustee of one of the fraternities and has been prominent in the national industrial arts awards program. He is the author of three volumes and co-author of one, editor of two, and co-editor of two. He has contributed to many professional journals. Area of specialty is teaching graduate professional courses in industrial arts and vocational education. Leader E has travelled widely in China, Japan, Hawaii, the United States and Canada. His avocational interests include laboratory planning, architecture, and the raising of commercial citrus.

Leader F

Born in the Midwest in the early 1900's, Leader F is Professor and Head of the Industrial Education department at a large southern college. He is married and has no children. Holder of two degrees from a midwestern state teachers college, he received the Ed.D. degree from an eastern state college in 1950. He has had five years of experience in three positions in the public schools and a like number of positions in seventeen years of association with institutions of higher learning. He has held his present position since 1940. Author of seven volumes and co-author of three, he has contributed ninety-two articles to four professional journals. He is a member of his state vocational, education, and industrial arts associations, Institute for Air Age Activities, Oklahoma Association of Municipal Junior Colleges, American Industrial Arts Association, American Vocational Association, Mississippi Valley Industrial Arts Conference, Iota Lamda Sigma, and Phi Delta Kappa. He has been president and vice-president of one organization and has served as chairman of important committees of divisions in four others. Leader F specializes in woodwork, handicrafts, and writing. Travel in the United States included a trip through seventeen states with visits to twenty-three industrial arts teacher education departments. His hobbies are handicrafts, travel and gardening.

Leader G

Leader G, Professor of Education at a large midwestern state university, was born in the 1890's in a midwestern state. He is married and has no children. He holds two degrees from a midwestern state university and received his Ph.D. degree from an eastern university in 1928. He has had five years of experience in the public schools of two states and has been connected with his present institution since 1925. In addition to six years of practical work experience, he has held numerous educational and civil defense posts in the armed forces both here and abroad. He served in both World Wars. Co-author of one volume, he has contributed many articles to several professional periodicals. He is a member of the American Industrial Arts Association, National Education Association, American Vocational Association, American Association of School Administrators, North Central Association of Colleges and Secondary Schools, Western Arts Association, President's Advisory Committee on Industrial Safety, and Epsilon Pi Tau. He is the founder of two of the organizations and former president of two. Leader G specializes in research and profes-

sional courses and has travelled extensively in the United States and abroad.

Leader H

Born in the Southwest in the 1880's, Leader H is Professor of Industrial Education, Emeritus, at a midwestern state university. He is married and has one child, now deceased. He has studied at four institutions of higher learning and received his Master of Arts degree from a southern college in 1924. He taught at three public schools over a period of four years, at a state teachers college for eleven years, and at a university for twenty-one years. For a year following World War I, he was director of vocational training at a United States Army camp. He is the author of four volumes and co-author of four; and he has contributed a large number of brochures, research reports, and magazine articles. He is a member of the American Vocational Association, his state vocational association, Phi Delta Kappa, Kappa Delta Pi, Kappa Phi Kappa, and Iota Lamda Sigma. He is former president of one of the associations, former vice-president of one, and honorary life member of one of the fraternities.

Leader I

Leader I is head of a school of industrial arts at a large southern college. Born in the Southwest in the 1880's, he is married and has no children. Holder of five degrees from three institutions, he received the Ph.D. degree at a midwestern state university in 1939. He taught for three years in one public school and for four years in another, and he has been associated with his present college since 1915. He is the author of four volumes and has contributed a large number of articles to at least seven professional journals. He is a member of the American Industrial Arts Association, National Education Association, American Vocational Association, American Society for Engineering Education, his state education association, Mississippi Valley Industrial Arts Conference, School Shop Safety Evaluation Committee of the National Safety Council, his state advisory committee for industrial arts, his city safety council, President's Committee on Industrial Safety, Phi Delta Kappa, Iota Lamda Sigma, Epsilon Pi Tau, and Kappa Delta Pi. Leader I specializes in woodwork, general shop, graduate work, and shop safety. He has travelled widely in the United States, and his avocational interests include tennis, travel, and community safety.

Leader J

Leader J, head of industrial arts teacher education at a well-known eastern teachers college, was born in an eastern state in the 1890's. He is married and has no children. Holder of three degrees from two universities, he received the Ph.D. degree at a midwestern state university in 1941. He obtained eleven years of experience at three secondary schools before entering college teaching in 1933. He has held his present position since 1940. He is the author of one volume, used widely as a text, and co-author of two. He also has contributed to many professional periodicals and has lectured before a large number of industrial arts gatherings. He is a member of the American Industrial Arts Association, American Council on Industrial Arts Teacher Education, National Association of Industrial Teacher Educators, American Vocational Association, his state vocational and industrial arts associations, Epsilon Pi Tau, and Phi Delta Kappa. He has been president of two of the national organizations, chairman of numerous committees, and is a trustee of a fraternity. His areas of specialty include administration and metalwork. He has travelled widely in the United States and Canada and his avocational interests are metal spinning, gardening, fishing, and color photography.

Leader K

Born in the Midwest in the 1880's, Leader K is Professor of Industrial Education and Head of the Department of Industrial Education at a midwestern state university. He is married and has three children. He holds three degrees from two midwestern state universities and received his Ph.D. degree in 1926. After holding teaching and administrative positions in the public schools for twelve years, he joined the staff of his present university in 1921. He is the author of several books and bulletins and has contributed about one hundred articles to professional magazines. He is a member of the National Education Association, American Vocational Association, American Association of University Professors, American Association for Adult Education, National Association of Industrial Teacher Educators, his state vocational association, Mississippi Valley Industrial Arts Conference, Phi Delta Kappa, Epsilon Pi Tau, Iota Lamda Sigma, and Mu Sigma Pi. He has served as president of three organizations, vice-president of one, and secretary-treasurer of another. Areas of specialty include administration, supervision, and methods. Leader K has travelled in the United States and Germany, and his avocational interests are reading, writing, community and social affairs, and home maintenance.

Leader L

Leader L is Professor of Industrial Arts at a large midwestern state university. Born in 1900 in the southwest, he is married and has three children. He holds three degrees from a like number of institutions and received the Ph.D. degree at a midwestern state university in 1934. He taught for three years in the public schools and has held eight positions at institutions of higher learning in the past twenty-six years. He has held his present position since 1938. He is the author of numerous magazine articles and bulletins. He is a member of the American Association of University Professors, National Association of Industrial Teacher Educators, American Industrial Arts Association, American Vocational Association, his state vocational, industrial education, adult education, and education associations, National Education Association, and Phi Delta Kappa. Leader L specializes in professional courses and research. He has travelled in the United States, Mexico, and Canada, and his avocational interests are stock farming and bird hunting.

An examination of the biographical sketches reveals that while all of the leaders hold the full professorial rank, exactly half of them are designated as heads of administrative divisions. They have held their present positions for an average of 10.44 years.

Average age of the leaders is 55.33 years. They were born in eight different states and one foreign nation. Three are natives of Texas and two were born in Wisconsin. All are married, but the average number of children is only 1.41.

Eight of the leaders hold the Ph.D. degree and one holds the Ed.D. degree. The other three hold master's degrees. The average age at which the doctor's degree was conferred is 38.44 years.

The leaders held an average of 2.26 positions in 5.91 years of public school teaching and 3.09 positions in 25.08 years of industrial arts teacher education experience at the college level. They have written an average of two and one-half books and co-authored 1.75. All have contributed a large number of articles to several professional journals.

The twelve leaders belong to an average of 8.09 professional organizations and three professional fraternities. All have held responsible posts in the organizations. Travel among the leaders has been limited largely to the United States, where it has been extensive. Only three reported travel in foreign countries. There is no uniformity in areas of specialty or in avocational interests, though most leaders spend a considerable portion of their time teaching graduate courses.

Relationships

A comparison of biographical data concerning the leaders with that for the profession as a whole will reveal some similarities and some rather startling differences. This material will be presented in factual form. No attempt will be made here to draw conclusions.

The categories of "Area of Specialty" and "Avocational Interests" will not be included in the comparisons since there are no fixed patterns either for the leaders or for the members of the profession as a whole.

Age and Birthplace

As would be expected, the average age of the leaders is considerably higher than that for all industrial arts teacher educators. Leaders averaged 55.3 years of age as compared to 41.9 years for the profession as a whole, a difference of 13.4 years. Youngest of the leaders was forty years old, youngest of the entire group, twenty-four. Only three of the leaders were between forty and fifty years of age, five between fifty and sixty, and four between sixty and seventy. Eight per cent of all industrial arts teacher educators were more than sixty years of age, compared with 33 per cent of the leaders. Whereas 70 per cent of the entire group were less than forty-six years of age, 75 per cent of the leaders were more than fifty.

While New York, Wisconsin, and Texas are the native states of 23 per cent of all industrial arts teacher educators, they account for the birthplaces of 50 per cent of the leaders. The fifteen states listed as native by 63 per cent of the entire group account for 91 per cent of the leaders. The following is a percentage comparison by areas:

East – Leaders, 16 per cent; entire group, 19 per cent.
Midwest – Leaders, 50 per cent; entire group, 48 per cent.
South – Leaders, 25 per cent; entire group, 24 per cent.
West – Leaders, none; entire group, 7 per cent.
Foreign – Leaders, 9 per cent; entire group, 2 per cent.

Family Status

All of the leaders are married, compared with 94 per cent for the profession as a whole. However, only 17 per cent of the entire group was childless, while 33 per cent of the leaders had no children. The largest number of children for the profession was ten, for the leaders three.

The leaders had an average of 1.41 children, compared with 1.94 for all industrial arts teacher educators. One child was reported by

30 per cent of the entire group and by 25 per cent of the leaders. Forty-one per cent of the leaders had two or more children, compared with 52 per cent for the profession as a whole.

Formal Education

All of the leaders hold advanced degrees, whereas 1.4 per cent of all industrial arts teacher educators hold no degree and 12.6 per cent hold only the bachelor's degree. The master's degree is held by 25 per cent of the leaders and by 74.4 per cent of the entire group, the doctor's degree by 75 per cent of the leaders and by only 11.6 per cent of the entire group.

The doctor's degree was received by members of the profession as a whole at the average age of 39.69 years, by the leaders at an average age of 38.44, a difference of only 1.25 years. Fifty-five per cent of both the entire group and the leaders received the doctor's degree after the age of thirty-six years, whereas 19 per cent of the entire group and 11 per cent of the leaders received the degree after age forty-five. The range in ages for the leaders was thirty to fifty years and for the profession as a whole, from twenty-eight to fifty-six years.

Public School Teaching Experience

Whereas a rather large number of the total profession, or 21 per cent, reported no experience in public school teaching, all of the leaders had some such experience. But the average number of years of teaching in the public schools was 7.4 for the entire group and only 5.91 for the leaders, a difference of about 1.5 years.

Seven per cent of the entire group and none of the leaders reported only one year of public school teaching experience. More than five years of experience was reported by 43 per cent of the entire group and 58 per cent of the leaders, more than ten years by 20 per cent of the entire group and 17 per cent of the leaders, and more than twenty years by 7 per cent of the entire group and none of the leaders.

College Teaching Experience

The leaders have been teaching industrial arts education at the college level for an average of 18.3 years more than have all industrial arts teacher educators. Average number of years for the entire group was 9.8 years, compared with 25.08 years for the leaders.

Whereas 53 per cent of the entire group had five years or less experience in the profession, the fewest years among the leaders was twelve. More than twenty-five years of experience was reported by

10 per cent of the entire group and by 75 per cent of the leaders, more than thirty years by .8 per cent of the entire group and 33 per cent of the leaders.

Publications

One or more books have been written by only 12 per cent of all industrial arts teacher educators, compared with 91 per cent of the leaders. While the leaders were authors of an average of two and a half volumes and co-authors of an average of one and three-fourths volumes, the average for the entire group would be less than .1 of a volume.

All of the leaders contributed a large number of articles to a wide variety of professional journals, while one or more articles were contributed by only 27 per cent of the profession as a whole.

Organizations

All of the leaders and 38 per cent of the entire group reported membership in the American Vocational Association. The American Industrial Arts Association was represented by 66 per cent of the leaders and 34 per cent of all industrial arts teacher educators. Thirty-three per cent of the leaders and 24 per cent of the entire group were members of the American Council on Industrial Arts Teacher Education, while 33 per cent of the leaders and 32 per cent of the profession were members of the National Education Association.

It may be of interest to note that five, or 41 per cent, of the leaders were members of the Mississippi Valley Industrial Arts Conference, represented by a negligible percentage of the profession as a whole.

Membership in Phi Delta Kappa was reported by 91 per cent of the leaders, compared with 37 per cent of the entire group. Forty per cent of the entire group and 66 per cent of the leaders were members of Epsilon Pi Tau.

Leaders listed forty-three different professional organizations and nine fraternities, compared with more than fifty organizations and twenty fraternities for the entire profession.

Travel

Forty-seven per cent of all industrial arts teacher educators reported travel beyond the boundaries of the United States, compared with 58 per cent of the leaders. Only 25 per cent of the leaders, however, travelled beyond the continent of North America. Three fourths of those who reported foreign travel among all members of the profession had gained the experience through service in the armed forces.

Summary

There is little difference between the leaders and the profession as a whole in terms of birthplace, marital status, age at the time of receiving the doctor's degree, membership in the National Education Association, general breadth of organizational affiliation, and amount of travel.

There is some difference between the two groups from the standpoint of average number of children, those having two or more children, teaching experience in the public schools, and membership in the American Council on Industrial Arts Teacher Education and Epsilon Pi Tau.

The leaders show a marked difference from the entire group in terms of age, those having no children, those who hold master's and doctor's degrees, those having no public school experience, number of years of college teaching experience, number of books and articles written, and membership in the American Vocational Association, American Industrial Arts Association, and Phi Delta Kappa.

CHAPTER V

Some Apparent Ideational Relationships

Leaders work with ideas. This is equally true in any field–politics, business, religion, or education. The student of leadership who writes of "causes," "insight," "problems of association," and "creative processes" points directly to the realm of the idea, be it borrowed or original.

Hitler capitalized on the idea of a super-race; Gandhi led his millions on the idea of passive resistance; and Franklin D. Roosevelt was elected on the idea of a new deal. The whole march of western civilization has been based upon an idea of freedom, despite the fact that the concept of freedom has not remained static. There is no minimizing the power of the idea.

Hence, any study of leadership in a specific situation must be concerned with ideas. In a professional association of individuals, the guiding ideas are tied in with the objectives and problems which brought about the organization of the group and sustain it. They either nourish the organization into vigorous health–or starve it to death.

The General Plan

It was pointed out in Chapter I that this study would be concerned with the ideas of leaders. On June 3, 1952, a letter was addressed to each of the selected leaders, explaining the plan of the study and requesting a list of "those problems facing the profession, which you feel are most urgent." The leaders were also asked to state briefly how each problem should be approached.

The first letter directed to the thirteen leaders brought nine replies. A follow-up letter, mailed on August 11, 1952, resulted in two replies; and a final letter, mailed October 1, 1952, brought no result. This chapter, then, will be based on the replies of eleven leaders.

The reaction of leaders varied from a brief letter, written in long-hand, to several thousand words of typewritten materials. This was undoubtedly a result of the general nature of the request, but it was believed that any qualification of the request would influence the reaction and thereby decrease its weight.

The problems expressed by each leader and his proposed solutions will be treated in his own words. Letter designations used here do not correspond to the numbers used previously.

Leader A

Problem 1:

The instructional content in industrial arts.

Approach:

Generally, I believe that industrial arts is taking good direction. Most persons in leadership believe that there is instructional content in industrial arts just as in the practical occupations out in the world, and most industrial arts is taught that way—samplings of the occupations, if you please. There are a few persons who dislike to recognize the relationship of industrial arts to samplings of occupations in the world's work. Industrial arts would have little guidance value if it did not represent world opportunity.

Problem 2:

The role of the analysis technique in industrial arts.

Approach:

There are those who believe that the analysis technique has no place in industrial arts. The majority of persons, however, are of the opinion that it makes a significant contribution to course construction in industrial arts. It interferes in no way with methodology or philosophy. It puts system and organization into the industrial arts shops. Frankly, I do not see this as a major problem, but perhaps it should be mentioned. Quite often we are thoughtless in our expressions of philosophy in college and university classrooms and forget the practical problems out in the public schools.

Problem 3:

The role of industrial arts in the upper secondary school.

Approach:

Industrial arts in the upper levels of high schools should be of occupational nature. When a person graduates from high school, he should have salable abilities. The abilities will not be salable if they do not represent the real work world. Here again, organization of instruction and methods of instruction would be factors in the success of such a program. I can not conceive of a person taking a semester or two of machine shop in senior high school without having had real practical instruction and experience so that he could go out and earn in consequence of that instruction. Anything else would be mere "puttering" and would not have guidance value.

The above points in no way conflict with modern ideas relating to

the general education values of industrial arts, which of course is the trend that industrial arts is taking.

Leader B

Problem 1:

The misuse of the trade analysis procedure in determining industrial arts content.

Approach:

In nearly every state course of study, in our coursemaking textbooks, and in our pupil-used textbooks, the job or occupational or trade analysis procedure dominates. I do not see how we can go far in improving the instructional content of industrial arts until we cast aside job analysis and use a behavioral change procedure based upon an analysis of objectives.

The double-barreled question of *what* we shall teach and *how* we shall teach will continue to be a problem as long as we have a dynamic industry, changing concepts of human development, a democratic way of life and critical-minded industrial arts teachers.

Industrial arts must make adjustments to new curriculum demands or run the risk of being supplanted by a program which can more closely relate education to the needs of our people. The simplicity and directness of the traditional trade and/or job analysis procedure are tempting virtues. But today, an industrial arts program, like any other phase of general education, requires the analysis *and synthesis* of a variety of factors which impinge upon the curriculum. We must be concerned not only with materials, processes, and operations of a variety of the arts of industry, important as they are. We must be able to offer a fundamental education which takes into account the problems, interests, and values of children and youth, the community framework in which the pupils are reared, the unique characteristics of an industrial culture, and the human values which are basic to the democratic way of life.

Problem 2:

The social interpretation emphasis, suggested by Dewey, Richards and Bonser, has not made much progress.

Approach:

By 1952, we have still done very little to introduce industry into the industrial arts program. It is understandable that a crafts, home mechanics, or a shop program intended for the orthogenic backward or for those with handicaps, may well emphasize construction activities alone. The implication seems equally obvious that industrial arts, having its origins in industry, should be concerned, as Bonser said,

with "the changes made in the forms of materials to increase their values" and also with "the problems of life related to these changes."[1]

The "social interpretation" concept has been one new approach in the field of industrial arts. The root idea may be credited to John Dewey with the initial occurrence dating back to the last decade of the Nineteenth Century.

Dewey, having the advantage of living in a nation which had become highly industrialized after the Civil War, sensed the complexity of human interrelationships which had accompanied the basic socio-economic changes. Furthermore, Dewey had recognized the need for practicing the behavior to be learned and had, therefore, cast aside mental discipline assumptions. In brief, Dewey envisioned new functions to be served by work with tools and materials and he made this vision a reality by incorporating it in an education program.

Dewey explained the reasons behind his plan when he said:

> We must conceive of work in wood and metal, of weaving, sewing, and cooking, as methods of living and learning, not as distinct studies.
>
> We must conceive of them in their social significance, as types of processes by which society keeps itself going, as agencies for bringing home to the child some of the primal necessities of community life, and as ways in which these needs have been met by the growing insight and ingenuity of man; in short, as instrumentalities through which the school itself shall be made a genuine form of active community life, instead of a place set apart in which to learn lessons.[2]

A few years later, in 1904, Charles R. Richards presented the case for a change in name from "manual training" to "industrial arts" and in so doing cited psychological support for a change in method and sociological support for change in point of view. James E. Russell, in 1909, urged "the study of industries for the sake of a better perspective on man's achievements." Frederick G. Bonser was a most effective spokesman for the social interpretation approach. His definition of industrial arts has had wide circulation and with various modifications appears in numerous state and city bulletins. However, the fundamental change in viewpoint which the definition connotes has been side stepped or disregarded in many instances.

Nevertheless, the social interpretation approach remains a top priority challenge to the profession. Conditions outside the school›

[1] Frederick G. Bonser and Lois Coffey Mossman, *Industrial Arts for Elementary Schools*, p. 5. New York: The Macmillan Co., 1924.

[2] John Dewey, *School and Society*, p. 11. Chicago: The University of Chicago Press, 1900.

increase the pressure on those who continue to teach as if social and economic conditions of today are simply refinements of the 1900 era.

Problem 3:

There is confusion caused by the neglect to distinguish among the different types of shop programs such as art crafts, manual arts therapy, specific trade trainings, adult evening programs, practical work for the orthogenic backward, and industrial arts. Sometimes this confusion is intentional; in other instances, the people simply do not know any better.

Problem 4:

Terminology stands in the way of clear thinking. By now we have used the terms like exploration, orientation, and consumer value until they have become shibboleths. It is not that there is something basically wrong with the terms. Rather, the indiscriminate use has prevented clear thinking. Obviously the term exploration should mean something different than having youngsters pass seriatim through a series of teacher planned projects in two or more shop areas.

But professionally we have reached an almost automatic response—exploration means a variety of canned experiences rather than a *procedure* to be learned as one approaches something new.

Problem 5:

Our materials of instruction are sad in several regards:

a. Many pupil texts are written by persons not qualified in the fields in which they write. It is difficult to generate respect for our professional area when the student references are lacking in scholarship.

b. There is an imbalance in our written materials. Even though we have an abundance of woodworking books, each year we add more woodworking texts than any other.

c. The books written follow a uniform pattern: construction or process instructions and project plans. We have little or nothing of the industrial interpretation type.

d. At the teacher education level, the authors and publishers, in the interest of maximum sales, have endeavored to write books which cover industrial arts and vocational industrial interests. These books have confused the young men in undergraduate and graduate programs.

Problem 6:

Just as we need to delineate between industrial arts and vocational industrial education, we must likewise be clear on the boundaries with the physical sciences, the social sciences, and art. Perhaps the last mentioned one is the most pressing. Several big industrial

arts departments have come under the jurisdiction of art people. Cities and states are likewise veering in that direction.

Furthermore, some curriculum development people would lump all the "arts" together under the heading of expressional subjects. There is an instance of a partial statement of a much more comprehensive truth.

Problem 7:

Community relationships are still unsettled. On the one hand, we have the community study technique in the pattern of the trade and industrial survey. On the other hand, we have instances of state-wide courses which ignore the local circumstances completely. As a professional group, we need to work out what this relationship shall be.

Problem 8:

Evaluation is now and has been a neglected area. For the most part pupil appraisal tends to be a project grading affair with the teacher giving the grade. It won't be feasible to teach for broader purposes until we start giving weight to these additional purposes in the evaluation process.

Problem 9:

The greatest attention has centered upon the junior high school level. When elementary school programs have been projected, the programs have been downward extensions of the junior high offering. In a similar manner, senior high programs have tended to be much like the junior high offering with the projects a little more complex and difficult. This is the old curriculum problem of scope and sequence.

Problem 10:

Research has been neglected in many areas. It is not my notion that the "scientific" study of our problems alone will lead to worthwhile solutions. But there are places where systematic research will help. We know very little about the development patterns of children and youth in so far as industrial arts instruction is concerned. For example, when can the abstractions of orthographic, multi-view projection be learned efficiently?

Problem 11:

The preparation of industrial arts teachers is a source of many of our difficulties. It is almost amazing how different these teacher preparation programs are and how they differ in quality. But there are some continuing problems regardless of qualitative differences. Our undergraduates are for the most part pretty strong, technically speaking. But their backgrounds in terms of educational perspective and in terms of their understandings of the learner leave much to be desired.

Problem 12:

On the operational level the ubiquitous source of difficulty is the superordinate role of those who operate the vocational industrial program. Supervision at the city and state levels too frequently lies in the hands of Trade and Industrial people. This pressure keeps the industrial arts program specific, and it is operated as a pale carbon copy of the vocational offering.

Leader C

Problem 1:

Though there is now considerable agreement in industrial arts concerning its over-all departmental aims (not specific course aims), we need much analytical study concerning which of these aims apply with greatest force to:

a. Each of the several shop areas of industrial arts.

b. The mandated common learnings of the junior high school and those special-interest learnings of the senior high school.

c. The industrial and handicraft activities significant to both boys and girls (jointly or segregated), as distinguished from those which are applicable essentially to boys.

d. The industrial arts programs for adults.

Approach:

Institutional research, studies by state departments and state professional organizations, and community trial and experimentation followed by good reporting. National professional organizations in industrial arts could lay out numerous studies which are needed and give direction and assignment to help prevent overlapping of efforts.

Problem 2:

There is great need for clarification of marginal areas of industrial education which are neither common or special-interest learnings of industrial arts on the one hand, or unit-trade vocational industrial education on the other. Reference is made particularly to general industrial education in senior high schools for a degree of versatility in a family of trades. The industrial arts teacher (with adequate occupational experience) and the facilities of industrial arts are frequently used. The chief aim of the instruction is frankly a form of occupational preparation. Proper labeling of such instruction would clarify the thinking of educators in both fields of industrial education as well as those in general education.

Approach:

This problem probably should be attacked at the state level because of state involvement in subsidized vocational education. Conferences, study and understandings by committees of state officials, local

industrial education leaders, and *qualified* instructors in industrial arts and vocational industrial education might arrive at, approve, and publish policies.

Problem 3:

There is a need for unity of forces in industrial arts in the United States so that pronouncements, with a degree of authority, can be made when necessary. Recent uncertainty of representation of agencies on a national committee to establish criteria for study and upgrading of industrial arts teacher education institutions is an example of lack of unity in leadership.

There is ample room for more than one fraternal professional organization. There is room for but one national professional organization. If there are particular interests of small groups, these should not now bar the way to unity. Twenty-five or thirty thousand industrial arts teachers would undoubtedly be better served in a single national organization.

Approach:

The American Industrial Arts Association has the identity of an autonomous national organization. The American Vocational Association and many of its long-time members have promoted, directed and actively taught industrial arts at state and local levels. There is great and sometimes long-time loyalty in both organizations. Would a proposal by the American Industrial Arts Association to transfer its present autonomous organization in the National Education Association, to the American Vocational Association, *in identical organizational relationship,* be accepted: Some friends of industrial arts in both organizations believe such a proposal would be accepted. If either accepted or rejected, it would help to clarify the present intolerable situation. The American Vocational Association was formed in Louisville in 1925, in a not greatly dissimilar manner, of the National Society for Vocational Education and the Vocational Education Association of the Middle West.

Problem 4:

We need an understanding in the area of certain creative, avocational handicrafts. In recent years some of those in fine arts education have been incorporating more and more of the *constructively* creative handicrafts into their offerings in *emotionally* and expressively creative fine arts. Teachers prepared in industrial arts are very generally not qualified to teach the fine arts, and it is also obvious that most fine arts or "art education" instructors are equally unprepared to teach creative expression in work involving trade and industrial techniques and three-dimensional *construction.* To some

Approach:

A national study (could be a doctoral dissertation) under the guidance of an association or combination of associations covering existing conditions in all states—number of institutions and capacity of institutions now offering programs and how many teachers are absorbed annually. The study could be the basis for a bulletin issued by the sponsoring association or associations, presenting facts to various state departments of education, taxpapers associations, etc. Such factual material might dispel the idea of regional college services here as it has done for medicine, dentistry, law, and similar programs.

Problem 2:

To what extent does the particular mode of acquiring craft skill affect future teaching procedure? Is it true that persons will teach as they are taught? If that is true, how could a person who has come through an apprenticeship program ever become a good teacher? In other words, may a person acquire craft skill by intensive application in trade or unit shop classes and then learn to teach by taking professional courses and student teaching and also be better skilled in the doing phases of the work than if he got his skill in comprehensive general shops or laboratories?

Approach:

A controlled study of teaching success of graduates who have finished four year programs only from colleges where each of the procedures is used. This would include philosophy expressed, satisfactory skills, rating by administration, etc. Also, expression of teachers after some years of experience.

Problem 3:

What type of student teaching program leads to the best initial performance by beginning teachers?

Approach:

Similar to suggestions for Problem 2.

Leader E

Problem 1:

An Orientation Program—Need of industrial arts orientation for all youth providing a broad introductory overview of technology. Such an orientation, preferably scheduled during grades eight or nine, should provide a number of appropriate laboratory experiences leading to an understanding of various media (e.g. woods, metals, drawing, plastics, handcrafts, etc.). The underlying purpose of such programs is to provide a pupil with information leading to a degree of

extent there is similar over-stepping of subject areas by some teachers of home economics, but this does not seem to be as critical because many of the materials and processes in this instance are normally associated with home economics.

Approach:

Joint committees of teachers' associations in the two areas, state department leadership, and state teacher certification regulations are agencies through which to attempt to solve this problem before it becomes unpleasant and harmful to teachers and to education.

Very superior results from instruction in certain creative constructional handicrafts through industrial arts may provide the answer shortly without consultation and negotiation.

Problem 5:

The uncertain status of handwork or industrial arts in elementary education is lamentable, and an unhappy reflection of lack of interest, study and effective cooperation on the part of those in both areas of education. There is uncertainty of the chief purpose or purposes of handwork in the first six school years, of correlations, of training of teachers, of who should teach, of what should be taught and of school and classroom organization for effective use of learning through doing as an additional sense avenue in the educative processes in these school years.

Approach:

Collegiate and public school study and research by persons and groups representing both industrial arts and elementary education, working independently and jointly, might help to solve this problem. The agencies in the National Education Association or in the United States Office of Education, which represent these two areas, might undertake studies through commissions. This is not a difficult problem because the industrial arts phases are service-type responsibilities, either directly with children or indirectly through the classroom teacher.

Leader D

Problem 1:

How to prevent indiscriminate launching and continuance of new departments of industrial arts teacher education in schools where reasonable financial resources do not exist for furnishing a minimum of facilities for a successful program and where often no demand exists for additional teachers for the general area served. Such programs are often based on institutional rivalry and political maneuvering.

awareness so essential in present-day living. These programs are introductory in nature and provide a base upon which specialization may later be built. Such orientation offerings are necessarily broad in scope and rich in the study of related materials, audio-visual aids and industrial and community visitation.

Approach:

To accomplish the above will not be an easy task. The problem of orientation will need to be approached on a broad front, including general agreement on the part of industrial arts teachers as to the appropriate scope of an adequate and necessary industrial arts offering for all youth. A point of view and acceptance of the idea must be held by teacher educators, supervisors, and administrators. Instructional materials must be developed to focus on this need. Particular emphasis may be given to the extension of an industrial arts orientation concept by an active state supervisor or consultant in the area of industrial arts education.

Problem 2:

Industrial Arts in the Small School. A pressing need for industrial arts programs exists in the small school. Seven out of every ten secondary schools enroll three hundred pupils or less; and these are, as a group, the schools with the least industrial arts opportunity. Nevertheless, distinctive examples may be found among these schools of low enrollment which indicate programs may be broad in scope and rich in instructional provisions. The period ahead will undoubtedly reveal a great acceleration of this trend.

Approach:

The necessary momentum required in the accomplishment of the above will be slow. Representatives of general education as a group have not viewed the possibilities of industrial arts for *all* youth as a necessity and educational birthright. Advancement in technology is accelerating the trend of increased realization and acceptance. Dynamic leadership, reflecting the wholesome benefits of industrial arts, coupled with sound public relations on the professional level, should do much to expand the effectiveness of such programs.

Leader F

Problem 1:

The encouragement of worthy high school graduates to become interested in the industrial arts teaching profession.

Approach:

Solicit cooperation of industrial arts teachers and of senior students in our teacher education programs to contact outstanding high school

graduating seniors, and to discuss forcefully and enthusiastically the merits of our profession.

Problem 2:

Unification of outstanding associations and agencies in the interests of professional improvement for industrial arts education.

Approach:

Creation of a National Advisory Council consisting of representatives of these associations and agencies. Such action has been proposed.

Problem 3:

Standardization for accreditation of industrial arts teacher education departments. Our profession should have a certified agency comparable to the various phases of engineering to regulate teacher education programs.

Approach:

The present committee studying certification standards would be the logical group to pursue the subject further and make recommendations for the solution of this problem.

Leader G

Problem:

The role of industrial arts in general education.

Approach:

I believe that industrial arts, as a phase of the total program of education, will receive even more attention in the future than it now receives. There are some dangers in the present situation that in my judgment tend to weaken the educational value of this work.

I have in mind chiefly the emphasis on freedom on the part of the student at the expense of the careful planning and the maintenance of high standards of achievement. In considering the concept of creativity on the one hand and careful development and self-discipline, skill, and accurate knowledge on the other, I do not regard these values as contradictory.

Many of us who have been teaching for many years have taken for granted both sets of values. I believe that in the near future our teachers will again come to the point where they will stress organization, skill, and technical knowledge without sacrificing freedom of choice or creativity.

Leader H

Problem 1:

The Need for Leadership in Industrial Arts Education.

Approach:

Historically, industrial arts has had few lifetime champions. Bonser's interests were divided with elementary education, and Snedden became a sociologist. Other accepted leaders have left industrial arts work. Several contemporary heads of teacher education departments in our universities are attempting to combine industrial arts teacher education with vocational industrial teacher preparation. In a few great schools, separate departments of industrial arts education are maintained with more or less success. The greatest need of the profession of industrial arts teaching today is a group of nationally accepted leaders. In the teachers colleges, there are many patriarchs as well as younger men of promise. Because of difference in educational philosophy or apathy or possibly both, no one individual is credited with national leadership. The future is bright for the keen young man who aspires to lead the hordes of industrial arts teachers out of a wilderness of disunified activities into a cohesive national organization.

Problem 2:

Fundamental textbooks on Industrial Arts.

Approach:

A second need in the field of industrial arts is a wholesome deluge of books on philosophy, methods, organization, school shop planning, design, and administration. With only one recent book in a few of these areas and none in others, the need is acute. Again, the production of these books would develop leadership, unify the thinking of industrial arts teachers, and tend to professionalize the teaching of industrial arts.

Problem 3:

The Need for Research.

Approach:

The need for research is evident and the need for printed reports of research projects is even more urgent. A profession survives and makes progress in direct proportion to completed research investigations. Experimentation and investigation based on research techniques will provide the basis for advancing the profession.

A corollary is the fact that more Ph.D. degrees are needed in the field of industrial arts education. This will result in a greater volume of research applied to the specialized problems of teaching industrial arts. The leaders of our profession should try to secure the inclusion of the advanced industrial arts degree in more universities.

Problem 4:

State Supervision of Industrial Arts.

Approach:

While the need for centralized state supervision of industrial arts programs is not questioned, the practical problems of its installation must receive very careful consideration. Industrial arts as a phase of the school curriculum is so different from all other school subjects, that its supervision must be independent of control by other agencies. Since industrial arts is concerned with the general education of all children and youth, its opportunities must not be limited by confining it to one phase of education. Industrial arts for all elementary school children, for all boys and girls in junior high school, and for a large majority of high school boys and girls should be the ultimate goal.

Problem 5:

Local Supervision for Industrial Arts.

Approach:

In the organization of a city system of schools, supervisors should be employed for each special subject. When a school or a system has two or more teachers of industrial arts, one should be named the supervisor. In larger cities where programs of vocational industrial education courses or trade courses are operated, there should probably be two supervisors, with one having the title of director of industrial education. In a day of extreme specialization, a director of industrial education can not be equally well prepared or temperamentally disposed to supervise both trade classes and industrial arts classes. Adequate supervision of industrial arts instruction by qualified supervisors should be ultimately realized.

Problem 6:

Post Certification Education of Industrial Arts Teachers.

Approach:

Within a decade, practically all industrial arts teachers will have earned master's degrees. What program of education should be provided for the year of post graduate schooling? If the master teacher concept is adopted for the graduate period of training, industrial arts teacher education departments should offer many courses in crafts, design, carving, jewelry work, etc., as well as advanced courses in the usual industrial arts subjects. Specialized courses in visual aids, projected pictures, methods, curriculum construction, and kindred professional subjects should also be offered. For those graduate students who plan to work for a Ph.D. degree, the standard program of graduate courses must be pursued on the master's level.

Problem 7:

Membership in Associations.

Approach:

Every teacher should maintain membership in local, district, state, and national associations. Through reading the official publications of his associations, he can perfect himself in an understanding of the aims of his group.

He should also attend meetings. What would happen if a national association for industrial arts teachers could meet during the summer vacation period? Would more classroom teachers be in attendance? Could we say that no teacher should have taught any ten-year period without attending a national convention of industrial arts teachers?

Problem 8:

The Role of the Industrial Arts Teacher in the Guidance Program.

Approach:

Guidance is an essential segment of the education of youth. If guidance could be "integrated" in all courses and classes, the problems of young people relating to the selection of adequate programs of educational preparation and fields of life activity would be simplified. As a segment of the integrated program of guidance, industrial arts courses and classes have a significant place. Every boy or girl enrolled in an industrial arts course is exploring his interests and capabilities with reference to the materials and processes included in his course.

Each industrial arts teacher should be an intelligent guidance worker in that he should have completed one or more college courses in guidance. His guidance work may well be of an informal type.

Problem 9:

The Need for New Type Programs of Industrial Arts Instruction.

Approach:

The new type industrial arts program includes a series of shopwork subjects rather than an extensive experience in a single subject, most commonly woodworking. This change has been realized in large city schools because of their ability to purchase new and varied necessary equipment. This can not be said about smaller cities. There are 4,627 cities in the United States with a population between one thousand and five thousand. In each of these cities, an industrial arts department is a possibility.

For professionalizing industrial arts teaching in these one-teacher situations, a new shop name is proposed–The Community Shop. This place in the school building or on the school campus would contain equipment representing from ten to fifteen industrial arts subjects. With adequate equipment, the needs of the youth in the community for practical work experience could be met. The teacher would neces-

sarily be a master teacher with course work in all of these industrial arts subjects. He should serve the industrial education needs of the community much as the vocational agriculture teacher serves in the agricultural divisions of the school community. He should conduct night classes for adults at least twice each week. For this, he should receive extra compensation and he should be relieved of a portion of his daytime duties. It will also require year-round employment of the industrial arts teacher.

Leader I

Problem 1:

The problem of freeing industrial arts from the influence and domination of vocational education. This is particularly serious in the states where all of the supervision from the state level is done by vocational representatives.

Approach:

a. Assignment of industrial arts to the department of secondary and/or elementary education in the state departments, and appointment of state and local supervisors who owe allegiance to industrial arts rather than vocational education.

b. Continue objection to the term "industrial education" which artificially unites industrial arts and vocational education under one title.

c. Stress the importance of complete separation of industrial arts and vocational education at the teacher education level. No single department can adequately prepare teachers for both fields, and the tendency seems to show that vocational education holds the favored position in most such departments.

Problem 2:

Acceptance of industrial arts by general educators as a significant part of general education. It is my feeling that whereas most general educators will give lip service to industrial arts, they tend to look upon it as a means of taking care of those individuals who can not profit from the ordinary academic school program.

Approach:

a. Pertinent and well written articles by members of the industrial arts profession in periodicals read by school administrators.

b. Willingness by industrial arts teachers to assume the responsibilities of other teachers in the general education program such as homerooms, club sponsorship, etc.

Problem 3:

Acceptance and implementation by the industrial arts teaching pro-

fession of the idea of exploration and breadth of experience as opposed to limited and intensive training. We still have a long way to go before the general shop or laboratory of industries is completely accepted and put into practice.

Approach:

a. Teachers colleges and teacher education departments must impress on new teachers the full significance of the exploratory concept, and must exemplify this concept in their programs.

b. New teachers must be prepared in a variety of areas and must have experience in working and teaching in situations requiring activities in many areas simultaneously.

Problem 4:

Recognition of behavior changes as important outcomes of industrial arts rather than the mastery of subject matter or the acquisition of skills.

Approach:

a. Emphasis by teacher education departments on the definition of objectives in terms of behavior changes, and de-emphasis on the trade analysis approach to the selection of subject matter.

b. Preparation of courses of study for the public schools in terms of behavior changes, e.g. the Denver, Colorado, bulletin recently published under the title, *Industrial Arts Education in the Denver Public Schools.*

Leader J

Problem 1:

Industrial education, in both its phases, must proceed on the assumption of major need and value as parts of a total educational program. Better integration is indicated and would be attained much more rapidly through consistent orientation of those holding and to hold administrative positions.

Problem 2:

It seems more important that we strive for acceptance and pattern of each of the so-called "practical subjects" in the total program than that there be closeness among them.

Problem 3:

Trade education should become increasingly more specific and industrial arts increasingly more general, in keeping with their related yet distinct purposes.

Problem 4:

Industrial arts instructors should be more broadly prepared and trade instructors should be subject to more intensive professional grooming.

Problem 5:

Industrial arts content should be made progressively more difficult with advancement through the secondary grade levels, in both the informational and manipulative aspects.

Problem 6:

There must be great expansion and improvement of our work in the elementary grades.

Problem 7:

Observation and student teaching should be greatly strengthened and should be made to apply more in the field of trade teaching.

Problem 8:

State supervisory practices may well change toward less of the travel type and more of regular office-desk aid to teachers in service and conference aid to local supervisors.

Leader K

Problem 1:

The matter of recruiting, properly training, placing, and retaining well qualified teachers.

Approach:

This problem involves, of course, higher salaries for teachers and a more realistic recruiting program that we have had. It involves also a reorganization of our teacher training programs and the modernization of our facilities in many places.

Problem 2:

Providing effective supervision of industrial arts on the state and local levels.

Approach:

In my judgment, this should be combined with supervision of Trade and Industrial Education, both on the local and state department levels. To do otherwise pits the two phases of the program against each other.

Problem 3:

The consolidation of our professional organizations in the field of industrial education.

Approach:

There is, in my judgment, no excuse for having an industrial teacher education group in the American Vocational Association and another parallel group in the National Education Association. The solution to this problem involves, first of all, a goodly amount of common sense and the willingness to comprehend the true relationships between industrial arts and its vocational counterpart.

What the profession needs is some leadership that will get the two groups together. By remaining split down the middle, people in industrial education weaken their organization.

Problem 4:

The extension of industrial arts down into the elementary school and upward into the adult evening school.

Approach:

These problems, of course, involve teacher education and the enlargement of teaching staffs and classroom facilities.

Summary

The eleven leaders considered in this chapter have presented a total of fifty-two problems facing industrial arts teacher education. Duplication occurred in only twelve instances, leaving the number of separate problems at thirty-seven. Nine of the problems were mentioned twice and three were listed three times.

There is considerable overlapping within the thirty-seven separate problems; yet each possesses an identifying quality which separates it from the others. A three-way controversy among advocates of industrial arts as a part of general education, of vocational industrial training as special education, and of industrial education as a combination of the two is evident in many of the problems under consideration. This question will be treated in greater detail in the concluding chapter.

CHAPTER VI

Summary and Conclusions

In the front ranks of the march of progress, there has ever been an increasing accent upon organization in human affairs. The degree of organization swells in proportion to the expansion of business and government, the advancement of science, and the upsurge in populations.

As a result, the process of living becomes more and more complex. Today, man spends most of his time in group endeavors of one kind or another. Organization has bred organization, until the primary focus of social research has been forced away from the individual to problems of association and interaction.

In a democracy, the success of a group in attaining its objectives depends not so much upon command or executive direction as upon the quality of leadership displayed within the group. Leadership, then, implies something more than command and/or executive administration. Definitions of leadership have veered away from concentration on the personal qualities of the leader, though these remain important, toward a consideration of the situation in which leadership functions and of interaction between the leader and the group. Attention is fixed upon causes or goals and the results of leadership within those who are led.

Leadership may be conceived as both an "art" and a "science". The leader works with human material, applying imagination, vision, and technical skill to the organization of ideas, in order to attain his and the group's objectives.

A single study of leadership must of necessity be confined to a limited area of investigation. This study has been limited to an investigation of particular components of leadership in industrial arts teacher education. It springs from an interest in the American Council on Industrial Arts Teacher Education, organized two years ago under the sponsorship of the American Industrial Arts Association.

It seems evident that if the council is to succeed in its stated aim of improving industrial arts teacher education, it must be increasingly concerned with the development of leadership. Concrete issues in the areas of philosophy, curriculum, method, and personnel have been

raised within the council; and the resolution of these issues will demand strong, able leadership in order to derive cohesive action from the profession as a whole.

This study has attacked the problem of leadership in industrial arts teacher education through an identification of the leaders, a brief investigation of biographical data concerning the leaders, and an examination of their ideas with respect to critical issues facing the profession.

This study does not pretend to solve all of the problems of leadership in industrial arts teacher education. Its limitations have been stated, and it is offered in the spirit of "pointing the way." A number of general studies of leadership, published in the last two decades, have been of great assistance in determining the direction to be followed here.

Leader Identification

On the basis of the experience of previous studies, it was determined that leaders may best be identified by the group in which they function. Therefore, a cross-section of the profession including about two hundred and fifty industrial arts teacher educators was asked to list outstanding national leaders and the general criteria upon which selection was based.

Thirteen leaders were thus identified on the basis of slightly more than one hundred returns. Geographically, the returns were representative of the profession, e.g. the South was represented by 37 per cent of the returns and by 37 per cent of the industrial arts teacher education programs.

Thirty-six individuals were mentioned as leaders five or more times, but there was a definite break between the thirteenth and fourteenth leaders. Hence, thirteen were selected for study. Of these, one failed to furnish either biographical or ideational data, and another failed to furnish ideational data.

The first-ranking leader was mentioned by 56 per cent of those who returned the questionnaire, the thirteenth leader by 21 per cent.

Each return listed an average of about four criteria as a basis for leadership identification. Fifty-four distinct criteria were identified, and these were arranged in eleven different categories.

Biographical Relationships

An examination of biographical data indicated that half of the leaders were heads of administrative divisions and that they had held their present positions for an average of more than ten years.

The leaders averaged about fifty-five years of age. All held advanced degrees, with nine holding the doctor's degree. They averaged almost six years in public school teaching and more than twenty-five years in industrial arts teacher education. All have contributed to periodicals and they have written an average of two and a half books. They belong to an average of almost nine professional organizations and fraternities.

Ideational Relationships

Ideas are the tools with which leaders work. They most often take the form of goals or of methods of attaining goals. On the basis of this assumption, the selected leaders were asked to name the most critical issues facing industrial arts teacher education and to outline the methods by which these issues should be met.

Eleven of the thirteen leaders responded to the request. Replies ranged from three pages, written in longhand, to five pages typewritten single-spaced and enclosing several samples of previously written materials.

A total of fifty-two problems were listed. Nine of these were mentioned twice, and three were listed three times, leaving thirty-seven separate problems. Many of these overlapped, as will be revealed later.

Conclusions

Conclusions drawn here will seek to answer, in so far as possible, three questions:

1. What is the concept of leadership held by industrial arts teacher educators as a group?
2. Are there significant factors in the lives of leaders that set them apart from the general membership of the profession?
3. Will an analysis of the leaders' ideas concerning critical issues have any bearing on the future of the profession?

It has been demonstrated that leadership functions around a nucleus of causes or objectives. Hence, Question 3 must take precedence over the others. Questions 1 and 2 may have some significance, however, in any future research concerned specifically with the development of new leadership in industrial arts teacher education.

A Concept of Leadership

An examination of Table XIV will reveal the percentage of industrial arts teacher educators listing criteria for the identification of leaders in each of ten general categories. From the standpoint of the

professional concept of leadership, this breakdown is more significant than that in Table XIII, which dealt with percentages of the total criteria listed. For example, in many cases the same individual listed a number of personal and professional qualities, but listed publications only once.

In comparing the two tables, the "Publications" category takes over the top rank by a wide margin. Eighty-one per cent of the teacher educators listed publications as a criteria of leadership. "Personal and Professional Qualities" dropped to second place with 57 per cent. "General Promotion", with 51 per cent, and "Activity in Professional Organizations," with 44 per cent, retain third and fourth places respectively. Thirty per cent listed "Program Development", which moved up to fifth place, followed by "Status and Philosophy", each with 22 per cent. "Research" and "Experience" follow, each with 14 per cent; and "Education" trails with 10 per cent.

Therefore, it would seem logical to conclude that *the professional concept of leadership places by far the heaviest emphasis on contributions to the literature of industrial arts education,* and that the personal and professional qualities of the individual, his general efforts to promote the profession, and his activities in professional organizations are powerful factors. The development of programs, status, and philosophy contribute to the concept; but research, experience, and formal education are not significant.

TABLE XIV

TABLE SHOWING PERCENTAGE OF THOSE LISTING CRITERIA IN EACH CATEGORY

Category	Percentage
Publications	81
Personal and Professional Qualities	57
General Promotion	51
Professional Organization Activity	44
Program Development	30
Status	22
Philosophy	22
Research	14
Experience	14
Education	10

The concept, however, is not quite that simple. It must be borne in mind that writing may be considered a criterion only as it reflects

personal and professional qualities, program development, philosophy, or research. Status may enter the picture or it may be considered a criterion, *per se*. Personal and professional qualities may reflect status. Status, indeed, may include all of the other criteria.

In other words, the question of criteria for leadership is a highly complex one, and the results here attained must be tempered in that consideration. There is considerable overlapping of categories, and there is no way of testing the degree of thought that produced a single criterion. It would be foolhardy to attempt a definition of leadership in industrial arts teacher education on the basis of the findings, but they do serve to indicate the general direction of thought in the field. Additional research, concentrating on the specifics of leadership identification, is needed to clarify the picture.

It may be noted here, also, that no single leader on the national scene commands the choice of a large majority of industrial arts teacher educators. Only two (see Table XI) were listed by more than half of those who returned the identification questionnaire.

Thus, leadership in industrial arts teacher education is not concentrated in the hands of a few individuals. It is fairly well spread among a relative large number of leaders. This is undoubtedly due in part to the comparative infancy of the profession in terms of national significance and to the cleavage in philosophy which will be discussed later.

There is a definite need in industrial arts teacher education for leaders who will be closely identified with the group in terms of objectives and of recognition.

The Lives of Leaders

It is not surprising to find that the average age of the leaders is about thirteen and a half years greater than the average of the entire profession, nor that 33 per cent of the leaders are more than sixty years of age, compared with a mere 8 per cent of the entire group.

Nevertheless, the facts would indicate that there is a tremendous opportunity for young men to assume positions of leadership in industrial arts teacher education. This is in no way intended to detract from the contributions of the older leaders, but a more balanced leadership in terms of age might prove to be more representative of the profession.

No special significance is attached to the birthplace or family status of the leader group.

The fact that all of the leaders hold advanced degrees and that all but three hold the doctor's degree sets them apart from the profes-

sion as a whole. Those who do not hold the doctor's degree are in the upper age bracket. This probably is not a coincidence, despite the insignificance of formal education among criteria listed by members of the profession.

While the advanced degree, itself, is no assurance of leadership, it does indicate a degree of professional ability and interest which the leader must possess. In other words, *it is almost axiomatic that leaders in industrial arts teacher education will hold advanced degrees and that the great majority will hold the doctor's degree.*

To a somewhat lesser degree, it is probable that all leaders in the profession will have had some experience in public school teaching. While the leaders averaged slightly less than six years of public school teaching, the least reported was two years.

Closely corresponding to the relative age of leaders is their average of more than twenty-five years of teaching at the college level. The implications are similar to those concerned with average age. Despite the fact that experience rated low on the scale of leader identification, the leaders actually averaged eighteen years more experience than did the profession as a whole. *Currently, at least, experience is an important component of leadership in industrial arts teacher education.*

In this connection, it may be noted that leaders reported very little experience that did not have a direct bearing on industrial arts education as a profession. A few reported some practical work in industrial or other areas, but the great majority left college to teach a few years in the public school before devoting full time for many years to industrial arts teacher education. Apparently, there was little time for diversion even though it be indirectly connected to the profession.

All of the leaders have produced a considerable amount of professional writing and great majority of them are authors of two or more books. It will be recalled that writing ranked far ahead of all other criteria listed in the identification of leaders. *The importance of writing as an element of leadership in the profession can not be questioned.*

However, there is little evidence here to establish professional writing as the cause or effect of leadership. Leadership certainly can not function without communication. Writing as an important form of communication is undoubtedly a first-ranking tool of leadership in a national profession such as industrial arts teacher education. While it may, by itself, produce leadership of a spurious nature, it must reflect many other elements if it is to be an indicator of true leadership. Since no attempt will be made here to evaluate leadership, settlement of this question must await future research.

Similar conclusions might be reached in regard to the activities of leaders in professional organizations. All have held important posts in national and state associations and they are members of an average of almost nine professional organizations and three fraternities. Whether these activities are a result of or have resulted in national leadership remains in doubt. It remains, however, that *present leaders are extremely active in professional organizations of all types.*

The Ideas of Leaders

It is virtually impossible to allot each of the thirty-seven issues discussed by the leaders into hard-and-fast compartments. Many of them have common elements, and most are dependent upon fundamentals of philosophy. However, for purposes of discussion, they have been classified under four main headings: Philosophy, Curriculum, Organizations, and General Professional Problems.

Philosophy

Seven issues have been included under this heading. They are: the need for an analytical study of objectives, the lack of progress made by the social interpretation emphasis, the role of industrial arts in general education, the acceptance of the general education concept by general educators, the acceptance by industrial arts teachers of emphasis on exploration and breadth of experience, recognition of behavior changes as important outcomes, and a clarification of differences between trade and industrial arts education.

In discussing the first issue, Leader C states that there is general agreement on over-all objectives but there is a need to study objectives of various specific phases of industrial arts. Though each is treated in a different manner, the next five issues might well be combined as the problem of industrial arts in general education. Leader B traces the social interpretation concept to Dewey and supports it warmly. It is, he states, a "top priority challenge to the profession." Leader G advocates equal emphasis upon organization, skill, and technical knowledge on the one hand, and freedom of choice and creativity on the other. Leader J states simply that industrial arts must become increasingly more general, in keeping with its distinct purposes.

Leader I deals more fully with the problem by listing three issues applying to the same general theme. He asserts that there is a need for greater acceptance of industrial arts as an important part of general education by the general educators, themselves, and of the idea of exploration and breadth of experience by industrial arts teachers.

He also cites the need for greater recognition of the prime importance of behavior changes rather than the mastery of subject matter or the acquisition of skills.

Finally, Leader J touched upon the need for orientation of administrators toward clarification of the differences between trade and industrial arts education.

Curriculum

A total of seventeen issues, many of them overlapping, have been included in this general classification. Similarities are evident in such issues as the need to clarify the marginal areas of industrial arts, industrial arts versus fine arts, and the boundaries of industrial arts. Each of these is concerned with overlapping between industrial arts and other areas.

Related but more confined are the questions of *what* shall be taught: instructional content, types of shop programs, instructional materials, and the orientation program. The accent on *who* shall be taught is reflected in the problems of industrial arts in elementary education and in secondary education, concentration on the junior high school, industrial arts in the small school, and the extension of industrial arts downward into the elementary school and upward into adult education.

Other questions included in the general heading are the place of the analysis technique in industrial arts, evaluation, student teaching, the graduate program, and the role of the industrial arts teacher in guidance.

Leader C attacks the problem of marginal areas in terms of vocational implications in the senior high school and suggests that the solution should be sought at the state level, because the state is concerned with subsidized vocational education. He also discusses the problem of industrial arts versus fine arts, suggesting that the constructively creative handicrafts are a part of the former and the emotionally and expressively creative arts are part of the latter. He infers that superior results by industrial arts in the constructively creative handicrafts may settle the problem. Leader B asserts a need to clarify, not only the line between industrial arts and vocational industrial education, but also the boundaries of industrial arts with reference to the physical sciences, social sciences, and art.

Instructional content is discussed by two of the leaders. Leader A believes that content should consist of occupational samples, without which "industrial arts would have little guidance value." Leader J simply states that content should become progressively more diffi-

cult with advancement through the secondary grades, in both informational and manipulative aspects. According to Leader B, there is intentional and unintentional confusion brought about by failure to distinguish among various types of shop programs such as art crafts, manual arts therapy, trade training, and industrial arts. The inference is that all shop programs should not be considered as a single field. He also attacks instructional materials for want of scholarship among authors, lack of balance in written materials, the uniformity of pattern, and the attempt to include two separate fields (i.e. vocational industrial education and industrial arts) between the same covers. Leader H calls for a "wholesome deluge" of new textbooks. Leader E sees the need for an industrial arts orientation program for all youth, preferably scheduled during grades eight and nine. The implication here is that while the orientation program has long been advocated, little progress in that direction actually has been made; and the profession should concentrate on the practical application of the idea.

Leader C points out the "uncertain status" of industrial arts in the elementary school and suggests nationally-sponsored research to clarify such matters as instructional content, preparation of teachers, and classroom organization. Leader J comments on the need for "great expansion and improvement" of industrial arts instruction in the elementary grades. Leader A sees the role of industrial arts in the upper secondary school as primarily occupational in nature. He concentrates on the need for producing "salable abilities" in high school graduates. Leader B is worried by the fact that "greatest attention has been centered upon the junior high school," resulting in a mere downward extension of the junior high school program into the elementary school and an upward extension of the same program into the senior high school. Leaders E and H discuss the need for the development of a suitable industrial arts program for the small school. Both point to the large number of small schools which do not now offer industrial arts opportunities and suggest methods for introducing programs into the small schools. Leader K suggests the need of greater extension of industrial arts in the elementary school and in the adult evening school.

The role of the analysis technique in industrial arts was attacked from opposite extremes. Leader A was the staunch defender of the technique, claiming that "it puts system and organization into the industrial arts shops." Leader B, however, asserts that industrial arts must "cast aside job analysis and use a behavioral change procedure based upon an analysis of objectives." Leader B also men-

tions evaluation as a neglected area, suggesting the need for considering broader purposes in evaluating pupil progress. Leader D calls for research to determine the type of student teaching best suited to industrial arts, while Leader J seeks "strengthening" of observation and student teaching and its application to the field of trade teaching. Predicting that within a decade most industrial arts teachers will have earned the master's degree, Leader H sees a need for greater study of the graduate program with special emphasis on the doctor's degree and the advanced graduate courses. He also mentions the role of industrial arts in the guidance program and suggests a minimum of one college course in guidance for all industrial arts teachers.

Organizations

Only two issues were listed under this general heading—the need for unity of national organization and the importance of membership in professional organizations.

Leader C states that there is room for only one national professional organization in industrial arts teacher education and suggests that the American Industrial Arts Association "transfer its present autonomous organization in the National Education Association to the American Vocational Association, in identical organizational relationship." He believes that such a proposal would help to "clear the present intolerable situation." Leader F seeks the creation of a national advisory council to suggest ways of unifying outstanding associations and agencies, while Leader K sees "no excuse" for two parallel associations and believes the solution will "involve willingness to comprehend the true relationship between industrial arts and its vocational counterpart." Leader H simply advocates membership for all teachers in both groups.

Miscellaneous Problems

Eleven issues were classified as miscellaneous. Three of these are concerned with supervision, but approach different aspects of the problem. Each of the remaining eight seems to be a separate issue which does not fall under any of the preceding categories.

Leader B feels that terminology "stands in the way of clear thinking". Terms, he states, have become crystallized until they are of little value, e.g. "exploration means a variety of canned experiences rather than a *procedure* to be learned as one approaches something new." He also lists the need to clarify community relationships.

The problem of research is mentioned by Leaders B and H. The former maintains that we know very little about the development patterns of children and youth in so far as industrial arts instruction is concerned, while the latter states that the general need for research is obvious.

The preparation of teachers is, itself, listed as an issue by three of the leaders. Leader B points out how widely teacher preparation programs differ in quality and the need for strengthening the educational perspective of undergraduate students. Leader D raises the question: may a person acquire craft skill by intensive application in trade or unit shop classes and then learn to teach by taking professional courses and student teaching? He suggests research to study the question. Leader J simply states that industrial arts teachers "should be more broadly prepared."

Leader D is concerned with the "indiscriminate launching and continuance of new departments of industrial arts teacher education where reasonable financial resources do not exist . . . and where often no demand exists for additional teachers." Leader F suggests the needs for standardization of accreditation of industrial arts teacher education departments. The greatest need of industrial arts teacher education is for "a group of nationally accepted leaders," according to Leader H. He sees a bright future for young men who aspire to lead industrial arts teachers into a cohesive national organization.

Leaders F and K agree that the recruitment of students is a critical issue. The former would approach the problem through industrial arts teachers in the high schools and senior students in industrial arts teacher education. The latter cites the need for higher teachers' salaries and "a more realistic recruiting program."

Finally, the problem of supervision was listed six times. Leaders B and I deplored dominance by the vocational industrial program over industrial arts supervision. Leader I would assign industrial arts to "the department of secondary and/or elementary education in the state departments and appoint state and local supervisors who owe allegiance to industrial arts," object to the term "industrial education," and separate industrial arts from vocational education at the teacher education level. Leader I points out the need for state and local supervision of industrial arts apart from vocational industrial education, while Leader K takes the opposite view: "this should be combined with supervision of Trade and Industrial Education . . . To do otherwise pits the two phases of the program against each other."

The Approach

A brief analysis of suggested approaches has a definite bearing on the issues raised by the leaders. It may help to clarify professional problems in several instances.

For example, in nine instances a philosophical approach is advocated. While this approach does not deal in specifics, it again highlights the whole problem of philosophical differences. Research, though mentioned only twice as a specific problem, was listed seven times as a suggested approach to the problem. Curriculum reorganization, state and local supervision, and the teacher education program each was mentioned six times as a vehicle for the solution of problems. Professional group action was suggested five times.

An approach to problems through new instructional materials, including textbooks, was suggested four times. Other approaches included: public relations and joint committees, each three times; administrative changes and solicitation of assistance from outside groups, twice each; and state-sponsored conferences and extension of the industrial arts program, once each.

Some General Conclusions

One of the problems facing industrial arts teacher education, according to the leaders, is the need for independent supervision of industrial arts at state and local levels. Supervision was discussed by the leaders six times, more than any other specific issue, and two-thirds of the weight favored independent supervision.

This problem is less concerned with the provision of state and local supervision of industrial arts than it is with freeing present supervision of industrial arts from the officialdom of Trade and Industrial education.

The need for research in many areas is crucial. This issue is clear in light of the frequency with which the leaders would depend upon research for the solution of problems.

A third major problem facing the profession is the question of the role of industrial arts in varying school environments. This involves objectives and structure at various grade levels and in schools of different size. Seven specific issues were directly related to this problem.

The question of instructional content, including materials of instruction, needs further study and clarification. This problem is closely tied in with that of research, and it is supported by six issues listed by the leaders and by the volume of suggested approach by way of curriculum change.

There is at least an implied need for expanded testing of the general education concept of industrial arts. Those who champion the cause admit openly or by inference that little has actually been accomplished in this direction.

Leaders in industrial arts teacher education are more concerned with over-all problems of industrial arts than they are with the specifics of their own profession. This is as it should be, since it is indicative of a primary interest in the children and youth served by the public school. Only nine of the thirty-seven problems listed by the leaders were exclusively concerned with the teacher education phase of industrial arts. While the teacher education program was mentioned as a problem only three times, it was suggested as a medium of solution six times. There is an apparent general acceptance of the belief that the problems of industrial arts teacher educators take root in the problems of industrial arts teachers.

The Basic Cleavage

Running in a continuous stream through the thinking of leaders who have participated in this study, there has been evident on the surface or as an undercurrent a fundamental difference in philosophy. It is not a new problem, nor is it the exclusive property of industrial arts teacher education.

The cleavage in industrial arts teacher education is the logical outgrowth of the history of industrial arts education in the United States during the past seventy-three years. The early concept of manual training was in keeping with the educational psychology of the day. It differed little in structure or technique from vocational industrial education which originated in the technical institutes. Thus, the relationship between manual training and trade training was at first an intimate one.

However, changes in science, psychology, and philosophy wrought a change in the objectives of manual training in the public schools. The new demands were apparent, even at the turn of the century, and in 1904 Charles R. Richards appealed for the adoption of the term "industrial arts" in the light of the new objectives.

The result is considerable confusion. The term "industrial arts" has been used to describe everything from a broad experience intended to benefit all children to a fixed course for the development of skill in a single type of industrial work. In many cases, there has been little, if any attempt to distinguish between "industrial arts" and "industrial education."

There is a distinct danger of oversimplification in an attempt to

analyze the resulting cleavage in industrial arts teacher education. However, it is undoubtedly true that the profession today is divided into three general groups.

The first of these might be called the "special industrial education" group. It views industrial arts primarily from the standpoint of skills and subject matter to be learned in shop work. Objectives range all the way from the development of consumer knowledge to the learning of salable skills; but in any case, the emphasis is on production of the project. Quality of work and efficiency of operation are stressed, and specialization at the upper grade levels aids in attaining vocational objectives.

The second, or "general education" group holds that industrial arts is a field of education. It would make the term "industrial arts" at least as comprehensive as "social studies" or "sciences." Industrial arts opportunities should be made available to all youth at all age levels, with a primary objective of popular understanding of industry and technology. The shop, or laboratory, becomes a method of teaching; the skill, the project become instruments of investigation and understanding.

Between these, there is a third heterogeneous group. It consists of those who honestly seek a compromise between the special industrial and general education concepts, those who keep a foot in each camp for political reasons, and those who simply are unable to make up their minds.

The first group is represented generally by the Industrial Arts Section of the American Vocational Association, and the second by the American Industrial Arts Association of the National Education Association. The present national organizational framework appears to be the best that can be devised for the current growth and development of industrial arts teacher education.

Neither conceptual group could function, let alone make progress, under the organizational domination of the other. Were the American Industrial Arts Association to throw in the towel, all of the energies of its members would be concentrated in the argument of general education versus special industrial education.

Leadership and the Future

The importance of leadership to industrial arts teacher education as a national profession is clear from this study. Also apparent is the vital role played by the ideas of leaders. Outstanding leaders *do* have definite ideas concerning professional problems, and they are eager to make use of any effective vehicle of expression in expound-

ing those ideas. Their primary instruments have been books, periodicals, and professional organizations.

The successful communication of ideas sets the leader apart from the average industrial arts teacher educator. Herein lies the task of tomorrow's leadership in industrial arts teacher education—to assist the entire profession in the clarification of its purposes and of the avenues by which those purposes may best be approached.

Techniques of Selection and Guidance of Graduate Students

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CHAPTER I

Introduction

Instructors in industrial arts education believe a student is enabled to do a better job if he understands the material with which he is working. Likewise, the college can do a better educational job if it knows its students better; for here, too, the planning and the doing of the job depend upon understanding the material.

The colleges have used various devices, plans, and techniques to appraise the fitness of the student to pursue a graduate program. For the most part they have held that a program of graduate study should have as its basic purpose the development of research workers, or the education of individuals who plan to enter a highly specialized field.

In contrast to, and to some extent in conflict with, this purpose is that of the agencies hiring teachers. The school board often looks upon the advanced degree as a measuring stick of value in terms of dollars and cents, and assumes the teacher is a *better* teacher as the result of obtaining the degree. As a result the teachers involved are subject to pressures that have exhibited themselves in terms of increased requirements for certification, preferential salary scales, promotions and professional advancement for those who obtain the advanced degree.

The requirements for teacher certification and the requirements of the graduate school continue in conflict. "There has been a marked shift in emphasis from research to professional education in the Master's degree program and even on the doctoral level."[1]

Two distinct types of master's degree programs have come into existence. The traditional type, based upon the German model and often referred to as the research degree, was designed to prepare the student for research as an occupational requirement. The student frequently had as an additional objective the attainment of a doctor's degree. The master's degree then became a stepping-stone on the way to the doctorate.

Until about twenty-five years ago the master's degree with thesis

[1]C. Alexander, and A. J. Burke, *How to Locate Educational Information and Data*, p. ix, New York: Bureau of Publications, Teachers College, Columbia University, 1950.

was the only plan offered. A study of college catalogs today reveals that the advanced degree may be obtained either in the traditional manner or without writing a thesis. The colleges have recognized the pressures put upon teachers and others and have adjusted methods or processes of earning a master's degree to meet the implied needs.

The second type of master's degree, which has evolved from this demand for satisfying the certification credential, is designed to produce master teachers rather than the research workers. Thus a different type of graduate program, a program designed for the improvement of teaching and the broadening of the interests of the student was needed.

The Purpose

The counselor of graduate students is confronted with the problem of determining the fitness of the candidate to pursue a graduate program. Also he must determine where to place this student in the program. Which students should be encouraged to do a scientific study and which should be encouraged to train themselves as master teachers are decisions he must make.

What techniques of selection may be used prior to this counseling effort that may be beneficial to all concerned? The objectives of the student must be determined and met if possible. The requirements of the graduate school must be fulfilled. A program of graduate study must be planned. The counselor must have at hand criteria of selection and placement for use in determining the fitness of a student to pursue a graduate program, and vice versa, what graduate program will best suit the objectives and needs of the student and others concerned.

The two-fold purpose of this study is to make an investigation, through the counselors of graduate students in industrial arts, of practices used to determine the fitness of a student to pursue a graduate program; and to determine techniques of selection employed to locate the student in such a program.

The Problem

In the interest of effective guidance and educational service, selection of registrants for graduate study in industrial arts education is needed. Certain information and criteria are, therefore, essential as bases for valid selection techniques.

The general problem in this study is: What information and criteria are essential as bases for valid techniques of selection of graduate students in industrial arts education?

The specific schools which were considered in this study were

seventy-five colleges and universities which offered a program leading to a master's degree with either a major or minor in industrial arts education. These colleges and universities have set the patterns of requirements, admission practices, and selective techniques in the United States. Since the number was small it was deemed desirable to secure as complete a coverage as possible.

An analysis of graduate catalogs of colleges and universities was made to establish existing admissions practices and selection techniques followed in admitting students to the graduate school and to a program leading to the master's degree in industrial arts education. The purposes of the programs were also sought.

The list of colleges and universities offering a master's degree with either a major or minor in industrial arts education was secured from Yearbook I, American Council on Industrial Arts Teacher Education.[2] This list was checked against that made by Olson[3] in his thesis, "A Study of Graduate Industrial Arts Teacher Education Offerings in the United States." In this manner seventy-five schools were included on the list. A letter was sent to the head of each Department of Industrial Arts asking for his assistance in making the study, the name of the graduate dean, and a copy of the graduate school catalog. A return postal card was supplied for his use as a convenient method of reply. Replies were received from sixty-nine; a follow-up letter brought in three more, making a total of seventy-two. Of this number only one declined the invitation to assist, three indicated they had dropped the graduate program in industrial arts, one reported they had no industrial arts program, and one said their graduate program was still pending. This made a total of sixty-six who agreed to assist. Questionnaires were sent to these. Fifty-six of the questionnaires were returned by heads of departments, or approximately 85 per cent.

Requests to assist in the study were sent to sixty-five graduate deans or directors of graduate studies. The difference in number of heads and deans occurred because one school reported they had no graduate dean. Fifty-four replies were received, two refusing, to make a total of fifty-two who agreed to assist. Questionnaires were sent to these, thirty-nine were returned, or 75 per cent. It was believed that

[2]Walter R. Williams, Jr., and Harvey K. Meyer, Editors, *Inventory Analysis of Industrial Arts Teacher Education Facilities, Personnel, and Programs,* Yearbook I of the American Council on Industrial Arts Teacher Education. Bloomington: McKnight & McKnight, 1952.

[3]Philip W. Olson, "A Study of Graduate Industrial Arts Teacher Education Offerings in the United States." Unpublished Master's thesis, College of Education, University of Florida, 1952.

the percentage of returns in each case was high enough to lend validity to the survey.

The questionnaire attempted to determine the procedures and selective techniques currently used by counselors to admit, appraise, and place a student in a graduate program leading to a master's degree in industrial arts education. Where possible, this material was presented in tabular form for more critical analysis.

CHAPTER II

Admission Practices and Selection Techniques Noted in Current Catalogs, 1952-54

An analysis of sixty-six college catalogs revealed the purposes of the graduate school, practices of admission to the graduate school, practices of admission to candidacy for an advanced degree, general requirements for the degree, and techniques used for selection and retention of graduate students.

Purposes.—Two purposes of graduate work were found to exist—improvement of classroom teaching and the development of research and research workers.

Admission to Graduate School

The bachelor's degree, transcripts of collegiate work, and an application for admission to the graduate school were universal requirements.

There were three categories for admission—full status, provisional status, and non-degree status.

Full status.—In general, a *B* average in undergraduate work was a common requirement for admission to the graduate school on full status. Likewise, the basic undergraduate preparation for the major field must have been satisfactory.

A preliminary or comprehensive examination was a frequent requirement.

Approval of the department and the graduate dean was also a general requisite for admission.

Appointment of an advisor and/or an advisory committee was frequently recommended.

Teaching experience or a teaching certificate were used as admission and selection aids.

Provisional status.—A large number of colleges provided for admission of students on provisional status. Most frequent causes for placement of a student in this category were deficient basic preparation for the degree, and graduation from a non-accredited college or university. Procedures for changing to full status were provided by several schools.

Non-degree status.—Students in this category were allowed to register for any course for which they held the prerequisites. Several colleges indicated they were not obligated to accept the credit toward a degree.

Admission Not Authorized

Few institutions stated causes for not admitting a student. Bases for refusal to admit a student were low grade average and graduation from a non-accredited school.

Admission to Candidacy for Degree

Admission to the graduate school and admission to candidacy for an advanced degree were designated as two definite procedures in a student's progress.

A formal petition of candidacy was a general requirement of sixty-six colleges in the survey. A grade average of *B* was a universal requirement for admission to candidacy and for retention by the graduate school.

Initiation of candidacy.—Admission to the graduate school preceded admission to candidacy for the advanced degree in all sixty-six colleges and universities. Procedures for initiating the petition for candidacy centered around a specific number of credits earned in graduate work and/or residence on campus for a specified time.

Approval of the student and his plan of work by the department and the graduate dean were common practices for selection and admission to candidacy.

Additional requirements.—Adequate undergraduate preparation was a regular requirement for admission to candidacy. Other requirements included a plan of work, a demonstration of ability to do graduate-level work, a statement of a thesis problem or an outline of term papers or projects, competence in the use of the library, satisfactory usage of the English language, removal of all deficiencies, and the fulfillment of all college requirements.

Teaching experience or a teaching certificate were listed as prerequisites to candidacy by about one-third of the schools. A satisfactory score on a qualifying test was required by more than one-fourth of the colleges and universities for admission to candidacy for the master's degree.

CHAPTER III

The Current Pattern of Practices of Admission, Selection, and Guidance of Graduate Students in Industrial Arts Education

Practices followed by institutions for the admission, selection, and guidance of students seeking admission to a graduate program of studies and to candidacy for a master's degree in industrial arts education have shown wide variation among the sixty-six colleges and universities included in this study.

Number of Students Enrolled as Candidates for the Master's Degree

In answer to the request to indicate the number of students enrolled, on full and part-time bases, as candidates for the master's degree in industrial arts education for the year 1952-53, usable replies were received from fifty-one institutions. As shown in Table 1, the number of students enrolled was 619 in fourteen State Universities, 434 in twenty-one Teacher-Education Colleges, 358 in thirteen Land-Grant Colleges, and 336 in three Private and Municipal Universities. A total of 1747 students were enrolled as candidates for the master's degree in industrial arts education in the fifty-one responding institutions, 553 as full-time students and 1194 as part-time.

Degrees Granted

The degrees most commonly granted to students majoring in industrial arts education, as listed in Table 2, stated in the order of their frequency, were Master of Education by twenty-three, or 41 per cent of the fifty-six schools; Master of Arts by twenty, or 36 per cent of the institutions; Master of Science by twenty, or 36 per cent; Master of Science in Education by nine, or 16 per cent; and Master of Arts in Education by six, or 11 per cent of the schools. The Master of Education was the sole degree offered by six of the fifty-six schools; the Master of Arts was the sole degree in three; and the Master of Science was the sole degree in five. The degrees were most often conferred by the graduate school.

TABLE I

DISTRIBUTION AND ENROLLMENT OF FULL AND PART-TIME STUDENTS AS CANDIDATES FOR THE MASTER'S DEGREE IN INDUSTRIAL ARTS EDUCATION FOR THE YEAR 1952-53 IN THE INSTITUTIONS RESPONDING

Number of Students	Type of School							
	Teacher-Educ.		Land-Grant		University		Private & Municipal	
	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time
0	5	1	1	0	1	0	0	0
1-9	11	6	7	6	9	5	1	0
10-24	4	5	2	3	1	4	0	0
25-49	0	4	1	1	2	1	1	2
50-74	0	1	0	2	1	1	1	0
75-99	0	0	1	0	0	1	0	0
100-149	0	0	0	0	0	0	0	0
150-174	0	0	0	0	0	1	0	1
Numbers enrolled	101	333	173	185	180	439	99	237
Total enrollment, full & part-time	434		358		619		336	
Number of Institutions	21		13		14		3	

Purposes of Graduate Study

Central to the purposes of graduate study in the sixty-six institutions were the advanced training of students in their field of service and the promotion of research. Ninety-five per cent, or sixty-two of the institutions, have as a purpose the improvement of classroom teaching through a program planned to meet the needs of teachers and administrators of industrial arts, and that was the sole purpose in twenty-four, or 36 per cent of the schools. The promotion of research was an objective in forty-one, or 62 per cent of the schools, but only two, or 3.0 per cent, said it was the sole purpose of graduate work in their institution.

TABLE II

VARIOUS MASTER'S DEGREES GRANTED STUDENTS MAJORING IN INDUSTRIAL ARTS

Name of Degree	Type of School				
	Teacher Educ.	Land-Grant	University	Private & Municipal	Total
Master of Arts	9	2	8	1	20
Master of Arts in Industrial Arts	1	..	..	..	1
Master of Arts in Industrial Arts Education	..	1	..	..	1
Master of Arts in Education	4	1	1	..	6
Master of Education	7	7	7	2	23
Master of Science	7	5	7	1	20
Master of Science in Education	6	3	..	..	9
Master of Science in Industrial Arts	1	2	..	..	3
Master of Science in Industrial Arts Education	1	2	1	..	4
Master of Science in Industrial Education	1	2	1	..	4
Master of Science in Vocational Education	..	..	..	..	..
Master of Industrial Education	..	..	1	..	1
Master of Industrial Arts Education	..	1	..	..	1

Admission to Graduate Study

A bachelor's degree was a universal requirement for admission to graduate study in all sixty-six institutions. Transcripts of all work of collegiate grade, at both undergraduate and graduate levels, were also commonly required.

Applications.—An application to enter the graduate school was required by all but three of the schools. It was to be submitted to the Dean or the Director of the Graduate School in thirty-two of the schools. Only nineteen institutions said it must be made prior to the date of registration. That the schools are liberal with students who have failed to file an application before registration was shown by the fact that thirty-seven made provision for the student to enter on a provisional basis and file the application during the first term of residence. It is doubtful that the three which did not admit students would actually turn the student away if he presented credentials which showed indication of promise on his part to do the level of work required at the institution.

The application for admission was most often passed upon by a a group composed of the Dean or the Director of the Graduate School,

the Head of the Industrial Arts Department, members of the Graduate Council, and the staff of the Industrial Arts Department.

Prescription of undergraduate course work.—In order to insure satisfactory undergraduate preparation in industrial arts education, fifty of the schools surveyed made prescriptions of undergraduate work offered by the student. The requirement might be described by the statement that the course work offered must be equivalent to that required by the institution for its own bachelor's degree in industrial arts education. Stated as quarter credits for those schools on the quarter system and semester credits for those on the semester plan, about two-thirds of the schools required seven semester or thirteen quarter credits in industrial arts theory courses, and thirty-three semester or thirty-two quarter credits in shop courses. In foundation courses in education they required about three semester or three quarter credits in Principles of Education; six quarter or three semester credits in General Psychology; four semester or five quarter credits in Educational Psychology; three semester or five quarter credits in Methods and Observation of Teaching; and six semester or thirteen quarter credits in Student Teaching.

The requirements in General Education were nine semester or twelve quarter credits in Physical Science; eight semester or fourteen quarter credits in Language-Arts; five semester or seven quarter credits in Biological Science; and eighteen semester credits or thirteen quarter credits in Social Science.

Full or regular status.—Students were admitted under three categories: full or regular status, provisional or limited status, and non-degree status. To be admitted to full graduate status, in thirty-seven schools a student must have attained a *B* or better average in undergraduate work for all four years. Likewise, a *B* average must have been shown on a transcript of previous graduate work. While a *B* was required by more than three-fourths of the schools, some were more liberal. Five accepted a 2.5 average, between *C* and *B*, and six accepted a 2.0, or *C* average.

One-fourth of the schools asked the student upon registration to state whether or not he intended to become a candidate for a degree. A tentative program of graduate study was also asked.

Evidence of satisfactory preparation in the major field, industrial arts education, was a general requirement in fifty-four schools. Evidence of preparation in foundation courses in education was also required in several schools.

One-third of the schools required a satisfactory score on a preliminary or comprehensive examination for admission to full status. Others reserved the right to request the student to take such examination. A test named by eight schools was the Graduate Record Examination,

while two named the Miller Analogies Test.

The approval of the industrial arts department and the graduate dean were necessary for admission to full status.

The appointment of an advisor and/or advisory committee early in the student's progress was recommended by about one-half of the schools.

Teaching experience was required in a few schools. In about one-fourth of the schools a student must hold a teaching credential to be admitted to full graduate standing.

The student usually must be in good health.

Provisional or limited status.—That the schools have adopted a liberal attitude concerning admissions was exhibited in the manner in which they have provided for admission of a student who does not have a *B* average during some part of his undergraduate work, who may have graduated from a non-accredited college, or who may have failed to show evidence of some particular competency on the required preliminary examinations.

The statement that the student must have demonstrated his ability to do work on the graduate level appeared in forty-six of the sixty-six catalogs reviewed in this study. Obviously, such level of work could only be shown when the student has been permitted to perform in graduate course work.

Forty-three, or 65 per cent of the colleges and universities, have established procedures to enable a student to enter a graduate school on a provisional or limited status. Basic preparation considered deficient by the department concerned, graduation from a non-accredited college, and undergraduate grade average below a specified standard were the conditions most often cited as cause, by twenty-nine, seventeen, and eleven schools respectively, for granting a provisional permit to enter a graduate school. The student could remove those deficiencies by enrolling in courses, usually undergraduate, although five of the colleges allowed him to remove the deficiency in graduate credit courses, by demonstrating that he was capable of doing graduate level work, usually in graduate courses; and by making grades of *B* or better in all course work, graduate and undergraduate, for which he was enrolled during his first term of residence.

Students on provisional status did not automatically attain full or regular status upon removal of deficiencies or at the end of the first term of residence in which they demonstrated their ability to do work at the graduate level. Twenty-eight of the schools stated that the student must, upon clearing deficiencies and meeting *all* qualifications for regular status, petition the Graduate Council for the change. The

responsibility rested with the student and his advisor for initiation of the petition.

The minimum honor-point average permitting a student to enroll on a provisional basis was 2.5, or between *C* and *B*, in nineteen of the schools; only one dropped it below a *C*.

A small number of schools, eight, held the student for diagnostic tests before changing the status. Tests specified were the Graduate Record Examination by three, and the National Teacher Examination by one.

Non-degree status.—While only eighteen of the schools mentioned the non-degree status, it is generally known that most colleges allow students who hold the bachelor's degree to enroll in any graduate course for which they have the requisite background. The eighteen schools followed that plan. The need for adult education has long been recognized by the colleges and universities. Admitting students to courses on the non-degree status often meets that need.

Admission not authorized.—Admission to the graduate school was not authorized if the student's undergraduate grade average was between *C* and *D* with one exception where a grade average of *D* was the point at which admission was refused.

Techniques for selection and guidance of students seeking admission to a program of graduate study.—Few, if any, of the colleges and universities made use of the term, entrance examinations. Qualifying or preliminary examinations were the terms most often used to describe the tests used. Such tests were used in a number of colleges to establish bases for determining deficiencies in basic preparation, to establish the fact that the student had a fundamental knowledge at hand which might be applied in the solution of problems, or for the purposes of counseling and guiding a student into the type of program that would best meet his occupational objective. With the above in mind, Part V of the questionnaire was designed to secure from the heads of the industrial arts departments and from the deans or directors of graduate schools their opinions of the value of suggested techniques as determinants for admission status, selection and/or guidance of graduate students in industrial arts education.

The results of the survey of opinion from the heads of departments of industrial arts and from the graduate deans or directors indicate the two groups are in close accord on the value and use of the techniques suggested. On the bases of the evaluations given and the frequency of use made by the department heads and graduate deans, certain of the techniques listed may be suggested as having some value as determinants for admission status, selection and/or guidance of graduate

students in industrial arts education.

Those techniques which received 60 per cent or more first (most efficient) and second (fairly efficient) rankings from both the heads of departments and graduate deans combined were thought to be of most value as determinants. Those techniques receiving 40 to 59 per cent of such rankings were classed as borderline. Those receiving 39 per cent or less of first and second places were considered of doubtful value.

In Part V of the questionnaire the heads of departments and graduate deans were asked to encircle the ranking given a technique to indicate they were now using that particular technique as a determinant for admission status, selection and/or guidance purposes. A relatively small number complied with the request to indicate that they were using the techniques. The length and completeness of the questionnaire may have caused the busy heads of departments and the equally busy graduate deans to stop at this point. In general, it may be stated that the techniques ranked as most efficient or fairly efficient were also being used as determinants by more of the department heads and graduate deans than were those less frequently given the high rankings, while those techniques in the doubtful value category were being used by fewer of the men.

Under the title *evidence of adequate basic preparation,* an evaluation by an advisory committee was highest on the list. This was in accord with the policy of many schools to make an early appointment of a student's advisor and committee. A subject matter examination given by the faculty, a preliminary comprehensive examination in the major field, a test to determine an adequate grasp of the fundamentals of English usage, a cooperative comprehension test, and a test to measure the ability to discriminate word meanings, comprise the balance of the group which, in the opinion of the heads and deans were efficient techniques for use as determinants. A study of the catalog statements of requirements for admission to the graduate school revealed the fact that many of the schools required or might ask the student to take a qualifying test, a preliminary comprehensive test, and a test covering fundamentals of English usage. In each case the counselor no doubt looked for those factors which disclosed the basic preparation of the student.

The groups would exclude such techniques as tests covering natural science (U.S.A.F.I.), tests covering social science (U.S.A.F.I.), and contemporary world affairs tests, as being of doubtful value in the admission, selection, and guidance of students in a graduate program of industrial arts education.

TABLE III

MERIAN NUMBER OF CREDITS IN UNDERGRADUATE WORK PRESCRIBED FOR ADMISSION TO GRADUATE STUDY IN INDUSTRIAL ARTS EDUCATION IN 32 COLLEGES AND UNIVERSITIES, 1953

Subject Area	Quarter		Semester	
	Replies	Required Credit (Median)	Replies	Required Credit (Median)
Industrial Arts:				
Theory	13	15.3	21	7.2
Shop Practice	15	31.9	21	33.1
Education:				
Principles of Education	9	3.2	12	2.7
History of Education	12	5.9	13	2.7
General Psychology	13	6.0	12	2.7
Educational Psychology	11	4.6	15	4.3
Methods and Observation of Teaching	11	5.0	13	2.7
Student Teaching	13	12.5	17	6.3
Philosophy of Education	5	2.5	5	2.9
General Education:				
Physical Science	11	11.8	12	9.3
Language-Arts	12	14.5	14	8.5
Biological Science	12	6.7	11	5.3
Social Science	13	15.3	13	18.5
Philosophy	1	4.0	3	3.0

As *evidence of ability to complete the program* two techniques, the graduate grade average and the undergraduate grade average, were rated as most efficient or fairly efficient by more than 90 per cent of the group. An intelligence or psychological examination given by your faculty, the Graduate Record Examination, a preliminary comprehensive examination in general education, the National Teacher Examination, and a written qualifying examination were also adjudged most valuable.

Three techniques may be considered as borderline in value; about 50 per cent ranked them as efficient and an equal percentage ranked them as least efficient to valueless. However, as the greater number

of the latter were as least efficient rather than as valueless, they cannot be said to be without some merit. The three techniques were testimonials concerning scholarship, an oral qualifying examination, and a proposed program of study submitted by the candidate. About 60 per cent of the two groups ranked the Miller Analogies Test and a test of ability to recognize logical fallacies as least efficient to valueless. About as many ranked them valueless as rated them fairly efficient, so some doubt may exist regarding the value of these techniques as determinants of ability of a student to complete a graduate program.

The techniques listed under *contacts with university personnel* were, as a group, ranked most efficient, or fairly efficient by a larger percentage of the deans and department heads than were any of the other groups. Appraising the individual student is a function of every department head and graduate dean. It is not an impersonal process and is, therefore, of a subjective nature. This does not lower the value of the ratings given nor the value of the techniques employed for the purpose of selection (appraisal) of the student for retention in a graduate program. Because the heads of departments and the graduate deans have rated these techniques so highly, and because the techniques were being used by at least one-third of the group, it may be assumed with a great deal of assurance that these techniques occupied a prominent place as determinants in the selection and guidance of graduate students in industrial arts education.

Ranked as most efficient or fairly efficient by from 95 to 75 per cent of the group were, in order of rank, the departmental recommendation to the Graduate School, a rating of competence by staff members who know the student personally, the departmental acceptance, interviews with preferably three staff members, and a personal interview with the admissions official or officials. Only one technique in the list could be classed as borderline: 52 per cent of the group said a proposed program of study submitted by the candidate was an efficient technique for selection and guidance of graduate students, while 48 per cent would rank it least efficient to valueless.

When evaluating the techniques listed under the title of *personal factors,* the department heads and graduate deans exhibited a tendency to rate the techniques as borderline in value. Only one technique, an experience record form, received above 70 per cent of the votes for first and second rank. Three more barely passed the 60 per cent level adopted as the cut-off point between those suggested as efficient techniques and those classed as borderline. A physical examination with 65 per cent, an interest test with 64 per cent, and a certificate

of good health with 61 per cent of the rankings as most efficient or fairly efficient were the three barely above the 60 per cent point.

About one-half of the techniques were rated borderline in value. By about an equal number testimonials concerning character, a personality test, an autobiography, and an evaluation of the social abilities of the candidate were said to be efficient techniques and non-efficient. In the other two borderline cases, an Emotional Adjustment Needs Test and an interview with a psychiatrist, only 40 per cent of the department heads and graduate deans ranked them as efficient techniques.

Techniques of doubtful value as determinants were the age of the candidate, time since last school attendance, and time since baccalaureate was conferred.

Evaluation of the personal qualities of an individual is a slow process. Many of the desirable, and also many of the undesirable, personal qualities within the individual may not make their appearance until the student is well underway in a graduate program. The top ranking techniques under *personal factors* could assist the counselor in making an objective appraisal more readily.

Of interest were the rankings given the techniques age of candidate, time since last school attendance, and time since baccalaureate was conferred. In contrast with the evaluations shown here, Saum, in his study, "Selection Techniques at Stanford School of Education,"[4] recommended that closer attention be given the age of the student and the time-lapse since the last formal education. He believed they were quantifiable and potential predictors of success in the graduate program.

Techniques in the group, *evidence of teaching ability,* were all, with one exception, ranked as most efficient or fairly efficient by large percentages of the department heads and graduate deans. Since one of the primary objectives of graduate study in the colleges and universities was the improvement of classroom teaching, it naturally follows that evidence of ability in teaching would be judged as most efficient or fairly efficient techniques as determinants for admission status, selection and/or guidance of students seeking admission to graduate study. Advancement in profession, testimonials concerning teaching experience, and testimonials concerning general fitness for teaching were ranked in first or second places by more than 80 per cent of the heads of departments and graduate deans. Length of time

[4]James Arthur Saum, "Selection Techniques in the Stanford School of Education," p. 119. Unpublished doctoral dissertation, School of Education, Stanford University, 1951.

on each teaching job was given the same ranks by 69 per cent of the two groups. The fifth technique in the list, a state certificate to teach industrial arts, was classed as borderline because only 55 per cent of those ranking it felt it was of value.

The current practices of admission to the graduate school in the fifty-six responding colleges and universities granting a master's degree in industrial arts education show the existence of a policy which tends to make it easy for the student to enter the graduate school. The student with grades between *C* and *B* is often allowed to enter on a provisional basis; the student with deficiencies in basic preparatory courses may make up those deficiencies; and the graduate of a non-accredited college is permitted to demonstrate his ability to do satisfactory work at the graduate level. Tests used in the graduate programs were designed to point out deficiencies that might exist in a student's preparation. The results were used by the counselor, not for elimination, but rather for guidance of the student into a program designed to aid him to reach his occupational objective or, as Reed expressed it, "his professional destination."[5]

A large number of institutions have inserted in the catalog the requirement that "he must demonstrate ability to do work at the graduate level." An assumption may, therefore, be made that a criterion of ability to do work at the graduate level can only be validated by permitting the student to perform in course work while enrolled in the graduate school.

Admission to Candidacy for the Master's Degree

Admission to graduate study and admission to candidacy for the master's degree were two separate and distinct procedures in the institutions covered in this survey. More than 80 per cent of the schools have the statement in their catalogs to the effect that admission to the graduate school does not admit a student to candidacy for a degree. The institutions hold to the policy that admission to candidacy for the master's degree entails further requirements and qualifications on the part of the candidate than are required for admission to graduate study. More than three-fourths of the institutions required a formal petition for candidacy for the degree.

More than one-half of the institutions required the removal of all deficiencies and the fulfillment of all college and departmental re-

[5]Glenn A. Reed, "Fifty Years of Conflict in the Graduate School," *Educational Record,* XXXIII (January, 1952), p. 10.

quirements before final approval of admission to candidacy was granted.

Initiation of candidacy.—All of the schools surveyed required that the student must have been admitted to the graduate school before candidacy might be initiated.

Considerable variation was found in the time schedules given, both in terms of credits needed and the elapsed-time interval for initiation of the petition. In the thirty-four institutions which stated in their catalogs the amount of graduate credit needed before the petition for candidacy might be initiated, there were more than a dozen different amounts of credit named, ranging from six to twenty-four quarter credits and six to sixteen semester credits. An approximate mean for each would be twelve quarter credits and twelve semester credits.

In elapsed-time interval before a petition for candidacy could be initiated, there was also considerable variation in the amount stated. It extended from immediate admission to candidacy upon admission to the graduate school on full graduate status to within a few weeks of graduation. It appears that the term candidacy is not interpreted with the same meaning in all of the institutions. In some, candidacy is a definite step in the plan of work for the degree, while in others it appears to be no more than a notice to the registrar's office that the student has completed all work for the degree and is ready to receive it. There is need for a definition of the term *admission to candidacy* as used in college and university catalogs so that it may have a common interpretation by all who read it.

Commonly the period of time between admission to graduate study and admission to candidacy would be a minimum of one quarter or one semester of graduate study in residence at the institution. Underlying the requirement of a minimum period of residence between admission to the graduate school and to candidacy was the need on the part of the student to demonstrate his ability to do work on the graduate level, on the part of the members of graduate staff to pass judgment on the quality of graduate work done by the student, and in general to determine the fitness of the student to pursue the graduate program of his choice.

The petition for admission to candidacy must carry the approval of the student's advisor, of the head of the department or a major professor, and of the graduate dean or supervisor of graduate studies.

Additional requirements.—The distinction between admission to the graduate school and admission to candidacy became more defined when the additional requirements for admission to candidacy were made known.

The candidate for a master's degree in industrial arts education must have presented a plan of work or program of study. This requirement was made by more than two-thirds of the institutions. Further, the plan must have been approved by the student's advisor in most colleges, and in some the approval of the graduate dean was also required.

More than one-half of the schools reserved the right to require additional or supplementary course work even after admission to candidacy.

An applicant must have presented an approved outline of a thesis problem, or outline of the paper or project in lieu of a thesis, before he was admitted to candidacy. Approval of the outline by the advisor, the head of the department, and the graduate dean was a common requirement.

While only a few of the catalogs carried a statement to the effect that the student must demonstrate his ability to use correct English, it is common knowledge that such evidence of ability is extremely desirable in the pursuit of graduate study. Many institutions provided opportunities for a student to improve in the use of the English language. Many used tests in English usage as diagnostic measures to indicate points of strength, or weaknesses in need of remedial action.

About one-half of the institutions required the student to make a satisfactory score on a qualifying examination before admitting him to candidacy. A comprehensive test in industrial arts education was frequently used. Tests to determine qualifications outside the field of specialization were also employed. The Graduate Record Examination was named by ten institutions as the one employed. Others mentioned by heads of departments were the Ohio State University Psychological Test, the California Test of Mental Maturity, the National Teacher Examination, the Miller Analogies Test, and the Cooperative English Test.

No one test was relied upon to the exclusion of others to get a complete picture of the qualifications of the student. Evaluation of the student is a cooperative task among the personnel of the college and university. Several devices may be used, each measuring or seeking a particular factor in the make-up of the candidate, which enable the staff to arrive at a reliable judgment concerning the promise of a student as a candidate for the master's degree in industrial arts education. Some institutions employed virtually no tests of any kind, nor did they make use of many devices or techniques for selection of students. Comments to that effect appeared on a number of the questionnaires when they were returned. One pointed out they were not

"bogged down" with unnecessary details such as might be encountered if standardized tests, preliminary and final oral and written examinations were employed.

About one-fourth of the institutions required the student to hold a teaching credential in industrial arts education, and a few required the student to show evidence of satisfactory teaching experience. A number indicated their intention of requiring teaching experience before granting admission to candidacy.

The student who graduated from an accredited institution, but with deficiencies shown in the undergraduate work in English or another subject not in the major field, must have removed such deficiencies before he might be admitted to candidacy for the master's degree. That the colleges were, on the whole, extremely generous with such individuals was shown by the fact that he might remove the deficiencies in his basic preparation by enrolling in undergraduate courses while also enrolled in graduate courses. Some, about one-fifth of the institutions, allowed the student to enter full graduate standing with the minimum requirement for the degree. A few permitted the student to confirm his knowledge of basic course work by allowing him to demonstrate that knowledge in an examination in the subject.

Generally speaking, the applicant for admission to full graduate standing as a candidate for the master's degree in industrial arts education must have had previous work in industrial arts education, preferably with a major or minor. Basically, 87 per cent of the institutions held to the policy that basic preparation for a master's degree in industrial arts education could only be established through an undergraduate major or minor in the proposed graduate major. Only seven admitted to candidacy the student with no previous work in industrial arts education. The assumption would be, however, that the advisor of students admitted to those schools as candidates for the master's degree in industrial arts would suggest a program heavily structured in industrial arts education. The possession of a major or minor might preclude the necessity of removing deficiencies in the field.

Graduates of accredited institutions having a bachelor's degree in education and only a minor in industrial arts education would be admitted to full standing as candidates for the master's degree in industrial arts education by a majority, thirty, of the fifty-five institutions which furnished a reply to the question. The remaining twenty-five institutions required the student to establish a major, in twelve cases, while thirteen permitted him to enroll in a graduate program and remove the deficiencies shown. Current practice apparently favors

the admission of holders of a bachelor's degree in education with a minor in industrial arts to full graduate standing with about the same requirements as are made for the applicant who has a major in the field.

A graduate of an accredited institution which did not grant a bachelor's degree in industrial arts was required to make up any deficiencies shown in his transcript before he might become a candidate for the master's degree in industrial arts education in the majority of the institutions covered by this study. Twenty-six allowed him to remove the deficiencies in course work. Since he had already earned a bachelor's degree, more than three-fourths of the institutions did not require him to earn a second bachelor's degree in industrial arts; their requirements were satisfied if he removed the deficiencies or established a major or minor in industrial arts. Ten institutions were more generous in their disposal of the application. The student was admitted to the graduate school on probation and allowed to demonstrate that he could do satisfactory work. If he did so, the school might waive a portion or even all of the deficiencies and admit him as a candidate for the master's degree in industrial arts education. Several institutions took a more drastic stand and required that the student earn a bachelor's degree if admitted at all, while two would refuse to admit the applicant to candidacy.

A graduate of an approved professional school of engineering would not be admitted to full graduate standing as a candidate for the master's degree with a major in industrial arts education by virtue of his professional degree. Forty-two of the institutions would agree to that disposition, while twelve would admit the applicant to full graduate standing as a candidate for the degree. The applicant, the graduate of an engineering school, has few avenues for meeting the admission requirements laid down by the graduate schools which offer a master's degree in industrial arts education. In about three-fourths of the schools, to be admitted as a candidate for the degree, he must have established a major in industrial arts or earned a bachelor's degree in industrial arts. About one-fourth of the schools, fourteen, were more liberal in their disposition of the applicant. Their requirements would be satisfied if he established a minor in industrial arts and removed any other deficiencies shown in his undergraduate preparation for the master's degree. Only five institutions would not allow the applicant to become a candidate for the master's degree, but they would permit him to enroll in a program of graduate study. Several heads of departments of industrial arts commented on the question and indicated that training as an engineer was far afield

from that of teacher education in the field of industrial arts education, therefore, no justifiable bases could be established on which to allow a graduate in engineering to enter as a candidate for the master's degree in industrial arts education.

Commonly the applicant must have graduated from an accredited institution if he were to be admitted to candidacy for the master's degree in industrial arts education. However, if he were a graduate of a non-accredited school the way was not blocked entirely by most of the institutions for his eventual admission as a candidate for the master's degree in the institution of his choice. Five institutions did refuse to admit him as a candidate. Eighteen institutions said he must obtain a bachelor's degree from an accredited college or from their own institution. The majority of the schools, thirty-four, were far more generous in their treatment of the applicant. They permitted the student to enter the graduate school on a provisional basis, requiring him to demonstrate in course work his ability to do graduate work by earning a *B* or better average in such work. If he did so, he was allowed to apply for candidacy to the master's degree.

Techniques for selection and guidance of students seeking admission to candidacy.—The heads of departments of industrial arts and the graduate deans were asked to rank each of the suggested techniques as a determinant for selection and guidance of students seeking admission to candidacy for the master's degree *with thesis,* and again for selection and guidance of students seeking candidacy for the degree *without thesis.*

The evaluation for the two options was asked to determine, if possible, whether any distinctions were made in the qualities thought desirable of students who elected either plan. Should there *be* a difference in the caliber of students who choose either plan, the one with a thesis or the one without a thesis? A comparison of the evaluations given each technique by the heads of departments and by the graduate deans indicated that there was no difference in the qualities considered desirable in graduate students selecting different paths toward the same goal, the master's degree. It would appear from this observation that there should be no difference in the caliber of the students who are accepted as candidates for a master's degree, whether with a thesis requirement or without a thesis requirement.

The results of the survey which covered the two options for candidacy for the master's degree showed that the heads of industrial arts departments and their graduate deans were in very close accord on the relative value and use of the suggested techniques as determinants for admission to candidacy for the master's degree with thesis

and as determinants for admission to candidacy without thesis. Because the rankings given the techniques by the heads of departments and by the graduate deans in Columns *B* and *C* of the questionnaire were so close, and in many cases actually the same, the rankings given were combined for each technique. The techniques included here and suggested as being of most value, as borderline, or of doubtful value, were selected on the basis of order of frequency shown in the combined rankings of the department heads and graduate deans and apply to either option.

Under *evidence of adequate basic preparation* the same techniques selected as having most value and being in more frequent use as determinants for admission to graduate study were also designated as having most value and were in more frequent use as determinants for admission to candidacy for the master's degree. First in order of frequency, that is, receiving the highest percentage of rankings in first and second places, was an evaluation by an advisory committee. A test to determine an adequate grasp of the fundamentals of English usage followed. It was noted that this technique had placed fourth when considered as a determinant for admission to graduate study. However, when considered as a determinant for admission to candidacy for the master's degree it rose in order of rank to second place. The thesis requirement along with other writing requirements which call for specific evidence of proficiency in the use of English no doubt influenced the ranking of this technique.

Following, in the same order of frequency as was indicated when considered as determinants for admission to graduate study, were a subject matter examination given by your faculty, a preliminary comprehensive examination in the major field, a cooperative comprehension test, and a test to measure the ability to discriminate word meanings. Of doubtful value as determinants to candidacy were a contemporary world affairs test, tests covering natural science, and tests covering social science.

As *evidence of ability to complete the program,* the technique, graduate grade average, received almost 100 per cent of the rankings given as a most efficient or a fairly efficient technique—a lone department head said it was a least efficient technique as a determinant for admission to candidacy. About half of the group also made use of this technique as a determinant.

The undergraduate grade average was given a very high proportion of rankings as first and second in efficiency. The technique was also used by more than one-third of the group. Other techniques said to be of some value as determinants by 60 per cent or more of the deans and

heads were, in order of frequency, a written qualifying examination, an intelligence or psychological examination given by your faculty, a preliminary comprehensive examination in general education, an oral qualifying examination, and the Graduate Record Examination. Each of the techniques was used as a determinant by from seven to thirty men.

Techniques considered of doubtful value were the National Teacher Examination, testimonials concerning scholarship, a proposed program of study submitted by the candidate, the Miller Analogies Test, and a test of ability to recognize logical fallacies.

Of interest was the change in rank order given some of the techniques when used as determinants for admission to graduate study and for admission to candidacy. Moving from seventh to third place was a written qualifying examination. Ability to express ideas, meanings, and facts in well-written sentences, paragraphs, and sections, is a quality sought by the counselor in the written examination. The oral qualifying examination also moved upward in rank order, from ninth to sixth place in the list. Those dropping in rank order were the Graduate Record Examination, from fourth to seventh, and the National Teacher Examination, from sixth to eighth place, indicating less confidence on the part of the deans and department heads in these tests as determinants for admission to candidacy for the master's degree.

All of the techniques listed under *contacts with university personnel* were said to be of some value as determinants for admission of students to candidacy for the master's degree. More than 90 per cent said a rating of competence by staff members who know the student personally, a departmental recommendation to the Graduate School, and departmental acceptance were highly valuable as techniques for determining admission to candidacy. Each of the three was being used by from eighteen to twenty-three of the men.

The other two techniques, an evaluation by the Graduate Council or Committee and a personal interview with the admissions official or officials, were also judged of some value, but only by 63 per cent and 60 per cent of the men respectively.

A greater interest was shown in the techniques in which contacts with university personnel exist than in most others. Judgments formed of the student's ability while in the classroom and while being interviewed lead to acceptance or non-acceptance of the student by the department. If doubt exists concerning the student, contacts with the staff often bring out pertinent information about the qualities of the student that can be obtained in no other manner.

The heads of departments and graduate deans considered only one technique listed under *personal factors,* an experience record form, of most value as a determinant for the admission of a student to candidacy. Seventy per cent of the group ranked it thus.

The group followed closely their tendency to class the techniques in this list as borderline in value. Those placed in that class, in order of frequency, were a personality test, a certificate of good health, a physical examination, testimonials concerning character, an evaluation of social abilities of the candidate, and an autobiography. There was also a tendency to lower the classification of most of the techniques below that given as determinants for graduate study. Three classed as of most value as determinants for admission to graduate study and dropped to the borderline class for admission to candidacy were a physical examination, an interest test, and a certificate of good health. Changed from borderline to the doubtful value class were an interview with a psychiatrist and an Emotional Adjustment Needs Test. Others again considered of doubtful value were age of the candidate, time since last school attendance, and time since baccalaureate was conferred.

As determinants for the two purposes, admission to graduate study and admission to candidacy for the master's degree in industrial arts education, either with the thesis or without the thesis, the heads of departments and the graduate deans were in complete agreement on the value of each technique under *evidence of teaching ability.* Four of the techniques, in order of frequency, advancement in profession, testimonials concerning teaching experience, testimonials concerning general fitness for teaching, and length of time on each teaching job, were said to be of most value as determinants for both purposes by more than three-fourths of the men. The fifth technique in the group, a state certificate to teach industrial arts, was classified as borderline. Each technique was used by from four to nine of the heads and deans as a determinant for admission to candidacy.

In general those techniques rated as of most value and also more often used as determinants for admission, selection and guidance to a program of graduate study, to candidacy for a master's degree in industrial arts education with thesis, and to candidacy for the degree without thesis, were located in the group labeled *contacts with university personnel.* Four in this group so classed were, in order of frequency, rating of competency by staff members, departmental recommendation to the Graduate School, departmental acceptance, and interviews with three staff members.

The second group in which the techniques were most often ranked

of high value and were also used by a fair number of men was that labeled *evidence of teaching ability.* The three considered of most value were advancement in profession, testimonials concerning teaching experience, and testimonials concerning general fitness for teaching.

Four techniques in the list under *evidence of adequate basic preparation* most frequently given higher ranks and also being used more often were an evaluation by an advisory committee, a preliminary comprehensive examination in the major field, a subject matter examination given by your faculty, and a test to determine an adequate grasp of the fundamentals of English usage.

The list of techniques suggested to determine *evidence of ability to complete the program* contained five which were more often in the upper ranks and again were more often in use by the men. The five were graduate grade average, undergraduate grade average, an intelligence or psychological examination given by your faculty, a written qualifying examination, and the Graduate Record Examination.

Few techniques listed under the heading of *personal factors* were said to be of most value as determinants, and, likewise, the techniques were in less use among the heads of departments and graduate deans. Only one, an experience record form, was said to be of most value by nearly three-fourths of the group. Three considered of some value were a physical examination, an interest test, and a certificate of good health.

CHAPTER IV

Summary and Conclusions

Central to the purposes of graduate study in the sixty-six institutions were the advanced training of students in their field of service and the promotion of research.

An observable pattern of admission practices and techniques of value in the selection and guidance of graduate students and candidates for the master's degree in industrial arts education was evolved.

It would be difficult to draft and recommend a set pattern of admission practices, selection techniques, or guidance procedures that would be commonly acceptable to and usable by all sixty-six colleges and universities which were included in this study.

There are certain existing ideas concerning admission to graduate study and selection techniques that may be brought together in a pattern, as follows:

1. The chief requirement for admission to graduate study in industrial arts education is a bachelor's degree with at least a minor in the field.
2. An application for admission to the graduate school must be submitted through the graduate dean.
3. Satisfactory preparation in industrial arts, foundation courses in education, and in general education equivalent to that required of undergraduates in the school should be shown.
4. Students may enter on full or regular status, on provisional or limited status, or on non-degree status.
5. The student should state his objective upon entering the school.
6. A satisfactory score on a preliminary or comprehensive examination must be made.
7. Approval by the industrial arts department to study in that department, as well as by the graduate dean, is required.
8. The appointment of an advisor and/or an advisory committee at an early stage of the student's progress is recommended.
9. Teaching experience before beginning graduate study is recommended.
10. A physical examination or presentation of a certificate of good health is recommended.

Admission to graduate study and admission to candidacy for the master's degree were two separate and distinct processes in the institutions covered in this study.

A pattern of requirements for admission to candidacy for a master's degree in industrial arts education would include the following:

1. A bachelor's degree with a major or minor in industrial arts education.
2. An acceptable pattern of study in undergraduate work.
3. A formal petition for admission to candidacy, carrying the approval of the department.
4. Full or regular graduate status before initiation of the petition for candidacy.
5. A minimum residence of one quarter or one semester before initiation of the petition.
6. A demonstration of the student's ability to do the quality of work desired at the graduate level.
7. A plan of study approved by the head of the department and by the graduate dean.
8. An approved outline of a thesis problem, or of a paper or project in lieu of the thesis.
9. A qualifying examination or a preliminary examination to demonstrate certain competencies thought desirable in a candidate for the degree.
10. A comprehensive examination, primarily for guidance purposes.
11. An examination to test the student's proficiency in the use of the English language.
12. Teaching experience, required by some and recommended by many institutions.

The following conclusions may be drawn from the data secured for this study:

1. Problems of selection, appraisal, retention, and guidance of graduate students are individual in nature. Each institution has problems peculiar to its own size and objectives; each, therefore, must set up its own solution to those problems. Fewer techniques for selection were being employed in the schools with smaller enrollments.

2. As complete a picture as possible of the graduate student should be secured through a minimum of techniques for selection. Already overworked faculty should not be bogged down with unnecessary details. If tests are used as techniques, a follow-up program is an essential part of the guidance process.

3. The particular selection devices to be used depend on the qualities, desirable in a graduate student or candidate for the master's degree, which are to be measured.

4. The scholastic record as an undergraduate student and as a graduate student continues to be the basic technique for admission to the graduate school, to candidacy for the degree, and as a determinant of ability to complete the program.

5. More attention should be given to the undergraduate preparation in industrial arts for those seeking candidacy for the master's degree. The master's degree in industrial arts education should indicate the holder is well grounded in the field.

6. The great bulk of enrollment in graduate study has been composed of those who were planning to teach. While the chief objective of graduate study in industrial arts education is the improvement of teaching, a second objective is the promotion of research. Programs for graduate students in industrial arts education should be geared to the objective (the professional destination) of the student, and student programs should be built around either objective.

7. Since one of the purposes of the graduate program is the improvement of teaching, more attention should be given to the needs of those who have that as their goal. However, sufficient research should be contained in such programs to demonstrate how truth may be established.

8. There should be no difference in caliber of students who follow either the option with thesis or one without thesis toward attainment of the master's degree. The master's degree, as its name implies, indicates mastery of something. Work at the master's level should be required.

9. In the interests of effective guidance, the graduate student should make his objective known at admission to graduate study.

10. An advisory committee should be appointed early in the student's progress and its functions well defined.

11. Contacts with college and university personnel continue to be most effective techniques for appraisal of the qualities of graduate students.

12. The department staff should review the qualities of each candidate before final approval for candidacy is given.

13. Age is a relatively minor factor in the pursuit of a graduate program and should be given little consideration when appraisal of the student is made. The older student, no doubt, wishes to improve his professional as well as his economic status and has, therefore, more clearly defined his objective for pursuing a graduate program.

14. Time since last school attendance and time since baccalaureate was conferred have little or no value as techniques for selection of graduate students. Experience gained during the elapsed time often more than compensates for the lack of continuous school attendance.

15. In line with the latter conclusion, since teaching experience is required in more and more institutions, it may be concluded that successful experience as a teacher should be required of the applicant seeking candidacy for the master's degree in industrial arts education.

16. Techniques concerning personal factors of the student are of doubtful value as determinants for the admission, selection and guidance of graduate students in industrial arts education.

17. Also of doubtful value as determinants for admission, selection and guidance of graduate students in industrial arts education are tests covering natural science, tests covering social science, a contemporary world affairs test, Miller Analogies Test, and test of ability to recognize logical fallacies.

18. No single technique or group of techniques for the selection and guidance of students have been discovered which may be used with entire confidence to forecast success in the graduate school.

19. On the basis of the evaluations given and the number of users among heads of industrial arts departments and graduate deans, the following techniques for selection and guidance of graduate students should prove to be most reliable as determinants for admission to graduate study, and for admission to candidacy for the master's degree in industrial arts education:

a) Contacts with university personnel:
   (1) Rating of competency by staff members.
   (2) Departmental recommendations to the Graduate School.
   (3) Departmental acceptance.
   (4) Interviews with three staff members.

b) Evidence of teaching ability:
   (1) Advancement in profession.
   (2) Testimonials concerning teaching experience.
   (3) Testimonials concerning general fitness for teaching.

c) Evidence of adequate basic preparation:
   (1) An evaluation by an advisory committee.
   (2) A preliminary comprehensive examination.
   (3) A subject matter examination given by your faculty.
   (4) A test to determine an adequate grasp of the fundamentals of English usage.

d) Evidence of ability to complete the program:

(1) Graduate grade average.
(2) Undergraduate grade average.
(3) An intelligence or psychological examination given by your faculty.
(4) A written qualifying examination.
(5) The Graduate Record Examination.

e) Personal Factors:
(1) An experience record form.
(2) A physical examination.
(3) An interest test.
(4) A certificate of good health.

It is, of course, perfectly obvious that certain of the techniques carry little positive weight unless combined with other techniques to determine the necessary qualities considered paramount to success in the graduate school. If a combination of techniques can be found to determine and measure even a fair number of desirable qualities which enable the counselor to guide the student to successful completion of a graduate program, then he may consider the combination successful. While the Utopian goal is to bat a thousand, it must be remembered that the "300" batter is regarded as a highly useful member of the team.

The graduate schools must continue their efforts to improve the reliability of existing techniques for selection and to develop multiple predictors so that they may make timely appraisal of a student's potential for success at a graduate level of work.

It is recommended that more emphasis be placed on individualized selection. The personal qualities of the student, his maturity and experience, his ability to reason, his perseverance and ardent pursuit of an objective are often more significant for purposes of retention than is his failure to have attained, or his attainment of, a high scholastic average in the undergraduate college.

Special attention should be given to the problems of selection of students which are peculiar to the program of industrial arts education.

A clear definition of "admission to candidacy" should be made and inserted in college and university catalogs so that a common interpretation may be made by all who read it.

There is a decided lack of information on prognosis of success in graduate study in industrial arts education. It is recommended that administrators be encouraged to publish their ideas and findings for the benefit of the graduate programs in the United States.

An Analysis of Textbook Emphases

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CHAPTER I

Introduction—The Problem Defined

In this age of the specialist the industrial arts teacher must be a general practitioner. While teachers in other fields may specialize in one subject area, industrial arts teachers should be familiar with at least three subject areas of industrial arts to be certified. Although these subject areas are related, they often contain diverse elements, and some of them are further subdivided into related material or trade categories. A strong background in general education and in professional teaching methods is also expected of the industrial arts teacher. If he teaches "general shop" he must supervise simultaneously different projects and the use of different tools and materials. Add to this the problem of the individual pupil in a flexible laboratory situation, and the enormity of the task often seems overwhelming. It is only through effective organization and constant diligence that the industrial arts teacher may operate his program. Probably one of the best available sources of aid is the textbook; yet the proper and appropriate use of textbooks may be one of the most neglected phases of teacher-education. An inquiry among teachers will seldom reveal anyone who has made a study of the use of textbooks as a part of his undergraduate education.

The textbook is no less a tool for teaching than the hammer, each of which serves a specific function. Industrial arts teacher-education develops skill in the use of hand tools. Frequently, however, it would appear that the proper use of textbooks is assumed to be an inherited trait among teachers. William H. Cartwright makes the following comment concerning the textbook:

> As a classroom tool the textbook serves three principal functions: to provide organization for the course, to supply a basic content, and to furnish common materials for learning. The organization is necessary and welcome to most teachers. To the alert teacher, however, it is not a limiting feature. Using the textbook only as a framework, he will expand portions or insert whole units in areas where he is particularly competent, where the local community can be utilized most effectively, where students express unusual interest, or where library materials are richest.[1]

To date, except for a few bibliographical compilations upon special subjects, industrial arts teaching personnel have not taken an inventory of the textbook tools available to the profession. In a recent statewide meeting of industrial arts teachers, two statements were made illustrating the state of confusion which exists concerning industrial arts textbooks. One statement was to the effect that an adequate supply of textbooks is available for industrial arts use. Later, an equally positive statement was made that there are very few textbooks available suited to industrial arts instruction. Evidently, one, or even both, of the individuals was guessing or misinformed.

The Problem

The illustration cited above pinpoints the central purposes of this study, which are to determine the status of the industrial arts textbook and its availability to the public schools. In order to determine the status of textbooks for industrial arts use a systematic approach must be made to the evaluation of status. Criteria must be established for the study to obtain an orderly and thorough analysis of textbook availability and to determine points of adequacy and failure. The study will be made with the following guiding purposes:

1. To determine adequacy of existing textbooks to meet the accepted emphases of industrial arts
2. To estimate adequacy of coverage of the subject areas taught under the classification of industrial arts
3. To discover which textbooks best meet the over-all objectives of industrial arts in each area of emphasis
4. To find the gaps or "vacuum pockets" which may exist in coverage of subject matter or in industrial arts emphases
5. To develop criteria for classifying industrial arts textbooks
6. To provide a suitable framework for appropriate industrial arts textbook content
7. To state a workable hypothesis of the relationship of industrial arts to industrial-vocational education for the purposes of this study

An assumption of the study is that publishers are able to select and recommend the industrial arts textbooks which they produce. Publishers were selected upon the basis of advertising in industrial arts periodicals and by cross checking bibliographies and references in textbooks and professional literature.

[1]William H. Cartwright, *How To Use a Textbook*, How to Do It Series, Number 2, pp. 1-2, Washington: National Counsel for the Social Studies, 1947.

Procedure

In order to provide a clear statement of the conditions existing in the industrial arts textbook field the following steps must be completed:

1. To develop appropriate classification categories in the light of a clear statement of position regarding the relationship of the objectives of industrial arts to those of industrial-vocational education
2. To evolve definitive criteria for determining classification
3. To examine textbooks available for school use in the area of industrial arts to determine:
   a. The emphases outlined by the aims of the author
   b. Subject-matter materials presented in each textbook
4. To tabulate the data for analytical purposes
5. To provide an analysis of the tabulated data
6. To interpret the data and draw pertinent implications and conclusions.

Definition of Terms

Industrial arts. A commonly accepted definition is one used by Wilber which defines industrial arts as "those phases of general education which deal with industry – its organization, materials, occupations, processes and products – and with the problems resulting from the industrial and technological nature of Society".[2] It is felt that Wilber's definition is satisfactory for the purposes of this study.

Industrial-vocational education as used in this study is synonymous with "specialized education" as defined by Good as follows: "Education that seeks to prepare individuals for specific types of occupations".[3]

Textbook as used in this study is defined as "any manual of instruction".[4]

Specialization is used to denote "education that seeks to prepare individuals for specific types of occupation"[5] and is used synonymously with industrial-vocational education.

Orientation as used in this study refers to general education content or materials designed to be used in industrial arts courses aimed

[2] Gordon O. Wilber, *Industrial Arts in General Education*, p. 2, Scranton: International Textbook Company, 1948.

[3] Carter V. Good, *Dictionary of Education*, p. 216, New York: McGraw-Hill Book Company, Inc., 1945.

[4] *Ibid.* p. 423.

[5] *Ibid.* p. 383.

at developing attitudes, abilities, behavior, and appreciations considered desirable by society and to enable the individual to locate himself in relation to his technological environment. The term is used interchangeably with the general-education concept of industrial arts as defined above.

Limitations of the Study

This study is not intended as an exhaustive study of the industrial arts textbook. Format, readability, and construction of the textbook are not considered. Similar general details have been treated in previous textbook research. This study does not cover all textbooks used in the field because to do so would involve many more books than could be accurately appraised in one study. Only those books are covered which textbook publishers define as industrial arts textbooks and which are now in current supply during the academic year 1952-1953, in order to limit the study to the currently available books which may best meet the requirements for industrial arts.

This study is further limited because it is the first of its kind in the industrial arts field. There are no sources of comparative data. Inability to secure outside validation may open the data to some criticism, especially when the data are subjective. The data used have been carefully scrutinized in an effort to maintain objectivity but it is subjective judgment and is subject to personal bias.

This is the first of a group of studies of textbooks which is to be made by the American Vocational Association in cooperation with other interested groups. Since this is a pilot study, one of its major tasks is to develop appropriate evaluative criteria and procedures. The development of these tools necessarily limits the scope of the study if reasonable bounds are to be maintained.

The number of subjects dealt with under the group title of industrial arts limits the size of the sample in some subject areas. Some areas contain as few as four books and the generalizations which may be drawn have limited validity, since one book may radically change the generalization. This is recognized as a limiting factor.

Generalizations concerning the total number of textbooks examined are also limited. The divergence of subjects and approaches to subject matter in individual books and groups are not comparable in many cases. Under these conditions generalizations for the entire group are seldom accurate or justifiable. Only generalizations which seem applicable are made for the entire sample.

While the philosophical and curricular concepts basic to this study are stated, no attempt is made to develop them or trace their history.

Other Studies

As far as can be determined, this is the first study of its kind in the field of industrial arts. It has been undertaken as the result of requests of representatives of both the Industrial Arts Section of the American Vocational Association, and the American Council on Industrial Arts Teacher Education, an affiliate of the American Industrial Arts Association. It is the first of three or more studies to be made concerning textbooks in industrial arts education.

Implications of the Study

Initially, the major purpose was to evaluate the status of the textbook as a means of determining need and adequacy in the textbook field. As a result of findings made in the process of developing criteria other implications have developed. The method of content factoring seems to be applicable to use as a selective criterion in choosing textbooks for use in the classroom and as a screening device for state, municipal and individual selection. The device seems particularly well adapted for use by committees seeking objective data concerning textbook content applicable to industrial arts. The instrument is also useful in describing textbooks, as it describes the content and basic approach of a textbook in one typewritten line. The system is not complicated and may be easily learned for selective purposes, making its use as a classification tool feasible. It is possible to select complementary textbooks that will insure good industrial arts coverage in almost any subject matter area with reference to emphases in the desired objectives of industrial arts. Further, the system discriminates between industrial arts and specialization or industrial-vocational textbooks.

To summarize the above statements: (1) the data have important implications for industrial arts personnel concerned with textbook selection and production, and (2) the classification system seems to meet a need for selecting textbooks for complementary purposes which have heretofore been purely subjective. The classification system may prove to have more immediate application in the field than the data collected through its use in this study.

Sources of Data

Data used in this study are taken from: (1) the one hundred fifty-two textbooks submitted by publishers of industrial arts textbooks, (2) the United States Office of Education, *The Biennial Survey of Education in the United States,*[6] (3) various periodicals and publica-

tions listed in the Bibliography, and (4) correspondence with publishers. The publishers were very cooperative in making their publications available for this study and in selecting the textbooks which they consider applicable to industrial arts.

Scope and Sequence of the Study

In this chapter the problem has been defined. Chapter II states the philosophic and curricular principles used as guides in this study and discusses the significance of the textbook in education. Chapter III develops and illustrates the application of criteria for textbook classification. Chapter IV presents and interprets the data of the study and provides conclusions drawn from the data. Chapter V gives general conclusions and makes recommendations.

[6]U. S. Office of Education, "Offerings and Enrollments in High School Subjects," *The Biennial Survey of Education in the United States*, Chapter 5, 1948-1950. Washington: Government Printing Office, 1951.

CHAPTER II

The Textbook and Education

Most writers of articles concerning textbook evaluation agree that philosophical and curricular implications govern the content and use of textbooks within all particular subject areas.

Ivan R. Waterman, Chief, Bureau of Textbooks and Publications, California State Department of Education, makes the following statement which seems to summarize the general opinion:

> Evaluation implies standards. Textbooks should be chosen in terms of the particular purposes they are expected to serve. It would be difficult indeed to make intelligent choices of textbooks without a definite set of standards.... The aims of instruction should govern the choice of books. Otherwise the result in practice is likely to be confusion, or even worse, the nature of the particular book will determine the aims and nature of the instruction. This is putting the cart before the horse. Following is a list of points relating to the purposes to be served and values to be derived by starting the procedure of textbook evaluation with a valid set of standards.
>
> 1. Criteria for textbook selection are an expression of educational philosophy with respect to teaching the subject under consideration.
> 2. The course of study should serve as a guide in developing a statement of the purposes and nature of the textbook.
> 3. The use of a set of standards forces an analytical approach to the problem, and tends to assure that the final judgment of relative merit will be based on comparison of the textbook on each and every important standard.
> 4. The use of a set of standards tends to eliminate hasty judgment based upon superficial examination and general observation.
> 5. The use of a set of standards assures that books will not be selected because of their excellence in a few traits, although they may be deficient in others.
> 6. The use of a set of standards provides the same basis of judgment for all judges.
> 7. The use of a set of standards furnishes a basis for objective comparison in determining the relative merits of the textbook.[7]

Waterman also makes the following observation concerning the sources of the evaluative criteria: "The chief sources of criteria for textbook evaluation is the literature on curriculum and on methods of instruction".[8] He also states that specific standards must be estab-

[7] Ivan R. Waterman, "When You Choose A Textbook", *Phi Delta Kappan*, XXXIII No. 5 (January, 1952) 256.

[8] *Ibid.* p. 256.

lished for each subject.

This study is not intended as an attempt to select textbooks for special purposes, but it does constitute an evaluation in terms of objectives. Objectives are the expressions of the purposes of the curriculum in terms of outcomes. The curriculum is an expression of philosophy; and method is the means to the end, – the guidance of activity leading to the realization of the objectives established by philosophy. All phases of the problem are concerned with philosophy and its implementation in the classroom or laboratory. Since philosophy is illusive and may not be observed directly, and since methods vary, the objectives or ends will be used in this study as the basis of evaluation of textbook emphases. This study is not intended for one particular situation; therefore, a synthesis of objectives from many sources will be used as the basis for standard criteria. No attempt is made to trace the development of philosophical abstractions, because it is felt that to do so would be like another sprint around a much-traveled racetrack. The trip would exercise the runner; however, the average result would not be changed. It is generally assumed that the builder of a house need not manufacture the bricks to use them intelligently. If the builder properly applies the size and strength of the materials he uses, the building is sound. This study uses the materials produced by others and draws implications from the characteristics of the materials. If an understanding of the process of manufacture is desired, the manufacturers should be consulted rather than the user; therefore, documentation will not be used. The following sources provide the background for the implications stated:

American Vocational Association. *A Statement of the Place and Function of Industrial Arts in Education.* A report prepared by the Industrial Arts Policy and Planning Committee of the American Vocational Association. Washington: American Vocational Association, 1952.

Bode, Boyd H. *How We Learn.* Boston: D. C. Heath and Company, 1933.

Dewey, John. *Democracy and Education.* New York: The Macmillan Company, 1916.

Dewey, John. *How We Learn.* Boston: D. C. Heath and Company, 1933.

Educational Policies Commission. *Education for All American Youth, A Further Look.* Washington: National Education Association, Rev. edition, 1952.

Kelley, Earl C. *Education for What is Real.* New York: Harper and Brothers Publishers, 1947.

Kelley, Earl C. *The Workshop Way of Learning.* New York: Harper and Brothers Publishers, 1951.

Keller, Franklin J. *Principles of Vocational Education.* Boston: D. C. Heath and Company, 1948.

Rugg, Harold. *Foundations for American Education.* Yonkers-On-Hudson, New York: World Book Company, 1947.

State Committee on Coordination and Development, William E. Warner, et al. *A Prospectus For Industrial Arts in Ohio.* Columbus, Ohio: Ohio Education Association, 1934.

Wilber, Gordon O. *Industrial Arts In General Education.* Scranton, Pennsylvania: International Textbook Company, 1948.

Williams, Walter R., et al. *Florida Presents a Guide to the New Technology in Industrial Arts.* Bulletin No. 12, 2nd edition. Tallahassee, Florida: State Department of Education, 1948.

In order to orientate the reader to the philosophical and curricular assumptions made in this study, a series of general rather than specific industrial arts principles will be stated.

The Organic Theory of Education

The organic theory of education is accepted as basic to this study. If all education is one organic entity, the parts (subject areas) take their cues from the purposes of the whole. Thus, activities in the member parts have meaning only when related to the whole. The end of all education is the well integrated and organized individual; therefore, all units in education should contribute to this end. The specific implications for this study are:

1. Industrial arts must be justified not as a subject area but as a part of the educational whole. Industrial arts must be justified for inclusion in the curriculum by the nature of society and the needs of the individual for orientation to that society in order that he may become an intelligent participant.

2. There can be no disjunction between industrial arts and industrial-vocational education, since each takes its direction from the whole. This implies that the two divisions must be considered as a division of labor and not as warring elements. Under this philosophy all factors must be reconciled, since no other arrangement is compatible with the unity theory.

3. Textbooks and other materials must serve as tools to educate toward the end of all education and are diffentiated only by a division of labor. The nature of the task to be performed establishes the content and approach of the textbook.

4. Education is the end – not subject matter. To consider subject

matter as an end violates the organic concept of education in that perception is based upon a closed system which finds its relationships internally and not with the whole of education. The experience or reconstruction theory of education is also violated if subject matter is considered as an end and internal reference is used for authority.

5. Orientation to a technological society is not achieved through a study of technology in a vacuum. Orientation to the American way of life is achieved through developing relationships between the individual and his entire environment and among objects and ideas in the American culture. Industrial arts as the instrument for achieving a particular phase of orientation must be related to work in other subject areas and particularly to general education content.

The Learning Process

The following implications from current educational theories and interpretations concerning the nature of the learning process are accepted for this study:

1. All learning takes place as the result of activity. Therefore the following may be assumed:
   a. Textbooks should contain suggestions for activities, projects, experiments, field trips, collection of data, et cetera, as materials leading to learning.
   b. General and technical information should be directly applicable to the activities, since information best becomes knowledge through application within concrete situations.
   c. Activities should have many common applications, since transfer of learning is possible only through the existence of common elements in the different situations or problems. General and technical information should be integrated within the text rather than "added on".
   d. The knowledge gained through activity should be the basis of abstractions. Generalizations should be drawn from concrete situations.
2. Reflective thought is a necessary part of the learning situation; therefore:
   a. Projects and problems should be in the form of problems and not in the form of simple directions of "how to do".
   b. Projects and problems should require the use of both familiar and new information if learning is to progress.
   c. Projects and problems must lead into new fields of thought.
   d. Projects and problems must require time and development. One thing must lead to another and provide for consecutively ordered activities.

e. Subject matter "set up to be learned" is of doubtful value, since thought is not required without applications.

f. Activity for the sake of activity is a poor learning situation because it calls for little or no reflective thinking.

g. Reflective thinking without motivation is impossible. The problems and projects must create interest if learning is to be most efficient. Interest should be related to process.

h. Text material should be organized as to encourage the development of creative thought – the applications of principles to new production and to new uses of materials and products.

3. The scientific attitude is necessary for learning. The "open mind" is necessary for the "reconstruction of experience" since the closed mind prevents change or reconstruction.

a. Books should present subject matter as the experience of the author, to be subject to revision in the light of new evidence.

b. No "one best way" should be presented to the exclusion of other ways.

c. Learning should not be forced. Imposition of the will of the teacher upon the pupil often closes the mind of the learner.

d. Orderly procedures should be stressed but should not be used to constrict learning. Scientific method should be used as an aid to ordered thought and process and not as a standard pattern.

e. Evidence should be presented for alternate choices. Ready-made solutions relieve the learner of all responsibility for choice and do not lead to independent and creative thought.

f. Mistakes should be expected and should be utilized as directives to the evaluation of situations and as stimuli to inventiveness. Reevaluation and new trials are frequently valuable as learning situations and should serve as a spur to accomplishment. Mistakes may be a part of the procedure of scientific method.

4. The evidence that learning has taken place is the changed behavior pattern. "Reconstruction of experience" causes the learner to act differently.

a. Objectives should be stated in terms of expected behavior changes in order to facilitate observation.

b. Materials selected for the learning situation should be those that will change behavior in a desirable direction.

c. All tests for learning should be based upon changed behavior.

d. Evaluation of the learning process is a learning situation in which the student evaluates in terms of his original objective.

Success and failure depends upon the achievement of student and teacher objectives as agreed upon and not by comparison to a set standard. The student should be able to justify all statements concerning his judgments by evidence.

5. Democratic procedures and processes should be used in the education of a democratic society.

a. Respect for the individual must be maintained. Individual differences must be provided for through flexible programs and through the use of suitable flexible textbook materials.

b. The teacher is a status leader by virtue of experience and superior knowledge and not by authority. Loyalty should be directed to truth and to principle. Textbooks should direct their approach toward creating respect for truth and principles as derived from sound evidence and should not take an authoritative approach to subject matter.

c. Democratic procedures and processes should be practiced in all class activities.

(1) Decisions concerning group activities may be best based upon group consensus if all students are to participate purposefully.

(2) Textbooks should provide for democratic group activities.

(3) Materials in textbooks should have group appeal if they are to be used by a group.

(4) Textbooks should focus upon democratic principles and processes.

d. Democratic process in class work should be related to democratic process in real-life situations.

6. Interest or motivation is necessary for learning.

a. Probjcts and problems must have intrinsic worth. The problem must be worth solving – must be something valuable to life.

b. Reflective thinking without motivation is impossible. The process as well as the product should be interesting in order to produce effective motives for learning.

c. Successful participation insures interest and future participation. Textbooks should present problems and projects suited to the age level and general ability of the students for whom they are written.

d. The learner should be a student of his own progress. Textbooks should provide means for evaluating student progress in terms that students understand.

e. Students should be allowed to plan their activities whenever

practical. Textbooks should provide instruction in planning. Creativity should be encouraged.

Relationships of Industrial Arts and Industrial-Vocational Education

The relationship between industrial arts and industrial-vocational education presents a particular problem for this study because of the overlapping nature of the two in subject matter areas and the consequent confusion that exists in textbooks and among professional personnel. The discussion that follows is based upon the principles stated previously.

Industrial arts and industrial-vocational education are related to each other and to the whole of education. Coordination of purpose should be determined in the light of the total purpose of all education – to achieve the developmental ends of the individual in an organized society. Since the two are concerned in some way with this end, the only efficient way to operate is by a division of labor. Efficient division of labor implies definition of function. This definition should relate to the natural function of each and should not be arbitrary or artificial.

Comparison and contrast may be used to show the natural bases of division of the two areas. Industrial arts has become associated with general education. This can be illustrated through an examination of any recent professional textbook on the subject. As general education, industrial arts seeks to orientate youth to industrial or technological society. This exploration is achieved through a two-stage process. The "overview" is the function of junior high school work and is associated with the general comprehensive shop. The testing of special interest and exploration in semi-specialized work is usually given at the senior high level in the unit shop or the general unit shop. If industrial arts coursework were confined to junior high s, schools, there would be little confusion between the functions of the areas. The confusion is a development growing out of the close similarities of industrial arts and industrial-vocational education at senior high school levels. The technical high school generally is organized for grades ten through twelve. Industrial arts at this level is usually elective and is concerned with semi-specialized exploration for the development of concepts of more advanced techniques used in industry. Industrial-vocational education at this level is also concerned with exploration to discover particular aptitudes, to develop general skills, and to provide tryout for guidance purposes. To the uninitiated, the two branches apparently treat the same materials for the same purposes. It should be noted that the "pale carbon copy"

idea of industrial arts is a natural product of this situation. At this point is is frequently assumed that industrial arts is a "junior vocational program" and should assume the role of feeder to the industrial-vocational program. If industrial-vocational education is to build from the foundation established by industrial arts, it is only one step further to the assumption that industrial arts should be controlled by industrial-vocational personnel. The fallacy in this reasoning is that all factors have not been considered. The evidence is selected and weighted in order to reach a premeditated conclusion. All contrary evidence is avoided.

The evidence which has not been considered in making this apparently logical conclusion may be summarized as follows: First, industrial arts is taken by approximately one student in four in all high schools.[9] Less than one out of ten students are enrolled in industrial-vocational education.[10] This means that approximately seven out of twenty students now taking industrial arts might be expected to continue in industrial-vocational education, or seven out of each one hundred enrolled in all subjects in grades nine through twelve. If related subjects are not counted as industrial-vocational education, the ratio is materially decreased, being approximately one for each five students taking industrial arts, or less than five in each one hundred students enrolled in the last four years of high school. To give supervisory functions to industrial-vocational education personnel is analogous to the tail wagging the dog.

The second basic factor that has been neglected in the matter of degree of emphasis. It is assumed that each area places equal emphasis upon each of the functions commonly served. This is not the case, however. Industrial arts treats exploration and orientation as an end. Industrial-vocational education uses orientational materials, but the emphasis is upon the orientation of the "worker to industry" and the amount of orientation to technological society is negligible. The efficient worker is primary; orientation to live in a technical society is secondary. Time allotted to industrial arts is usually five periods per week. It is inconceivable that a skilled worker could be produced in the time spent in class activities. In industrial-vocational education the practice is to allot at least fifteen periods a week to the development of skills in a trade.

Materials selected are a third neglected factor. Specialization materials are selected to produce saleable skills. To be saleable the

[9] U. S. Office of Education, *op. cit.* p. 18.
[10] U. S. Office of Education, *op. cit.* p. 19.

skills must be those immediately usable in industry. Transfer of thinking is of little concern. The central purpose is to produce a worker who thinks well in one particular area and who knows the tricks of the trade. Industrial arts materials should be applicable to many situations and should be taught for the purpose of giving general experiences at the senior high school level.

A fourth situation, which has not been taken into account by showing the like and unlike factors, is that industrial arts programs and industrial-vocational education programs are seldom provided in one school. This particular situation produces a vacuum into which the existent program is drawn. Industrial arts programs attempt to perform some of the functions of the industrial-vocational program in the name of needs. Industrial-vocational programs provide more orientational emphasis because of the need. In view of the fact that the two exist together in only a few large city situations, overlapping is a general condition and the consequent confusion is multiplied. To operate efficiently and without confused outlook both programs must operate simultaneously and within bounds. Industrial arts should provide orientation for all youth. Industrial arts should utilize the senior high school program as a tryout program for guidance and for development of industrial concepts. This program should be an elective through guidance and should enable the student to evaluate his potential interest and ability in a trade. Evaluation of this experience should help the student in deciding upon a future vocation. When vocational choice has been made, the student should have the opportunity of electing a vocational program in which he may develop saleable entry skills for his chosen industrial field. In this way the industrial arts program may serve as a feeder program for industrial-vocational education; not as an agency to be controlled by the program being fed, but as a referal agency. The matter of control of industrial arts by industrial-vocational education is a debated problem. Control can be effected only through the body of education as it seeks to integrate and coordinate all effort for the good of the individual student. If both divisions dealing with industrial education become aware of their true function in the organic concept of education, there is no real difference that cannot be satisfactorily resolved. There is no justification for a divisive theory of education except for purposes of guaranteeing proportional emphasis. There are no disjunctive alternatives between industrial arts and trade education. The disjunctive alternative is only an appartition or a lack of insight into education as a unified whole. It is the result of seeing the part as an entity rather than as a portion of the pattern in the "field". It is only as industrial arts or

trade education is seen against the *total field of education as life,* taking its cues from the nature of the *organism* learning and living in socially *organized* units that either may be perceived in its relationship to other members making up the pattern or to the *field as a whole.* Divisive elements are often the result of ideational nearsightedness upon the part of many specialists. If education is to become what it should be, every member of the teaching profession must be fitted with bifocal vision. Perspective cannot be gained by seeing only the near element. "Perception sets reality." Until all parts of the picture are related, perception does not approach reality. The elements must be seen from several viewpoints.

When, and if, the comprehensive high school becomes common, the two areas can be expected to find definition upon orientation and specialization. If both programs are included in every school, division of labor and efficiency will be achieved by allotting all orientation to industrial arts and allotting all special trade education to industrial-vocational education. This basis is used to establish the criteria in this study for differentiating between industrial arts and industrial-vocational materials.

The Role of the Textbook

Professional literature has been both friendly and hostile to the textbook. According to some writers it might be assumed that the textbook as a useful tool in education is on the way out. "Dry as dust" textbooks, the "lockstep of the textbook" and other such phrases are often evidence of attempts to place the blame for poor teaching and learning. The textbook is said to "restrict the teacher and confine the pupil, to formalize the organization and stultify the procedure, to narrow the viewpoint and deaden the interest, to instill an awe of the printed word, and to freeze the content of the curriculum".[11]

Cartwright identifies the textbook critics as follows:

> Textbook critics are of three principal classes: those who ignore the advances which have been made during the past generation in selecting, grading, and in organizing textbook content; ultra-progressives, who do not believe in a fixed curriculum because they think there are no facts or ideas of enduring value; and those who seem to believe that the typical overburdened American teacher can in a comparatively short time, dash off a course of study and round up materials which will provide a better basis for instruction than a textbook does.[12]

[11] William H. Cartwright, *How to Use a Textbook,* How to Do It Series, Number 2, p. 5, Washington: National Council for the Social Studies, 1947.
[12] *Ibid.* p. 6.

Many statements have been written in answer to the critics of the textbook. Several quotations will give the gist of the defense.

Hollis Caswell states, "From the long view, textbooks have played and most likely will continue to play a highly important role in instruction."[13]

In a slightly different vein, Donald Durrel, Professor of Education, Boston University, remarks, "Textbooks may become the basis for blind regimentation, but even then the teacher stupid enough to let this happen would probably do worse without textbooks".[14]

E. R. Jobe, Executive Secretary of the Mississippi State Board of Trustees of Higher Institutions of Learning, makes the following observation:

> The place of the textbook in the American public is as secure today as it was in the days when promotion of students was from book to book, and when the quality of a recitation was judged upon how closely it followed the words of the text.... The time honored tool of the teacher, though used differently today, is still a prime factor in the efficiency of the public schools in educating the masses of the people. Because of the organization and completeness of subject matter provided in the text, the time provided for the recitation may be used in critical analysis, in application of principles, in discussion, in independent thinking, in whatever way that the teacher may plan since he is relieved of the necessity of imparting the basic information.[15]

The quotations cited are only a few which illustrate a cross section of viewpoint. The citations are not proof but serve to show the types of evidence available.

The Function of the Textbook

The textbook has been compared to a tool. The skill with which a tool is used determines the quality of the product. The way the textbook is used determines to a large extent the quality of the educational product of the school. It is not a simple tool to use efficiently. Methods teachers in teacher education institutions frequently spend their time with other matter, or emphasize methods of teaching without the use of textbooks. The fact that many teachers blame the textbook for personal ignorance should cause little surprise. The novice is seldom able to use an unfamiliar tool and perform a creditable job. The teacher should be as skilled in the use of textbooks as a carpenter is in the use of a rule. Most of the literature on textbooks is

[13] "What are Textbooks For?", A Symposium, *Phi Delta Kappan*, Vol. XXXIII No. 5, (January, 1952), 242.
[14] *Ibid.*, p. 243.
[15] *Ibid.*, p. 243.

concerned with criticism of textbooks, defense of textbooks, and with evaluation of textbooks. There are, however, a few articles and reports dealing with their use.

The Purpose of the Textbook

Caswell gives the following purposes of the textbook:

> Textbooks should serve as an aid to teaching. They should provide the common body of source material most needed by pupils studying specified fields of problems. They should be organized in a form that facilitates their use by teachers with various levels of skill—those who are incapable of planning the broad outlines of a program and those who do not have competent curriculum leadership available to help them to do so, and those who are able to sense the needs of a particular group of children so fully, and who know the fields upon which they draw so well, that they can tailor make the program for each class, giving them what they most need.[16]

Paul R. Hanna, Professor of Education at Stanford, cites two main purposes of textbooks:

> (1) It is an organized presentation of some core of knowledge: and (2) It is an instrument by which the reader is helped to observe his own experiences in the world about him and from such observation to organize his own system of ideas and to shape his own attitudes about the subject at hand.... Modern psychology has finally convinced most educators that, unless a textbook simultaneously carries both purposes forward, for the great majority of learners at least, little desired change in behavior will result from the use of the textbook.[17]

The Use of the Textbook

The textbook must be used intelligently if it is to serve the purposes for which it is intended. The textbook should not be followed slavishly; neither should it be discarded. The textbook is an aid to learning, a support for the course of study. Criticisms aimed at textbooks have come largely as a result of the overuse of the textbook. The course of study is an organized plan for coordinating all of the learning activities which go into the learning processes. Other activities may include field trips, motion pictures, recordings, surveys, demonstrations, projects, dramatizations and other aids to learning. The textbook is one of the more important sources of information, yet it is not a substitute for other activities, and in no case is it a substitute for the course of study.

[16] "What Are Textbooks For?" *op. cit.*, p. 243.
[17] *Ibid.*, p. 298-299.

The teacher's responsibility in textbook use does not end with delivery of the textbook to the pupil. The teacher should be thoroughly familiar with the content. He should know something about the publishers and the author, how the book is intended to be used, what the materials of the book are, how it is written, the teaching aids which are provided, and whether or not the book is one of a series. If the book is a series edition, something should be known about the other books in the series. The reading level of the text should be known. Reading and concept difficulties are frequently the keys to poor learning. Appropriate word level will not compensate for concepts which are foreign to the children using the book.

The teacher should do more than know the nature of the textbook; he should take time to make the child aware of the needs met by the book and of the study aids provided. Special attention should be given to appropriate ways for studying the book, and to the use of review and testing aids when they are provided. The child should also be taught to interpret and use materials in graphic forms. Much of the information provided in books is often presented through these aids.

Limitations of Textbooks

The intelligent teacher does not use the textbook as a substitute for teaching or for organized classwork. Textbooks are most often written for use on a national scale and may not meet some of the local needs. Teachers should be alert to these needs and should make provisions for them by supplementing the text with other written materials, with field trips, and with visual aids. Textbooks often contain sections that are not particularly suited for use in the class which the teacher has planned. The teacher should omit these sections or provide supplements from other sources. Books often are not up-to-date in content and must be supplemented with more recent materials from periodicals or more recent books. The teacher must also be alert to the differences in children's reading and comprehension abilities and should provide other books appropriate to the educational level of the child.

Choosing a Textbook

The literature on the textbook is rich with materials telling how to choose a textbook for use and for adoption by schools. These suggestions range from the ridiculous to well developed methods. In choosing a book, the method is comparable to the method of choosing any other consumer item. The final choice depends largely upon per-

sonal needs and comparative qualities. The American Textbook Publishers Institute gives the following suggestions:

1. Look for books whose teaching aims are in harmony with your own.
2. Be sure the book does well what it claims to do.
3. If a compromise must be made, select the book that does the job that it claims to do.
4. Try the book on yourself. "Take the course" or at least enough of it to see how it works.
   a. How good is the author's teaching program?
   b. How well does he visualize the classroom scene?
   c. Does he visualize what children can and like to do?
   d. Does each step in the book drive toward the goals you would like to achieve?
   e. Does the author give materials appropriate to the learners that will be in your class?
      (1) Will the child understand the language used?
      (2) Has he anticipated the children's reactions?
   f. Does the author make the materials personal for the child? Does he "talk down" or over simplify?
   g. What about the use of visual aids – pictures, cartoons, diagrams, maps, graphs, charts? Do they really teach? Are they just added on?
   h. Does he provide for frequent breathing spells? For discussions? Does he make suggestions that take the class completely out of the book? Are suggestions made for outside readings? For dramatizations? For research? Are the activities practical for the class and for you?
   i. Does the author provide for individual differences?
5. Try out the book on your class in the way that the author intended it to be used. This will give you the final proof for selection. To give it a fair trial you should:
   a. Read the directions for use.
   b. Follow the directions carefully.[18]

Ivan R. Waterman in an article entitled "When You Choose A Textbook" gives the following four steps in choosing a textbook:

1. Formulate a set of criteria or standards by which the textbook under consideration may be judged.

[18] The American Textbooks Publishers Institute, *Textbooks in Education*, Gilbert Loveland, editor. New York: The American Textbook Publishing Institute, 1949, pp. 85-92.

2. Construct a score card assigning numerical values to the several items of the criteria in accordance with their relative values.
3. Conduct comparative studies, objective in nature so far as possible, to determine the relative merits of the several books on each item of the criteria.
4. Rate the books.[19]

The advantage of using a set of standards are given at the beginning of this chapter. It should be pointed out that it is necessary to develop standards in each subject area because general standards often do not apply fully to special subjects.

The following six points for judging textbooks appeared in an article prepared by The American Textbook Publishers Institute.

1. Date of copyright – Books reflect the climate of opinion at the time they were written.
2. Fair criticism – Material should be considered in terms of subject matter and author's intent.
3. Context – Materials should not be criticized out of context. Materials should be considered as a whole.
4. Effect on the pupil – Materials should be considered in terms of producing insight and understanding in the student.
5. Intended use – Materials should be considered in terms of its use for authoritive or evaluative purposes in the school.
6. Bias – Materials should be considered in terms of the bias of the whole book.[20]

Choosing Supplementary Textbooks

Cartwright makes the following comments concerning the choice and use of complementary textbooks.

> Most teachers use a single book as a text, but some prefer to use several textbooks, believing that in this way the student is exposed to different viewpoints and emphases. There is some question as to whether more is not lost than gained by the latter practice. The similarities among textbooks are more important than the differences. This is necessarily so because competing books are intended to serve the same purposes for the same readers. It is little wonder that the student who is required to reread the same account several times, whether in one textbook or many, soon learns to hate subject matter.... Another argument against the "multiple-textbook method" is that, to a considerable extent, it defeats the organization purpose of the textbook.[21]

[19] Ivan R. Waterman, "When You Choose a Textbook," *Phi Delta Kappan*, Vol. XXXIII No. 5 (January, 1952), 267.

[20] American Textbook Publishers Institute, "Six Tests of Textbooks". *American School Board Journal*, Vol. 122, No. 6. (June, 1951), p. 25.

[21] Cartwright, *op. cit.*, p. 6.

Supplementary texts should be chosen in the light of need and not to secure a large variety of materials. Textbooks for supplementing should:

1. Contain emphases not included in the textbook chosen.
2. Meet different reading and concept levels
3. Contain reference materials not available in other books
4. Contain materials for "updating" the textbook used
5. Contain different methods for comparative purposes
6. Meet individual needs of superior and subnormal children.

In summary, the primary value of the complementary textbook is to give a complete treatment of subject matter and to aid in achieving all pertinent objectives of the courses. It should be considered as additional material to be organized in the "course of study" outline and not as a second course of study or a duplicate textbook. Supplementary textbooks should be used in the same way that the reference library is used and not as core materials.

CHAPTER III

Classification of Industrial Arts Textbooks

The classification of textbooks for industrial arts use is at present a very difficult task for several reasons. Probably the most confusing element of the task is the nature of industrial arts subject matter. Industrial arts includes a complex of many trade and industrial related subjects. An examination of *The Biennial Report of The U. S. Office of Education, 1948 - 1949*[22] reveals the following facts:

1. Industrial arts as reported consists of eight different major categories. These are: (in order of popularity) general shop, woodworking, mechanical drawing, metalwork, printing, electrical work, handcrafts and automobile mechanics.
2. Certain minor categories are reported. Examples are home mechanics, photography, ceramics, mathematics, plastics, et cetera. These constitute less than one-half of one percent of the total offering in industrial arts.
3. The major categories are often composed of several subdivisions. For example, metal work is composed of general metals, machine shop, sheet metal, foundry, forging, welding, et cetera, which correspond to trades within the general area.
4. Comprehensive general shop, as reported, may be composed of any combination of the separately reported categories.

The textbooks submitted for this study also serve to illustrate the complexity of subject matter. The following subjects are dealt with by books provided by textbook publishers for industrial arts use: Automobile mechanics, art metals, ceramics, drawing, electricity, foundry, general crafts, general metals, general references (materials, processes, shop safety and finishing), printing, home mechanics, leathercraft, machine shop, plastics, sheet metals, welding, forging, and woodworking.

In addition to the multiplicity of subject matter, the complexity of the task is compounded by the lack of standard classification categories. In one situation ceramics may be considered as only pottery. In another situation ceramics may include pottery making, concrete

[22] U. S. Office of Education, *op. cit.*, pp. 63-64.

work, keene cement work, brick making, the use of plastics and the use of glass. Graphic arts may be used to designate hand composition only, or, it may incorporate printing, silk screen work, linoleum block printing, bookbinding and other related subjects.

A third confusing factor is the relationship between industrial arts work and industrial-vocational education. The two areas have reached no agreement upon basic relationships. It is true that many statements have been issued by members of each area, but no agreement has been achieved. This element has been discussed in Chapter II.

A fourth factor leading to the difficulty of classification is the lack of basic agreements within the ranks of industrial arts teachers as to philosophy and curricular principles for the subject area. Relationships to education as a whole, to the learner, to the supporting society, and to other subject matter areas have not been generally agreed upon by industrial arts teaching personnel, and certainly no agreement has been reached with personnel in other areas.

A fifth confusing factor is the way in which textbooks are classified by publishers. In general, they classify all textbooks dealing with trades and industries under one broad classification. Books are classified as "technical", "trades", or may be classified by subject titles, as "woodworking" or "machine shop". An examination of almost any publisher's catalogue will illustrate this condition. Books suitable for engineering will be found in the same classification with those suitable for elementary craft work.

A sixth factor is the lack of textbooks prepared specifically for industrial arts use. The need for textbooks has been met by using textbooks from other fields. This is particularly evident from an examination of the authors' prefaces to the textbooks submitted for this study. Table 2 shows that only 24.4 percent of the books submitted are, according to the statements by the authors represented, especially designed for industrial arts use. This figure should be considered in relation to the assumption that the books submitted are the best industrial arts textbooks in the field, since publishers were asked to submit industrial arts texts and were not asked to submit books by titles or subjects. For this reason the percentage is suspected of being much higher than that which an examination of all books being used by industrial arts classes would reveal. The textbooks which are most frequently adopted or adapted deal with industrial-vocational education, crafts or avocation, and engineering. Books from the last named area are used particularly in college work. French's *Engineering Drawing* is probably the classic example of this type of "borrowing".

Some of the authors label their products for both industrial arts and industrial-vocational education. A count reveals that, of the books covered by this study, 6.6 percent fall into this category. If this figure is added to that for industrial arts (24.4), the books written for industrial arts amount to approximately one-third of those examined. Specialization accounts for 16.5 percent of the books, 25.6 percent are directed to crafts and avocational use, and 27.0 percent are not directed to any particular use. These figures show that statements by authors cannot be used as a means of satisfactorily classifying textbooks.

The foregoing statements and illustrations are given as a background to show the complexity of the problem and to show the need for a methodical way in which the classify textbooks so that intelligent selection of textbooks suitable for each particular use may be made.

Comparisons of Industrial Arts and Industrial-Vocational Textbooks

The crucial issue in textbook classification is the separation of industrial arts and industrial-vocational textbooks. This issue must be decided upon the bases of definition, philosophy, and the closely related matters of method and curriculum. The relationships which exist between the two areas as well as the differences have been shown in Chapter II. Textbooks written by liberal industrial-vocational writers as beginning treatments and those written by thorough going industrial arts writers are indistinguishable through an analytic approach. If content is used as the criterion of acceptability, these books may be considered as usable in either field.

Moving away from this point of agreement in either direction, the materials become progressively different in content and in emphases. Beginning courses for industrial arts and advanced specialization courses for industrial-vocational education show very little resemblance to each other except for treatment of common subjects. The industrial-vocational specialization materials contain very little content other than that suited for learning to perform the technical skills of a trade. Emphasis is upon saleable skills. The related information is for achieving expertness and not for understanding the contribution of the trade to social or cultural values. Operations and procedures are definite step-by-step activities taken from job analyses. The tools and machinery described are identical to those used in industry.

Differences become more pronounced as industrial arts materials developed for junior high school use are examined. The popularity of industrial arts courses in junior high schools throughout the United States is a result of the need for exploratory experiences at the junior

high school level and has caused materials to be developed for industrial arts which are exploratory or orientational in nature. This area represents a large part of all industrial arts work in the schools. According to the United States Office of Education, 48.2 percent of all junior high school pupils were enrolled in industrial arts classes in the 1948-1949 school year.[23] The materials developed for the use of junior high schools are characterized by a high proportion of related information dealing with occupations, the interpretation of the nature of our culture, historical development of industry, civic and social development of youth, and with the development of recreational and hobby interests. All materials do not contain all of these emphases but generally some of them are present.

Resolving the problem of separation of industrial arts and industrial-vocational materials hinges upon the differences rather than the relationships. Industrial arts materials may have specialization emphasis, but neglect of the general education materials invalidates textbooks for inclusion in industrial arts categories for other than reference purposes. Specialization materials may have general education emphases included without destroying their usefulness for vocational-industrial education; in fact, the liberal vocational-industrial author will include materials of this type. The inclusion of specialization emphasis, the inclusion of a strong technical information treatment, and strong emphasis upon operations and procedures fill the requirements for industrial-vocational specialization.

The Crafts or Avocational Textbook

The adoption of, or adaptation, of crafts books presents another problem for this study. These books are written neither for industrial arts nor for industrial-vocational education. The use of these books in either approach is questionable, since the materials often are not suitable. The crafts approach stresses "how to do" and does not give proper emphasis to technical information or general information, and seldom includes general education materials. The avocational and manipulative objectives of industrial arts may be achieved through the use of this approach; however, it is very unlikely that any course is justifiable upon this basis alone. It must be assumed that a strong industrial arts program will supplement these books if they are used at all. Some of these books may prove valuable for references, and in a few cases they contain sufficient general education content to warrant their use in industrial arts.

[23] The U. S. Office of Education, *op. cit.*, p. 19.

Subject Areas

The major subject areas will be designated by titles as reported by the United States Office of Education[24] as follows:

1. General Shop
2. Woodworking
3. Mechanical Drawing
4. Metalwork
5. Printing
6. Electrical Work
7. Handcrafts
8. Automobile Mechanics

Minor areas will use classification titles from this report as follows:

1. Home Mechanics
2. Photography
3. Ceramics
4. Industrial Arts Mathematics
5. Plastics

Objectives of Industrial Arts

Nine categories are used to designate the objectives of industrial arts which textbooks may be expected to achieve if the materials are used as the textbook directs. This may seem to imply that good method and teaching organized around a textbook are synonymous. This is not the intent of the statement. The assumption is that judgment must be made in terms of intended use and not by a preconceived standard of classroom method.

A second assumption is made that all competent teachers and textbook writers should be concerned with the achievement of over-all objectives of industrial arts. These assumptions may not seem compatible to the careful reader, because in one case the viewpoint of the author is considered as very pertinent and in the next an outside criterion is used. Perhaps an analogy is the best means of explaining this conflict and of showing the underlying logic. In the building trade division of labor is used. The carpenter works with wood, the mason with brick and mortar, and the painter with paints and finishing materials. The architect is responsible for overall planning and with specifications for the structure. The end is a structure with certain characteristics. In order to obtain the finished product all concerned work with their respective materials conforming to the general plan, and

[24] U. S. Office of Education, *op. cit.*, pp. 63-64.

specifications of the architect who has deduced these requirements from the end product desired. Each workman works in his own way to achieve results which are acceptable or which meet standard specifications. Ends to be achieved are dictated by the general plan; how the ends (objectives) are achieved depends upon the methods best suited to the workman. It makes little difference whether the carpenter uses the saw with his left or right hand; the fit is the important factor in the situation. Whether the teacher uses a demonstration or a project is not too important; it is the learning which occurs that is important. Learning and achievement of objectives are synonymous.

The nine objectives used in this study have been derived by a process of reducing various statements to nine "common denominators" or objectives. Fifteen statements of objectives taken from the professional literature in the field of industrial arts were recorded on cards. Statements of objectives were divided into single factors or objectives and each placed upon a card. The cards were then arranged in trial groupings for homogeneous emphases. Each group was summarized into a composite objective stating the particular single emphasis of the group. Statements which were not in harmony with the single objectives were removed and placed in new groupings to achieve a complete set of unique statements or objectives. By trial and error process overlappings and incongruences were eliminated. The final result was then checked against a statement of objectives found in the *Evaluative Criteria*,[25] for both completeness and intent. Definitions of the objectives were obtained by an examination of the original statements used in forming the composites, and by analyses of the factors which are found in textbooks for achieving objectives. These factors were derived by deduction, but they were tested by trials upon various textbooks to ascertain whether the factors could be identified in textbooks, whether these factors were consistently found in books, and whether overlappings and ambiguities were present. By a process of trial and error the following definitive factors emerged:

Objectives	*Definitive factors*
A. Manipulation	1. Tool descriptions
	2. Operations and procedures
	3. Material descriptions
	4. Projects and problems

[25]Cooperative Study of Secondary-School Standards, *Evaluative Criteria*, Section D-9, pp. 123-127, Washington: Cooperative Study of Secondary-School Standards, 1950.

B. Technical Skill and Knowledge	The factors contained in the objective of manipulation plus – 5. General information 6. Technical information 7. Design and planning information
C. Consumer Skill and Information	All of the factors in the two objectives above plus – 8. Consumer information
D. Orientation to Technology	All of the above factors plus – 9. Interpretative information
E. Guidance	All of the factors previously listed plus – 10. Occupational information
F. Personal safety	All factors through number 7 plus – 11. Safety information
G. Specialization	All factors listed above excepting numbers 8, 9, and 10. These three may or may not be included 12. Specialization emphases
H. Avocation	All factors through number 4 plus – 13. Avocational emphasis
I. Personal Development	Practically any combination of factors listed plus – 14. Values and attitudinal statements

The objectives and factors have been arranged in an order which facilitates a recombination into objectives. The relationship of factors and objectives are more easily seen in Table 1, which uses the idea of the progress chart to express these relationships. Each of the factors are defined below.

Criteria for Indicating Degree of Factor Emphasis

In order to discriminate between mere inclusion and a complete treatment of a factor the following symbols and general definitions are used for factor strength designation:

X* – to designate superior treatment of the factor.
The factor is presented in a complete and detailed way suitable to the purpose intended.
Complete adequacy.

X – to designate an adequate treatment.
The treatment meets general requirements.

(X) – to designate a weak or poor treatment of the factor.
The factor is included by the author but it is not satisfactorily treated.

TABLE 1

RELATIONSHIPS OF CONTENT FACTORS TO OBJECTIVES OF INDUSTRIAL ARTS

CONTENT FACTORS	OBJECTIVES	Manipulation	Technical Skill and Knowledge	Consumer Skill and Knowledge	Orientation to Technology	Guidance	Personal Safety	Specialization	Avocation	Personal Development
Tool Description		X	X	X	X	X	X	X	X	X
Operations and Procedures		X	X	X	X	X	X	X	X	X
Material Description		X	X	X	X	X	X	X	X	X
Projects		X	X	X	X	X	X	X	X	X
General Information			X	X	X	X		X	X	X
Technical Information			X	X	X	X	X	X	X	X
Design and Planning Information				X	X	X	X	X	X	X
Consumer Information				X	X		X	X		X
Interpretative Information					X	X		X		X
Occupational Information						X		X		X
Safety Information							X	X	X	X
Specialization Emphases								X		X
Avocational Emphases									X	X
Values and Attitudinal Information										X

X – designates inclusion of factor in the objective.

Definitions of Content Factors

Tool Descriptions.–Descriptive materials concerning tools, either written or pictorial, with accompanying explanatory notes.

X* – Superior. Technical and detailed descriptive materials that fully describe tools in terms of construction, functioning parts, and use.

X – Acceptable. Descriptive materials without detailed information; generally statements of use and general description.

(X) – Weak. Descriptions generally in terms of use without details of construction or an illustration without notes of description.

Operations and Procedures.–Statements of "how to do" or how to perform jobs.

X* – Superior. Detailed steps in performance; descriptions of technical details involving the operator, tools, and materials.

X – Acceptable. Gives directions without details of technique; often expresses only "do" and the sequential order, or gives general directions which are not explicit.

(X) – Weak. Gives little detail, and very little attention to "how."

Material Descriptions.–Descriptions of physical characteristics, technical specifications for use, chemical properties, relationships to uses made, et cetera.

X* – Superior. With complete description in terms of physical, chemical, and other technical characteristics and descriptions in terms of the relationships of characteristics to use.

X – Acceptable. General characteristics with some detailed information; general physical properties with relationship to use; or uses with some relationships to physical properties.

(X) – Weak. General descriptions of color, et cetera, or of simple use with little or no explanation leading to the understanding of technical qualities.

Projects and Problems.–Exercises, jobs, experiments, or articles to be constructed for purposes of developing understanding and skills.

X* – Directly related to skills to be learned; makes use of tools and information by direct application; well designed, variety for individual selection, and with both "boy or youth interest" and utility; concrete problems related to real situations and involving problem-solving and planning techniques.

X – Acceptable. Related to skills in tool and material uses, but the selection is limited. Designs do not show a high degree of imagination, but are suited to the learning situation by providing planning and problem-solving conditions.

(X) – Poorly designed projects and problems which are not well suited to interest and to the learning situation.

General Information.–Informational treatments which are not directly connected with tools, operations, materials, the production of a project, or solution of a problem. Information of a non-technical nature dealing with the production of materials or products and their uses, transportation, how sold, et cetera.

X* – Comprehensive and pertinent information, well integrated into the text.

X —Pertinent but lacking in comprehensiveness. Fairly complete.

(X) —Not pertinent. Not sufficiently complete to be orientational or educational.

Technical Information.—Information of a technical nature. Information pertinent to the performance and planning of operations and to design. Physical qualities, chemical analyses, working characteristics, dimensions, formulae, calculation constants, et cetera.

General strength criteria are used.

Design and Planning Information.—Information on how to plan a project, problem solution (general), or the elements of design as applied to the particular problems and projects contained in the subject matter.

General strength criteria are used.

Consumer Information.—Evaluative information and procedures relative to the selection and use of products and services by the individual consumer. Instructional materials in the use, care, adjustment and repair of products used in the home and in the care and general maintenance of the home itself.

General strength criteria are used.

Interpretive Information.—Explanations and discussions of relationships among individuals and discussions of the relationship between factors connected with the production and use of industrial products, and factors connected with living in a technological democracy, and the economic and the historical development of American institutions as influenced by technology.

General criteria of strength are used.

Occupational Information.—Information relative to working conditions, personal-physical requirements, educational requirements, opportunities and disadvantages, employment trends, obtaining employment, et cetera.

General criteria of strength are used.

Safety Information.—Statements of rules and principles of safe working practices.

General criterion of strength are used.

Specialization Emphases.—Emphases upon speed and accuracy to meet skill demands for entering a trade. Projects and procedures taken directly from industry. Narrow subject field. Related information pertinent to trade only.

General criteria for strength are used.

Avocational Emphasis.—Emphasis upon development of recreational skills, hobbies, or crafts. Emphasis upon the use of skills as a recreational medium. Projects and procedures of hobby or recreational

nature. Designate only for inclusion. This emphasis is either included or is omitted.

Attitudinal and Values Information or Statements.—Statements or discussion of values, morality, ethics, et cetera. Statements dealing with good workmanship, honesty, cooperation, responsibility, et cetera. Statements concerning social justice, working relationships, trade union and management relationships, political relationships, international relationships, race–color relationships, et cetera.

General strength criteria are used.

Categories of Appropriate Use

The criteria for defining appropriate use is inherent in the definitions given in Chapter I. All of the objectives used have industrial arts implications. Specialization composites are defined by factors of technical information, operations and procedures and by specialization emphases. This characterization is derived from the definition of specialization as used in this study and by inductive derivation from practices of authors who state that their books are written for specialization purposes.

A third category is the "crafts approach". These books contain manipulative factors and avocational emphases. Some of these books also have a factor which is not included in the inductive definition derived by factoring. This "creative approach" is an organizational feature which may not be apparent to the casual observer. This approach features strong planning and design and gradually eliminates projects in favor of "creative planning" by the student. This feature is generally carefully pointed out in the preface of the book.

The Inductive Process Used in Developing Content Patterns

The inductive process is used in establishing factor patterns. This procedure should be thoroughly understood by the reader if he is to clearly understand the derivation and implications of the data presented.

Simply stated, the procedure by which category patterns were derived is as follows:

1. Books were examined for factors of content by carefully reading the preface, the table of contents and at least one or two chapters to discover the organization and to determine the type of materials contained in the text of the book. Other chapters were carefully scanned but were not read word by word.
2. Common factors of books which authors designated for a particular use were noted.

3. By a process of inspection, and by factor analysis as used in test building, the factors that discriminate between books designed for different uses were isolated. These factors become the bases of selection for appropriate uses.
4. Other books were examined and the factors recorded. Using only symbols and numerical identifications, all books were described for factor content. These books were then placed in the "use" categories by the patterns that were found to define the categories. The validity of the pattern was determined by comparison with the authors' stated intention in writing the book. Where accurate predictions were possible the pattern was assumed to measure the same thing that authors include in books for the purposes stated. If the predictive accuracy was poor, the pattern did not measure what it purported to measure and further refinements and trials were made.

The patterns used in this study are not perfected to the extent that all books can be classified by a pattern. Some books were not written with a clear purpose in mind; others were written to sell to two fields and make a combined pattern. A few books seem to possess no pattern and are practically useless as textbooks because of a lack of direction and organization. One advantage in the system is that it facilitates identification of these books by their failure to conform to a pattern. In experimental tests it has been found that a novice with fifteen minutes instruction is able to locate a high proportion of the books for any particular use and that, while not all of the books that authors say should be in a particular category will be located, no books belonging to another definite classification should be selected. Tests also show that all of the books with good content for a particular use will be selected. The books that cannot be classified generally are those which authors do not direct to any specific purpose. An individual with considerable experience is able to place most of these as being in this "no man's land".

Recognition of Factor Content

This study is based upon the premise that a factor must be observable through evidence in the written text of the book to be present. No factor should be implied that depends upon interpretation from sources other than the materials presented. Assumptions are also made that the teacher is competent, that the material will be read and understood by the student, and that appropriate activities suggested by the textbook will be engaged in. It is further assumed that the activity engaged in by the student will lead to learnings and changed

patterns of behavior. While it may not be considered good pedagogical practice, it is assumed that the teacher will follow the textbook in matters of organization and that the materials will be interpreted as written. If books are examined for industrial arts, judgments of strength must necessarily be made from reference to industrial arts purposes and objectives. This procedure does not produce unbiased data when books written for other purposes are judged; but to judge from a constantly changing point of reference would invalidate the study. At best, the judgments represent to a degree the bias of the judge and the procedure cannot be expected to produce a pure measure of content. Validity claims are based on internal and logical consistency and upon predictive accuracy in use. At present there are no criteria for testing validity except by comparison with the authors' stated purposes.

Recording Data

All data for this study was recorded upon 5″ x 8″ index cards. In recording the information, the bibliographic information was recorded first, followed by a one-line description of the book. The approach to subject matter was next recorded. Textbook subject content was taken from the table of contents. In some cases special features were also recorded. Recording these materials proved helpful in becoming orientated to each book.

After the above items had been recorded, the author's preface and the first two chapters were read to determine the style and content of the chapters. The remaining materials were scanned to discover any change in plan or content of the chapters.

After the book had been examined the content factors were recorded, using symbols as explained later. Both content factors and objectives were recorded. It should be pointed out that factors make up objectives. Recording of both is unnecessary except to provide a check upon the objectivity of the analysis. Notes were placed on the reverse of each card to serve as personal references and are not a part of this study. The time required to complete books varied. Some books required more than two hours while others required less than fifteen minutes. The average time required was one hour and fifteen minutes. Re-examination of several of the books examined first was necessary in order to offset discrepancies produced through differences in levels of examination experience. A second examination was also required in some cases where factors and objectives recorded were not consistent.

The last step in recording data was to place on a single card the

content factors and objectives from each card in a particular subject area. These cards give a graphic indication of the coverage and treatment of the subject matter area. Only numbers and symbols were used to record these data. Arranging individual book cards in order of the number of included factors helps to visualize results. Numerical sequence can be determined easily by assigning numbers to factor strengths. "Weak content" should be assigned a value of one; "acceptable" should be assigned two units, and "superior" a value of three. This process tends to put industrial arts textbooks at the top of the combined list for each subject area and to place supplementary materials, such as workbooks and narrow references at the bottom of the group. This arrangement results from the definition of industrial arts materials as having the factors common to industrial arts, industrial-vocational education, and crafts, with general education factors added. Crafts and industrial-vocational education textbooks will not be placed in any definite arrangement by this system, since each may have the same number of factors.

The Use of Symbols

Symbols are very useful in recording data of the type used in this study. The symbols used are taken from the outline of objectives and definitive factors given earlier in this chapter. Alphabetical symbols are used for objectives and numerical symbols are used for content factors. The letter "A" is used for the "Manipulation" objective, the letter "B" is used for "Technical Skill and Knowledge", et cetera. The numeral "1" is used for "Tool Descriptions", "2" is used for "Operations and Procedures", et cetera. The asterisk is used to designate strength of a factor, plain numerals or letters designate acceptable strength, and enclosure is parenthesis is used to designate a weak factor or category.

Interpretation of Content Factor Patterns

The system of content factoring provides a method for interpreting the appropriate use of textbooks in terms of orientation, specialization and avocational emphases. The system also provides a means for differentiating between books written for general education purposes and those written for specialization and avocational purposes. Other interpretations are also possible for mixed categories of "use".

Specialization Pattern

The specialization pattern has the following characteristics:

1. Inclusion of specialization emphases

2. Strong inclusion of operations and procedures
3. Strong technical information content
4. General information generally, but not always, weak
5. Avocational emphases nearly always absent
6. Consumer information weak or not included
7. Interpretive information weak or not included
8. Values and attitudinal statements not included
9. Material descriptions may be prominent
10. Tool descriptions may or may not show content strength
11. Projects are often omitted.

In terms of symbols used in this study three major cues are used for identification purposes. The general pattern is indicated by factors 1, 2*, 3, 4, 5, 6*, 7, and 12. The first cue is factor 12; if present it is indicative of the author's direction in the book. If factors 2 and 6 are strong the entire content is nearly always specialization. In this pattern factors 1, 3, and 4 will sometimes be missing and 5 may sometimes be weak. Inclusion of other factors may make the text suitable for both industrial arts and industrial-vocational education. Weakness in factors 2 and 6 should be considered as disqualification for this category.

Orientation or Industrial Arts Pattern

The orientation pattern is recognized by the following characteristics:

1. Inclusion of nearly all of the factors.
2. Strength shown in general information, interpretive information, occupational information, avocational emphases and sometimes in values and attitudinal statements.
3. Inclusion of technical information and manipulative factors, tool descriptions, operations and procedures, material descriptions, and projects. Does not preclude specialization emphases.

Industrial arts patterns have certain characteristics which are easily seen. The factors that may be found are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, and sometimes 12. Factor 11 does not materially affect the pattern. The first indication of content for industrial arts use is factor 14. However, its absence does not preclude industrial arts use. The cues are more easily picked from the group and may serve as a first indication. The specific determiners are content factors numbered 5, 6, 7, 8, 9, *and* 10. Not more than one of these factors should be missing for good industrial arts use. Factor 7 will be missing in some cases and occasionally factor 8. Superior 5, 8, 9, and 10 factors are highly indicative of industrial arts utility. Factors 1 and 4 are

sometimes weak or missing, but these factors should not be given much weight in determining whether the industrial arts pattern is present.

Combination Pattern

In some cases there will be no definite pattern. All factors will be in strength and all will be included. These books provide for strong general education courses and at the same time are suitable for specialization. It should be thoroughly understood that the liberal industrial-vocational school of thought is practically the same as that held by industrial arts personnel who do not believe in the weak or "watered down" treatment of subject matter. Beginning industrial-vocational work is conceived as exploratory but thoroughgoing by these educators. The two branches of industrial education use the same material for class work in this closely correlated concept without detriment to either.

Special Cases

In some books, apparently incongruent factors may be found. In many cases this is an indication of a special interest of the author, or of a text written for a specific purpose. Unusual strength in a particular factor or group of factors may indicate a work *adopted* but not *adapted* for industrial arts education. Strength in operations and procedures, material description, projects and avocational emphases when found with very weak treatments of other factors indicates the typical crafts approach. These books are generally written for hobbyists and home craftsmen and are not suited for industrial arts use because only two objectives are possible from the use of these writings. In terms of symbols, crafts patterns are characteristically strong in content 2, 3, 4, and 13. Thirteen is the first cue. If 13 is present, examination should be made to ascertain whether 2, 3, and 4 are acceptable or strong. These two conditions serve to identify this category. If factors 8, 9, and 10 are missing, the evidence is confirmation of the avocational approach. Factor 7 may be included and may be strong. Factor 9 may also appear in some books, particularly those attempting to develop creativity. Factors 12 and 14 are seldom present.

A very high design and planning content is often indicative of textbooks written by authors for the fine arts. These authors also frequently load their books with values and attitudinal statements, avocational emphases, and sometimes with interpretative information.

A pattern found in books borrowed from physical science is the

laboratory-theory pattern. These books are characterized by general and technical information, operations and procedures of an experimental nature, projects for experimentation, and very little emphasis upon other materials. The pattern, in symbols, will be very similar to the crafts pattern except for factors 7 and 13, which will not be found. The pattern will be 2, 3, 4, 5, and with strength in 6 and sometimes 2, 3, and 5. If the book is pure theory without the experimental factors the pattern may be simply a 3, 5, and 6 pattern.

Testing the Study Hypothesis

For valid and reliable data to be obtained in any study, the basic criteria should be valid; i.e. they should measure what they purport to measure. Since no outside criteria have been developed, the validity of this study can be tested only through comparisons of classifications by the criteria and statements by authors of intended textbook use. In the test the author's statement is taken as correct and the criteria of the study are used to predict the authors' statements of use. Since books which are not directed to any use are expected to change, they were removed from the group as a spurious factor. Books with only project content were also removed because they are not textbooks and cannot be directed. The remaining one hundred nine books were tabulated for changes. Seventeen changes were made. If only the changes that alter the authors' statements of use are counted, the number is fourteen and one-half changes. The latter figure represents the total number of errors; the first figure enumerates the changes made. Calculating the percentage of change gives 15.6 percent. The percentage of error is 13.3 percent. If books treating electricity which cannot be classified into industrial and crafts categories are removed, the error is reduced to eleven and one-half changes, or 10.8 percent error. This last figure is the most accurate estimate of the reliability of the instrument because it considers all of the predictable possibilities of the criteria. This does not necessarily mean that the criteria are inaccurate, but rather that in slightly more than one case in ten, the factor-synthesis system predicts a different use from that to which the author has directed his writing. The error may be that of the author; it may be due to needed refinement in the criteria; or it may be due to errors in personal judgment of the judge in the original analyses of factor content. With the completion of other studies it may be possible to remove some of the error; or, it may be shown that the author is responsible for the error and that the criterion is valid.

The degree of accuracy shown is satisfactory for use under the

limitations of the manner in which the accuracy is calculated. The limitations are: (1) Non-textbook treatments, which include project and reference books, should not be judged without using an added category, and (2) Non-directed books must be assumed to fall into appropriate categories in nine out of ten cases if the accuracy of the instrument is to hold. In use the criteria should be expected to indicate the author's viewpoint in nine cases out of each ten, or to be 66 percent better than guessing when three categories are involved. If the fourth category for electricity is included, the accuracy represents a predictability of 85 percent better than guessing or chance.

In practice the criteria will be found to be very usable because of the discriminating accuracy of the instrument in separating industrial arts, specialization, and crafts or avocational books. The instrument will not classify all books but will leave about thirteen percent unclassified or in a non-directed category. The system tends to place books by their factor strengths. Textbooks will not be classified for industrial arts use without inclusion of necessary materials for achieving industrial arts objectives. Content in excess of that necessary for one use may suit the book for additional uses but never restricts the use of the book. Where definite factor content patterns exist, the user of the system can be reasonably sure that the book selected is applicable. It is only the nebulous book that is not classified. It is highly probable that these books are unsuitable for textbook use; therefore, the system performs a second service in not selecting books which do not have definite direction.

The evidence for reliability and validity of the criterion has been presented as an effort to enable the reader to assess to some degree the significance of the instrument for use and to evaluate the conclusions based upon the data presented.

Textbook Selection

Textbook selection is not a primary purpose of this study but is worthy of some space. By experimenting with the factor descriptive system it was discovered that it is possible to arrange textbooks in a rank order within each subject matter area. By close study this rank order is found to be the same order which the books would occupy if arranged by other methods by competent judges. This system also is found to place textbooks which authors write for industrial arts purposes high in the order, and specialization books low in the order. One exception to this rule is found in the fact that books specifically written for both fields tend to rank higher than books written for either industrial arts or industrial-vocational use, and in a few exceptional

cases to rank high books that are not directed to either field. As a general rule books written for both branches of industrial education which authors do not direct to either field will be found to rank near the center of the group.

The ranking system does not serve as a criterion for final selection of textbooks, but it may serve as a screening device to narrow the number of textbooks that should receive further study by the individuals or groups concerned with selection.

The procedure for ranking is as follows:

1. Using symbols for factors, rate the factors as follows: 1 for weak content, 2 for average acceptable content, and 3 for superior content.
2. Add the total of the factors, using the numbers assigned for degree of strength.
3. Rank high totals high, and low totals low. Arrange in the order of the totals.
4. Books receiving identical scores should be examined subjectively for ranking or may be considered as equal.
5. Differences in scores of less than two units should not be considered as highly significant.

This system is not suitable for ranking groups in which books treating narrow subjects are not separated from those treating broad subject areas. As an example, books dealing with machine woodworking should not be ranked with books for general woodworking. Books for silk screen should not be ranked with books for graphic arts in general. The high ranking books will be found to contain suitable materials for industrial arts use, but final selection should be upon individual merit and the specific purposes to be served by the textbook.

In selection of textbooks for specific purposes the following suggestions are offered:

1. Agreements should be made upon the objectives of the course in which the book is to be used. These objectives should be stated in terms of content factors. Using symbols facilitates the search if books have been examined previously and have been rated for factor content.
2. The specified factor content resulting from the agreement upon objectives should be compared with the content of books which have been examined for content factors. Selection of one or two books which seem to have the factors desired should be made.
3. A more thorough study of the books selected should be made in order to make comparisons of each factor.

If a jury system is used in selection, this procedure will be found to be useful in securing objectivity, because content is defined in the light of objectives, all textbooks are judged upon the same factors by each judge, and final judgments are made in the light of evidence and not from purely subjective factors and personal bias.

Selection of Supplementary Books

Frequently, under present conditions, those who select textbooks will not be able to select single books which meet all of the objectives of a good industrial arts program. The factoring system described in this study provides an easy solution to this problem in that two or more books with strengths in particular factors may be selected in order to provide strength in all of the factors needed. In some instances two books will not provide all of the factors, and a third reference book may be needed; however, an examination of the textbooks submitted for this study indicates that two books will be found sufficient for many of the subjects taught, and in some cases one book provides good coverage of all of the pertinent industrial arts objectives.

The importance of selecting one book for organization and others for supplementation must be understood. Selection of two similar textbooks will not solve the problem of complete treatment since both books will cover the same factors. Textbooks written for different purposes will contain different factors of content but will also have differing organizations. If two textbooks are selected for content coverage, both cannot be used for organization because to do so would result in confusion and disorganization. The only practical solution is to select one basic text for organization and to treat other books as references to be integrated through the course of study.

The procedure of following a textbook has been severely criticized by some and defended by others. The suggestions given are not for those who are strong in organizational technique, but for those who find it useful to adapt rather than to initiate. It is better to adapt wisely than to organize poor materials just for the sake of being different. Many of the courses of study used in industrial arts are not unique but are built upon the strengths of good textbooks. Emphasis should be upon strong courses rather than upon the use of diverse materials.

Summary

Classification of textbooks presents a complex problem. Factors leading to this complexity are:

1. The subject matter is not single; it is complex.
2. Standard procedures for classifying the content of single subject areas have not been defined.
3. The basic relationships of industrial arts and industrial-vocational education have not been defined.
4. Philosophy and curriculum matters in industrial arts have not been agreed upon by the professional personnel concerned with industrial arts education.
5. Textbooks have not been written for industrial arts use that are acceptable to all teachers and as a consequence "borrowing" has confused issues.
6. Authors' labels are not reliable indices to use of textbooks.

Textbooks are classified in this study in the following categories:

1. Subject area
2. Industrial arts (by objectives and content factor analysis)
3. Specialization textbooks for use by industrial-vocational education and by semi-specialized unit courses in industrial arts.
4. Crafts or avocational approach
5. General reference use for industrial arts and industrial-vocational education.

CHAPTER IV

Presentation and Interpretation of Data

The materials presented in the preceding chapters have developed the background for understanding the data used in this study. This chapter will present the data by descriptive and by graphic means.

The textbook data compiled in this chapter are taken from the books submitted by the publishers. A total of 152 books are represented. One book was not submitted, but it is included as the only book available for the comprehensive general shop. It was published by a company which does not specialize in industrial arts textbooks and was secured from the Education Library, University of Florida.

Data concerning offerings were taken from the United States Office of Education study of Secondary Enrollment[26] made during 1948-49.

Textbook data were collected under the conditions described in Chapter III, and under the limitations of Chapter I. The data will be presented in the following order:

1. General data and interpretations
2. General analyses
3. Analysis of subject matter areas.

General Data

Averages are often misleading because their use tends to cover up individual characteristics and other pertinent data which are far more useful than the information provided through averages. The data presented in this section should be evaluated in this light, and should be considered as a background for specific data concerning subject matter areas and for general analyses.

Books Submitted

Each publisher was asked to submit the books which, in his thinking, should be included as industrial arts books. This procedure was made necessary by the complexity of classification of published materials existing in the industrial arts textbook field as explained in Chapter III. If all books having subject matter with possibilities for

[26] U. S. Office of Education, *op. cit.*

industrial arts are considered, the books submitted for this study represent approximately one-fourth of those published by the publishers represented. The books submitted fall into several major and minor categories. To make the data meaningful, books are classified in homogeneous groupings. Some books which are not in any definite group are placed in a miscellaneous grouping. The categories "General Reference" and "General Arts and Crafts" contain most of the miscellaneous books not classified elsewhere.

Figure 1 compares the percentage of subject offerings with the percentage of books submitted for each area. If the books examined in this study represent a valid sample of the books available, this comparison shows a lack of agreement in needs and in the provision for meeting these needs. It seems apparent that handcrafts has been well taken care of. It should be known in interpreting this particular area, however, that handcrafts books represent a large number of sub-subjects. One or two books in each sub-subject tends to give a disproportional emphasis in terms of percentages. The comparison shows that woodwork and drawing are subjects in which the textbooks examined represent a smaller percentage than the percentage of course popularity in the high school. The one comparison that may be assumed to be alarming is the disproportionate representation in general comprehensive shop textbooks for the needs indicated. It must be assumed that this course is now being taught from a series of books in many cases.

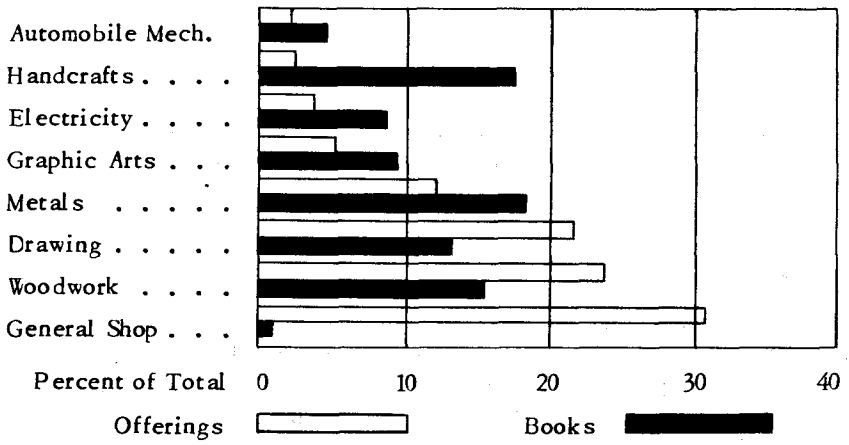

Fig. 1.—Comparison of subject offerings and books submitted.

General Content Emphasis

According to Table 2, only forty-seven books were written for industrial arts use. This is approximately one-third of the texts examined. The remaining two-thirds of the books are for crafts or vocational purposes and contain little general education content. The result is practically the same if data from Table 3 are used. These data seem to indicate that the inclusion of books written for other uses is the best explanation of the failure of the books examined to meet general education objectives.

TABLE 2

FREQUENCIES OF AUTHORS' STATEMENTS OF INTENDED TEXTBOOK USE

Subject Areas	Ind. Arts	Spec.	Both	Crafts	Non-Direct
Automobile Mechanics	2	0	0	0	4
Art Metal	0	0	0	4	2
Ceramics	3	0	0	6	0
Drawing	7	8	2	0	3
Electricity	5	1	1	0	6
Foundry and Welding	0	1	1	0	4
General Crafts	1	0	0	6	0
General Metals	5	2	1	2	3
General Reference	0	2	2	0	1
Graphic Arts	5	3	0	3	3
Home Mechanics	1	0	0	1	2
General Shop	1	0	0	0	0
Leathercraft	0	0	0	0	0
Machine Shop	0	3	0	0	2
Plastics	0	0	1	2	3
Sheet Metal	0	3	1	0	1
Woodworking	7	2	1	6	7
Totals	37	25	10	39	41
Percent of Total	24.4	16.5	6.6	25.6	27.0

When the specialization textbook is used for industrial arts purposes, it may be misleading to both the student and the teacher. Implications are often drawn from the textbook for course content.

The student may attach importance to the emphasis of the textbooks, and the teacher may discover too late that he is not teaching industrial arts, but that he is working to overcome the false leads.

Reference to Table 3 shows that 25.6 percent of all textbooks submitted for this study are crafts or avocational centered books. The crafts or avocational approach emphasizes manipulative factors and avocational or hobby interests. This approach presents a special problem for industrial arts teachers closely related to the previous discussion of the use of specialization books. Students, and some teachers, using textbooks for this approach may conclude that activity for the sake of activity is the chief factor in the industrial arts program. These books should not be considered as adequate industrial arts textbooks. They do not *mislead;* they do not lead at all. No direction is given. The result may be the vibratory program which moves without accomplishing important educational objectives.

If the definition of industrial arts is valid the remedy is apparent. *Industrial arts textbooks should be written and selected for industrial arts use.* Borrowed books not only limit the possibilities of achieving general education objectives, but in many instances hinder the teacher in his efforts. A textbook which establishes wrong impressions and improper values may prove more harmful than using no textbook at all.

General Analysis of Approach Emphases

Two methods are used to tabulate the approach emphases of the textbooks submitted for this study. The first is based on the author's statement in the preface to his book, which often indicates the field or area for which the book is written. The second approach is to determine the usage of the book through factor analysis. The results of each method will be presented and comparisons made of the results in order to demonstrate the strengths and weaknesses of each and, at the same time, to show the status of textbook emphases. Table 2 tabulates "use" emphases as stated by the author.

The fact that approximately one-sixth of the books included are directed toward specialization use has the implications ascribed previously to the use of specialization and crafts books, but there is one factor which should be discussed. Under the assumption that there is no disjunction between industrial arts and industrial-vocational education, and in light of the close relationship of the two areas at senior high school levels, the inclusion of books written for specialization seems to be necessary and possibly desirable for this level. There seems to be very little basis for objections to the use of these books if they are used in courses elected as the result of interest

developed in exploratory and interpretive courses at the junior high school level. They are not suitable, however, for first courses in industrial arts since they neglect many of the general education objectives of industrial arts. The use of these books must be expected to continue until suitable books written specifically for industrial arts use are available.

The number of books directed to industrial arts use is disappointingly low and indicates to a degree the confusion and lack of direction in the field of industrial arts. The fact that two out of every three books selected by publishers to represent the best that they have to offer for industrial arts are not specifically written for industrial arts use should not be lightly considered. This fact shows the necessity for an examination of textbooks by professional industrial arts personnel in order to re-define and to re-evaluate the purposes of the textbook for use in the teaching field. It is assumed that textbooks reflect the philosophy of the writers who author them. If all of the authors represented by books included in this study are considered as industrial arts writers, then facts seem to indicate a state of indifference toward industrial arts as an integral part of general education. The proportion of crafts books submitted may be an indication that some of the industrial arts programs are based upon a philosophy of industrial arts which values activity for the sake of activity. One of the most significant features of Table 2 is the high percentage of books which authors do not direct to any particular use. More than one-fourth of the books are not directed.

A second feature of the table is the number of books directed by authors to crafts or avocational emphases. One-fourth of the books are classified in this category. When this fact is considered in relation to the way in which the books were selected for the study, there seems to be an indication that textbook publishers do not differentiate between crafts books and industrial arts books. The proportion of crafts books is too high to suspect their inclusion to be by chance or by coincidence. If selections were made in terms of use, it is evident that the industrial arts teacher is using a very high proportion of books with crafts emphases. In either case, a need is indicated for better criteria of textbook selection and for textbooks better suited to industrial arts purposes. The crafts books are designed primarily for manipulative-avocational objectives and do not consider all industrial arts objectives.

Table 3 shows the results of the use of factor analysis and synthesis for classifying the textbooks included in this study. The first difference to be noted is the decrease in the number of non-directed

TABLE 3

TEXTBOOK EMPHASES AS DERIVED FROM FACTOR ANALYSIS

Subject Areas	Ind. Arts	Spec.	Both	Crafts	Non-Direct
Automobile Mechanics	4	0	0	0	2
Art Metal	1	0	1	4	0
Ceramics	4	0	0	5	0
Drawing	5	10	2	0	3
Electricity	6	0	0	1	6[a]
Foundry and Welding	1	3	2	0	0
General Crafts	1	0	0	6	0
General Shop	1	0	0	0	0
General References	2	2	0	0	1
Graphic Arts	8	2	1	2	1
Home Mechanics	1	1	0	2	0
Leathercraft	0	1	0	8	0
Machine Shop	0	4	0	0	1
Plastics	0	0	1	0	0
Sheet Metal	0	4	1	0	0
Woodworking	4	8	1	5	5[b]
Totals	43	35	11	43	20
Percent of Total	28.3	23.0	7.2	28.3	13.2

[a]Special pattern – Laboratory-Theory.

[b]Combined Specialization-Crafts (3 books).

books. The use of analysis provides classification of use for one-half of the books which authors did not classify. However, it should be noted that 13.2 percent of the books remain in the non-directed category. Some books are not classifiable under the categories used in the table. Two additional categories would reduce the number of non-classified books to eleven. The percentage of unclassified books would then be 7.25. The two additional categories are: (1) a combination crafts and specialization pattern and (2) a theory-laboratory pattern. The first is a definitive pattern for handcrafts as used in both industrial applications and for avocational use. This particular approach is based upon a different concept of crafts from that held by the "activity for the sake of activity" school. The end product is a saleable item, and emphasis is placed upon technical information and

upon operations and procedures for making a saleable product. The laboratory-theory pattern is typical for the testing of theory in a laboratory situation.

Most of the statements and conclusions drawn from the information in Table 2 apply equally to Table 3. The principal changes are the result of a more complete means of classification which raises all of the percentages in directed classifications by lowering the percentage of non-directed books. The specialization category is increased by about 7 percent, crafts by less than 3 percent, and industrial arts by about 4 percent.

Analyses of Textbook Emphases in Subject Areas

The data which have been presented serve to show the general conditions related to the emphases in industrial arts textbooks. This analysis will contain two viewpoints. One viewpoint is that the use of all books presented is desirable, either as textbooks, or as supplementary books. This viewpoint considers the total sample and shows how the textbook situation may be dealt with by using books written for other uses as supplements which may be made in the name of "expediency". The use of "stop-gap" measures can be put on an intelligent basis if the situation is understood and the proper approach is made to the selection of materials. The use of these materials should be considered temporary, however, and should be used only until sufficient and suitable materials have been prepared.

The second viewpoint is concerned with only those textbooks found to be suitable through factor analysis. Consideration of only these books gives a true picture of actual conditions in the industrial arts textbook field without supplementation from outside sources. Previous discussions have shown that only one-third of the books submitted are suitable for industrial arts use as textbooks.

TABLE 4

TABLE OF SYMBOLS AND FACTORS USED FOR CONTENT

Symbol	Factor	Symbol	Factor
1	Tool Description	8	Consumer Information
2	Operations and Procedures	9	Interpretive Information
3	Material description	10	Occupational Information
4	Projects	11	Safety Information
5	General Information	12	Specialization Emphases
6	Technical Information	13	Avocational Emphases
7	Design and Plan Information	14	Values and Attitudinal Information

Only content factors and the use categories will be presented in the summary tables for each subject area.

The symbols and the contents represented by each symbol are defined in Chapter III. The names and symbols used for content factors are given in Table 4 as a matter of convenience to the reader.

By pattern analysis forty-nine books were picked from the total group as meeting the requirements for industrial arts use upon the basis of sufficient general education content to satisfy the definitive criteria of this study, i.e., to establish definite patterns of industrial arts content. This selection eliminated project books and general references. Of the books selected nineteen were not directed to industrial arts use by the authors. Of these nineteen, five were directed to other uses. The remaining fourteen books were directed to no specific use. Table 5 shows these facts in table form and in terms of percentages of the forty-nine books.

TABLE 5

PERCENTAGES OF BOOKS DIRECTED BY AUTHORS TO USES

	No.	Percent
Books Directed to Industrial Arts	30	61.2
Not Directed to Any Particular Use	14	28.6
Directed to Crafts or Avocational Use	3	6.1
Directed to Industrial-Vocational Use	2	4.1
Totals	49	100.0

Under the assumption that it is desirable to use books that are suitable to industrial arts as defined by the criteria of this study, Table 6 has been prepared to show the status of textbooks meeting the criteria in terms of the number of books in each subject area and in terms of the total number of books presented.

Table 6 shows that forty-nine books were found suitable for use in industrial arts subjects by the factor-analysis method. This number is 32.28 percent of the number of books examined in this study. The discrepancy between this table and Table 3 is due to counting multi-purpose books as industrial arts when industrial arts content is sufficient for this use. Other pertinent generalizations may be developed by an analysis of each subject area. These findings will be given under subject area headings.

TABLE 6

TEXTBOOKS IN EACH SUBJECT AREA FOUND SUITABLE FOR USE IN INDUSTRIAL ARTS BY FACTOR ANALYSIS

Subject Areas	No. Bks.	% Total Suited	% Subj. Area	% Total Sample
General Shop	1	2.04	100.0	0.66
Woodworking, General	4	8.17	37.6	2.63
Woodworking, Machine	1	2.04	16.6	0.66
Drawing, General	7	14.30	16.6	4.60
Metals, General and Bench	5	10.20	41.7	3.30
Metals, Sheet	1	2.04	20.0	0.66
Metals, Art	1	2.04	16.6	0.66
Metals, Welding, Foundry, Forging	3	6.12	50.0	1.97
Metals, Machine Shop	1	2.04	16.6	0.66
Graphic Arts	8	16.32	61.5	5.26
Electricity	6	12.24	46.2	3.94
Handcrafts, General	0	0.00	0.0	0.00
Handcrafts, Textiles	1	2.04	100.0	0.66
Handcrafts, Leathercraft	0	0.00	0.0	0.00
Plastics	1	2.04	16.6	0.66
Photography	1	2.04	100.0	0.66
Ceramics	4	8.17	44.5	2.67
Home Mechanics	1	2.04	25.0	0.66
Automobile Mechanics	3	6.12	50.0	1.97
Totals	49	100.00		32.28

General Shop

The course most often reported in the *Biennial Survey*[27] is general shop, which accounts for more than 30 percent of the total offering in industrial arts. Ordinarily one would expect to find many textbooks prepared for this area because of the popularity of the offering. An examination of Figure 1 shows that this is not a valid assumption. The number of books correlates very poorly with the need. Indeed, the only text examined was not submitted by a major industrial arts publisher, but was procured for the purpose of examining at least one approach to this problem. Less than one percent of the books examined were prepared for use in the general comprehensive shop. The

[27] U. S. Office of Education, *op. cit.*, p. 355.

problem of meeting this need evidently is being met through the use of multiple textbooks or through the use of teacher-made syllabi. This problem should be explored in another study, since it is outside the scope of the present undertaking.

It must be assumed from the evidence in this study that the need for general shop textbooks has not been met. The one book examined contains materials for drawing, woodwork, metalwork, electricity, and plastics. The problem of avoiding a superficial approach to industrial arts for orientational purposes has not been solved in this text. There seems to be an impasse in industrial arts concerning this cruical issue of covering a broad area and, at the same time, of maintaining perspective. There is a real need for orientation; but research should be undertaken to discover whether orientation is best achieved through a light and shallow approach to a large number of subject areas or whether it is best achieved by more penetrative studies in less diverse fields.

At best, it must be concluded that general comprehensive shop textbooks are needed and that they are in short supply.

TABLE 7

SUMMARY: GENERAL COMPREHENSIVE SHOP

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	(X)	(X)	(X)	X	X	(X)	(X)			(X)	X				(Ind. Arts)

Woodworking

Woodworking has always been one of the most popular of all courses offered in the area of industrial arts. *The Biennial Survey,* United States Office of Education[28] shows that woodwork courses constitute 23.6 percent of the total offering in industrial arts. This popularity is also reflected by the numbers of woodworking textbooks submitted for this study. Woodworking textbooks constitute 15.1 percent of the total sample. Table 8 summarizes the content and the use patterns of woodworking textbooks. Fifteen textbooks submitted are classified as general woodworking. This classification does not constitute a uniform treatment of woodworking, but, the books are classed as "general" upon bases of general handtool operations, general machine operations, and because the books do not treat a specific phase of

[28]U. S. Office of Education, *op. cit.*, p. 35.

woodworking such as "cabinet making," "mill work," or "machine woodworking." Six textbooks are classified as machine woodworking. Two books are primarily project books. Each of two books in machine woodworking treats one particular machine, and one book contains materials for two related machines. These three books are the first of a series of books which are being published to cover the machine woodworking field. One book on the subject of pocket knife whittling was classed as arts and crafts because the book bears little or no relationship to woodworking as an industry.

General Woodworking

The fifteen books in general woodworking have several characteristics in common. All of the books describe tools and operations. All books describe operations and procedures. Material descriptions are not found in two of the fifteen books. Projects are not given in four books, three books have very little related information. All books include technical information. Less than half of the books contain planning and designing materials. Consumer information, except that which may be implied from general knowledge of materials and construction methods, is conspicuously missing from woodworking textbooks. Three books contain very weak treatments of this factor. Three books contain interpretive information, three books have occupational information, seven books have safety information, one book weakly emphasizes specialization, and four books include materials conducive to personal development.

Four textbooks may be said to be strong in industrial arts content for general education. Each of the four books has at least one failure to meet all factors of content either by omission or by weak treatment. The one book treating only related information, if used for the purpose for which it is designed, serves to fill these gaps in content. It should be pointed out that the use of this treatment with any one of several books submitted results in complete industrial arts content. The danger in such a procedure is the likelihood that teachers may follow one text and neglect the other, particularly if the teacher tends to be weak in unit organization. By using two textbooks it is possible to provide all factors with strength. From this fact it is safe to conclude that the field of general woodworking is adequately provided for. This is not to imply that a comprehensive text is not desirable in this area. In general woodworking, textbooks tend to be either shallow in content or to omit the general education approach. A comprehensive text must contain more material than any text examined and must be well written if it is to compete successfully with the texts already on

the market. The comprehensive and well balanced textbook has not been yet produced for this area, but by selection it is possible to do a good job in teaching woodworking with industrial arts emphases.

TABLE 8

SUMMARY: WOODWORKING

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	X*	X*	X*	X*	X*	X		X	X			X*	X*	Ind. Arts
2.	X	X	X	X	X*	X	X	X	X	X	X		X*		Ind. Arts
3.	X	X	X*	X	X*	X	X	(X)	X	X	X			X	Ind. Arts
4.	(X)		X		X*	(X)	X*	X*	X*	X*	X*			X*	Ind. Arts
5.	X	X	X	X	X	X	X*	X*			X		X*	X*	Crafts
6.	X*	X*	X*	X	X	X*	X				X				Spec.
7.	X	X	X*	X*	X*	(X)	(X)		(X)		X		X		Crafts
8.	X	X	X	X	X	(X)					X		X		Crafts
9.	X	X	X*		X	X*						(X)			Spec.
10.	X*	X*	X*	X		X									Spec.
11.	X	X*			X	X	X								(Spec.)
12.	(X)	X	(X)	X	X	(X)									Crafts
13.	X	X*			X	X*									Spec.
14.	X	X	(X)	X		(X)					X				Crafts
15.	X*	X*				X									Spec.
MACHINE WOODWORKING															
1.	X*	X*			X	X*					X*	X*			Spec.
2.	X*	X*			X	X*					X*			X	Spec.
3.	X*	X*			X	X*					X				Spec.
4.	X	X	(X)	X	(X)	X*	Lathe only				X	(X)	X		Crafts & Spec.
5.	X	X	(X)	X	(X)	X*	Circ. Saw				X	(X)	X		Crafts & Spec.
6.	X	X	(X)	X	(X)	X*	Band Saw				X	(X)	X		Crafts & Spec.
Project and Procedures															
7.		X		X*	X	(X)	X								
8.		X		(X)	(X)										

Six of the woodworking textbooks submitted are textbooks for specialization purposes. They may be recognized by the characteristic strengths in technical information, operations and procedures, and by omissions in projects, consumer information, interpretive information, and occupational information. This pattern of emphasis builds the

learning situation around tools and operations and slights the individual in the learning situation. These textbooks are not easily used in a general education approach because of their emphases for different purposes. The teacher who is not inherently strong in philosophy and method will find his educational product to be "junior vocational" in character if he uses these textbooks.

Two approaches to subject matter appear in the textbooks studied. Textbooks usually contain informational and operational units. The techniques vary: some of the books are written with operations and related tools as the center of instruction; others are organized around specific operations and individual tools. It is particularly significant that the subject matter in specialization textbooks is based upon analysis and is presented in a logical order, which is arranged by tool or operational families and related units.

The second approach is the graded-project-centered organization used in books written for crafts and self-instruction purposes. Two of the fifteen books examined fall into this category. The graded-project-centered technique is a psychological approach relating instruction to the needs of the learner to perform increasingly difficult tasks.

Machine Woodworking

Six textbooks were submitted for machine woodworking. The general pattern for the machine woodworking text differs from that presented by the general woodworking text. This may be accounted for by the fact that, in general practice, machine woodworking is taught as a unit shop. Only three authors are represented.

Two authors did not include material descriptions or projects. None of the books contain materials for planning, consumer information, interpretive information, or occupational information.

The stress in machine woodworking is upon machines, operations and procedures, general information, and technical information. Safety is stressed by all books, and four books have a degree of specialization emphasis. One book stresses specialization rather strongly but it is also one of the two books strong in general education content. Each book is machine and operation centered. The number of machines to be covered makes it impossible to make a thorough coverage in one book of all machines and, at the same time, to include the necessary related materials for a comprehensive industrial arts approach. It is generally assumed that students working in this area have explored the field in a general woodworking course and are enrolled in the course because of previously discovered interests. The planning and selection of projects and materials as well as interpretive and con-

sumer information should have been studied previously; therefore, inclusion of these materials in machine woodworking might be considered as duplication. It seems, in the light of the foregoing statement, that the textbooks examined may be considered as an entirely adequate treatment of this phase of woodworking.

Mechanical Drawing

Thirteen books were submitted in the area of mechanical drawing which are classified as textbooks for general drawing. The offerings in this field show considerable uniformity of content. The major differences are found in the comprehensiveness of coverage. All of the

TABLE 9

SUMMARY: MECHANICAL DRAWING

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	X*	X*	X	X*	X*	X*	X*	X*	X*		X	X	X	Ind. Arts-Spec.
2.	X*	X*	X	X*	X*	X*	X*	X*	X*	(X)				X*	Ind. Arts
3.	X	X	X	X	X	X	X	X	X	X*				X	Ind. Arts
4.	X	X	(X)	X*	X*	X*	X*	X	X	X*				(X)	Ind. Arts
5.	(X)	X*	X	X*	X*	X	X	X	X	(X)					Ind. Arts
6.	X*	X*	X	X*	X	X*	X		(X)			X			Spec. & (I.A.)
7.	X	X*	X	X	X*	X*	X	(X)	(X)			X			Spec.
8.	X*	X*	X	X	X	X*	X		(X)			(X)			Spec.
9.	X*	X*	X	X	X	X*		(X)	(X)			(X)			Spec.
10.	X	X	(X)	X	X*	(X)		(X)	X	(X)					(Ind. Arts)
11.	X	X	X	X		X									(Spec.)
12.		X		X	X	(X)									(Spec.)
13.	(X)	(X)		X		(X)									No Pattern
Workbook															
14.				X											
Blue Print Reading and Sketching															
15.		X*	X	X*	X	X*			X						Spec.
16.		X*		X	X	X*		X	X	X					Spec.
17.				X		X									No Pattern
Reference (Perspective)															
18.					X	X	X		X*			X	X		Theory

books, with the exception of one which develops only orthographic projection and isometric techniques, cover the general area. Particularly significant is the lack of specialization books for architecture, sheet metal, or machine drawing. Table 9 shows the factors of content and the suggested uses of the drawing textbooks examined in this study.

Ten textbooks are fairly strong in content for general education. Some weaknesses are present but they are minor. Two texts are outstanding in general education content and seven books show good content for this purpose. With this number of textbooks showing strength, it is safe to conclude that the textbook provision for drawing is sufficiently well made.

There are certain factors which are either omitted or dealt with very lightly. Five books have little or no materials for planning. Five books deal with consumer uses of drawing. Six books are strong in interpretive information. Three of those are outstanding in this factor. Five other texts make some attempt at interpretive treatments. Only two texts have strong treatments of occupational information. One text emphasizes the avocational uses of drawing. Three texts deal with values and attitudes acceptably well. It is significant that the removal of four books materially alters the overall picture. These four books contain the majority of the less frequent factors and also show strength in nearly all of the factors which they do contain.

It is interesting to note that general education content in drawing books is not new. Copyright dates for the four texts listed above are 1930, 1938, 1945 and 1950. The book copyrighted in 1930 was revised in 1935, and the text first copyrighted in 1938 was revised in 1949. In the literature on textbook selection generalizations are found to the effect that books reflect the thinking of the period of their first copyright date. If this generalization is true, the beginning of general education emphases by drawing textbook authors dates back at least twenty years.

Workbooks

The use of workbooks in industrial arts drawing is illustrated by two books. These books contain projects and cannot be used as textbooks without the references given in the workbook. The teacher should be aware of the existence of this type of aid for teaching drawing. Its chief value lies in the time saved in layout of drawing sheets and in the added time which may be used in learning fundamental operations.

Blue Print Reading and Sketching

Three textbooks were submitted for blueprint reading. Two included sketching practice. The third deals entirely with interpreting blueprints. These materials are recommended for use as supplementary materials for drawing or may be used as supplements in metalwork or other unit courses where texts have weak or no treatments of drawing and the interpretation of drawings. A second use which these materials may serve is to teach the fundamentals of visualization and description of objects. This may be considered a makeshift arrangement, but the fundamentals of shape description may be taught rapidly and without drawing equipment by using these books.

It should be noted that the blueprint reading and sketching approach to teaching shape-description stresses two factors in particular. Operations and procedures and technical information are generally given major emphasis, while general information, interpretive information, and occupational information receive little or no emphasis.

Metalwork

Metalwork is a composite of several specialized trades. It is not possible to treat the whole composite as a single subject area because of the variety of treatments. Art metal has been classified as a craft

TABLE 10

SUMMARY: GENERAL AND BENCH METALS

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	(X)	X*		X*	X	X	X	X*	X*	X*			X*	Ind. Arts
2.	X	X	X	X	X	X	X	X	X	(X)	X*		(X)	X	Ind. Arts
3.	(X)		X		X*	(X)	X*	X*	X*		X			X	Ind. Arts
4.	X*	X*		Reference, Hand Tools											Reference
Bench Metals															
5.	X	X	X		X*	X	X*	(X)	X	(X)	X			X	Ind. Arts
6.	(X)	X	X	X	X*	X	(X)				X				Crafts
7.	(X)	X	X	X	X	(X)	(X)		(X)	(X)	(X)				Ind. Arts
8.	X	X	(X)	X	X	(X)	X				X				Crafts
9.	X*	X*			(X)	X*	X				X				Spec.
10.	X	X	X	X	X	X									Crafts
11.	X	X	X		X	X					X				Crafts
12.	X	X	X	X	X	(X)									Crafts
Projects Book															
13.				X	(referenced to textbooks)										

subject, although it might be considered as more related to metalwork. If art metal is not included, the textbooks in the area number twenty-nine. If the six books for art metals are added there are thirty-five. These numbers represent respectively 19.2 percent and 23.0 percent of the total number of books submitted. Metalwork, as offered in the high schools, represents 11.2 percent of the total offering in industrial arts. Table 10 summarizes the factors and uses of both general metals and those prepared for bench metals.

General Metals

Four books dealing with general metals were submitted. Two are comprehensive textbooks dealing with hand and machine operations, a third book treats related information, and a fourth book treats hand tools and their uses. The last mentioned book is suitable for reference purposes only, but it serves this purpose well. One of the general comprehensive texts does not contain projects, but, other than this one omission, contains a complete complement of industrial arts factors. Used in conjunction with book number 3, which treats related information, either of the two should prove satisfactory for a general metals course. The first book has a weakness which should be noted; procedures are not strongly treated and supplementation should be made for this weakness. General metals textbooks examined are adequate, although improvement in over-all coverage by a single text is possible and desirable.

Bench Metals

Eight textbooks are included in the bench metals classification. One referenced project book is included in the group which cannot be considered as a textbook. The textbooks treating related information which have been discussed as general metals, are also applicable to bench metals. These texts will not be discussed in bench metals except to point out that these references may be used as supplements to fill in the existing gaps.

The texts examined present the following common characteristics. Five have a full complement of manipulative factors. Two of the remaining books have no projects and the third has neither projects nor material descriptions. All have general technical information. Three show weaknesses in technical content, and only one shows strength. Five have materials for planning; but only one shows strength in this factor, and three are weak. Consumer values are included in only one textbook. Interpretive information is found in two books, but only one of them adequately treats this factor. Occupational information is

found in two texts, but not to an acceptable degree. Two books fail to stress safety. One text makes values and attitudinal commitments. One of the textbooks is designed for specialization purposes but does not refer to this emphasis. Its character is noted by strength in tool descriptions, operations and procedures, and technical information. The omission of material descriptions, together with weak general information, also tends to show the orientation of this book toward specialization. The books classified for bench metals tend to be weak in general education content. This weakness is found to be a characteristic of technical treatments and may be stated as a generalization – textbooks treating highly technical subject matter areas tend to neglect general educational values.

Since only two textbooks contain industrial arts emphases for general education, there is a need for textbooks of the comprehensive type for this particular area. By using the textbook dealing with related information discussed in general metals, it is possible to organize materials for an adequate industrial arts treatment. However, the specific texts prepared for this area are not adequate if used alone.

Machine Shop

Five textbooks in the machine shop area are included in this study. One of these is comprehensive in approach, covering grinding, drilling, lathe work, shaper work, milling machine work, and power hack sawing. Two cover lathe work and related operations used by the lathe operator. One is a series textbook and constitutes only one part of a six-book series which covers the machines and operations generally carried on in a machine shop. While only one in the series was submitted by the publisher, the general pattern is indicated and it can be assumed that with the related books of the series a complete coverage of machines would be obtained. This series is not designed for industrial arts but is specialized in emphasis. This does not necessarily disqualify the series for industrial arts use, but it does make careful supplementation and careful organization of class procedures necessary if general education content is desired.

Table 11 shows that the textbooks in this area have the common characteristics of all technical textbooks; emphases are upon operational skills and the general and technical knowledge connected with these skills. All general educational factors are neglected, making extensive supplementation necessary. The two books previously discussed in general metals are also suitable for supplementing this area.

There is not a clearly defined need for extensive general education

content in machine shop courses because these courses are nearly always elective following some type of orientational course. Under this provision the textbooks examined will provide an adequate basis for the machine shop area.

TABLE 11

SUMMARY: MACHINE SHOP

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	(X)	X*		X*	X	X	X	X*	X*	X*			X*	Ind. Arts
2.	X*	X*	X	X	X	X*					X				Spec.
3.	X*	X*		(X)		X*					X	X			Spec.
4.	X*	X*				X*					X	X			Spec.
5.	X*	X*			(X)	X*					X				Spec.
Project Book															
6.				X*											

Sheet Metal

Sheet metal is generally included in bench metals and is not generally taught as an individual subject for orientational purposes. Whenever sheet metal is taught as a separate course, it generally follows an orientational course which makes many of the general education factors unnecessary. If sheet metal is taught as a first course, the general education factors should be included.

Five books represent this area. The factors of content are summarized in Table 12. All of these texts are strong in specialization factors and none are strong in orientation or general education factors. All except one are weak in design and plan information. None of the books emphasize consumer values. One has a satisfactory degree of interpretive information and also contains consumer information. All of them emphasize safety, and one has specialization emphasis. Two of the books in this section are part of a series developed for industrial-vocational education. The complete series constitutes a course of study which is comprehensive in scope. The series includes books on layout, mathematics, job sheets, machine processes, and hand processes. Only the books treating hand processes and machine processes are included in this study. Two other books were also written for specialization, and the remaining book has practically the same content. Book number 1 may have been written specifically for industrial arts but the treatment of subject matter is shallow. It is doubtful whether this is a desirable feature for semi-specialized

course work, since the orientation desired at this level is achieved only by a more penetrative study.

If it is assumed that sheet metal taught as a unit-shop course should orientate to technology through semi-specialization, the books discussed constitute an adequate treatment. If, however, the theory is held that all industrial arts courses must contain the general education factors, the books submitted are not adequate, and books should be prepared containing these factors.

TABLE 12

SUMMARY: SHEET METAL

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	X*	X*	(X)	X	X*(X)			X	X	X*	X*			Ind. Arts & Spec.
2.	X	X*	X*	X	X	X*(X)					X	(X)			Spec.
3.	X	X	X	X	X	X	X		(X)		X				(Spec.)
4.	X*	X*			(X)	X*(X)					X				Spec.
5.	X*	X*			(X)	X*(X)					X				Spec.

Note: No. 4 and No. 5 are a series presentation and must be used together.

Hot Metals

The subjects of welding, forging, and foundry, are closely related and are treated as a group. Table 13 summarizes the content of the books in these areas. Welding may be taught in general metals or it may be taught as a unit course. As a unit course it is specialized or semi-specialized in content. If it is taught as an industrial arts course, it should be very similar to a vocational course except for the purpose in teaching and learning the content and skills involved. The textbooks will be interchangeable except that vocational work will devote more time to practice and will spend less time with orientational factors. The difference is in degree and not in kind.

Welding

Four welding textbooks are included in this study. All are similar in factor content. One book does not have projects. All contain little or no planning and design information. Only one has occupational information. Two books have specialization emphases. All other pertinent factors are present in all these books in acceptable proportions. The theory of the function of the unit shop determines adequacy in

TABLE 13

SUMMARY: HOT METALS

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Foundry and Pattern making															
1.	X*	X*			X	X*		(X)	(X)	X	X*	X			Ind. Arts & Spec.
2.	X	X	X	X	X	X	(X)	(X)	(X)	(X)	X				(Ind. Arts)
Forging															
3.	X	X	X	X	X	X	(X)		(X)		X				(Ind. Arts) & (Spec.)
Welding															
1.	X	X	X	X	X	X	(X)		(X)		X				(Ind. Arts) & (Spec.)
2.	X	X**	X		X	X					X	X			Spec.
3.	X	X	X	X*	X	X					X				(Spec.)
4.	X	X*	X*	X	X	(X)			(X)	(X)	X	X			Spec.

this as in other unit type organizations. The books are adequate if the assumption holds that industrial arts unit shops may use specialization materials. If the individual feels that it is not feasible to use these materials, the textbooks are not adequate and should be revised or supplemented, or new books should be written.

Forging

Only one textbook was submitted for the subject of forging. This book combines forging and welding. It is not possible to determine whether or not this one book constitutes an adequate treatment for the area. Selection is limited to only one book and this probably should not be considered as adequate. The manipulatory, general and technical information factors are present. Interpretive information is not strong and occupational information is missing. Consumer information is present only by implication. The need is not known in this area because this course is reported as metalwork and is not distinguishable from the group heading. The content of this book is shown as book number 3 in Table 13.

Foundry

Foundry is represented by two books. One book is definitely for specialization or engineering, but it includes the factor content nec-

essary in an industrial arts approach, particularly if used for the unit shop. The other book is addressed more nearly to industrial arts and contains design and planning factors which are not included in the first book. It also has projects which are not included in the specialization text. Foundry is usually taught as a part of the general metals course in industrial arts. Since unit courses are rarely, if ever, taught in this subject for industrial arts purposes, these books should probably be classified as references for general metals.

Handcrafts

Handcrafts constitutes two percent of the total offering in industrial arts work (see Figure 1). It is evident that books have been prepared out of proportion to this need. Nearly 18 percent of the books examined in this study were written for crafts or avocational uses. To explain this over-emphasis is not part of this study, but it should be pointed out that the diversity of subjects grouped under this collective heading accounts in part for the great number of books submitted in this area. Leathercraft, art metal and jewelry making, textiles, basketry, wood carving, shell craft, fly tying, paper crafts, ceramics, plastics, graphic arts, and other subjects may be dealt with in this area. If one book were used for each subdivision of the area, the resulting number would constitute more than a proportionate share of books for the area when compared to the percentage of offering. In most of the subject areas adequate provision has been made. Many of the handcrafts are orientated toward the avocational objective in industrial arts education and do not necessarily contain factors for other purposes. That many of the books presented do meet other needs is to the credit of the authors and benefits education in general.

General Arts and Crafts

The provision for general textbooks for handcrafts is not as good as might be expected from the above discussion. Four books were submitted covering general crafts. Several generalizations may be made. (1) The crafts approach carries the manipulative factors of tool description, operations and procedures, material descriptions, and suggested projects. (2) A certain amount of technical skill and knowledge is involved in the production of crafts items. These books meet this need. (3) The crafts should be creative experiences and should contain planning and design information. This factor is dealt with strongly in one text but rather weakly in three. It should be mentioned that one of the texts is suitable for elementary grades and probably should not be considered for use in the junior high school or beyond. As in

other diverse subject areas, the problem of adequate treatment of a number of subjects in a competitive type text has not been solved. The largest volume examined contains approximately one thousand pages and is both expensive and unwieldly as a textbook. While this type of comprehensiveness is desirable, textbooks of this type are too expensive for use by every student. This problem is the same problem that must be met in courses such as general shop, and the answer is not immediately evident. Research is needed to develop books with appropriate balance between comprehensiveness and penetration for the composite subject areas. Table 14 summarizes the content of the books in this category.

TABLE 14

SUMMARY: GENERAL ARTS AND CRAFTS

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X	X*	X*	X	X	(X)	X*	X	X				X		Crafts
2.	X	X	X	X	X	(X)	(X)						X		Crafts
3.	(X)	X	(X)	X*	(X)	(X)	(X)						X		Crafts
4.	(X)	X	(X)	X*	(X)	(X)	(X)						X		Crafts
Textiles															
5.	(X)	X	X*	X	X	X	(X)	X*		(X)			X		Ind. Arts
Basketry															
6.	(X)	X	X	X	X	(X)							X		Crafts
Woodcarving															
7.	X	X*	(X)				X						X		Crafts

Plastics

Plastics are frequently included in handcrafts courses. The classification of plastics as crafts will probably be discontinued in the near future because of the promise of these materials to become equal in rank with wood and many of the metals. Six books were examined. The content factors and patterns of use for these books are shown in Table 15. Probably the best treatment of plastics was not designed as a crafts approach but treats the crafts idea only incidentally. In this book the technical aspects of the use of plastics are well covered. Consumer knowledge, occupational and guidance information and specialization emphases are included. By supplementing this book with projects it becomes the best approach for general education use.

In general, the other five books are strong in operations and procedures, material descriptions, projects, general information, and technical information. Design and plan information is treated adequately but not strongly in three books. Two books contain interpretive information, but only one contains adequate occupational information. The plastics area may be covered well by the use of two texts. The subject of plastics is adequately treated for avocational purposes; however, selection is not adequate if the subject is taught as a materials area for general industrial arts objectives.

In industry this field is rapidly expanding, and books that are now up to date will be obsolete in ten years or less. Revisions will be necessary from time to time.

TABLE 15

SUMMARY: PLASTICS

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	(X)	X*	X*		X*	X*		X	X	X		X	X		Ind. Arts-Spec.
2.	X	X*	X*	X*	X*	X	X		X				X		Crafts
3.		X*	X*	X*	X	X	X	(X)	(X)				X		Crafts
4.	(X)	X*	X	X*	X	X	X	(X)					X		Crafts
5.	X	X	X	X	X	X		(X)	(X)	(X)			X		Crafts
6.	X	X	X	X	X		(X)						X		Crafts

Leathercraft

Leathercraft, as one of the most popular of the handcrafts, is generally dealt with in both single-subject books and in general crafts books. Six textbooks and three projects books were examined. One of the books was weak in general information and two books were weak in technical information. One book did not describe materials and tools. None of the books contain appreciable interpretive information, and only two mention consumer values. One of the texts treats a narrow subject, dealing only with the production and care of hand-made gloves. In general, the manipulative factors and general technical information are adequately treated. All books except one are oriented toward avocational purposes. For avocational objectives, the texts examined are adequate. None of the texts treat leather as an industrial material, and none of them contain general education or industrial arts content factors. The books examined are adequate for the narrow avocational objectives, but they fail to meet general industrial arts specifications. Table 16 summarizes the content of books for leathercraft.

TABLE 16

SUMMARY: LEATHERCRAFT

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	X*	X*	X*	X	X	X*	X					X*		Crafts & Spec.
2.	X*	X*	X*	X*		X	X						X		Crafts
3.	X	X*	X*	X*	X	X	X	(X)							Crafts
4.	X	X	X	X	X	X	X	X				X	X		Crafts & Spec.
5.	(X)	X*	X	X*	X		X						X*		Crafts
6.		X		X	X		(X)								Crafts
Projects Books															
7.				X											
8.				X											
9.				X											

Art Metal

Two types of books are found in this category. The following information is taken from Table 17. Four books were written on the subject of jewelry making, and two are concerned with treatments of metal for other art uses. All have crafts or avocational emphases and contain the manipulative and general-technical information factors. Materials for design and planning are treated in a superior manner by one book and acceptably by four of the remaining five. Two books have interpretive materials. Three of the books contain occupational information, but only one adequately treats this factor. Two have specialization emphases indicating that the approach is not the regular crafts

TABLE 17

SUMMARY: ART METAL

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X	X*	X	X	X*	X*	X*	(X)	X*	(X)			X*	X*	Ind. Arts
2.	(X)	X*	X	(X)	X	X*	X			(X)		X	X		Crafts & Spec.
3.	X	X	X	X	X	X	X			X		X	X		Crafts
4.	X	X	X	X	X	X	X	X			X				Crafts
5.	(X)	X	X	X	X	X	X		X						Crafts
6.	X	X*	X	(X)	X	(X)		(X)					X		Crafts

information. These books have a combined crafts-specialization approach and are concerned with saleable hand skills or crafts.

In general the conclusion may be made that the books examined constitute an adequate treatment of this subject area, particularly if art metals are considered as hand crafts materials and not as industrial materials.

Ceramics

Ceramics, as an industrial arts subject, has not attained a highly significant popularity in terms of offerings. The percentage of all high school offerings is slightly higher than 0.1 percent, or in terms of industrial arts offerings less than one-half of one percent. The comparatively large number of books submitted does not reflect this lack of popularity. It should be noted that this area is often included in crafts courses and would not appear as a single course because it is reported under the composite heading. It should also be pointed out that fine arts uses this subject in many instances and that this area has become a popular hobby or home craft.

Table 18 summarizes the content factors of the nine books submitted. This is approximately 6 percent of the total number of textbooks examined. In general, the books are orientated toward manipulation and avocational use, but often contain strong general and technical information. Design and plan information is strongly emphasized in two of the books and adequately in three others. This plastic material medium lends itself to the creative approach and some of the best

TABLE 18

SUMMARY: CERAMICS

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*	X*	X*	(X)	X*	X*	X*	(X)	(X)	(X)		(X)	X*	X*	Ind. Arts
2.	(X)		X		X*	(X)	X*	X*	X*	X*	X			X	Ind. Arts (ref.)
3.	X*	X*	X*		X	X*	(X)		(X)	X		X	X		Ind. Arts (Spec.)
4.	X	X*	X*	X*	X*	X	(X)	Keene Cement Only					X*		Crafts
5.	X	X	X	X	X	X	X						X		Crafts
6.	X	X	X	(X)	X	X	X						X		Crafts
7.	X	X	X		X	X	X	(X)					X		Crafts
8.	(X)	X	X	X	X*	(X)		(X)	X	(X)			X		(Ind. Arts)
9.	(X)	X	X		X	X			X				X		Crafts

treatments of "creativity" are developed in these volumes. Except for one book, consumer education is neglected. Interpretive information is strongly emphasized in one book and is found in two books to an acceptable degree. Occupational information is strongly emphasized in one, is considered adequate in another, and is present to some degree in two books. Safety is treated in only one book; however, it should generally be understood that this factor is not particularly applicable, since the processes involved are not generally hazardous.

Two books strongly emphasize avocational interest and six addition texts contain this emphasis to a degree. Values and attitudess are stressed in two books.

One of the books contains all of the pertinent factors for this area. The four textbooks classified for industrial arts constitute an adequate provision in this area.

Home Mechanics

Home mechanics has achieved little popularity as an industrial arts subject. It is not possible to state whether the lack of popularity effects the textbook situation or whether the textbooks situation has adversely affected the initiation of home mechancis courses. Four books were submitted which are classified in this area. One book was classed as home mechanics because of its close relationship to this area. The general pattern in this area is one of manipulative factors, general information, a light treatment of technical information, consumer information and safety. In general, the approach is shallow and is not always based upon fact. The areas generally covered include drawing, woodworking, re-glueing and refinishing furniture, painting, patching plaster, re-upholstering, care of floors and finishes, electricity, care of appliances, windows and doors (hardware and screens, shade roller, et cetera), plumbing and heating, repairs, et cetera. Only one book is classified for industrial arts by the criteria of this study. In general, this field suffers from diversity of materials. The statements tend to be general and not well related to student understanding. Background materials are not developed, thus making the subject matter a group of unrelated facts. The area has possibilities for general education, but with the textbooks submitted not too much can be expected. At best the textbooks examined for this area are inadequate.

The related text which was submitted does not fall under the same criticism but might well serve as a basic reference or supplement for providing material in this area. The care and construction of furniture, judging fabrics, construction of draperies and slip covers, selection

and use of period furniture, and the use of colors and paints in the home are covered by this book in a fairly comprehensive manner and might be used profitably by those teaching courses in this area. Table 19 summarizes the content of these books.

TABLE 19

SUMMARY: HOME MECHANICS

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	(X)	X	X	X	X	(X)	X	X*			X				Crafts
2.	X	X	X	X		X*	X*	X*							Spec.
3.	X	X	X	X	X	X		X			X				Crafts
4.	(X)	X	(X)	X	X	(X)	(X)	X			X				(Ind. Arts)

Graphic Arts

Printing or graphic arts represents nearly 5 percent of the total offering in industrial arts subjects. The books submitted represent approximately 9 percent. If reference books and supplementary books are not considered, however, the percentages are nearly equal. Eight of the thirteen books in this area are textbooks. One book treats related information and serves to fill in the general education gaps in other textbooks. With the exception that projects are not provided in three of the books, the remaining seven books all contain provisions for manipulative work. General information and technical information are factors common to all books in this area. Five books emphasize planning procedures, two emphasize consumer values, and six books contain occupational information and emphasize safety instruction. Only one book deals in terms of specialization. Two books stress avocational uses of graphic arts, and three contain values and attitudinal references. Two books may be used together to cover all factors pertinent to this area. Supplementary materials are provided in the form of project and reference materials for texts which are not otherwise complete.

Specialized Books and References

Two comprehensive treatments of silk screen process (one for the professional and one for school use) are available, and one book treats book binding for exploratory or avocational purposes. A complete treatment of type face recognition is also available as a reference. Two sets of job and operation sheets for printing are provided around which a course may be organized by using appropriate refer-

ences. These sheets may also serve as projects for textbooks which omit this factor.

The books examined constitute an adequate provision in this area. Table 20 summarizes this information in table form.

TABLE 20

SUMMARY: GRAPHIC ARTS

Bk. No.	Content Factors (symbols) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X	X	X	X	X*	X	X	X	X*		X		X	X	Ind. Arts
2.	(X)		X		X*	(X)	X*	X*	X*		X			X	Ind. Arts (ref.)
3.	X	X	X		X	X	X		X	X	X				Ind. Arts
4.	X	X	X	X	X	(X)		(X)	(X)	X	X			(X)	Ind. Arts
5.	X	X	X	X	X*	(X)		(X)	X*	X					Ind. Arts
6.	X	X	X	X	X	X	X	(X)	(X)	X					Ind. Arts
7.	X	X	X		X	X	X		X			X			Spec.
8.	X	X	X		X	X							X		Crafts
9.			X			X**									Spec. (ref.)
10.		X*		X*		X	Supplement, Printing Job Sheets								
11.	X	X	X		X	X	X	(X)	(X)	X		X	X		Ind. Arts - spec.*
12.	X	X	X		X	X	X	(X)	(X)	X					(Ind. Arts)
13.	X	X	X	X	X	(X)		X					X		Crafts, Narrow Subj.
Photography															
14.	X	X	X	X	X	X	X	X				(X)	X		Ind. Arts

* N. S. - Narrow subject field.

Electricity

Electricity, as taught in high schools, constitutes 3.6 percent of all industrial arts offerings. The books submitted for inclusion in this study constitute 8.6 percent of all books submitted in subject areas. All of the books submitted are standard textbook approaches with the exception of one book which deals with related information only. Thirteen books were submitted. Table 21 summarizes the content and use of these books.

Textbooks for the electrical area have the following characteristics: Tools are seldom described, operations and procedures are

given by ten textbooks, eleven books describe materials, and ten books contain projects. The projects are often in the form of experiments and do not result in a finished product. All of the books contain general information, but two do not contain technical information to an observable degree, and four are weak in technical information. Planning and design factors are found in three books. Consumer information is emphasized by three, is satisfactorily included in two, and included to an observable degree in three books. Three books give interpretive information and two have weak treatments of this information. Five books stress safety. Only two books stress avocational use of electrical activities and none of the standard texts make value and attitudinal statements. None of the books stress specialization directly. Two of the books, however, show strength in the technical information factor and are, therefore, suitable for specialization purposes.

TABLE 21

SUMMARY: ELECTRICITY

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.		X	X	X*	X*	(X)	X	X	X	X	X		X		Ind. Arts
2.			X		X*	(X)	X*	X*	X*	X*	X			X	(Ind. Arts)
3.		X	X	X	X*	X	X*	X*	X		X*				Ind. Arts
4.	X	X	(X)	X	X*	(X)			X	X	X				(Ind. Arts)
5.		X	(X)	X	X*	(X)		X	(X)	X	X				Ind. Arts
6.	(X)	X	X	X	X*	X*	X	X*							(Ind. Arts)
7.		X	X	X	X*	(X)					X				Lab.-Theory
8.		X	X	X	X	X		(X)	(X)						Lab.-Theory
9.	X	X	X	X	X			(X)							No Pattern
10.		X	X	X	X	X									Lab.-Theory
11.		X	X	X	X								X		Crafts
12.			X		X	X*									Theory only
13.					X	X		(X)							Theory only

The one book which treats related information is an excellent supplement to fill the general educational omissions in the other

textbooks. By using this book in conjunction with either of several of the other textbooks, an adequate coverage is obtained. This area can be considered as adequately provided for with six books which contain industrial arts emphasis and which provide an adequate selection in approach. There is a need in this field, however, for a comprehensive textbook written specifically for industrial arts use.

Photography

Photography is not often taught as an industrial arts course, but it may be offered as part of graphic arts or as science. It constitutes less than one-half of one percent of all industrial arts offerings. One book[29] was submitted for this study. This treatment was written for an introductory course, and contains all of the manipulative factors as well as general and technical information pertinent to this type of course. In addition it contains materials for design, consumer information and occupational information. Stress upon specialization is only slight. Avocational emphasis is present.

Automobile Mechanics

Automobile mechanics represents slightly more than one percent of the total offerings in industrial arts. As in other courses making up a small percentage of the total offering, the percentage of books is comparatively high, being approximately four percent. This may be accounted for by the closely related offerings in industrial-vocational education and from the fact that books are often written in the "twilight zone" for use in both fields. Included in this area is a workbook for driver safety education, and a book treating transportation and power.

Eliminating these two, four textbooks dealing with automobile mechanics remain. One of these is a supplementary text using a blueprint reading and sketching approach to an understanding of technical and general information in automobile mechanics. If properly used this supplement should prove very valuable, particularly where knowledge is desired without an extended use of laboratory equipment. It is well adapted to use for developing specialized knowledge of structural and operational principles. The book cannot be considered a textbook because it depends upon references for information and does not contain materials other than blueprint exercises.

Of the three textbooks in automobile mechanics, two are orientational in scope and one integrates the principles of physics and the

[29]This book is No. 14, Table 20, Summary: Graphic Arts.

principles of automobile mechanics. This book also contains materials valuable for orientational purposes. Two of the books are adaptable for both orientational and specialization purposes, and one is a typical orientational textbook.

None of the three describes tools and only one provides projects or problems. One book does not give operations and procedures and does not give material descriptions. The manipulative factors are included in only one book. All three contain general information, technical information, and deal thoroughly with consumer values. Two have interpretive materials, and the other contains a weak treatment of this factor. One deals with occupational information, though weakly; two books stress driving safety. None of the books emphasize avocational or specializational factors. One book makes value and attitudinal statements and inferences.

The three texts discussed above are all orientational in approach and each does an acceptable job. In view of the creditable coverage and the quality of the books submitted, it must be said that this area is well provided for. It should be understood that each of these books is prepared for courses of at least two semesters, and that no textbook was submitted which makes a rapid survey in this area.

TABLE 22

SUMMARY: AUTOMOBILE MECHANICS

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	(X)	X	(X)	X*	X*	X	(X)	X*	X		X*			X	Ind. Arts
2.		X	X*		X*	X*	X	X*(X)		(X)					Ind. Arts
3.					X	X	X	X*	X		X				(Ind. Arts)
4.				X	(workbook)										
5.				X	(Driver Ed. Wrkbk.)						X*				
Transportation and Power															
6.		X		X	X*(X)			(X)			X				No Pattern

Transportation and Power

One book in the field of transportation treats automobile safety, gasoline and diesel engines, fuel and electrical systems in automobiles, lubrication and cooling, and power application and control. The treatment is rather weak, due to the broad area treated. Manipulative factors, consumer skills and knowledge, and technological orientation is developed to a degree. This treatment is recommended for orientational courses in junior high school only.

General Reference

Books for general reference purposes are not of sufficient number to warrant a discussion of the composite category. Table 23 gives the content and use pattern for each book.

The chief value in references is the use which the books may serve in filling the gaps in other texts. In teacher education institutions offering special technical courses, the books may become textbooks or auxiliary materials.

TABLE 23

SUMMARY: GENERAL REFERENCE

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Planning															
1.	(X)				X	(X)	X**		X	(X)	X*			X**	Ind. Arts
Materials and Processes															
2.	(X)	X		X*	(X)	X*	X*								Ind. Arts & Spec.
3.			X		X		X	X	X						Ind. Arts (ref.)
Shop Safety															
4.											X***				Ind. Arts & Spec.
Finishing Materials and Methods															
5.	X*	X*	X*		X*	X*	X*	X		X*	X*	X			Ind. Arts & Spec.

CHAPTER V

Summary and Recommendations

Summary and Recommendations

Basic background materials have been presented, criteria developed, and data compiled and interpreted in order to determine the status of the textbook as it is used in industrial arts education. The purpose of this chapter is to portray some general conclusions and recommendations.

While many of the basic problems of industrial arts education are beyond the scope of this study, some of these are closely related to the problems of textbook selection and use. The conclusions of this chapter define several of the general problems and recommendations suggest an approach to their solution. The data presented in this study provide a basis for the following:

1. The definition of industrial arts and teaching practices should be carefully examined in order to bring them into congruency.

2. The relationships of industrial arts and industrial-vocational education should be explicitly defined and an agreement reached concerning the discrete functions of each of the complementary divisions of industrial education.

3. This study indicates that the textbook needs for the industrial arts unit shop and those for beginning industrial-vocational shops are closely related. An agreement should be reached upon these basic needs. This should provide a basis for a better understanding of the specific functions of each area and should lead to better working relationships.

4. The lack of adequate criteria for textbook content, for textbook classification, and for textbook selection presents a serious problem in the field of industrial arts education. The lack of textbooks with adequate content restricts the growth and development of a complete industrial arts program. The lack of classificatory and selective criteria makes intelligent selection of textbooks very difficult and leads to inefficiency and confusion. Criteria should be developed and adopted by professional groups. Selective criteria and procedures should be developed for use by individual teachers and by groups concerned with state and municipal selection or adoption of textbooks for

the classroom. Publishers should use the developed classification criteria for catalogue descriptions of their textbooks.

5. To achieve an adequate coverage of all industrial arts objectives it is necessary to use two or more books in many of the subject areas. Selective criteria should provide for an intelligent selection of complementary textbooks. Selection should be based upon the suitability of content for use in achieving the objectives of industrial arts. The methods employed in this study are recommended as one approach to this problem.

6. At present, the comprehensive textbook is non-existent in many of the subject areas. For purposes of clear organization, comprehensive textbooks should be specifically written for all sub-divided areas of industrial arts. The textbooks should provide complete coverage of both subject area and objectives. The most critical need exists in the comprehensive general shop area. The need in this area should be brought to the attention of the profession and to textbook publishers.

7. In order to provide for continued growth of industrial arts, the production of textbooks should be based upon need. An inventory of all available textbooks should be established and continuously reviewed to insure proper guidance to authors and publishers in the field of industrial arts. Future needs should be anticipated and provisions should be made to meet them as they may occur.

8. The quality of textbooks should be improved through adequate research. Authorship should reflect valid experience in the areas covered. Only qualified individuals should be encouraged to write the textbooks needed by the profession. Textbooks with errors in information and approach should either be corrected or they should be rejected for use as industrial arts textbooks.

9. A study should be made to determine both the appropriate levels of use for all textbooks properly listed for industrial arts and the needs in relation to reading and comprehensive abilities of students. This study should deal with concept difficulties as well as word-count techniques.

10. The textbook is a tool to be used in achieving educational objectives. The way in which the tool is constructed determines the function which it may best serve. The skill with which it is used determines the quality of the educational product. It is the duty of every qualified teacher to be able to recognize the correct tool for the task and to be able to use the tool effectively. The proper use of the textbook should be given appropriate emphasis in teaching methods courses as an aid to more intelligent teaching and to better learning. Properly used, the textbook remains one of the best teaching aids available.