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ELEVENTH
YEARBOOK

Essentials of
**PRESERVICE
PREPARATION**

AMERICAN
COUNCIL
ON
INDUSTRIAL
ARTS
TEACHER
EDUCATION

1962

Essentials of
PRESERVICE PREPARATION

ELEVENTH
YEARBOOK

Essentials of
PRESERVICE
PREPARATION

DONALD G. LUX, Editor
Chairman, Industrial Education Division
University of Illinois, Urbana

AMERICAN
COUNCIL
ON
INDUSTRIAL
ARTS
TEACHER
EDUCATION

A DIVISION OF THE AMERICAN INDUSTRIAL ARTS ASSOCIATION
AND THE NATIONAL EDUCATION ASSOCIATION

1962

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Foreword

The American Council on Industrial Arts Teacher Education yearbooks provide a regular supplement to the literature of the field of industrial arts teacher education. The yearbooks enter the regular stream of catalogued library resources and are available to investigators seeking material on our field. This is the basic strength of the yearbook program.

The yearbooks thus provide a visible platform from which members may address themselves to the problem of improving the profession. In *Yearbook XI* a team of authors have directed their efforts to the most basic question facing us. What are the essentials of the effective preservice program of industrial arts teacher education? Here is presented a point of departure from which the profession can be improved. Postulates are stated; directions are indicated.

Industrial arts teacher educators may use *Yearbook XI* as a base with which to compare the guiding principles and resultant practice in their individual programs. Objectively done, this should lead toward attainment of the desirable goals of greater consistency between theory and practice and greater theoretical consistency between programs throughout the nation.

The American Council on Industrial Arts Teacher Education again wishes to express its sincere appreciation to the McKnight & McKnight Publishing Company for underwriting the yearbook program. Their efforts and generosity again enable the industrial arts teacher educators to provide the profession with a fine addition to the literature.

Sincere appreciation is extended to the editor and authors who have contributed so generously of their time and talents to produce this timely and worthy publication. This volume is a result of deep insights and fine scholarship on the part of the writers. Their good work is gratefully acknowledged.

The Yearbook Committee that works behind the scenes to give direction to the yearbook program is also to be commended.

Donald Maley, *President*
College Park, Maryland

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Preface

Yearbook XI is devoted to a delineation of the theory and arguments that underlie the basic essentials of a contemporary industrial arts teacher education undergraduate curriculum. This is not to say that this volume is just for industrial arts teacher educators — rather it is for all who can or do contribute to the total preparation of the competent industrial arts teacher: those in labor, management, the various fields of higher education, school administration, and those who supervise student teachers.

Industrial arts teacher education built on the apparently fixed but actually shifting sands of the current records of teacher placement office calls, or a survey of what is being done, will lead to the demise of industrial arts. Teacher education based on sound theory and with an eye on the future is needed to lead industrial arts to its appropriate role in a free, technological society.

Criticism of this work is invited, and the Editor volunteers to offer all comments and reactions to the Council program chairman for possible airing at an annual convention and to the Editor of the *Industrial Arts Teacher* for possible publication. The Editor further accepts full responsibility for all errors, omissions, and oversights in *Yearbook XI*.

Certainly more is left undone than done. No space is here devoted to the critical question of recruitment, in-service staff development, student personnel programs, and staff personnel policies and procedures. Perhaps here are topics for future yearbooks.

The Editor wishes to express his appreciation to Professors Howard Nelson, Delmar Olson, Kenneth Phillips, and Douglas Sherman whose contributions made *Yearbook XI* possible; to the American Council on Industrial Arts Teacher Education for the privilege of participating in their yearbook program; and to the McKnight & McKnight Publishing Company.

Donald G. Lux, *Editor*

Authors of Yearbook Eleven

Section 1. Background and Purpose

Donald G. Lux
Chairman, Industrial Education Division
University of Illinois
Urbana, Illinois

Section II. General Education

Kenneth Phillips
Chairman, Industrial Arts Department
San Diego State College
San Diego, California

Section III. Professional Education

Douglas R. Sherman
Assistant to the Provost
Wayne State University
Detroit, Michigan

Section IV. Technical Education

Delmar W. Olson
Coordinator, Graduate Study in Industrial Arts
Kent State University
Kent, Ohio

Section V. Selection of Students

Section VI. Implications for Program

Howard F. Nelson
Acting Chairman, Industrial Education Department
University of Minnesota
Minneapolis, Minnesota

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SECTION I

Background and Purpose

Donald G. Lux
Chairman, Industrial Education Division
University of Illinois
Urbana, Illinois

CHAPTER ONE

Background and Purpose

Individual worth continues as the primary distinguishing characteristic of American society. Because of this, our schools are evaluated in terms of the quality of the education provided for every citizen. So long as this is true, the better schools of America will continue to offer well-balanced programs of both academic and practical work. Only such a program can meet the educational needs of each individual and thus of society.

In the vast majority of American public secondary schools, offerings in industrial arts education are a prominent element of the practical aspect of the school program. An effective industrial arts curriculum is well organized, financed, staffed, and operated. If any of these factors is lacking, to that degree the total effort is inadequate. Despite this, the one limitation which cannot be compensated for is that posed by a less-than-fully-competent teacher. In teacher education lies the key to progress in the improvement and expansion of effective industrial arts education in America. The profession has not been unaware of this fact.

In the first yearbooks, the American Council on Industrial Arts Teacher Education inventoried its human and material resources. *Yearbook IV* presented to the profession a profile of the educational frontier in industrial arts teacher education at the undergraduate level. It reported the points at which the profession was making progress and the points where little or no advance was being made. In *Yearbook V* the Council studied some of the problems and issues in industrial arts teacher education, and some recommendations from it shortly will be considered in greater detail.

In *Yearbook XI* an attempt is made to conceptualize a schema of preservice education for industrial arts teachers that is consistent with their needs as general education teachers in contemporary society. The writers have as their objectives:

1. To identify and state some basic assumptions and arguments underlying the essentials of the general, professional, and technical preparation of industrial arts teachers
2. To recommend minimum standards of preservice education for industrial arts teachers as to (a) nature, (b) quantity, and (c) sequence in a program which is consistent with the developed rationale
3. To identify ways in which we can select better individuals who aspire to industrial arts teaching.

Yearbook XI, then, moves a step further toward identifying the minimum essentials of an adequate program of industrial arts teacher education. Evidence of some of the problems still confronting industrial arts teacher education were previously presented in preceding yearbooks.

In *Yearbook IV* the following comments were made as regards superior practices in the area of general education.¹

... the general education of Industrial Arts teachers may have been reported by numerous (schools) as superior practice but, in light of present data, the case is not supported. For example, Item 205: *Significant social-economic conditions and trends are studied* and Item 208: *The student studies the policies and programs of groups representing special interests such as agriculture, business, labor, health, etc.,* are among those for which no response was received. Of comparable significance is the fact that there was only one response to Item 207: *There are opportunities for developing an understanding of the social impact of industry* (e.g., urbanization, specialization, dependence upon the job of work, need for old-age security, etc.). This is not to state, however, that the general education of Industrial Arts students should differ essentially from that of other college students. Rather, from the viewpoint of an Industrial Arts educator, the experiences implied by these statements would seem to merit attention in any contemporary general education program.

In *Yearbook V*, the following are reported as changes which must occur in the general education of industrial arts teachers:²

... the student (should) be required, or allowed, whichever the case may be, to take a more active part in the direction of his own educational program, and to become an educated man through his interests in self-development, in finding out what his educational needs are, in hypothesizing some things to do to remedy those needs, and in evaluating his own growth.

¹ American Council on Industrial Arts Teacher Education, *Superior Practices in Industrial Arts Teacher Education*. Yearbook IV. Bloomington: McKnight & McKnight Publishing Co., 1956, p. 49.

² American Council on Industrial Arts Teacher Education, *Problems and Issues in Industrial Arts Teacher Education*. Yearbook V. Bloomington: McKnight & McKnight Publishing Co., 1957, p. 192.

Finally, it was suggested that many of our present-day college courses are very poor as general education courses. This does not mean that the courses are not good for preparing a specialist in that particular area. It simply indicates that when a student takes beginning courses in chemistry he does not receive a general education course in chemistry but instead, he receives an invitation into the area under the assumption that he is going to spend the rest of his life being a research specialist in chemistry. Although this may produce, after a considerable length of time in additional study, some excellent researchers in chemistry, it does very little for the general education of those people who are not going to be specialists in chemistry. They learn a few techniques about how to hold a test tube, memorize a few symbols, and that is about all. The big concepts of chemistry, and perhaps of more importance, the efficacy of the scientific method, is seldom, if ever, mentioned. By and large, this criticism will be found to be true in terms of each of the college areas; be it chemistry, mathematics, English, or to a lesser degree, industrial arts. Thus, the need seems to be not the taking of more courses but the re-designing of learning experiences.

In regard to professional education *Yearbook IV* reports the following:³

Student teaching and 'methods' courses occur universally. . . . In contrast, courses which pertain to providing educational perspective as suggested by educational sociology, community study, history of education, and principles of education occur much less frequently. Similarly, courses which include specific educational techniques such as the use and interpretation of standard tests, scales and inventories, or contacts with curriculum laboratories and reading clinics are reported infrequently. Although there is compensation for some of these omissions during the period of student teaching, too great a remainder of the professional programs may be assigned to the student teaching period. From these data it would seem that rather broad areas of educational perspective and educational techniques receive only minor or cursory consideration.

The following are listed in *Yearbook V* as critical needs for the improvement of professional education:⁴

1. Increased emphasis on the technical background of industrial arts teachers. More stress on *applied* mathematics, inorganic chemistry, metallurgy, and physics, particularly as it deals with electricity, heat, light, sound, and mechanics.
2. A new approach to method that lends itself to procedures followed in experimental laboratories, individual and group assignments, freedom to plan, investigate, construct and maneuver as required. This does not mean freedom to waste time, irresponsible conduct or aimless tinkering but on the contrary a businesslike atmosphere of responsi-

³ ACIATE, *op. cit.*, *Yearbook IV*, p. 66.

⁴ ACIATE, *op. cit.*, *Yearbook V*, pp. 221-228.

- bility, planned programs, and orderly approved procedures such as one would find in well-operated commercial laboratories.
3. A continued effort to provide an extensive acquaintance with industrial materials and processes, even at the expense of some specific manipulative skills in some areas.
 4. A more critical selection of those admitted to teacher education in industrial arts. Technical interest and aptitude must be in evidence in much the same degree as would be expected from the person preparing for technical employment. In fact, graduates of technical high schools who possess the personal qualities becoming of a teacher should be the most likely source of teacher material. For those lacking this background the teacher-education curriculum in industrial arts might well provide a similar program for the early years in teacher preparation.
 5. Since teachers invariably teach the way they were taught, it becomes obvious that the techniques and methods employed in teacher education should be of outstanding character in example as well as precept.
 6. Teacher education must assume leadership if our program is to progress. Little progress can be hoped for if those who prepare industrial arts teachers confine their efforts and thinking in terms of what we have instead of what we should be doing. Remember that a teacher in preparation today is at his best as a teacher twenty years from now, and that his pupils will project his influence on their lives for another twenty-five years. Teacher education must project itself well into the future just as industry must anticipate what is to come, or education will always remain at the rear in the ranks of progress.

In regard to the technical preparation of Industrial Arts teachers, *Yearbook IV* states:⁵

The implication is sometimes that students become aware of industrial methods and manufacturing processes by participating in similarly named school shops. That is, the student in his metal working shops learns about basic metal fabricating, processing, and assembling procedures. That is, at the best, an assumption, and whether the relationship exists is dependent upon the instruction; understanding industrial processes does not necessarily accrue from the construction of projects in a school shop. Similarly, shop and drawing activities lend themselves well to the study of occupations, but, again, the correlation can be achieved only through conscious effort.

Yearbook V also offers suggestions for the improvement of the technical preparation of industrial arts teachers.⁶

It is probably universally accepted that countless problems face industrial arts teacher education, and that teacher education is the weakest link in the total industrial arts program. However, the basic

⁵ ACIATE, *op. cit.*, *Yearbook IV*, pp. 120-121.

⁶ ACIATE, *op. cit.*, *Yearbook V*, see pp. 207-208.

problem is with theory. This publication attempts to get at this problem by identifying the basic theoretical considerations which might appropriately underlie a sound program of industrial arts teacher education. The major hypotheses for each of the areas of general, professional, and technical preparation are identified below. The remainder of the Yearbook is a presentation of an elaboration of the arguments to support these hypotheses and suggests the minimum essentials of a teacher education program consistent with them. Also included is information which can help in the formulation of a sound system for selecting individuals who are most likely to satisfactorily complete the preservice program in industrial arts teacher education.

The basic theoretical considerations underlying the general education of industrial arts teachers are:

1. General education is a common experience and background for all educated persons.
2. General education results in the improvement of the individual's ability to live wisely and well.
3. General education contributes to the development of a code of ethics based upon democratic principles.
4. General education develops a sense of responsibility to and understanding of social, economic, and political problems.
5. General education provides for optimum development of knowledge in the areas of sciences, humanities, communications, social sciences and in personal maturity.

The basic theoretical considerations underlying the professional education of industrial arts teachers are:

1. Industrial arts teacher education is an integral part of the total field of teacher education.
2. Professional education gives teacher education curricula their professional qualities.
3. Foundational knowledge in the theory of education is essential to effective teaching.
4. Teaching skills and techniques are essential to effective teaching.
5. Through laboratory and field experiences, theoretical and applied professional knowledge and skills are integrated toward better teaching of subject matter and youth.

The basic theoretical considerations underlying the technical preparation of industrial arts teachers are:

1. The origin of subject matter is in technology.
2. The body of subject matter is in continuous change.

3. The study is of industries.
4. The subject matter contributes to an advancing of technology.
5. The creative imagination is of greater consequence than knowledge.

Yearbook XI is not meant to be a final work which will provide *the* industrial arts teacher education program for each of the hundreds in existence. Such a work would be of questionable value. Each program will continue to be an individualized development which reflects the complex of goals, physical assets, staff competencies, institutional strengths and clientele which shape its character. Despite these necessary and desirable differences, there should be a continuing thread of basic principles which provide for consistency and adequacy over all.

Basic assumptions are here presented, and logical implications for programs are derived. Teacher educators may evaluate individual programs using these benchmarks. From this we would hope that programs generally would become more consistent with the theoretical considerations which should give direction to their work. We assume this to be a meritorious goal.

SECTION II

General Education

Kenneth Phillips
Chairman, Industrial Arts Department
San Diego State College
San Diego, California

CHAPTER TWO

General Education —

A Discussion of Definition

A review of the materials and statements on general education indicates that the problem of "What it is and how to accomplish it effectively" is open to much discussion. Commonly, general education is approached from a slightly different view and almost on a personal basis by each individual. One's educational philosophy is involved and many strong positions are held. This section of the Yearbook will *first* present an overview of the definitions of general education and then offer a compromise statement that can be used on the action level. Even if this compromise statement might be subject to disagreement, it should be acceptable enough to serve as a common ground for further discussion. *Second*, the programs and methods of teaching general education will be introduced. *Third*, the major areas of understanding that have been identified as important to the general education of the individual will be reviewed, and *fourth*, the implications of all this for industrial arts teacher education will be examined.

The author was impressed by the writings already available to the industrial arts profession in the American Council on Industrial Arts Teacher Education Yearbooks. The material presented in those yearbooks contributed much to the writing of this section. The reader will find that the quotations which follow also are necessary to a common background of understanding for the discussion of this topic.

A detailed, learned philosophical discourse on the principles and problems of general education seems to be indicated for such an important topic; however, space does not permit this type of treatment. Much has already been written and a concise statement will be more usable for our purposes. This chapter will give an overview, identify some major issues, and present a statement which is as understandable and usable as possible. The danger here, however, is that simplification

of the presentation tends to oversimplify and does not take into account the many and varied opinions expressed on this subject. The writer recognizes this danger and has guarded against it as much as possible in formulating a statement which may be useful for discussions on general education and basic for the profession of industrial arts.

Definitions — An Overview

In order that a common background can be brought to bear on the problem of a definition of "general education", it is necessary to review certain word definitions. Carter V. Good's first edition of the *Dictionary of Education* defines words important to a fundamental understanding of the complications of a definition. "General education", "liberal education", "cultural education", "academic" and "nonacademic" are all defined. These terms are frequently used in discussions on general education, and their definitions are a good point of departure.

GENERAL EDUCATION: (1) a broad type of education aimed at developing attitudes, abilities, and behavior considered desirable by society but not necessarily preparing the learner for specific types of vocational or avocational pursuits; see education; (2) sometimes used as a synonym for cultural education or liberal education.¹

Note that "cultural education" and "liberal education" are sometimes used in a synonymous sense. Let us examine their definitions.

CULTURAL EDUCATION: (1) all education insofar as it serves as a process of transmitting the folkways and mores of a people or nation; (2) education that is not strictly practical or vocational but that emphasizes the classical and human values of history, science, literature, and art; (3) progressive enlightenment and refinement by enriched experience and understanding.²

LIBERAL EDUCATION: (1) historically, the education suitable for a free-man as distinguished from that suitable for a slave; originally identified with the seven liberal arts of antiquity, namely, grammar, logic, rhetoric, arithmetic, geometry, astronomy and music, and hence education for leisure as contrasted with education for work or vocational education; (2) in the modern sense, a broad, academic education, as opposed to a strictly vocational education, especially that type of education given in the academic high school and the liberal arts college. (Note: In preparation for certain professions, as, for example, that of professor of English, a liberal education may be regarded, strictly speaking, as a form of vocational education. The term, however, generally implies that the emphasis is on the acquisition of general culture.)³

¹ Carter V. Good, Editor. *Dictionary of Education*, First Edition. New York: McGraw-Hill Book Company, 1945, p. 183.

² *Ibid.*, p. 112.

³ *Ibid.*, p. 240.

The term "academic" has been introduced in the above definition. Good defines "academic" and "nonacademic" as follows.

ACADEMIC: (1) (sec. ed.) pertaining to the fields of English, foreign languages, history, economics, mathematics and science; (2) (higher ed.) pertaining to the liberal arts fields; (3) pertaining to the realm of ideas or abstractions. (See nonacademic.)⁴

NONACADEMIC: (1) (sec. ed.) pertaining to fields other than English, foreign languages, history, economics, mathematics, and science; (2) (higher ed.) pertaining to fields other than liberal arts; (3) pertaining to capacities and interests in subjects involving primarily but not exclusively the managing of people or things. (See academic.)⁵

Several points of major importance can be discerned from the above definitions. First, "general education", "cultural education" and "liberal education" are sometimes used synonymously, with the term "general education" being a broader and more flexible term in its conception. Second, any schism of education which may arise between the abstract and the practical is based in the historical approach to liberal and general education.

In order that we may better appreciate the wide and fundamental differences on general education matters and the difficulty of definition, we shall review the full spectrum of views. Cunningham, in his book *General Education and the Liberal College* expresses the classical viewpoints as an approach to general education.

The type of schooling open only to a privileged few is inimical to democracy, where all men are free and all must work. Nevertheless, the American people need the kind of education which prevailed among the relatively free *liberi* in ancient Greece and Rome. If for no other reason, we need liberal education because in freeing or liberalizing the mind it prepares the individual to discharge the duties of his citizenship intelligently and thus serves as a safeguard of our democracy. History has proved that liberal education has conferred remarkable benefits on the qualified few who were able to secure it. Likewise we must admit that the liberal education of the Greeks and Romans made their governments strong and their society so effective that today we participate in the cultural advantages these early leaders procured for posterity.⁶

This is a strong statement in support of general education as liberal education in the classical sense. In many cases you will find the church related colleges emphasizing this approach. This is not unusual and

⁴ *Ibid.*, p. 2.

⁵ *Ibid.*, p. 274.

⁶ William F. Cunningham. *General Education and the Liberal College*. St. Louis: Herder Book Company, 1953, pp. 18-19.

quite understandable for this tends to carry forward their philosophy of education and is consistent with their position. Cunningham makes a statement in reference to the aims of the liberal college. "The aim of the college is to turn out young men and women with informed, cultured, and disciplined minds, not uneducated specialists."⁷ He equates the truly educated man to the *liberi* of ancient Greece and Rome.

Robert M. Hutchins is also concerned with general education from the liberal arts view, but expresses his position somewhat differently. He indicates the objectives of liberal education:

I am asking you to think therefore, what one university might do to establish for the country and the educational system the ideal of the common good as determined in the light of reason. I suggest again the primary object of institutions with this aim will be the cultivation of the intellectual virtues. I suggest that the cultivation of the intellectual virtues can be accomplished through the communication of our intellectual disciplines. This means understanding the great thinkers of the past and present, scientific, historical, and philosophical. It means a grasp of the disciplines of grammar, rhetoric, logic, and mathematics, reading, writing and figuring. It does not, of course, mean the exclusion of contemporary materials. They should be brought in daily to illustrate, confirm, or deny the ideas by writers under discussion.⁸

General education from another standpoint, that of the Harvard Report, *General Education in a Free Society*, is now introduced. This view differs from the positions described above and yet has many characteristics in common when examined superficially. The differences will be discussed later in this section of the Yearbook. In the chapter "Theory of General Education" the following statements are made:

Students of antiquity and of the Middle Ages can therefore rightly affirm that decisive truths about the human mind and its relation to the world were laid hold of then, and yet agree that, when new application of these truths was made through a more scrupulous attention to fact, their whole implication and meaning were immensely enlarged. Modern civilization has seen this enlargement of meaning and possibility, yet it is not a new civilization but the organic development of an earlier civilization. The true task of education is therefore so to reconcile the sense of pattern and direction deriving from heritage with the sense of experiment and innovation deriving from science that they may exist fruitfully together, as in varying degrees they have never ceased to do throughout the Western history.⁹

⁷ *Ibid.*, p. 141.

⁸ Robert M. Hutchins. *Education for Freedom*. Baton Rouge, Louisiana: Louisiana State University Press, 1943, p. 59.

⁹ Harvard Committee on General Education. *General Education in a Free Society*. Cambridge: Harvard University Press, 1945, p. 50.

. . . Education can therefore be wholly devoted neither to tradition nor to experiment, neither to the belief that the ideal in itself is enough nor to the view that means are valuable apart from the idea. It must uphold at the same time tradition and experiment, the ideal and the means, subserving like our culture itself, change within commitment.¹⁰

Justman and Mais take a view similar to the above in their book on *College Teaching: Its Practice and Its Potential*:

. . . No civilization can evade the task of examining universal values and translating them into working principles consistent with the demands of its own age. For education to base its goals on universal ideals as abstractions would be to attempt to build a sound structure of human character on a foundation of words: the result might be ornamental but it is sure to be substantially defective.¹¹

In formulating goals of instruction it is not sufficient to assume that we can adopt without reservation ready-made ideals culturally transmitted to us. We must fashion our own goals by analyzing both our traditional inheritance and the more recent and emerging principles by which our own way of life is being ordered. Each generation has an obligation to do this for itself.¹²

The Harvard Report and Justman and Mais seem to be in rather broad agreement on general education. Justman and Mais encourage readers of their book to consider their position, but to draw their own personal conclusions. It is important, however, to be able to identify one's goals so that some statement of intent can be made. John P. Wynne, in his book on *General Education in Theory and Practice*, introduces yet another concept of general education. He calls his theory the experience theory.

Since any general trait or quality of personality represents the cumulative effect of qualities of experience, we may theoretically define the ends of general education in terms either of personality traits or desirable qualities of experience. We have stated these ends in terms of qualities of experience because they can be more clearly defined in terms of the process — experiencing — than they can in terms of product — personality. However, *we have called our theory the experience theory, not because we have defined the ends of general education in terms of desirable qualities of experience, but because we have looked to experience itself as the sole authority in deciding what qualities of experience are desirable*. We have considered experience itself the sole authority in deciding upon the ends of general education because only in doing so are we able to conform to the requirements of the scientific method broadly conceived. This method is the most

¹⁰ *Ibid.*, p. 51.

¹¹ Joseph Justman and Walter H. Mais, *College Teaching: Its Practice and Its Potential*. New York: Harper and Brothers, 1956, p. 4.

¹² *Ibid.*, p. 5.

effective way, if not the only way, of securing reliable knowledge in any field.¹³

. . . The qualities of experience which we have proposed as the ends of general education are subject to modification through further study. They should not, therefore, be accepted unconditionally and as final without any further study of experience.¹⁴

Moreover, *such qualities of experience as we have defined as desirable are both universal and contingent*. They are universal in that they are applicable to all people everywhere. The same qualities of experience that are desirable for one person are desirable for all people. They are the proper ends of the good life and of general education wherever reflective humanity becomes articulate. They thus constitute guiding principles in the development of general-education programs, courses, and activities in all institutions, on all levels, in all countries.¹⁵

Wynne takes an extremely strong position based upon *his* conception of the experience theory. Dewey's writings and his approach to education have had considerable impact on education at all levels. Although Wynne's writings might not be in complete agreement with Dewey's position, both would base their general education program on experience. Dewey says education "must be conceived as a continuing reconstruction of experience." In his *Democracy and Education* he makes this often quoted statement:

. . . When it is said that education is development, everything depends upon *how* development is conceived. Our net conclusion is that life is development, and that developing, growing is life. Translated into its educational equivalents, this means (i) that the educational process has no end beyond itself; it is its own end; and that (ii) the educational process is one of continual reorganizing, reconstructing, transforming.¹⁶

Notice the emphasis on the factor of change and the individual's development based on experience. Dewey was and is one of the great leaders in this approach to general education.

In Good's second edition of the *Dictionary of Education*, "general education" is defined differently than in the first edition. Introducing the new definition of general education and the important subdefinitions of this point will aid in the understanding of the material covered

¹³ John P. Wynne. *General Education in Theory and Practice*. New York: Bookman Associates, 1945, pp. 236-237.

¹⁴ *Ibid.*, p. 237.

¹⁵ *Ibid.*, p. 237.

¹⁶ John Dewey. *Democracy and Education*. New York: The Macmillan Company, 1916, p. 59.

so far. Again, the reader will gain considerable background understanding if he will read through all of the definitions.

GENERAL EDUCATION: (1) those phases of learning which should be the common experience of all men and women; (2) education gained through dealing with the personal and social problems with which all are confronted; purposes and programs of general education may be described with reference to three different and in some respects opposing philosophical foundations: (a) rationalism, (b) neohumanism, and (c) naturalism or instrumentalism.¹⁷

RATIONALISM: (1) the philosophical doctrine that reason can be a source of knowledge and that truth can best be established by a process of deduction from *a priori* principles independent of experience (in this sense the term is opposed to sensationalism and empiricism) . . .¹⁸

HUMANISM: (1) in general, any philosophy that emphasizes the dignity or interest of human beings or the importance of man in relation to the cosmic order; (2) a philosophy of education common to the fourteenth, fifteenth, and sixteenth centuries, stressing the study of Roman and Greek language, literature, and civilization . . .¹⁹

HUMANISM, RATIONAL: a position (exemplified by R. M. Hutchins) in which appeal is made to the nature of man as man, rather than as a member of society, as the ultimate source of educational authority, the cultivation of latent rational faculties through an education ordered by first principles rather than by factors of time and place. See Great Books.²⁰

NATURALISM: (2) an educational philosophy considered and advocated by many earlier thinkers but given its most widely known application to education by Rousseau and later in succession, and with variations, by Pestalozzi, Herbart, G. Stanley Hall, and John Dewey; . . . stressed the necessity of education in harmony with natural human development, learning by activity and experience, self-imposed discipline, individualization of instruction, appeal to the senses, physical health, and development of moral character from within, by experience, rather than from without, by indoctrination . . .²¹

INSTRUMENTALISM: a philosophical theory holding that thought, or inquiry, is a means or instrument for improving conduct, not an end in itself; propositions are accepted or rejected on the ground of experimentation; the basis of the philosophy of John Dewey.²²

The above definitions should be read rather carefully for they establish a basic background for any discussion of general education.

¹⁷ Carter V. Good, Editor, *Dictionary of Education*, Second Edition. New York: McGraw-Hill Book Company, 1959, p. 245.

¹⁸ *Ibid.*, p. 441.

¹⁹ *Ibid.*, p. 274.

²⁰ *Ibid.*, p. 275.

²¹ *Ibid.*, p. 360.

²² *Ibid.*, p. 291.

The original definitions in Good's *Dictionary of Education*, first edition, define the words commonly used in this type of discussion. The next series of quotations illustrates the divergence of approaches to and definitions of general education. As one examines the last set of definitions from Good's second edition one can discern a pattern.

The second edition of Good's dictionary defines general education in terms of three philosophical foundations: (a) rationalism, (b) neohumanism, and (c) naturalism or instrumentalism. Quotations selected and presented above seemed to illustrate these philosophical positions. The authors quoted might not completely agree to being so categorized; however, the quotations did not appear to be out of context as related to total contents of the books cited.

Cunningham and Hutchins represent the humanistic position. Cunningham approaches general education from the more classical humanistic view than does Hutchins. Hutchins could be considered to be the neohumanist Good's definition mentions; however, both the classical and the neohumanistic views must be considered in any discussion of general education.

General Education in a Free Society, by the Harvard Committee, and *College Teaching, Its Practice and Potential*, by Justman and Mais, illustrate in a rather broad way the philosophical position defined as rationalism by Good.

Naturalism and instrumentalism are illustrated by the quotations from Wynne's book, *General Education in Theory and Practice*. He emphasizes experiences as the key. Dewey is also quoted, for he is essentially the American leader of this philosophical position.

The reader should now be able to determine better the fundamental position of those with whom he discusses problems of general education. This will certainly contribute to a greater understanding of the implications of statements made and their significance for action.

Working Definitions

Definitions representing a combined view of general education also have been evolved. They tend to be more acceptable at the action level because of this. It is important that the industrial arts teacher educator be aware of the differences in theories of general education and be able to identify his position so that positive communication can be established. The advantage of being able to participate effectively in developing a general education program in a college is self-evident. Let us examine several quotations illustrating the combined approach

to a position of general education. The first quotation is from the report of the President's Commission of Higher Education.

"General education" is the term that has come to be accepted for those phases of nonspecialized and nonvocational learning which should be the common experience of all educated men and women.

General education should give to the student the values, attitudes, knowledge, and skills that will equip him to live rightly and well in a free society. It should enable him to identify, interpret, select, and build into his own life those components of his cultural heritage that contribute richly to understanding and appreciation of the world in which he lives. It should therefore embrace ethical values, scientific generalizations, and aesthetic conceptions, as well as an understanding of the purposes and character of the political, economic and social institutions that men have devised.²³

The President's Commission then lists a series of basic outcomes for general education. The point is made that "the purposes of general education should be understood in terms of performance, of behavior, not in terms of particular bodies of knowledge."²⁴ A program of general studies should provide the kinds of learning and experience that will encourage and enable the student:

1. To develop for the regulation of one's personal and civic life a code of behavior based on ethical principles consistent with democratic ideals.
2. To participate actively as an informed and responsible citizen in solving the social, economic, and political problems of one's community, State and Nation.
3. To recognize the interdependence of the different peoples of the world and one's personal responsibility for fostering international understanding and peace.
4. To understand the common phenomena in one's physical environment, to apply habits of scientific thought to both personal and civic problems, and to appreciate the implications of scientific discoveries for human welfare.
5. To understand the ideas of others and to express one's own effectively.
6. To attain satisfactory emotional and social adjustment.
7. To maintain and improve his own health and to cooperate actively and intelligently in solving community health problems.
8. To understand and enjoy literature, art, music, and other cultural activities as expressions of personal and social experience, and to participate to some extent in some form of creative activity.

²³ Report of the President's Commission on Higher Education. *Higher Education for American Democracy*. Volume I. Washington: U. S. Government Printing Office, 1947, p. 49.

²⁴ *Ibid.*, p. 50.

9. To acquire the knowledge and attitudes basic to a satisfying family life.
10. To choose a socially useful and personally satisfying vocation that will permit one to use to the full his particular interests and abilities.
11. To acquire and use the skill and habits involved in critical and constructive thinking.²⁵

The above listing of the purposes of general education is comprehensive and deals with a broad variety of objectives. This list was developed by a committee of individuals who represented all shades of opinion and philosophical positions, and it presents undoubtedly a compromise of many strongly held ideas. It provides a statement that would be more acceptable than a more specific statement would be on most college campuses. Wilbur in his book, *Industrial Arts in General Education*, presents a short statement summarizing and highlighting the purposes of general education. He says, "Careful consideration reveals, however, that when stripped of verbiage and special applications the various statements may be summed up . . ."²⁶ He then discusses general education in terms of growth and changes in human behavior. He concludes this section with the summary statement which follows:

General education has three principal aims or objectives: (1) to transmit a "way of life," an important feature of our way of life lying in the fact that it is democratic; (2) to improve that way of life, the most feasible method being by training for effective critical thinking; (3) to meet the needs of individuals in the basic aspects of living.²⁷

The comprehensive statement written by the President's Commission on Higher Education, previously quoted, gives us a usable and detailed working definition. It is a compromise statement. Wilbur's statement is more concise and, even though it may oversimplify, it summarizes well a complex and sometimes confusing situation. As a possible balance between the above two quotations the following is suggested.

1. That general education is a common experience and background for all educated people.
2. That general education results in the improvement of the individual's ability to live wisely and well.
3. That general education contributes to the development of a code of ethics based upon democratic principles.
4. That general education develops a sense of responsibility to and understanding of social, economic and political problems.

²⁵ *Ibid.*, pp. 50-57.

²⁶ Gordon O. Wilbur. *Industrial Arts in General Education*. Scranton: International Textbook Company, 1954, p. 3.

²⁷ *Ibid.*, p. 15.

5. That general education provides for *optimum* development of knowledge in the areas of sciences, humanities, communication, social sciences and in personal maturity.

Much must be read into the above statements, for the broadest possible conceptions are necessary to a good program of general education. It is highly probable that all viewpoints could accept these statements as an operational definition and as a working compromise. Growth and development of the individual to his fullest potential are inherent, and the use of critical thinking as a normal process to reach conclusions is an integral part of the educational experience. The next chapter will deal with typical methods of teaching for general education purposes.

CHAPTER THREE

Teaching General Education

Chapter II has introduced some specific philosophical positions on general education. An attempt was made to present each of these positions by quotations illustrating something of the sense of their concept of general education. A philosophical position has significant implications for the type of program and the methods of teaching general education courses. In this chapter a short statement on the approach to the teaching of general education in each of the views will be made. Again, the explanation possible here will do each of the positions an injustice for many of the details and fine contrasts will by necessity be ignored. The reader will, however, be able to gain a usable impression of the implications involved. The second section of this chapter will summarize a series of survey reports of general education programs now being used in higher education. It will be organized into areas of understanding.

Programs and Methods

The first position reviewed is a classical viewpoint of general education as expressed by Cunningham in *General Education and the Liberal College*. Cunningham goes on to discuss the college curriculum and methods of teaching which will best accomplish the objectives of general education (liberal education) from his view. The "church related" school also adds the conception of the "Christian Ideal" as fundamental to any educational process. He makes the following statement in regard to curriculum.

The curriculum of any school on any level is an attempt to select the most worthwhile portions of the racial inheritance accumulated through the ages and make them available to the mind of the child according to his capability. In the university this accumulated knowledge is organized and presented according to the nature of the subject matter itself, since here we are dealing with the mature mind. The first division into which this accumulation of human experience falls is a simple one, namely, the sciences and

the arts. By "sciences" we mean those facts and insights which man has accumulated through the ages about the world in which he lives; by "arts" we mean those practices and procedures, skills and techniques, that he has developed through the ages to make his living more comfortable and more elevated, so that he can live the life of a truly civilized person.¹

Cunningham then goes on to explain what he means by the sciences and what materials he wishes to involve in the mind of the child. Children should be concerned with and think about the "physical world, the human world, and the spiritual world." The natural sciences deal with the physical world. The humanistic sciences: social sciences, deal with the human world and the philosophical sciences: "dealing with God and man's relation with God," deal with the spiritual world. He classifies the arts according to the arts of communication (mainly language arts), fine arts and the applied arts. He does not, however, feel that applied arts are an important portion of the course activity for general education purposes. He feels rather that much of the experiencee of a practical nature can be accomplished as out-of-class activity. The applied problem does not end here so far as implications are concerned, for this sentiment spills over into the attitude toward professional course activity as well. The feeling that the student must first be liberally or generally educated and then may specialize is very strong here. The real base or hub of general education is language, theology, philosophy, and history.

From the study of theology, philosophy, and history, the student should learn to think easily and precisely. Thought may be true and yet not sharply focused, as the daydreamer has often discovered to his chagrin. The development of facility in precise thought is one of the principal aims of liberal education. Yet precise thought is deprived of much of its value unless the thought is expressed in language equally exact. Language, as the art of communication, makes available to men all the treasures of thought contained in every field of learning. Like history, it is a study of universal incidence, which is basic inasmuch as it makes available in everyday life the light and shadow of every thought the mind of man can possibly conceive.²

Cunningham presents a diagram of the rest of his curriculum proposal as a wheel analogy. The hub is composed of the areas of general education just mentioned above. The spokes give balance, breadth, and depth in the areas to be considered in this second phase of general liberal education. The spherical studies, or the spokes of the wheel, in-

¹ William F. Cunningham, *General Education and the Liberal College*, St. Louis: Herder Book Company, 1953, p. 74.

² *Ibid.*, p. 106.

clude courses in (1) literature, English and foreign; (2) fine arts, visual and music; (3) mathematics; (4) natural sciences; (5) social sciences; with a provision for electives in the above areas. The rim or peripheral studies are in the field of concentration or in the professional program and assure depth in the student's field of primary interest according to Cunningham. In this approach the student spends almost two-thirds of his total undergraduate time in the areas of general education. If the student's primary interest happens to fall in one of the areas that builds upon the work included in the areas of general education, he can possibly become well qualified in his professional program. The question is raised as to whether there is not too much opportunity to pursue the student's primary interests for professional preparation and thus neglect general education:

Is the purpose of the liberal college to produce an educated person who will function adequately as a citizen of a free society in any life career, or is it to turn out the uneducated specialist, an expert highly trained in one narrow field?³

In this program Cunningham would have us carefully select the teacher. The teacher is the key to general education. In order to have dynamic, living education, it is necessary to have the dynamic, living teacher. The courses must be taught "liberally and not professionally."

As might be inferred from the historical development of the arts and sciences, to teach liberally is to teach the inner relationships of the various courses and the integration of part with part and one subject with another. To teach liberally means more than to teach the bare facts and to give their explanation. It is to teach the history of the fact, the philosophy of the fact, and the theology of the fact. It is to bring to one's teaching all the wealth of information contained in the several fields of liberal study which a liberally educated instructor may be presumed to possess.⁴

The teacher with this approach is basic to the educative process and must be liberally educated; moreover, he must be grounded in the traditional philosophy of the college. He is liberal, he teaches liberally and he can engender the same liberality in his students. Methods are the outgrowth of the teacher's liberal view. Let us now consider another position from the humanistic viewpoint.

Hutchins is the leading protagonist of the great-books approach to general education. This, too, is a humanistic position on general education. Cunningham represents the classical position; whereas Hutchins represents the neohumanistic view. This concept proposes to solve the common problems which occur and reoccur in society through

³ *Ibid.*, p. 168.

⁴ *Ibid.*, p. 194.

an understanding of the writings of the great minds of western civilization. These writers deal with the great problems of mankind and express themselves concerning them. This, in turn, is intended to help modern man live a better life by drawing upon the past experience of the race and applying it to the present situation. The educational problem for general education is interpreted as lying in the introduction of man to "the wisdom of the ages." He will then become a better member of society and seek to contribute to a better society.

Stringfellow Barr in 1943 discussed the development of the undergraduate program at St. John's College in Annapolis, Maryland, which was then in the process of curriculum reorganization on the basis of the "Great Books Concept."

Rejecting all responsibility for specialized training and focusing on a single great task, the college would teach students to practice the liberal arts: the arts of thinking, of reading, of writing, of reckoning, of interpreting, of speaking, of listening, of understanding. These arts were taught in Greece. They were taught in the medieval university. They are still taught, at least obliquely and accidentally, wherever solid work is done . . .

For four years they [the students of St. John's] live intimately with the greatest minds our civilization has record of; their young and awkward intellects follow the deft and graceful operations of those great intellects. And as children learn to talk by listening to men and women who already know how to talk and are doing it, so these youngsters learn to think by following the thinking of those who knew how to think well and did it.⁵

Hutchins and Barr are in close agreement on the "Great Books Concept" and their value for general education. General education stems from the study of about 100 great books in their English translations. About 2000 years of man's progress is covered in the first two years, and about 300 years in the last two years of the undergraduate program. No specialization or professional education is presented, and it is left for graduate work.

The St. John's curriculum, as it was being organized on the basis of this approach, required the student to carry the following work, presented in the equivalent of semester hours:

Course Work	One Year	Four Years
Language and Literature.....	10	40
Mathematics and Science.....	10	40
Lectures on the Liberal Arts.....	4	16
Laboratory	3	12
Seminars	8	32
—	—	—
	35	140

⁵ Stringfellow Barr. "Tomorrow's School is Here Today," *Magazine Digest*, November, 1943, p. 60.

The graduate is considered to have knowledge of the contents of the required books on the list, competence in the laboratory, competence in mathematics through elementary calculus, and a reading knowledge of at least two foreign languages.

The teaching methods used to give the proper liberal tone are rather unique and interesting. Mathematics and language are taught principally through the "tutorials." A tutor meets with 10 to 20 students in order to exchange ideas, study, discuss and interpret as well as to aid in personal difficulties. They meet one hour, five times weekly, throughout the four years. A constant effort is made to add "intelligibility" to the "operational skill" of the subject matter covered. The small number of students involved creates a situation which is conducive to student participation.

Seminars are substantially the mainstay of the program. The great books are assigned to be read as preparation for the discussion in the seminar. Students meet twice weekly for a period of two hours for the four-year program. The instructors sit with 10 to 20 students to form the seminar group. The conversation and discussion evolves around the great book currently being read. The discussion starts out with a specific problem derived from current reading and proceeds from there, touching upon other reading and drawing out implications from the total program of education.

At least once a week formal lectures are given to the entire student body. Visiting lecturers present about half of the lectures while the rest are given by the college faculty. The lecture usually lasts for one and one-half hours and is followed by a question and discussion period. The students have an opportunity to observe the "formal arts of the platform" and to hear a "sustained and artistic exposition of a subject matter they may have studied in fragments in other ways."

Laboratories are utilized as an "instrument of liberal rather than preprofessional training." Sections comprised of 20 students each meet for three hours twice weekly during the four years. Experiments are carried on under the guidance of staff members representing a variety of special interests and range beyond the special boundaries of each science.

Evaluation is carried on continuously through the close association of students and faculty. Oral examinations are frequently given as are essay examinations. Themes are often required to be submitted, followed by an oral examination on the content of the theme. The great-books approach to general education has many unique features in regard to program and method as discussed above.

General Education in a Free Society describes the program and indicates some of the methods used at Harvard University for their general education. Harvard is committed to having all students graduate with a basic and common background. This common background is the general education program. They are also concerned about the student's primary interest area. They want him to have optimum development as a specialist as well as be generally educated. They make this statement in introducing their recommendation for Harvard's general education program.

General education and special education are not, and must not be placed, in competition with each other. General education should provide not only an adequate groundwork for the choice of a specialty, but a milieu in which the specialty can develop its fullest potentialities. Specialization can only realize its major purposes within a larger general context, with which it can never afford to sever organic connection. General education is an organism, whole and integrated; special education is an organ, a member designed to fulfill a particular function within the whole. Special education instructs in what things can be done and how to do them; general education, in what needs to be done and to what ends. General education is the appreciation of the organic complex of relationships which gives meaning and point to the specialty. To some degree it should suffuse all special education. Every course given in Harvard College, however specialistic, should make some recognizable contribution to general education. To the degree that it fails to do this, it has failed to make its best contribution to the specialty as well.⁶

We should have some courses in the college which seek to fulfill the aims of general education exclusively and not incidentally, courses which are concerned with general relationships and values, not with the learning and the technicalities of the specialist. We do not propose that these courses should all be taken at one time, or even in one period of the college career.⁷

The Harvard committee then makes recommendations for courses and course content for their general education program. Out of the sixteen courses required for graduation with the bachelor's degree, six courses would be taken in general education. The six courses would include three elementary courses to include the areas of humanities, social sciences, and science and mathematics. The students could then select courses outside of their field of specialty for the next three courses. They could be courses available in the basic course offerings for general education, from a group of courses identified as second level general education courses or from departmental course offerings which have been selected as having general education values. These courses

⁶ Harvard Committee on General Education. *General Education in a Free Society*. Cambridge: Harvard University Press, 1945, p. 95.

⁷ *Ibid.*, p. 96.

would be taken throughout the four-year program. Students must also complete a year's work in English composition, take a year of physical education, have a reading knowledge of a foreign language and develop an area of specialty for graduation. Mathematics background from high school is commonly expected to include high school algebra and geometry. The general education courses at both the elementary level and at the secondary level cover work in the humanities, the social sciences, and science and mathematics. Titles mentioned in the various areas give a sense of the course organization for each one of the three areas of general education.

The humanities course titles at the elementary level include "Humanism in the West," "Individual and Social Values," and "Ideas of Good and Evil in Western Literature." At the secondary level "Classics of the Christian Tradition," "Art in Man's Environment," and "The Spirit of the Renaissance" are some of the titles listed.

In the social sciences course titles at the elementary level include "Introduction to the Development of Western Civilization," "Western Thought and Institutions," and "Institutions and Culture in the West." At the secondary level "History of Far Eastern Civilization," "Human Relations," and "The Impact of Science on Modern Life" are some of the titles listed.

In the science and mathematics course titles at the elementary level include "The Physical Sciences in a Technical Civilization," "Principles of Physical Science," and "Principles of Biological Science." At the secondary level, "Organic Evolution," "Introduction to the Philosophy of Science," and "Human Behavior" are some of the titles listed. In this area and through the activities in some of the courses the students are introduced to the use of calculus.

The methods of teaching these courses and the other selected general education courses which students may select are based first in the idea of good teaching and second in the idea of the proper background and attitude on the part of the instructor. More specific points can be made, however, in regard to the educational approach of the Harvard program.

The area of social science will be discussed here as an example of the attitude on method. The Harvard report discusses each part of the general education program in detail in regard to educational approach. The central theme in the social science is the "examination of the institutional and theoretical aspects of the Western heritage." This course "must raise more questions than it professes to answer," "questions of

ends as well as means," "of values and objectives as well as of institutional organization." These courses "should also include an analysis of some of the great attempts which have been made to find answers to these questions."⁸ The courses are to be focused and are not to be general survey courses. They are to be selective in their approach to topics and penetrate into a topic through discussion. The ideas of great authors will be explored and brought to bear on the problems being considered. The student should develop an understanding of some of the "principal elements in the heritage of Western civilization"⁹ through these courses and view them from an analytical standpoint with a positive attitude of improvement through future events.

The Harvard Committee does not feel that just any basic course is suitable for general education even though it is in a department that is commonly considered as one of the "liberal arts" areas. "Block-survey courses" made up of large blocks of the areas of social science are not the answer either. The use of a series of specialists to cover the course content as separate topics is also inadequate. The method here must be to establish relationships between bodies of knowledge, apply the aims of general education as criteria for selection, and have a carefully thought-out plan to give the course coherence and unity. This is fundamental to the course work of the general education program. A tutorial system of individualized instruction is also discussed; however, it is recommended for only special cases and therefore will not be discussed in detail here. The committee feels that it can contribute a great deal to general education if properly conducted. A final quotation on teaching seems to be valuable here, and seems to summarize much of the Harvard Committee's approach to teaching.

Finally, a similarly loose but perhaps useful contrast can be applied to teaching. It has been said that teaching has naturally two phases: the Olympian and the earthly. In the Olympian phase, the teacher actually or figuratively at some distance from the student, expounds the objective majesty of the subject — a majesty which exists, so to speak, whether the student heeds or not, which is greater than he and greater than the teacher, something austere and almost impersonal, a facet of the world. In the human phase, the teacher sits on the same level as the student, discussing the truth as it appears to each. The individual adjustment which each makes to the truth is then uppermost, and as the teacher examines, he can also be examined. We would not say that the Olympian phase of teaching is proper to the university and the human phase to the college. Graduate instruction

⁸ *Ibid.*, p. 214.

⁹ *Ibid.*, p. 217.

obviously involves discussion and personal oversight. Yet it is true that, insofar as the college aims to develop the total person, then it must attach special importance to this human phase of teaching. The justification of all teaching to some extent, and of this kind especially, is in the premises of the democratic way of life: teaching is important because the human being has value in himself — not as a potential scholar but as he actually is with his actual capacities and limitations. From this premise follows what was said earlier about the place of tutoring, advising, and small discussion groups in the college as a whole and in connection with the Houses. The university college must use both methods, the human as well as the Olympian, to fulfill its proper purpose.¹⁰

The Harvard report on general education seems to illustrate best the rationalistic view of the type of program and method that would be used to implement the position taken. Justman and Mais do not make a specific recommendation for a type of program or the educational method they would utilize to implement their view. Instead, they review several programs presently being used at various colleges, including Harvard. It might be well to read about these programs for additional details of general education in action in higher education.

Naturalism and instrumentalism have implications for program and method which are different from those covered. Wynne indicates that he feels that program is fairly well established and changes must be made in the way the established program is implemented through teaching. In his opening paragraphs in chapter four he says, ". . . any curriculum-improvement program in the college or anywhere else must indirectly or directly begin with the existing program."¹¹ Experience indicates to him that radical change is not only impractical, but rather unnecessary. In redesigning the courses for the newer, stronger general education program "the different psychological aspects of experience" are "the central points of emphasis" for the subject matter of the courses. The subject matter of the courses is important for, "The kind of content selected is one of the factors that influence the qualities of experience which are the ends of general education."¹² Wynne goes on to make the following statement concerning course organizations.

Since different types of subject matter corresponding to the different aspects of experience, such as those suggested in the preceding chapter, provide a basis of orientation, it is by no means necessary for institutions,

¹⁰ *Ibid.*, pp. 246-247.

¹¹ John P. Wynne, *General Education in Theory and Practice*. New York: Bookman Associates, 1945, p. 75.

¹² *Ibid.*, p. 79.

department, or individual instructors to postpone a systematic effort to reconstruct their courses for the purpose of fostering the ends of general education. An institution, a department, or an individual instructor may take as the starting point such courses as already exist. If the qualities of experience constituting the ends of general education are kept clearly in mind, existing courses may be so modified as to facilitate these ends. At least five different techniques have been used as a means of reconstructing courses for the purposes of facilitating the ends of general education. For the convenience of discussion, these techniques may be designed as: (a) the survey course; (b) the single-subject course; (c) the fusion course; (d) the core course; and (e) the multiple-functions course.¹³

At first reading it would seem that Wynne is equally convinced of the usability of each type of course organization listed. He goes on to discuss each type of course organization and indicates their strengths and weaknesses. The quality of the experience gained by the student is the important factor. Different course organization may result in a varying quality of experience and perhaps even get in the way of a high-quality student reaction. Course organization may differ according to the requirements of the situation. Careful consideration must also be given to the way in which the instructional program is carried on by the faculty members involved. The quality of student experience is largely dependent on the guidance of the instructor. Techniques of teaching are also most important in this process of general education. Wynne uses the term "technique" in a very broad sense and indicates the meaning of the word as well as its importance:

Technique represents the application of principles in the same way that a technique represents the use of a device . . . The development of a new technique of teaching through the application of principles of desirable experience is essential if the ends of general education are to be fully realized . . . desirable qualities of experience that constitute the ends of general education require the gradual building up of a technique that secures these new ends as effectively as our established technique now secures subject matter ends. This new technique should eventually render us as sensitive to the factors that emphasize the desirable qualities of experience as our old technique now renders us sensitive to the factors which contribute to the mastery of particular kinds of subject matter.¹⁴

Dewey's position on general education depends strongly, but perhaps more subtly, on experience. The course organization would not necessarily be unique; however relationships of subject matter and their inference for life would be most important. Core-type courses

¹³ *Ibid.*, p. 80.

¹⁴ *Ibid.*, p. 157.

have often been developed to provide for relationships. The course would be based in student activity as a means to develop understanding. Subject-matter courses would also be utilized; however, the approach to teaching the subject matter would be concerned with the student activity and the student's ability to handle the subject matter with understanding. Dewey makes the following statement which will help us to understand more about his position, and the challenge that he recognizes in the varied approaches to education.

Philosophic systems in their opposed theories of knowledge prove one sided because barriers to intercourse prevent the experience of one from being enriched and supplemented by that of others who are differently situated.

In an analogous way, since democracy stands in principle for free interchange, for social continuity, it must develop a theory of knowledge which sees in knowledge the method by which one experience is made available in giving direction and meaning to another. The recent advances in physiology, biology, and the logic of the experimental sciences supply the specific intellectual instrumentalities demanded to work out and formulate such a theory. Their *educational equivalent* is the connection of the acquisition of knowledge in the schools with activities, or occupations, carried on in a medium of associated life.¹⁵

The theme of relating general education to experience and to everyday life for the student is the approach of this position. Wynne explains his position most strongly in terms of experience. Experience broadly conceived is the key to his position. Dewey's position is more subtle for he mounts his arguments on a much broader base. Both men are naturalists as we have defined the term.

A review of each of the positions in regard to program possibilities and methods has been made. A sense of each of the views and their "stand" on these matters should have been gained. Greater detail and a more penetrating analysis can be achieved by further study of the literature. However, a pattern of the areas of understanding that are important to general education has emerged. The next part of this chapter will discuss these areas.

Areas of Understanding

Literature on general education begins to take on a pattern in regard to the areas of understanding that are to be developed in the program. Broad areas of understanding are identified; they are intended to be broadly conceived and flexible in their implementation. These

¹⁵ John Dewey. *Democracy and Education*. New York: The Macmillan Company, 1916, p. 401.

areas are the sciences, humanities, communications, social science and personal maturity. Courses are organized for general education purposes in these categories at most colleges. A series of publications reviews each of these areas of understanding and presents reports on general education courses and programs in existence in selected colleges. This series of 1960, a recapitulation of programs of 1949, provides some insight and a quick overview of what is happening in each of these areas in general education.

One of these publications, *Science in General Education*, Robert Ray Haun, Editor, presents an overview of the philosophy and the practices of general education in the sciences through selected programs. Many of the colleges represented had also participated in the reports of 1949, and wherever a trend is discernible, it is noted. Differing from the earlier report which recommended only one science course as necessary, it has become the trend to have some courses designed specifically for the students specializing in science, and others for nonscience or general students. The traditional courses for the major are taking on "more breadth," and the general courses "more depth."

A previous course organization to meet the objectives of science in general education, the "survey course," has now become defunct. It is replaced by the application of discussions of certain subjects only, rather than an overview of the major findings in all the sciences. Often referred to as the "block-and-gap" course, this particular phase of the survey course modification presents certain topics to be discussed and others to be omitted. However, no agreement is found as to the particular topics to be selected.

Science courses in general education have shown distinct changes in the way a course is to be taught. Rather than depend on the old concept of "the scientific method," techniques have changed from one single, simple scientific method to "some expression which is more extensive or else emphasizes an aspect which is an essential part of the scientist's procedures."¹⁶ As a new emphasis in science in general education courses, discussions now stress the impact of scientific developments upon society and the life of the individual rather than understanding the detailed workings and principles of the scientific developments.

Changes in the objectives have also brought about changes in the approaches used in the science general education courses. The "survey"

¹⁶ Robert Ray Haun, *Science in General Education*. Dubuque, Iowa, Wm. C. Brown Company Publishers, 1960, p. 5.

course, modified to meet today's usage, and the block-and-gap method (the selected topics approach) present a problem in the way to tie the various topics together in a specific continuity. This is being interpreted as an "indication that the natural world does not operate in compartments or by disciplines." The integration and interdisciplinary approach has thus developed. "By disregarding departmental lines it is easier to treat more comprehensively and possibly with greater depth a few basic and fundamental topics, principles or constructs."¹⁷ Popular in this approach are the topics of structure of matter, conservation principles, nature of energy and photosynthesis.

The historical approach to these kinds of topics reflect a different objective — that of helping students appreciate the way scientific concepts or theories develop. By studying case histories or perhaps by performing the classical experiments the student can better understand the original scientist's interpretation.

The problem approach, with no attempt to emphasize historical background, is used primarily to carry out the methods of science objective. Problem solution can be of either historical or current events, with students participating in the experiments. This introduces laboratory work, currently being revitalized as an approach to make this work more investigative and the student more self-reliant. This is being achieved in three ways: (1) having the student conduct the conventional experiments with less detailed instructions, (2) providing problems which the student seeks to solve using data from his own investigations, and (3) providing an "open-end" experiment with no particular problem to be solved, but a particular situation to be investigated at the student's limits of time, interest and ability to arrive at good results. Most general education science courses include laboratory experience as a part of their courses.

General education in science recognizes the need for courses specifically designed for the nonspecialist in science. "More emphasis is being put upon the student acquiring an understanding of scientific endeavor and the scientific enterprise."¹⁸ This emphasis, achieved by the objectives and approaches listed above, will progress further as does science itself.

The Humanities in General Education, another of the publications in this series, presents a review of the humanities as reported in the earlier volume in 1949, as well as a review of its progress in the last

¹⁷ *Ibid.*, p. 7.

¹⁸ *Ibid.*, p. 14.

decade. Recent programs continue to provide the student with a broader understanding of his cultural heritage, as well as a broader perspective in his viewpoint on life.

The three original areas of humanities: (1) the Great-Books or Great-Issues approach, (2) the history of Western Culture or Western Civilization, and (3) the approach which seeks to orient the student to the work of art and focuses upon critical judgment of the products which make up the humanities, continue today.

The great-books approach continues almost as it was stated in the original report of 1949, with no particular new trend indicated by reporting colleges. Today, in the historical-cultural approach, a trend to study only certain selected cultural epochs with a chronological framework of ideas and masterpieces has been noted. Study of the present day or contemporary life is decidedly a part of this course. The trend away from the "survey" type of study emphasizes enlarging the student's perspective and increasing his understanding of some of the forces which have created the society in which he lives. The third approach, "the broadly aesthetic," remains almost as constant as when reported upon in 1949. "Great works from the whole realm of artistic endeavor serve as the source for developing the critical attitudes sought."¹⁹

Methods now reflect the use of educational television as a media of teaching. Superior teachers can be used to reach a larger number of students, but herein lies the disadvantage of returning to the use of the large lecture. Educational television remains an experimental phase to be proven or disproven over a period of future use. Group discussions have been supplementing the group lecture, or excluding it completely. The formal lecture has been supplanted by the use of the discussion method, with student participation being the "core" of the course.

Definitely of interest to note is the new method of "team system" teaching introduced since the original report in 1949. In use at only one college, Boston University Junior College, to date, it is a method which may possibly establish a new trend. Another change noted since the original report has been the inclusion of the world of eastern culture. This change is significant in that it shows the effect of politics upon the curriculum planning of college educators.

Problems common to all courses in general humanities include the superior student, evaluation procedures and teacher education and

¹⁹ James A. Fisher. *The Humanities in General Education*. Dubuque, Iowa: Wm. C. Brown Company Publishers. 1960, p. 238.

recruitment. Awards for extra work accomplished, seminars and honor sections, and shortened length of time necessary to complete the course are some solutions to the superior student problem. "Since the advent of large classes and the IBM answer sheets, there has been a conflict . . . between the undeniable ease of the objective test and feeling that somehow this was not quite sound or that it did violence to the very aims they had set for themselves in their courses."²⁰ Equality of grading practices and the concern over adequacy of teacher-made objective tests to measure humanities have created a shift from objective examinations to essay type, even though sheer man hours of work become a major consideration here. Teacher education and recruitment, a problem common to all areas of general education, is most important to this teaching area; however, it will not be discussed here.

Study in the humanities in general education should introduce various artistic and philosophic forms in art, literature and philosophy, with some possible emphasis in religion. The humanities have been clearly illustrated as having progressed since the original report of 1949, with a definite place in the future.

Communication in General Education reports a survey of the communications programs and courses. In addition, essays are included at the front of the report which explore five areas of inquiry in relation to teaching methods in literature, media study, rhetoric, logic and grammar. The emphasis is on college composition and communication. English, Composition, Communications Skills, Rhetoric, The Uses of Language, The Art of Reading and Writing all appear as part of the descriptive material on college programs. The concern in this area is that students be able to read, write, speak and listen effectively. They must be able to use the arts of communication. Communications skills are very important to the success of the individual in college and colleges design the program to develop these skills as quickly as possible. Many of the courses described occur early in the four-year program and usually during the freshman year.

No single course described, according to the editors, attempts to encompass all of the field. Certain tendencies are noticeable, however. Literature is regarded as being very important. "Whole works are examined as imaginative formulations of values by authors addressing their contemporaries. Students are being led in audience studies, and at the same time in studies of the aesthetics of design through which

²⁰ Ibid., p. 252.

authors have achieved self-realization in speaking to their cultures."²¹ Other schools are concerned with all parts of communication — arts, skills and media — and attempt to work on all three in their courses. Others will select one of the parts and use it as the major vehicle, involving the other parts as they develop student skills. Some schools are tending to use communication learnings as an integrated portion of other general education courses and a basic tool of the course. "There is a persistent concern for study *of* and *about* language" with foreign language being increasingly involved. Rhetoric and logic are also being emphasized as the "arts which create human relations."

Certain organizational patterns and instructional procedures are becoming evident. A single course in communication skills is no longer the complete answer. Other courses in the area are being offered and students may select from several courses or from a series of courses. It appears as though communications courses in language and language arts, in communications concepts and media provide opportunity for greater depth and proficiency in this area. It is also becoming recognized as a discipline in its own right. Experimentation is going on in class size, frequency of meetings, and in methods of teaching. Independent inquiry and study, greater use of discussion, and the continuous evaluation of communications proficiency during the student's college career are taking place.

The editors close their introductory remarks on an optimistic note. They foresee better and better prepared professional people teaching in the field. They foresee an increasing flow of new knowledge into the field. They foresee the reinforcement of the relationships of the communications area and contemporary living. They are enthusiastic about the future of their field and the implications for the improvement of general education.

Social Science in General Education presents the varying approaches to the social sciences, as well as the issues and trends facing this area. Courses still maintain a general similarity to those reported in the initial series of 1949. The single subject course, the "survey" course, the historical framework course, and the problems course (e.g., crime) are the more basic approaches. These courses are not necessarily taught as one alone; they may be in combination with other approaches.

As in every aspect of general education, social sciences face several issues which have developed since the 1949 report. Besides staff prob-

²¹ Francis Shoemaker and Louis Forsdale, Editors. *Communications in General Education*. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1960. p. xvi.

lems, issues have evolved about the re-emphasis in society as a whole upon intellectual and technological importance. Student background, personal significance for the student, appraisal or evaluation of the results of courses, and the maintenance of enthusiasm for teaching in the general education structure are other issues pertinent to this area.

In discussing these particular issues, two remain unsolved: "Which is the most appropriate course for a particular college with a particular student body?"²² and "How to find the most appropriate theoretical framework which can accommodate several social science disciplines in the same course at a particular institution?"²³

Various trends have developed throughout the country. Behavioral sciences, a term gaining in popularity over social sciences, implies more interdisciplinary or multidisciplinary research as a solution to several of the above issues. A second trend, seemingly in direct conflict, tends to make all courses more like traditional courses. A more comprehensive reading material source, rather than a book of collected readings presenting varied views on the same subject, seems to be gaining impetus. Personal adjustment courses seem to be declining. Minor trends include a definite swing to more student independent study; inclusion of cultural heritages other than the American or Western European; and a questioning of the value of discussion methods in spite of seeming value.

Based upon the issues and resulting trends, principles by which social science courses in general education can be further developed and improved follow:

"The objectives of social science courses should be so clearly stated that the materials and techniques of teaching are definitely implied."²⁴ Students learn how social science really functions, but need further help in understanding these functions.

Student interest must be planned for in these courses, not merely taken for granted because they are in the course. Learning activities must have a decided background, but should reflect contemporary living.

Social science courses should be provided with a specific budget to prevent competition within the framework of the school.

"Social Science teachers should lean over backwards to make explicit to students the categories of knowledge they are employing."²⁵

²² Lewis B. Mayhew. *Social Science in General Education*. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1960, p. 6.

²³ *Ibid.*, p. 7.

²⁴ *Ibid.*, p. 16.

²⁵ *Ibid.*, p. 18.

Social science courses should be based upon the students and the educational problems within the student body structure.

Social science courses should reflect the kind of student activities relevant to that particular course.

Such principles, as stated above, reflect today's development in social science in general education. "Integration of knowledge must occur within the student himself . . . the general education course can present new insights to enhance the integration of knowledge in the social sciences."²⁶

General Education for Personal Maturity aims to provide a description and analysis of courses contributing towards students' personal maturity. "In these days of nuclear weapons, man-made satellites, and projected interplanetary travel, with the resultant cry that science is all important . . . the human element is still fundamental"²⁷ and the general education course attempts to meet this personal element.

Deep frustrations and maladjustments of the individual provide a necessary basis of approach to the need for personal maturity courses. A new movement is emerging "based on the conviction that the complex affairs of personal living can and must be subjected to the same kind of systematic study and illumination as is now given to . . . established subjects of the curriculum."²⁸ A college course such as personal-social adjustment, education for marriage, or vocational planning, based and designed on the student's need, can be more effective than the older orientation classes which have been generally replaced. "Courses at the college level designed expressly to help students meet their personal problems are still in a developmental stage."²⁹ This volume introduces and discusses the various programs in existence, as well as the problems in the field.

Most personal-social adjustment courses appear to share a strong bond with general education regardless of academic emphasis or department ties. They use some "psychological subject matter for the basic learning, but vary in content according to areas, or the backgrounds of persons, contributing to them."³⁰ The "course can help the student in developing a process for obtaining and integrating certain knowledge, skills, understandings, and appreciations in meaningful

²⁶ *Ibid.*, p. 98

²⁷ Horace T. Morse and Paul L. Dressel. *General Education for Personal Maturity*. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1960, p. x.

²⁸ *Ibid.*, p. 5.

²⁹ *Ibid.*, p. 11.

³⁰ *Ibid.*, p. 75.

situations which will encourage application to the situational demands on the student.”³¹

The rapid growth of marriage education courses has been partly due to the increasing democratization and heterogeneity of the student body. These courses consider the American marriage and the problems growing out of modern conditions and new emphases on personal adjustment.

Vocational planning courses, ideally, should “make it possible for the student, by whatever means, to explore . . . his capabilities . . . and to achieve a measure of self-realization by choosing and preparing for work.”³² Actual growth of these courses has been slow, competing with the widely accepted vocational counseling services.

Personal maturity courses in general education face many problems including that of finding acceptance by faculty in other fields than general education. These courses, organized in terms of individual problems and personal decisions, are found under a variety of titles and departments. Personal-social adjustment, marriage education, and vocational planning courses employ a variety of methodology, with small discussion groups the most common. “Development of the *adjusting* individual rather than the *adjusted* one” can be achieved by a “method of analysis, a knowledge of available resources, and a determination to face even complex personal problems rationally and objectively.”³³ The developmental stage of personal maturity general education courses has been difficult, but real progress has been made and will undoubtedly continue. They fill a real need in the total program of general education.

This chapter has discussed the programs and methods of general education from the three major views introduced in Chapter II. Some of the details of the program and the methods involved were not treated as completely as would be desired; however, a sense of the differences and a few of the implications were reviewed. The second section, areas of understanding, presents the overview of “what is happening” in general education for higher education in the United States. Some trends were identified and some problems raised. It would be wise to assume that most of the programs and methods described in this section are based in a variety of philosophical positions and represent a compromise approach. Change and re-evaluation are very evident in the

³¹ *Ibid.*, p. 74.

³² *Ibid.*, p. 220.

³³ *Ibid.*, p. 244.

development of general education programs. Improvement of content and effectiveness is constantly being sought.

Some common problems appear as one reviews the literature. Staffing is critical; the basis of the program is in the ability and background of the individual teaching the course. Greater attention needs to be given to the preparation and selection of the general education faculty. It is difficult to continue faculty members on the general education course assignment. Academic prestige often lies in a different direction, and the individual soon recognizes this. The general education field is not a traditional discipline and therefore is not as acceptable to the traditional academic mind. Because of this, remarks are often made about the lack of "real" depth in the general education course work. These indicating reactions on the part of the faculty present a very real problem and a considerable challenge to the development of the general education program on any campus. "General Education has developed to the point that it is becoming a specialization. General education cannot be compartmentalized because it is composed of other areas of knowledge and the interrelations are very intimate."³⁴ Stature must be earned and a constant effort for better understanding on the part of all faculty must be maintained. The next chapter will consider the implications of the development of a definition and program of general education for industrial arts.

³⁴ Robert Ray Haun, *op. cit.*, p. 14.

CHAPTER FOUR

Implications for Industrial Arts

Chapter II discussed definitions of general education so that a rather basic understanding of the named approaches could be gained. Three major philosophical positions were introduced and examples of typical statements from each of the views were presented indicating the concept of general education held by each. The chapter concluded with a compromise statement of a definition that could be used at the operational level. Chapter III used the three philosophical positions of Chapter II as the starting point for a discussion of types of programs and methods that each position would tend to develop. The second part of the chapter reviewed the common areas of understanding of general education and highlighted some of the trends that are discernible in each area. The implications of the philosophical positions, of a definition, of the kinds of programs and methods of general education, and of the areas of understanding are most important to the industrial arts profession and to industrial arts teacher education. The implications for the industrial arts profession are discussed first.

Purposes and Objectives

As one examines the literature of the industrial arts profession, it becomes evident that there is strong agreement as to the objectives of the program. It is broadly conceived and is designed to make a necessary contribution to the common background of the young people of the nation. The program is planned to meet the requirements of general education in American society. The relationships between accepted objectives of industrial arts and the purposes of general education, as included in the compromise definition, will be highlighted. The *Guide for Industrial Arts Education in California* has a statement on the "Objectives of Industrial Arts Education." These objectives are similar

to other lists which appear in the literature of the profession. Some lists of objectives will have fewer objectives, some more, and some will be written quite differently. However, upon careful examination of other statements on objectives, a basic agreement is evident. For the purposes of our discussion, we can assume that there is a close enough agreement on this list of objectives to illustrate our point. They are numbered here for ready reference.

Objectives of Industrial Arts Education¹

1. To develop understanding of industry in terms of organization, raw materials, processes, products, occupations, and services.
2. To develop appreciation of the influence that industry has on our social and economic life; and the ability to select, care for, and use industrial products intelligently.
3. To develop a reasonable degree of skill in the use of tools, machines, and materials; and understanding of basic types of construction, repair, and maintenance.
4. To develop sound practices, attitudes, and appreciations of safety in the school shop with application to the home and everyday living.
5. To offer opportunities for the development of constructive leisure-time activities or hobbies requiring mental and physical activity.
6. To satisfy the creative desire of youth, regardless of professional or occupational interest, to construct useful articles with tools and materials.
7. To develop the ability to measure and calculate, and to use scientific information, graphic illustrations, and reference materials effectively in the activities.
8. To develop the ability to plan and work, alone and in cooperation with others, toward the orderly, efficient and complete performance of assigned and selected tasks.
9. To develop appreciation of good design, construction, and craftsmanship.
10. To discover and develop personal aptitudes, interests, abilities, self-reliance, good judgment, and resourcefulness through problem solving and self-expression.
11. To enrich other instructional fields such as mathematics, science, and language arts by bringing theory and practice closer together through illustrations and practical applications.
12. To develop understanding of conservation and the sources of the basic materials that provide resources for man's comfort, health, and enjoyment.

¹ California Industrial Arts Curriculum Committee. *Guide for Industrial Arts Education in California*. Sacramento: California State Department of Education, 1958, p. 5.

13. To provide information and exploratory experiences in various industrial occupations and industries that will help the student to make a wise selection of his life work.
14. To provide opportunity for certain students to have more advanced experiences within chosen occupational areas.

The relationships touched upon in the following are not detailed; however, they do indicate a trend of thought which could be developed more completely. The definition of general education which is used here is the statement of purposes introduced in the closing part of Chapter II. Several important points that should be kept in mind, as one reads this section, are repeated below:

Much must be read into these statements, for the broadest possible conceptions are necessary to a good program of education.

Growth and development of the individual to his fullest potential are inherent, and

the use of critical thinking as a normal process to reach conclusions is an integral part of the educational process.

The five statements of purpose for general education will be followed in each case by a statement, by key phrases, or both to emphasize the meanings of the industrial arts objectives and their relationships to general education.

1. *General education is a common experience and background for all educated people.*

All the objectives of industrial arts would contribute to the general education of the "truly" educated individual.

Industrial arts is a program specifically organized for general education purposes and is a vital part of the total educational program for all students. They need an opportunity to become acquainted with processes and materials of industry. With increased mechanization becoming a part of their daily lives, it is essential that industrial arts experiences be regarded as basic and fundamental for *all*. All are involved in the American technology as consumers, many as producers, and all should be interested in recreational opportunities.

Regardless of the ultimate objective of the individual in his educational plans, whether he plans to be a scientist, a doctor, a lawyer or enter any other profession, he will find the practical experience of working with tools and materials a valuable background. If he has no *special* educational plans, but is interested in being liberally educated, it will help him to understand better the ramifications of the industrial-democratic culture in which he lives and

the implications of the technological age for his personal life. The opportunity to develop an idea in actuality, and construct it, is a most revealing experience. Other areas of general education and their broad and basic understandings are brought into sharper focus as they are applied practically in problem solving. The test of putting principles into action is, in the final analysis, the test of the "truly" educated person.

2. *General education results in the improvement of the individual's ability to live wisely and well.*

Again all of the objectives of industrial arts would have implications for this purpose of general education. The key phrases which follow indicate something of the sense of the industrial arts objectives in regard to this point.

Tools, processes, methods and products of industry . . .

Develop habits of orderly methods and procedures . . .

Experience in the use of common tools and machines . . .

Cultivate an interest in wholesome and enduring leisure-time activities . . .

Explore activities and hobbies requiring mental and physical activity . . .

Recognize good workmanship and design . . .

Discover one's own aptitudes, abilities and interests . . .

Be aware of the qualifications for, the duties and responsibilities of, and the opportunities available in occupations and professions . . .

Know what educational opportunities are available . . .

Develop the proper attitudes of safetymindedness . . .

Explain the implications of safety rules . . .

Be aware of dangerous situations and attempt to prevent accidents . . .

3. *General education contributes to the development of a code of ethics based upon democratic principles.*

The important objectives of industrial arts for this purpose of general education are objective one and objective eight with the method of teaching being the basis for the implementation throughout the course activity. Through an understanding of the American industrial complex, one realizes the worth of the individual and places it in new perspective. The system is a democratic, dynamic group effort. Each individual contributes to the success of the whole by attaining and maintaining maximum productivity. An insight into

how this operates at all levels of skill is most important to attain the real feel for democracy. The student personnel system, democratic shop management, and individual student and group planning used as an integral part of the industrial arts program, all give the student an appreciation of the need for individual leadership and for group effort. Some key phrases follow:

- Develop the ability to deal with people . . .
- Realize the values of cooperation and group effort . . .
- Foster desirable social habits and attitudes . . .
- Appreciate leadership abilities, techniques and values . . .
- Encourage respect for the rights of others . . .
- Be conscious of safety in everyday living . . .
- Be aware of the contribution of, and a respect for, each worker's part in the industrial complex . . .

4. *General education develops a sense of responsibility to and understanding of social, economic and political problems.*

Objectives 1, 2, 3, 12, 13, and 14 all have some rather specific implications for this phase of general education. The phrases which follow emphasize what trend the educational thinking would take as these objectives of the industrial arts program are met.

- Basic organization and management of industry . . .
 - Use of raw materials, conservation and distribution . . .
 - Realize the implications of technology for society . . .
 - Appreciate the problems of industrial expansion and development . . .
 - Understand the problem of the productivity of the individual and its implications for American society . . .
 - Select, use, and maintain the products and services of industry . . .
 - Appreciate the raw materials used, the manufacturing processes and the problems of distribution . . .
 - Understand something of the relationships of industrial personnel . . .
 - Appreciate the role of the individual and his contribution in the production system . . .
5. *General education provides for optimum development of knowledge in the areas of sciences, humanities, communications, social sciences and in personal maturity.*
- Objectives 1, 2, 7, 11, 13, and 14 have implications for develop-

ment of knowledge in the areas of understandings for general education. The method of industrial arts provides a fine vehicle to carry understandings from the abstract realm to the realm of application. Some key phrases follow:

- Understand the principles of planning and drawing . . .
- Construction of useful, well-designed objects . . .
- Understand the application of measuring, calculating, scientific principles and the use of the language arts . . .
- Develop the use of sketching and drawing as a means of expressing ideas . . .
- Realize the limits of one's own abilities in attempting a task . . .
- To obtain some practical work experience . . .
- Appreciate good design . . .
- Develop confidence in the ability to solve practical problems . . .
- Encourage creative expression in the use of materials . . .
- Apply good design principles in the development of ideas . . .
- Foster the application of new materials and techniques in construction . . .
- Encourage ingenuity and inventiveness . . .
- Understand the contribution of technology to the advancement of culture . . .
- Appreciation of the implications of cultures of the past for the present and future . . .

A sense of the way in which industrial arts is a part of and contributes to the purposes of general education has been broadly presented above. The details of program and method are most important for a more complete understanding of the role of industrial arts in general education. Much of the professional literature of the field has been devoted to just this topic. More could be said here; however, the pattern is evident. Industrial arts has a real contribution to make in higher education as a part of the general education program. Students who have not had enough of this type of experience must have an opportunity to gain more background and bring their skill level to a point where it is a usable tool. Each college would organize the program to fit its own approach to general education and meet the student needs. Some philosophical positions, and therefore colleges, can accept this type of activity more readily than others. The next section will discuss this problem from the standpoint of each of the major philosophical positions described in Chapter II.

Industrial Arts as General Education

Industrial arts as general education in higher education has a unique function to perform and can make a very necessary contribution to the total program of general education in the college. Each philosophical position accepts the idea of the "areas of understanding" that should be included in the studies of general education; however, they do not agree on the emphasis, methods and the program to accomplish the purposes of general education. This has very definite implications for industrial arts offerings in higher education as part of the general education program. Examination of several statements from the representatives of the three philosophical positions described and discussed in Chapters II and III indicates something of this problem.

Cunningham, from his humanistic philosophical position, makes this statement.

This writer believes, however, that the experience derived from working is one of the most educative influences in life, and this is one of the great advantages of our long summer vacation. Many a college student has received great profit from employment during this period over and above the financial returns. Those of us who passed our boyhood in the nineties know how hard we had to work after school and on Saturdays even though we were not reared on a farm. The experience of chores and odd jobs has now practically disappeared for most young people in this urbanized, industrial age. Recreational programs like the Boy Scouts and Girl Scouts are doing something to provide a substitute, but the question persists: cannot the school do something to bring this experience of work to the young, for whom it holds such valuable opportunities for learning one of life's fundamental lessons, that of personal responsibility for a job well done? In college the staging of a carnival for foreign student relief is an example of an extracurricular activity in which many students spend hours of labor, building, and decorating booths, for a worthy cause. Working one's way through college certainly has many disadvantages, particularly for the average student; but there are compensations. I heard an experienced college professor state that many of his former student secretaries later told him that they learned more working for him than they did in any class they ever took in college.²

Although Cunningham admits to the value of practical experience, he sees it as being outside the instructional program. He would encourage students to get this type of background for their general education, but it must be done on an individual basis and should not be part of the organized educational course effort.

² William F. Cunningham. *General Education and the Liberal College*. St. Louis: Herder Book Company, 1953, p. 127.

Robert Hutchins in his view of practical experience would take an even more negative position. The application of abstract ideas is left to the intelligence of the individual, and as he becomes more highly educated he will know how to proceed in the areas of understanding. Hutchins, from his rational humanistic philosophical view, takes the position that the study of the "Great Books" is the program and the method of true general education. This approach would be strongly opposed to any activity of an industrial arts nature being included in higher education.

The Harvard Report talks of the need for industrial arts in the secondary schools as part of the general education program there. The two quotations which follow indicate their interest in having their students have this type of background.

In the final section of this chapter we shall say something about the importance of shop training in general education. For those who intend to go into scientific or technological work, it has special relevance. The manipulation of objects, the use of tools, and the construction of simple apparatus all are required for entry into the world of experimentation. Even the pure mathematician is greatly aided by shop experience; the forms, contours, and interrelations of three-dimensional objects provide a stimulus and satisfaction not to be achieved altogether within the limits of plane diagrams. The lack of shop training is at present a most serious deterrent to entry into all types of technological work and to college and postgraduate training in science, medicine, and engineering. What students should learn in secondary school specifically is the use of simple hand tools and the execution of simple basic operations such as soldering and elementary glass blowing and joining. If the student can be taught to operate a drill press, a wood lathe and a machine lathe, so much the better. Obviously, the equipment for work with power-driven tools is not ordinarily available except in larger schools.³

In an earlier section we spoke of the importance of shop training for students who intend to go into scientific or technological work. Such experience is important for the general education of all. Most students who expect to go to college are now offered an almost wholly verbal type of preparatory training, while hand training and the direct manipulation of objects are mainly reserved for the vocational fields. This is a serious mistake. The bookish student needs to know how to do things and make things as much as do those students who do not plan to take further intellectual training. The direct contact with materials, the manipulation of simple tools, the capacity to create by hand from a concept in the mind — all these are indispensable aspects of the general education of everyone. In some schools pupils receive such training in the elementary grades. Other students gain such experience

³ Harvard Committee on General Education. *General Education in a Free Society*. Cambridge: Harvard University Press, 1945, p. 160.

outside of school; but for those who have had no experience in the use of tools, a high-school course may offer the only possibility.⁴

Justman and Mais do not discuss the use of industrial arts types of experience to any degree. A sense of how they feel generally about this educational approach is expressed by the following quotation as they are discussing "Some Specialized Techniques" of instruction.

Laboratory and Workshop. Laboratory work has long been a feature of instruction in the natural sciences, and under one or another designation the workshop principle has similarly been applied in teaching the fine arts and music, creative writing and dramatics, *and numerous technical and applied studies.* (Italics added.) Recently the terms "laboratory" and "workshop" have been generalized and expanded in use, and in various forms are associated with courses in psychology, the social sciences, foreign language, home economics, health education, and preparation for teaching. The essential principle involved is learning by doing, with the burden of course activity placed upon the student working under the teacher's direction.⁵

They do not take a strong stand for they are reporting more what is possible than expressing a position. However, the impression made is that they feel it is a good, acceptable technique of instruction.

Dewey and Wynne are the authors who are used as the examples of the naturalism and instrumentalism philosophical approaches to general education. Dewey has long been noted for his acceptance of the activity program as a most valuable form of educational experience. Industrial arts activity would be quite acceptable for general education from Dewey's viewpoint. Wynne, in speaking of the practical arts, makes the following statement:

The practical arts are related to the world's work by which men make a living. They represent an objective embodiment of overt activity as an aspect of experience. Overt activity is as much a part of life as are thought and feeling, and the products of overt action are just as much an indispensable part of the human world as are science and the fine arts. *The subject matter of the practical arts is as indispensable in the total program of general education as are the subject matter of science and the subject matter of the fine arts.* In fact, thinking is often a servant of action, and some of the most important knowledge is gained in the pursuit of practical ends. Likewise, feeling, even aesthetic feeling, often accompanies the most mundane of practical pursuits and transforms some of their productions into works of art. The separation of the fine arts and the practical arts is often disastrous to both. The necessary work basal to even the higher levels of human experience becomes drudgery and the fine arts become inane and irrelevant. A program

⁴ *Ibid.*, p. 175.

⁵ Joseph Justman and Walter H. Mais. *College Teaching: Its Practice and Its Potential.* New York: Harper and Brothers, 1956, p. 210.

of general education in which the practical arts are not represented involves such a separation.⁶

The industrial arts faculty at any college is interested in offering industrial arts courses as part of the general education program. The above quotations illustrate how each philosophical position approaches the idea of including practical activity courses as part of their course offerings for general education.

Hutchins would oppose the idea completely. Cunningham accepts the value of practical experience, but feels it should be part of the student's general education outside of the student's course work. From the humanistic position, the Hutchins view is more what one could expect. The Cunningham view, as expressed, is actually a broadening of a position on liberal education and general education.

The Harvard Report accepts the principle of practical experience as a necessary part of every student's background regardless of his ultimate goal in life. They feel that it should be available at the secondary level; however, they seem to imply that if this type of experience is not part of the student's general background, it is important and he should have it. Justman and Mais accept the "workshop" idea as a laboratory type of experience that is not only an acceptable but also a desirable technique.

Dewey and Wynne take the position that experience is the main-stay of education. The broader and the richer this experience, the better the educational program. They would support an activity-type program as a valuable part of the student's general education background.

The industrial arts faculty should assess the position of the group with whom they are discussing industrial arts as general education in higher education so that they can best determine to what extent and degree the program will be accepted. A clear understanding of the philosophical positions on general education as described here and the variations of these positions that are often discovered will help faculties to promote industrial arts in higher education. Industrial arts has a function here and is an important part of every student's general background.

Many industrial arts departments offer courses organized for general education purposes at the college level. Students take these courses to extend their experience in the areas of industrial arts, because they

⁶ John P. Wynne. *General Education in Theory and Practice*. New York: Bookman Associates, 1945, p. 61.

have discovered a need for more skill or they may never have had the opportunity to take certain industrial arts courses at the secondary level. Extensive experience is not usually desired; however, some experience in industrial arts is necessary. The methods of instruction are similar to the methods of other general education courses, and close attention to the objectives of industrial arts and their relationships to the purposes of general education must be maintained. General education courses in industrial arts in higher education could and should set an example and a high standard for courses in secondary schools to consider as patterns for the improvement of their course work. The colleges have a great opportunity to implement the objectives of industrial arts to an extent that may not be possible at any other level.

The problems of industrial arts courses for general education purposes are similar to the problems that the other areas of understanding have. Staffing is difficult for the prestige in the industrial arts department lies with the courses for the major. The more experienced faculty members should take over the responsibility for the general education courses for they should be the richest and best-taught courses in the departmental offerings. The general education courses should do the best possible job of meeting the objectives of industrial arts and relate them to the challenge of the purposes of general education. This requires the highest level of skill available in the department. Typically, however, the senior faculty members teach courses for the major and perhaps even more typically, in industrial arts, teach the professional courses. Another problem is the common feeling that the broad coverage of the typical general education course contains no real depth and therefore is not as acceptable a course for the department to have among its offerings. It is not as worthy a representative of the discipline. The department then tends to retreat from the general education course conception and offers only the traditional basic courses which the non-major student must then take. This last problem is not as critical for industrial arts as it is for many of the other disciplines. However, it does imply that special courses should be set up for general education purposes and that the course most logically should be taught in a comprehensive general shop. The method should be distinctly the problem solving and experimental approach with the student solving his problem by successfully constructing the object that he designs. The teacher's ability to teach and his ability to relate the course activities to the necessary broader understandings and implications is the key. The teacher will make the course. Facilities should be such

that just about any skill, process, and material could be used in the construction phase of the course activity.

To summarize this section and to re-emphasize many of the points formerly made, the following statements are submitted as beliefs of the industrial arts profession about their program as part of general education.

That the culture of the United States is essentially industrial-democratic and that it is of paramount importance to understand the implications of this fact.

That the industrial arts program makes a unique contribution in the educational system by orienting the individual to our industrial society through directly related activity.

That the industrial arts program, through its project method and practical activity, provides each student with an opportunity to apply other school subjects such as mathematics, science and the language arts.

That problem-solving techniques, critical thinking and the scientific method can be readily experienced and the results evaluated by students as they work in industrial arts.

That as students participate in the student personnel system of their classes, they gain valuable experience in social relationships and an insight into democratic practice.

That industrial arts is especially adapted to the recognition of individual differences.

That as the general objectives of the industrial arts program are reached by instructors with their students, the experiences, learning, and understandings involved are of utmost importance to all American youth. That if a student does not have industrial arts as part of his school experience he is not truly generally educated.

Teacher Education

Industrial arts at the collegiate level has several major objectives. In the preceding section we discussed the general education function of industrial arts courses taught at the college level by the industrial arts department faculty. This is a most important role for industrial arts. The primary objective, however, is the preparation of departmental majors to be successful and superior industrial arts teachers. This is industrial arts as special education. Before embarking on a discussion of the implications of the general education program for industrial arts teacher education, it is essential that the differentiation between *general*

and *special* education concepts be clearly established. This concept is rather basic and often misunderstood. The Harvard Committee on General Education makes this difference quite clear in the following quotation:

Now, a general education is distinguished from special education, not by subject matter, but in terms of method and outlook, no matter what the field. Literature, when studied in a technical fashion, gives rise to the special science of philology; there is also the highly specialized historical approach to painting. Specialism is interchangeable, not with natural science, but with the method of science, the method which abstracts material from its context and handles it in complete isolation. The reward of scientific method is the utmost degree of precision and exactness. But, as we have seen, specialism as an educational force has its own limitations; it does not usually provide an insight into general relationships.⁷

Industrial arts teacher education thus faces a dilemma. Industrial arts courses taught as part of the preparation of the major are no longer *general* in their basic conception, but rather they are *special* education. It is important, however, for these courses to be taught in a similar fashion to industrial arts courses taught for general education. The emphasis may be slightly different, but the methods and techniques of instruction should be quite similar. Good, exemplary teaching is necessary to demonstrate the best type of industrial arts instruction at all times. "The use of critical thinking as a normal process to reach conclusions is an integral part of the educational process," and must be equated with good teaching. The freedom of the industrial arts student to explore, investigate and bring his ideas into focus in the practical realm is also important in the process of teacher education. The physical setting of the industrial arts department must be rich enough and flexible enough to provide a facility that lends itself to this approach in this type of *special* education. The *special* education offered for teacher preparation purposes is the technical course work and the professional course work that the student takes. There is, however, an important relationship that must be maintained between the *general* education, the technical education and the professional education in the teacher education program. This relationship will be highlighted as part of the following discussion as recommendations are made concerning a general education program for industrial arts teacher education.

Assuming that most teacher preparation programs consist of a bachelor's degree and that the general education requirements are part

⁷ The Harvard Committee on General Education, *op. cit.*, p. 56.

of the degree pattern, the following recommendations are made. The general education pattern for industrial arts majors should be no different than the one which is required for any other student in the college or university. As you review the purposes of general education which were previously developed, no other position is possible. However, flexibility of the program should make it possible to meet certain student needs. All students do not come to college with the same general background, and, therefore, some choice is necessary.

Purpose one states, "General education is a common experience and background for all educated people." The industrial arts teacher should be as adept and as broadly educated as possible. Some provision is necessary to assure that the industrial arts teacher is as well prepared in general education as any college graduate. Research should be carried on in regard to this area of preparation. Standardized tests could be administered or additional tests developed. This is not a problem for the industrial arts profession alone. There is a common challenge here for everyone for further research into the success of general education and ways to accomplish its goals. Industrial arts could lead the way on many campuses if it would attack the problem now and set up evaluative procedures.

The second and third stated purposes, "General education results in the improvement of the individual's ability to live wisely and well," and "General education contributes to the development of a code of ethics based upon democratic principles," are broad statements, as is purpose one, and could be treated similarly. If evaluative procedures could be established for the industrial arts general education courses, and their success in contributing to these purposes of general education could be established, perhaps a valid assessment of the contribution of other courses would follow. This could have real value and would make it possible to better determine the success of the general education program for the industrial arts major. Certainly better student guidance would result, and perhaps a better program of general education would evolve.

Purpose four, "General education develops a sense of responsibility to and understanding of social, economic and political problems," is most important for the industrial arts teacher. This is a part of general education which concerns the industrial arts program directly. The profession speaks in these terms as the program is described. Socio-economic problems, the industrial American culture, the modern technology and many other phases are all common to the industrial arts

professional literature. The profession makes a direct contribution in this area, but we are not doing as much as we might. Teacher educators must be concerned with the preparation of students in this regard, for the broad understandings are not being carried into the teaching situation at a usable level of understanding. This could be the failure of the *general* education program, but it also could be the failure of the *special* education program. The question could be asked, "Are the necessary relationships being established?" Some effort must be made in the technical course work and the professional course work to make the student's background in this area a usable teaching background. The industrial arts college faculty must show the way and establish the bridge between needs of the secondary school teaching situation and the general education program at the collegiate level.

This same type of problem occurs in reference to purpose five, "General education provides for *optimum* development of knowledge in the areas of sciences, humanities, communications, social sciences and in personal maturity." A review of the typical structure for course offerings in the "Areas of Understandings" indicates approaches being used by general education faculties. Here again the industrial arts faculties have a real contribution to make. They can bring the understandings developed in each of the "Areas of Understanding" into focus and indicate how they can be utilized in the teaching of industrial arts. One example of this type of effort is the development of *Mathematics and Industrial Arts Education* published by the California State Department of Education. The subtitle states, "guide for the improvement of instruction of the practical application of mathematics in each area of industrial arts in grades seven through twelve." Another publication of this type is now being developed in the science field as well. These are examples of the profession developing materials useful to the teacher for the more effective implementation of the objectives of industrial arts. Resource files could also be developed. The college faculties are faced with the responsibility of guiding the college industrial arts major into the courses in general education of greatest value to the student, but then they must carry the process one step further and integrate these general education understandings into the teacher education process. The general education understandings become useful and usable concepts which the new teacher can pass on as he in turn teaches his general education industrial arts course at the secondary level. As these general education understandings become applicable in this way they demonstrate true learning and general education.

Some rather specific recommendations concerning the general education of the industrial arts major now can be made:

1. Industrial arts majors should have the same general education opportunities as any other major in the college or university.
2. The general education program must provide some flexibility to meet student needs.
3. The general education program should develop an attitude of interest in learning and a confidence in the areas of understanding.
4. The *special education* phase of teacher education has the responsibility to relate the general education understandings to the objectives of industrial arts so that proper implementation can be carried on.
5. The industrial arts college faculties can "show the way" to general education in method and in evaluation by teaching their general education industrial arts courses in an exemplary fashion and carrying on research to further improve offerings.

Each institution must work out the most appropriate general education program for its students. However, the course pattern for the areas of general education could be set up as follows, with approximately forty-five semester hours required.

Area	Minimum Semester Hours
a. Science	6
b. Mathematics	6
c. Applied Arts	6
d. Fine Arts	6
e. Social Science	6
f. Communicative Arts	6
g. Electives from a through f	9 (must be outside the major)

Advising would be critically important in selecting those courses most valuable to an individual student. Each student's background, abilities, and weaknesses would need to be evaluated, and the evaluation results should guide the general education course selection. Certain areas of general education, such as mathematics, fine arts, and science, might be especially important for the industrial arts teacher. However, a lack of background or a lack of ability in an area such as speech arts or social science also must be considered seriously.

Students should be encouraged to complete area requirements by demonstrating proficiency, and credit earned by proficiency examinations should count toward satisfaction of graduation requirements. This

would enable superior students either to enter advanced undergraduate courses within a normal four-academic-year period or to enter graduate school earlier than less-talented students.

A sense of the challenge that faces the profession can be gained by reviewing Chapter III of *Yearbook IV* of the American Council on Industrial Arts Teacher Education on "The General Education of Industrial Arts Teachers." This chapter discusses the reports of colleges on their superior practices in their general education programs. The omissions should be noted as well as noting the areas of understanding considered. Increasingly more research must be accomplished.

Micheels and Sommers in writing of *The Minnesota Plan for Industrial Arts Teacher Education* have reported on an extremely interesting experiment in developing a total program of teacher education. They have considered both the *general* education of the teacher as well as his *special* education. Note also the way in which the recommendations were developed through faculty action.

In discussing the general education program they recommend about one-half the student's time be devoted to general education. This is a little more than usual. They also express a great deal of concern for the relationships of the general education understandings to the industrial arts program. They have some unique ideas here which may make a real contribution. They suggest a broadly conceived design sequence as the vehicle to implement general education understandings. The total report should be reviewed for the details of the proposal. The important point here is the example of the work that was accomplished and the thorough report that was developed. Similar efforts should be started on other college campuses for much must be accomplished.

A summary of this section on general education may serve to indicate the complexity of the problems confronting the profession in this area. Three major approaches to general education were described from a philosophical view in Chapter II. A statement of the purposes of general education was developed which was used for further discussion. The implications of a philosophical position on methods, courses and program organization were described in Chapter III with a discussion of the areas of understanding and the trends in regard to methods and problems closing the chapter. This chapter has highlighted the implications of general education for the industrial arts profession. The college industrial arts faculties must take the responsibility for offering high-level general education industrial arts courses for all students on their campuses and exert leadership in setting an example for teaching

general education concepts. The industrial arts faculties must participate in developing the total general education program on their campuses and must guide their majors in optimum general education. The special education, technical and professional courses, must implement the general education concepts by using teaching methods in teacher education to place these concepts in the usable realm. These are some of the challenges that exist in regard to general education for the industrial arts profession. The profession must continue to work on these problems while proceeding at the same time with an awareness of the trends and developments in general education in all its aspects.

SECTION III

Professional Education

Douglas R. Sherman
Assistant to the Provost
Wayne State University
Detroit, Michigan

CHAPTER FIVE

By Way of Introduction

Professional education can be and has been defined, described, and characterized in many ways. Indeed, no other aspect of American education has evoked such a range of violent emotion and opinion. Vigorously attacked and warmly defended, it is discussed by many, analyzed by some, but understood by few. Regarded by one extreme as "methodology gone mad" and by the other as the "salvation of the nation," it exhibits a remarkable stability, surprising growth, and a practical regard for the future. As educators responsible for preparing industrial arts teachers, we must be willing to approach any discussion of our professional preparation and, particularly, of our professional course work requirements with an open mind. Such an attitude of inquiry would seem highly essential, for only then can we effectively deal with challenge and controversy.

It is important that we view industrial arts teacher education as an integral part of teacher education. Helsby, in discussing the professional education course work at Oswego, puts it this way: "The professional competencies provided include those understandings and skills needed by all teachers, with emphasis on those needed by teachers of industrial arts."¹ In other words, our profession is one integral part of the over-all teacher education picture.

A troublesome question that occasionally arises is whether industrial arts teacher education is tied "primarily" to teacher education as a professional curriculum or to industrial arts as a subject matter specialty. Now both are obviously essential. In a sense, this is splitting hairs; yet the issue is basic. Just as the preparation of high school biology teachers cannot be considered as an appended program to a depart-

¹ Robert Helsby, "Description of Selected Teaching Field Programs: State University of New York College of Education at Oswego, Industrial Arts," *The Education of Teachers: Curriculum Programs*, XX National Commission on Teacher Education and Professional Standards, National Education Association of the United States, Washington, D. C.: The Association, 1959, p. 386.

ment of biology in a college of liberal arts, neither can an industrial arts teacher education program be considered a logical conclusion to a series of shop courses. Fortunately for us, this issue has been primarily of theoretical interest since both our technical and professional work, generally speaking, have been organized and administered within colleges of education. However, the development of collegiate level industrial arts programs specifically designed to prepare students for employment in industry makes it essential that the basic relationship of industrial arts teacher education and the total program of teacher education be understood.

What Is Professional Education?

Two aspects of this question would seem to deserve consideration. *First*, what is the place of professional education in any teacher education curriculum? *Second*, what are the basic purposes of professional education?

Professional Education in the Teacher Education Curriculum.

Solely from the standpoint of formal course work, the total teacher education curriculum as viewed, for example, by a graduating senior represents the sum of all the courses which he has elected. Regardless of his teaching major, this same graduating senior would experience little difficulty classifying each of his courses under one of the three classic categories which together comprise any teacher education curriculum: general education, subject matter specialization, and professional education. This, the well-known three-part curriculum of teacher education, has been discussed many times and is a basic concept familiar to every teacher educator.

It is to be noted that a sound rationale lies behind this curriculum, for each of the parts makes a definite and unique contribution to the whole. Thus, the general education course work provides that broad background of knowledge which every educated person ought to have. Again, subject matter specialization provides that store of information and techniques from which the lessons to be taught by the prospective teacher are drawn. Finally, professional education provides those knowledges and skills, together with their proper integration, which are necessary in order to teach competently.

While every teacher education curriculum is composed of these three parts, most curricula in other fields have only two: a background in general education plus a subject matter specialty. Hence, a teacher

education curriculum has an added extra, a unique aspect which is not shared with most other fields. This "uncommon quality" is professional education, and it is this unique feature, professional education, which gives teacher education curricula their individuality and permits them to be considered as separate entities. Glennon puts it well when he states that in professional education course work "resides what is generally considered to be the heart of the teacher education program."²

Someone may ask, though, "Is this thing called professional education really necessary? Isn't a sound knowledge of your subject and a good background in general education enough?" Happily, this battle has been largely won, for virtually everyone — and this includes our most caustic critics — agrees that something more is needed. Our critics may quarrel with the content of professional education course work, and they may disagree with the amount of time that is required; but all admit, in a general way at least, that some sort of professional education is necessary. This concept that a teacher needs something more than a good background in general education and a sound knowledge of his subject matter specialty — that he in fact needs professional education — is, of course, anything but new and can easily be traced historically by anyone who is so inclined.

In reviewing the place of professional education in a teacher education curriculum three points seem important: (1) It is one of the three integral parts of teacher education curricula, (2) It is the unique aspect, in a very real sense the "heart," of teacher education curricula, and (3) It is regarded by almost everyone as critically necessary.

Purposes of Professional Education.

All too often, professional education is regarded as a series of "how to teach" courses. J. T. Kelley, Director of the Division of Teacher Education, Certification, and Accreditation of the Florida State Department of Education, maintains, however, that "the content of the professional program cannot be referred to properly as 'how to teach' since little of the program can be considered methods courses."³

² Vincent J. Glennon, *The Road Ahead in Teacher Education*. Syracuse, New York: Syracuse University Press, 1957, p. 56.

³ J. T. Kelley, "Regulation and Improvement at the State Level," *The Education of Teachers: New Perspectives*, Official Report of the Second Bowling Green Conference, National Commission on Teacher Education and Professional Standards, National Education Association of the United States. Washington, D. C.: The Association, 1958, p. 210.

F. E. Heineman, Director of Teacher Personnel, Minnesota State Department of Education, suggests that professional education course work ought to provide four things: (1) an understanding of children, their growth and development, and how they learn, (2) a knowledge of curriculum content and the use of materials of instruction in the promotion of learning, (3) a recognition and full appreciation of the teacher's place in the local faculty and his responsibility as a member of the profession, and (4) an understanding of the role of schools in society.⁴

John R. Beery, Dean, School of Education, University of Miami, states that professional education, in addition to providing instruction in such areas as curriculum and methods and requiring stimulating laboratory experiences, must also develop in each prospective teacher an understanding of the school in American society as well as an understanding of children and young people.⁵

W. Earl Armstrong, Director of the National Council for Accreditation of Teacher Education, identifies from the standpoint of job entry qualifications, four needs of teachers which should be met through the course work in professional education: (1) an understanding of children, (2) a knowledge of the materials of instruction and their proper use, (3) an understanding of the functions and responsibilities of a faculty member, and (4) an integration of these first three factors which can best be accomplished through student teaching.⁶

Glennon breaks down the over-all concept of professional education into two main parts: a knowledge of broad professional problems, and professional competencies and skills.⁷

Woodring also divides, in a manner not unlike Glennon's, professional education into two basic parts. He first lists "professional knowledge as distinguished from professional skills"⁸ but then mentions "skills in managing a classroom, working with children and young

⁴ F. E. Heineman, "What Should Professional Education Seek to Accomplish?" *The Education of Teachers: New Perspectives*, Official Report of the Second Bowling Green Conference. National Commission on Teacher Education and Professional Standards, National Education Association of the United States. Washington, D. C.: The Association, 1958, pp. 205-206.

⁵ John R. Beery, "Six Significant Issues," *The Education of Teachers: New Perspectives*, Official Report of the Second Bowling Green Conference. National Commission on Teacher Education and Professional Standards, NEA of U. S. Washington, D. C.: The Association, 1958, p. 206.

⁶ W. Earl Armstrong, "Teacher Education Curriculum," *Journal of Teacher Education*, 8, September, 1957, pp. 239-240.

⁷ Glennon, *op. cit.*, p. 17.

⁸ Paul Woodring, *New Directions in Teacher Education*. New York: The Fund for the Advancement of Education, 1957, p. 11.

people, and in the supervision of the learning process."¹⁰ Are not his divisions reminiscent of the "knowing" and "doing" classifications utilized in analyzing the service trades?

Hollis Moore reports a proposal to the effect that professional education ought to include "(1) studies which relate to the nature of individual personality; (2) studies which relate to the intricacies of the teaching-learning process; (3) analysis of the function of schools in our Western culture; and (4) the opportunity to practice the art of teaching in the presence of expert supervision and guidance."¹¹

While more references as to the purposes of professional education could easily be cited, the ones given above are representative and should prove sufficient for our needs. All of the above purposes can probably be summarized into three which, while general, are basic:

First, professional education ought to be concerned with developing understandings in such broad areas as the role of the school in modern society, the nature and development of children and young people, and the role of the teacher in American education.

Second, professional education ought to be concerned with developing those skills and techniques which are required to do such things as manage a classroom, teach a lesson, prepare instructional material, and evaluate achievement.

Third, professional education ought to provide each student with an opportunity to integrate all of these skills, techniques, and understandings — usually through a program of student teaching and other forms of professional laboratory experiences — into what can best be called the "art of teaching."

Parenthetically, it is interesting to note that as teacher education curricula have three basic parts, each with its own purpose, so, too, does professional education. They even equate with one another in a rough way. Is not the "broad understanding," listed above as the first purpose, really the general education of professional education? Are not the "skills and techniques," the second purpose, really the subject matter specialization or technical preparation of professional education? And finally, are not student teaching and the other forms of professional lab-

¹⁰ *Ibid.*, p. 11.

¹¹ Hollis A. Moore, "Elements in the Teacher Education Program — Professional Preparation," *The Education of Teachers: New Perspectives*, Official Report of the Second Bowling Green Conference, National Commission on Teacher Education and Professional Standards, NEA of U. S., Washington, D. C.: The Association, 1958, p. 32.

oratory experiences the most truly professional aspect of professional education?

Patterns of Professional Education

In order to set the stage, it is necessary to consider rather briefly certain aspects of the patterns of professional education which are current today. Armstrong testifies to the importance of these patterns when he states that "some curriculum patterns are more promising of desirable results than are others."¹² At the same time he recognizes that teachers will continue to be prepared by a variety of colleges and universities;¹³ consequently, curriculum patterns useful for one type of college may be less effective in another.

Five aspects of present-day patterns seem important: (1) the amount of time — credit hour wise — which is allotted to professional education within the total teacher education curriculum, (2) the "natural organization" or internal breakdown of courses and learnings within the area of professional education itself, (3) the positioning or location of professional education course work within the total four-year program, (4) the competing concepts of "generalized" and "specialized" professional education courses, and (5) the role of certification standards in the determination of professional education patterns.

It should be mentioned that this section purports to discuss only those aspects of patterns which are commonly found today. Newer developments, such as the five-year program, may be mentioned, but analysis and discussion will be reserved until the next chapter.

Time Allotted to Professional Education Course Work.

W. Earl Armstrong and T. M. Stinnett in their *Manual on Certification Requirements* state that the median number of semester hours of professional study for certification is 24 for the elementary school teacher and 18 for the secondary school teacher.¹⁴

Since, generally, there is a high degree of correlation between certification requirements of a given state and the professional course work which is required in teacher education curricula within that state, it seems fair to assume that these median figures are also indicative of the amount of time devoted to professional education within the col-

¹² Armstrong, *op. cit.*, p. 233.

¹³ *Ibid.*, p. 231.

¹⁴ W. Earl Armstrong and T. M. Stinnett, *A Manual on Certification Requirements for School Personnel in the United States*. Washington, D. C.: The National Education Association, 1955, p. 12.

leges and universities. Most educators who have studied this question feel that the present time allotments are too meager. One group at the 1959 Kansas TEPS Conference recommended 28 semester hours of professional education course work for prospective elementary school teachers and 21 hours for those planning to teach in secondary schools.¹⁵ At this same conference, another group specifically discussed teacher education for industrial arts. These persons felt that "about one-fifth of the total program should be devoted to professional education courses."¹⁶ Hollis Moore, reporting on one aspect of the Second Bowling Green Conference, states that 20% of the total teacher education curriculum should be devoted to professional education course work.¹⁷

It seems fairly clear, therefore, that the average school ought to devote more time to professional education courses. One wonders how much is actually offered in some institutions when schools as widely separated as Troy State College, Troy, Alabama, and the State University of New York, College of Education at Oswego require 42 quarter hours (28 semester hours)¹⁸ and 27 semester hours,¹⁹ respectively. A national median of 18 semester hours (from the standpoint of certification) for students in secondary education must mean that some students are receiving a most restricted program.

On the whole, 20% of the total — approximately 24-28 semester hours — would seem a realistic figure for industrial arts teacher education. Any error would seemingly be on the "too little" side, for interesting new programs, such as the one at Central Michigan University,²⁰ devote 25% of the total to professional education.

The Natural Organization Within Professional Education.

In a preceding section, it was pointed out that professional education had three purposes. (1) to provide understandings in such broad areas as the role of the school in modern society, the nature and development of children and young people, and the role of the teacher

¹⁵ National Commission on Teacher Education and Professional Standards, "Summary of Group Discussions," *The Education of Teachers: Curriculum Programs*. Washington, D. C.: National Education Association of the United States, 1959, p. 148.

¹⁶ *Ibid.*, p. 168.

¹⁷ Moore, *op. cit.*, p. 31.

¹⁸ Helsby, *op. cit.*, p. 386.

¹⁹ *The American Association of Colleges for Teacher Education, Eighth Yearbook*, Chicago: The Association, 1955, p. 255.

²⁰ C. B. Park, "New Program in Teacher Education," *High School Journal*, XXXXIII, February, 1960, p. 210.

in modern education; (2) to develop those skills and competencies required to do such things as manage a classroom, teach a lesson, prepare instructional materials, and evaluate educational achievement; and (3) to provide an opportunity to integrate these understandings, skills, and techniques into what has been called the "art of teaching." All courses and learnings offered in professional education tend to cluster around one or another of these three basic purposes, and this clustering provides the natural internal organization of three basic groupings which is characteristic of professional education everywhere. The terms usually associated with these three groups are "foundations," "materials and methods," and "student teaching."

The terms "foundations" and "student teaching" seem adequate in that they do communicate the gist of the learnings involved. "Materials and methods," however, leaves much to be desired. Including, as it does, such diverse course offerings as shop organization and management, methods of teaching industrial arts, writing instructional materials, techniques of audio-visual utilization, tests and measurements, and course of study construction, the term seems sadly inadequate. Nevertheless, because of the widespread use and acceptance of this phrase, it is here used to identify that grouping of courses related to the development of skills and techniques in teaching.

As a rule of thumb, foundations courses, materials and methods courses, and student teaching should each occupy approximately one-third of the total time devoted to professional education.²¹ Whenever this division is markedly out of line, a closer examination of the curriculum in question usually reveals that courses normally associated with professional education have been included in either the general education requirement or the subject matter specialty. Courses such as child psychology are sometime included in the general education offering and courses such as school shop planning have been occasionally listed among the technical offerings. Nevertheless, this rule of thumb functions surprisingly well and serves as a quick, if rough, measure of balance.

Offering professional education courses in their proper sequence is very important.²² Often this is accomplished by having students enroll first in foundation courses, work their way through materials and methods courses, and culminate their professional education expe-

²¹ L. D. Haskew, *Journal of Teacher Education*, IX, March, 1958, pp. 125-126.

²² M. M. Fulton, "Experimental Program in Teacher Education at Chatham College," *Journal of Teacher Education*, IX (September, 1958), p. 305.

riences in student teaching. Cottrell refers to this as organizing a sequence "in which experiences follow the internal logic or structure of the subject."²³ This generalization, like any other, is a far cry from a hard and fast rule, however. Student teaching may come earlier, much earlier, than the senior year. An initial offering of the materials and methods group, such as a survey of industrial arts education, may be required of all freshmen. Philosophy of education may be offered only to juniors and seniors. Yet, there is a basic organizational logic in moving from the general to the specific and, usually, this is what is done.

One final point should be made. Except for student teaching, most courses offered in professional education are rated at two semester hours (three quarter hours). Occasionally, a school may develop courses rated at three semester hours (four or five quarter hours), but it is very rare for any course in professional education to exceed that weight. From both the educational and administrative points of view, such "bits and pieces" type courses are problems, for they encourage excessive overlapping of content, cause undue fractionalization of the curriculum, and are difficult to schedule. The war currently being waged on the two-hour course by many college and university administrators is seemingly very much in order. From a strictly educational point of view, we must always keep in mind whatever has been dissected for analysis and study must also be reassembled into a meaningful whole. Unfortunately, this has not always been accomplished.

The Positioning of Professional Education Courses.

Beery has identified four possible positionings or locations for professional education courses in preservice curricula: (1) the professional course work can be spread throughout the four-year program; (2) the professional course work can be heavily concentrated, if not limited altogether, to the junior and senior years; (3) all professional education courses can be taken after the four-year program — during a fifth year — but before any form of student teaching; and (4) the professional course work can be taken during a fifth year in conjunction with student teaching — probably some form of internship.²⁴ Since analysis and discussion of possible five-year programs will be undertaken in the next chapter, they will not be considered here. Nevertheless, Beery has

²³ Donald P. Cottrell (editor), *Teacher Education for a Free People*, Oneonta, New York: The American Association of Colleges for Teacher Education, 1956, pp. 158-159.

²⁴ Beery, *op. cit.*, p. 207.

pointed out the two points of view which are commonly taken with reference to the positioning of professional education course work in a four-year program. These two points of view are often referred to as the two-year concept — wherein all professional course work is limited to the junior and senior year — and the four-year concept — wherein professional course work is distributed among all four years.

It should be emphasized that under the four-year concept a large part of the professional education requirement still is met in the junior and senior years. While professional courses are offered during all four years, they are not evenly distributed among them. Hence, if 28 semester hours represents the total requirement in professional education, no college or university would expect a student to enroll for seven semester hours of professional course work each year! Rather, one, or perhaps two, professional courses would be offered at the freshman level, three or four at the sophomore level, but the remainder would be taken during the junior and senior year. The actual quantitative difference, in terms of courses taken during the junior and senior year, between the two-year and the four-year concepts is not nearly so great as one is sometimes led to think. Other differences are far more significant.

Among teacher educators in general, there is little agreement as to which of these two concepts is preferable. In the summary of group discussions reported in connection with the 1959 TEPS Conference is this interesting statement: "There was divergence of opinion on when to begin professional courses; most groups thought in the junior year, but several urged early admission to teaching majors, and particularly early teaching experiences."²⁵ Broady maintains that "the professional parts of the curriculum should come after the general education is finished."²⁶ By implication this limits professional course work to the last two years. Cottrell, on the other hand states that professional education should be a part of each college year.²⁷

Armstrong has analyzed both patterns and has stated what he considers to be the advantages of each. He considers these to be the advantages of the two-year concept: (1) it delays specific occupational choices which, in turn, may result in more mature decisions, (2) all education majors can stay together in the beginning professional

²⁵ National Commission on Teacher Education and Professional Standards, *op. cit.*, p. 132.

²⁶ H. S. Broady, "NCATE Statement of the Teacher Education Curriculum," *Journal of Teacher Education*, X, March, 1959, p. 110.

²⁷ Cottrell, *op. cit.*, p. 169.

courses, and (3) more course work in general education is possible.²⁸ For the four-year concept he lists these advantages: (1) there is more motivation for the entering student, (2) it is particularly well adapted to the single-purpose institution, and (3) by including general education, subject matter specialization, and professional education in each year, the entire program can be made more meaningful.²⁹

Some educators are seemingly fearful of "empire building" in professional education course work if it is offered throughout all four years — a fear that this four-year concept will result in an encroachment on both general education and the subject matter specialty. On the other hand, it is admitted that early professional courses can act as both screening and recruitment devices and can also result in earlier on-the-job contacts with children and young people which is generally regarded as advantageous.³⁰

While teacher educators as a whole are uncertain as to whether the two-year approach or the four-year approach to professional education course work is preferable, industrial arts teacher educators generally prefer the four-year plan. This is both natural and practical, for industrial arts teacher education differs from most other fields in that its subject matter specialty is *not* usually a part of the general education course work. This has two important implications.

First, the subject matter concentration cannot "build on" (in the credit hour sense) courses which are required of all students. Rather, the amount of time spent in developing subject matter competency is completely over and above other requirements. Since the subject matter major (shop courses only) in industrial arts may require as many as 40 semester hours, it is essential that these shop courses be taken during all four years. Hence, it is fairly obvious that an entering freshman must start his major course work almost immediately if he is to complete an industrial arts teacher education curriculum in four years.

Second, most academic fields rely upon the general education requirements to "sell" their respective teacher education programs. Thus, biology courses act as recruiting stations for future biology teachers, English courses for English teachers, and so on. Consequently, any teacher educator in these academic fields must of necessity take the position that the general education course work should precede the

²⁸ Armstrong, *op. cit.*, pp. 233-34.

²⁹ *Ibid.*, pp. 234-35.

³⁰ National Commission on Teacher Education and Professional Standards, *op. cit.*, p. 149.

professional requirement, and that the student should delay choosing his teaching major until his general education course work is essentially completed. From the standpoint of industrial arts teacher education, this argument has no relevance whatever, for since industrial arts is not a part of the general education requirement, the recruiting of able and interested students must be accomplished in other ways.

Now, if an industrial arts teacher education student cannot, for all practical purposes, delay in stating his major, and if the general education requirement offers no recruitment possibilities, there is little logic in favoring the two-year concept. As Armstrong pointed out, this combination of general education, subject matter specialization, and professional education in each of the four years can only result in a more meaningful curriculum with a much higher level of motivation.³¹ For industrial arts teacher educators, therefore, the logical and effective approach is to spread the professional education course work throughout the four-year program.

"Generalized" Versus "Specialized" Professional Education Courses.

Almost everyone admits that this is not an "either-or" question, for the extreme positions are equally untenable. To summarize the point of view of the extreme generalist, one would have to say that every prospective teacher — whether his major is elementary education, biology education, English education, or industrial arts education — should take precisely the same foundation courses, the same materials and methods courses, and perform his student teaching assignments on exactly the same basis. The extreme specialist, on the other hand, would have us believe that philosophy of education and adolescent psychology cannot be offered in the same class to both English education majors and industrial arts teacher education majors, but must be taught separately to each of these groups. It is reasonably safe to assume that in no college or university is either of these extreme positions followed. The question continually facing teacher educators, however, is to distinguish those courses which can be effectively offered to all education majors from those of a more specialized character.

The 1959 TEPS Conference suggested that there were many common elements which could be combined for all education majors, particularly in the areas of sociological, historical, and philosophical

³¹ Armstrong, *op. cit.*, p. 234-235.

foundations.³² At this same conference, the group discussing industrial arts teacher education programs recommended, however, that the "methods course should be tailored to the industrial arts field."³³

While most of us would agree, in a general way, with Cottrell when he stated that "professional education should be related to the appropriate academic field,"³⁴ we also recognize that some courses in professional education transcend the various fields of teacher education specialities. Thus, educational sociology has specific applications in elementary education, in physical education, and in industrial arts education; nevertheless, as a foundations course in education, its content is so basic and so broad that it can, without serious loss, be offered on a first-come, first-served basis to all education majors.

At the other extreme are courses which are admittedly and necessarily highly specialized. Some examples from our own field are methods of teaching industrial arts, theory and organization of the general shop, and school shop planning. Speaking practically, these courses are valuable only to the industrial arts education major and would not constitute a really useful elective for students in other fields.

Between the generally offered foundations courses on the one hand, and the truly specialized offerings on the other, reposes a body of course work that is difficult to define. Some, such as principles of secondary education, constitute basic learnings for wide segments of education majors. Others, such as the production of audio-visual materials or educational statistics, represent offerings geared to special interest groups. It is important to note that while the generally offered foundations course is usually required of all education majors on an across-the-board basis, and the truly specialized professional course tends to be required of all majors in that particular field, this in-between group constitutes (with a few exceptions, of course) the elective courses in professional education.

An interesting relationship is seen to exist between the degree of specialization in professional course work which is permitted and the number of years in which professional course work is offered. Colleges and universities operating exclusively on the two-year concept must, of sheer necessity, have a greater percentage of generalized courses. On the other hand, those colleges and universities which allow some or all of their teacher education curricula to operate on the four-

³² "Summary of Group Discussions," *op. cit.*, p. 148.

³³ *Ibid.*, p. 168.

³⁴ Cottrell, *op. cit.*, p. 169.

year concept tend to offer more specialized professional education course work. Nevertheless, while the relative relationship of "generalized" courses to "specialized" courses may vary from institution to institution, it is a rare school today which does not require all education majors to enroll in certain generally offered foundations courses and, on the other hand, require students majoring in specific teaching fields to enroll for highly specialized professional course work in their area.

The Role of Teacher Certification Standards.

The part which these certification standards play in the development and control of the pattern of professional education is difficult to determine, for one is constantly faced with the chicken-egg problem. On the one hand, teacher education curricula do accurately reflect these standards and are constructed with them in mind. On the other hand, these standards have never been concocted in a vacuum, but are developed and changed through conferences with educators. Looming large in such conferences are representatives from teacher education..

Minor changes and revisions are often made in these standards as they seem necessary, and to this degree they are relatively flexible and easy to live with. Narrowly speaking, they do not inhibit the development of and change in pattern of professional education. However, since these standards have, in a sense, the force of law, it is as difficult to promote truly basic changes in them as it is to rewrite any important long-standing law. Consequently, in this larger sense, certification standards do inhibit changes and developments in the patterns of professional education. It is this larger reference which is most important to the continued improvement of professional education in the years ahead.

Standards of Professional Education

"Teachers," as Robert N. Bush of Stanford points out, "are the basic practitioners in the fields of education;"³⁵ consequently, any "discussion of American education that is critical in any way would soon turn to scrutinize the selection, the preparation, and the performance of teachers."³⁶ As a result of these discussions of American education, the principles and practices of present-day professional education are

³⁵ Robert N. Bush, "The Professional Content of Teacher Education for the Sixties," *Teacher Education Direction for the Sixties*. Tenth Biennial School for Executives. Washington, D. C.: The American Association of Colleges for Teacher Education, 1961, p. 5.

³⁶ *Ibid.*, p. 3.

continually being questioned. Because of this, there would seem to be real value in approaching the whole concept of "standards" in professional education from an analysis of current criticisms.

It is sometimes felt by persons responsible for teacher education programs, particularly by those in the professional education areas, that all criticisms of present practices are made with evil intent and are based on some malicious, anti-education design. Occasionally, of course, this may be true, but most of our critics are merely trying to be helpful. To re-emphasize what Bush has said, it is almost impossible for any discussion of American education to conclude without a searching look at teacher education and, particularly, the professional preparation. While critics may state that more or less time ought to be devoted to subject matter specialization or that more or less course work should be taken in general education, the central objective of most criticism is the professional education requirements. This is almost inevitable, for, as has already been mentioned, professional education represents the real heart of the program. Criticisms of teacher education, as a consequence, must be directed against professional education if they are to have lasting meaning as either helpful criticism or virulent attack. Living with such continuing criticism and attack is one of the prices one must pay for working in the critical area of a field which is becoming of primary importance to most Americans.

After reviewing a number of criticisms which have been leveled at teacher education curricula, but more specifically at professional education, the writer decided to conduct an informal inquiry among industrial arts teachers to determine whether their reactions correlated with those reported in the literature. The implications for all of these comments for the standards of professional education for industrial arts teacher education concludes the section.

Criticisms of Professional Education in the Literature.

The following comments are nothing more than a representative listing of criticisms, for while it would be only too easy to extend the listings, it would be very difficult to make it exhaustive. These, however, should serve our purposes.

Henry Heald, president of the Ford Foundation, has stated three areas of concern: (1) the relatively poor quality of instruction for future teachers in some places, (2) the neglect of subject matter in favor of undue concentration on teaching methods, and (3) the relative

lack of attention given to actual practice in regular school systems in the development of the art of teaching.³⁷

John Guy Fowlkes, of the College of Education at the University of Wisconsin, has remarked that "excessive verbalism, resulting in the damaging neglect of the 'materials' of learning, may characterize much now carried on under the name of 'professional education'."³⁸

Hollis Moore reports that teacher education needs more contact with the public schools than is normally provided today.³⁹ He also states that "present courses in 'education' were criticized most often because of repetition and redundancy of content."⁴⁰

Hartley introduces a different concept and is at odds with many other critics when she says, "As preparation for *teaching* in the traditional sense, our schools of education are functioning with increasing effectiveness. In preparation for educational leadership they are for the most part, timid, ineffectual and lacking in vision."⁴¹

Woodring agrees with other critics when he maintains that the public schools should play a more important role in teacher education.⁴² Somewhat later in his book, however, he discusses the difficulties which are inherent in evaluating any teacher education program. First, he feels that we simply do not know how effective the present programs are. Second, he maintains that in any good teacher it is difficult, if not impossible, to know whether his ability is due to student teaching, other professional education course work, or the liberal arts requirements. Third, he believes the possibility exists that the traits most important to teachers are such as are not altered appreciably by education. If this latter point be true, the selection of teachers becomes the critical issue.⁴³

Glennon feels that the weakness in teacher education lies in knowledge of broad professional problems. He mentions as examples: church and state relationships, freedom and equality, federal aid and federal control, and the merit rating of teachers.⁴⁴

³⁷ R. R. Purdy, "The Breakthrough in Teacher Education at Vanderbilt," *High School Journal* XXXIII (February, 1960), p. 202.

³⁸ John Guy Fowlkes, "Some Observations on the Preparation of Teachers," *High School Journal*, XXXIII (February, 1960), p. 193.

³⁹ Moore, *op. cit.*, p. 33.

⁴⁰ *Ibid.*, p. 31.

⁴¹ Helene W. Hartley, *The Unlaid Cornerstone of American Education*. The J. Richard Street Lecture for 1946. Syracuse: Syracuse University Press, 1946, p. 25.

⁴² Woodring, *op. cit.*, p. 12.

⁴³ *Ibid.*, p. 61.

⁴⁴ Glennon, *op. cit.*, p. 20.

A "poll taken at random" among Phi Delta Kappans showed (1) that 83% believe that proliferation and overlapping of education courses constitute a serious weakness in many teacher preparatory institutions and (2) that 58% agree there is overemphasis on methods courses or pedagogy in most teacher preparatory institutions. On the other hand, it was also reported that 40% of the sample disagreed with this second point, many of them violently.⁴⁵

The improvement of college instruction was a recommendation of ten different groups at the 1959 TEPS Conference.⁴⁶

Robert N. Bush has attempted to summarize the major criticisms which have been leveled at teacher education programs: (1) the best of the young people are not being attracted to teaching as a career, (2) teacher education curricula give undue attention to "methodology" at the expense of "content," and (3) professional education courses are poorly taught and methodology advocated for the student is not practiced by his professor.⁴⁷

This, then, constitutes a representative listing of criticisms reported in the literature. It is to be noted that many of these critics are professional "educationists," some of them most eminent ones. While some of the points can be viewed as relatively unimportant, others will simply not "go away." From these comments, certain suggestions with reference to professional education course work seem clear: (1) overlapping and redundancy should be eliminated, (2) the level of teaching should be improved, (3) the public schools should have a more important role in the education of teachers. These same comments also suggest two questions to which we must speak: (1) are we, as industrial arts teacher educators, devoting overly much time to professional education course work? and (2) so long as any curriculum can be designated as "poor" have we done enough as a profession, to set acceptable minimum standards?

Some Comments from Industrial Arts Teachers.

The following comments were gathered in what can be called only an informal inquiry. It was not, by any stretch of the imagination, scholarly research and was undertaken only as a quick check on the above comments and criticisms.

⁴⁵ "Criticisms of Teacher Education," *Journal of Teacher Education*, X (September, 1959), p. 383.

⁴⁶ "Summary of Group Discussions," *op. cit.*, p. 132.

⁴⁷ Bush, *op. cit.*, p. 5.

The teachers interviewed agreed that overlapping and redundancy should be eliminated, that the level of teaching should be improved, and that the public schools should play a more important role in the education of teachers. However, they made a number of other interesting, if pungent, comments. First, professional course work was sometimes referred to as "easy credit," "snap courses," or "rip courses." There was a strong feeling, because of redundancy and overlap, that many of the courses were a waste of time. This same redundancy and overlap made them "easy credits." Also, there was a strong feeling that the level of teaching in the professional courses ought to be the best on the campus, not merely good. Thus, the classroom teachers would seem to want a higher level of competency in the teaching of professional course work than is indicated in the literature. The role that the public school ought to play, except for professional laboratory experiences, was less clear to them, but all indicated that they would like to help if this were practicable.

With reference to the amount of time that is spent on professional education course work, the teachers gave the impression that the controlling factor was the effect of overlap and redundancy. All believed that even more time could have been devoted profitably to professional education courses, but most felt that "adding another course" was not the answer. All believed that the profession should do whatever it could to insure acceptable minimum standards for the preparation of industrial arts teachers, but there was certainly no agreement on how this might best be accomplished.

While this informal inquiry was designed only to check the published comments and criticisms and resulted only in the building of impressions rather than the collection of a body of factual data, it, nevertheless, gives rise to a strong conviction that many of our own classroom teachers share the feelings of our critics. It seems obvious that a truly scholarly inquiry into these same facts would be a fruitful piece of research.

The Implications of the Criticisms for Professional Education.

Obviously, and in terms of all of these criticisms, our standards have not been, and are not now, as high as they ought to be. This does not mean that the standards of professional education in the preparation of industrial arts teachers are any lower than they are in English education, pharmacy, or mechanical engineering. It does mean, however, that we have room for improvement.

Internally, we must raise the level of instruction in professional courses. Our standards on this point have been too low.

At the same time, we must try to develop a new approach to the course work in professional education, for it seems clear that something akin to this is needed. On this point, our standards are outmoded.

The role of the public school ought also to be redefined, for it seems obvious that the role can be and, in some cases, has been far larger than to serve simply as a laboratory for student teaching. Our standards here need to be recast.

It may be argued, perhaps justly, that this discussion on standards has been altogether too negative. This was not accidental, for it seemed essential at this point to emphasize in rather stark fashion those aspects of professional education which seem to require improvement. By doing this, it is hoped that the emerging trends which will be discussed in the next chapter will be seen in their true worth, for these trends, when taken as a whole, answer rather completely the criticisms which have been discussed in this section.

CHAPTER SIX

Some Emerging Trends and Their Implications

From the preceding chapter, it should be obvious that professional education is far from a static body of knowledge, but, rather, is characterized by a great deal of fluidity. In part at least, this can be traced to its battle-ground character, for since professional education is the "heart" of any teacher education curriculum and its only truly unique aspect, it does bear the brunt of the various attacks and criticisms which are continually leveled at the education of teachers. As a result, there is constant research and experimentation to discover better ways of preparing teachers.

From all of this research and experimentation, there would seem to be seven emerging trends which have major significance: (1) the concept of the five-year program, (2) the integration and consolidation of professional courses, (3) the changing concepts of professional laboratory experiences, (4) the improvement of instruction in professional education, (5) relating professional course work to subject matter specialization, (6) the greater involvement of "outside persons" in the planning of professional course work, and (7) the changing concepts of certification.

Since most of these trends are oriented to teacher education generally, rather than industrial arts teacher education specifically, each will first be analyzed in its general context. Following that, the implications for industrial arts teacher education will be discussed.

The Five-Year Program

The concept of a five-year program for preparing teachers is not new. It has long been recognized that a competent, educated teacher required more preparation than could normally be provided in a baccalaureate degree program; hence, school systems throughout the

United States have encouraged teachers to pursue graduate studies. All of this has been very good, and much of value has resulted. The difficulty with the present approach lies in the fact that there is all too little correlation between what is done in the first four years and what is accomplished in graduate work. What we have now is a planned four-year program (the bachelor's degree) and a planned one-year program (the master's degree) rather than a planned five-year program, and the latter, according to Stinnett, is what "every evidence indicates as a coming reality and a necessity somewhere out ahead."¹

Even a casual perusal of the literature will quickly reveal the importance which is attached to a planned five-year program. Academicians are in favor of it because they believe it will lead to a more solid subject matter specialization and a better background in general education. Teacher educators support it because they believe that it will result in a more appropriately prepared teacher. Everyone, it seems, is agreed that an adequate job of teacher education simply cannot be accomplished in four years. There is little agreement, however, as to the pattern of preparation which ought to be followed. Cooperative programs,² curricula designed to prepare "specialist-teachers,"³ and other interesting approaches have been devised and are currently in the experimental stage. Nevertheless, most proposals are only variations of one of three basic plans. For want of better terms these may be referred to as (1) the continental approach, (2) the straight five-year concept, and (3) the two-part plan.

The Continental Approach

The first of these plans, the continental approach, was originally conceived as a device to prepare liberal arts graduates for teaching careers. Since the student has graduated from a liberal arts curriculum and has, presumably, a solid grounding in some subject matter specialty as well as a good background in general education, the fifth year is entirely devoted to professional education course work. Student teaching is emphasized. Its pattern, therefore, resembles rather closely the teacher education programs in a number of foreign countries where a

¹ T. M. Stinnett, "New Horizons in Teacher Education and Professional Standards," *The Journal of Teacher Education*, X (December, 1959), p. 389.

² Park, *op. cit.*, p. 211.

³ I. R. Melbo and Leonard Calvert, "The Southern California High School Specialist-Teacher Program—A New Two-Year Graduate Preparation," *High School Journal*, XXXXIII (February, 1960), p. 167.

year or so of professional work above and beyond a liberal arts degree is required for teachers.

Designed, in part, to help alleviate the acute shortage of teachers by tapping a new source of recruits, programs of this type are found in both public and private colleges and universities. Often, these programs are truly experimental in nature, and in some schools such as Duke,⁴ North Carolina,⁵ Cornell,⁶ and Vanderbilt,⁷ are being supported by grants from the Fund for the Advancement of Education or the Ford Foundation.

While many teacher educators do not subscribe to the continental approach, except as an emergency measure to meet the teacher shortage, it has several interesting aspects which are worthy of study. First, since all of the professional course work is taken during one year, it has been necessary in many of these colleges and universities to integrate and consolidate many of the traditional two-hour courses into larger blocks. Second, because of the concentrated approach, more than usual consideration has been given to those knowledges and skills which a teacher *must* possess in order to get and hold a job. After all, there is no "next year" in which to pick up loose ends and present facts of importance.

The relative time allotment is also of interest. It may be recalled that in Chapter V it was reported that 20% of the total college program should be devoted to professional course work. While the pattern followed by this continental approach is different from what many teacher educators believe to be best, the amount of time devoted to professional education—one year out of five—is strictly in line with current thinking.

The Straight Five-Year Concept

The second plan, the straight five-year approach, is really nothing more than an extension of our present four-year programs. It is simplest, perhaps, to view this plan as an "improvement" on the continental approach. The reasoning goes something like this: If four years of strong academic preparation plus one solid year of professional edu-

⁴ Allan S. Hulbert and William H. Cartwright, "The Duke University Cooperative Program in Teacher Education," *High School Journal*, XXXXIII (Feb. 1960), pp. 213-17.

⁵ Arnold Perry, "North Carolina's New Fifth-Year Program in Teacher Education," *High School Journal*, XXXXIII (February, 1960), pp. 262-70.

⁶ Frederick H. Stutz, "The Cornell University Junior High School Project," *High School Journal*, XXXXIII (February, 1960), p. 188.

⁷ R. R. Purdy, "The Breakthrough in Teacher Education at Vanderbilt," *High School Journal*, XXXXIII, (February, 1960), p. 202.

tion will produce a satisfactory teacher, would it not be more effective from an educational point of view to spread this one year of professional education throughout the five years? Should this not result in an equally strong subject matter specialty plus more practical sequences in professional education? Such logic is difficult to refute, for a well thought out, thoroughly integrated five-year curriculum ought, clearly, to be superior to the continental approach. This plan, too, is obviously better than the present four-year approach, because heavier dosages of everything — general education, subject matter specialization, and professional education — are provided. However, this plan lacks solid appeal and is probably of only passing interest.

The Two-Part Plan

The third approach, the two-part plan, would seem to be the most practical from many points of view. Armstrong's short description of it is as good as most: ". . . the five-year curriculum should be broken into two parts each with its separate focus. The first part should be four years in length and should focus on preparing the teacher to begin to teach. The second part should be one year in length and should be given after one or more years of teaching experience."⁸ Undoubtedly, one of the chief attractions of this plan is that it can easily be fitted into the existing organizational and administrative patterns, for it readily lends itself to a four-year baccalaureate program followed by a master's degree.

On the surface, this third plan seems so similar to what we are now doing, that it almost looks like "new upholstery on the same old framework." Such is not the case, however. From the standpoint of professional education course work, the first four years are devoted to those things which are *absolutely necessary* for a teacher in terms of job entry qualifications as opposed to those learnings which, while important, are not in this category. The "must" courses are in the first four years; the "nice to have" courses are for the fifth year. Armstrong puts it well when he points out that the function of the preservice curriculum (the first four years) is to prepare teachers to begin to teach, and as a consequence, will leave all aspects of his professional preparation incomplete.⁹

Thus, the first four years are devoted to meeting job entry requirements — developing skills and techniques and obtaining that knowledge

⁸ Armstrong, *op. cit.*, p. 242.

⁹ *Ibid.*, p. 232.

which are absolutely essential to teach successfully. While all teacher educators would probably agree that a knowledge of the history of education is necessary for the fully qualified teacher, the history of education is not among the critical requirements from the standpoint of job entry or even job holding. It is clearly a "nice to have" course; consequently it should be moved from its position in the sophomore or junior year to the fifth year. Similarly, school shop planning is less essential to the beginning teacher than are methods of teaching industrial arts or shop organization and management.

From the point of view of professional course work in industrial arts teacher education, or any other teacher education curriculum for that matter, this developing five-year concept means that certain stands must be taken and certain changes made. *First*, for most of us, the practical choice in terms of the three basic plans is the third, the two-part approach. If we so believe, we should get out and work for it, rather than let someone else make the decisions for us. As any one familiar with the literature will attest, the first plan is getting a great deal of publicity. We should be experimenting with and reporting on the plan that makes the most sense to us in terms of our subject matter and our needs.

Second, if we believe that this two-part plan makes sense, we should implement it in our own programs. Curricula should be analyzed functionally and revised where necessary. If 24 semester hours of professional education course work is required during the four preservice years, we must be certain that the most essential learnings — not necessarily the easiest ones — comprise that total. To do this well, however, may require more knowledge about the needs of the beginning industrial arts teacher than many of us presently have. It requires, in essence, a workable and practical job description — one that is stated in specific knowing and doing terms and is not on the "good attitude" and "nice personality" level. The need and usefulness of this job description will be discussed in greater detail in Chapter VII, but it must be emphasized at this point that without such a statement it is all too easy to drift into a situation wherein all courses are "good" and all sequences "critical."

Third, the fifth year in this two-part approach should be viewed as a time to help the individual teacher do a better job of teaching. It is, therefore, in-service education. If such in-service education is to be effective, it is essential that we know as much as possible about the problems our graduates encounter as they begin to teach. This means that thorough follow-up studies should be undertaken and pursued

on a continuing basis. Information from such studies will also be extremely useful in evaluating and altering the preservice curriculum.

The development of the five-year program poses a real challenge to industrial arts teacher educators. It may well be that many institutions are following, in practice, the rationale behind the two-part approach. Nevertheless, these programs are not so advertised. By revising our curricula where necessary and implementing the two-part plan, it will be possible for industrial arts teacher education to progress more rapidly and play a significant role in leading and molding a development which has extreme importance for us and, in one form or another, seems inevitable.

The Integration of Professional Courses

For many years, the fragmentation of knowledge which has resulted from the proliferation of professional education courses has been recognized as a real liability. Yet, the proliferation of these courses is easy to understand, for as the critical need for professional education was realized by the lay public, by teachers, and by college and university administrators, it seemed only natural to meet this need by designing new and more varied offerings. Now, however, the situation is desperate because there are so many trees that only a few superior students can recognize the forest. Fulton states well the case for the integrated courses when she says: "Teaching is a process which in its practice cannot be divided into the separate skills which make up the whole. Yet, most teacher education fails to take this into account. A semester is devoted to one phase (the psychological, the historical, or the methodological). Thus, to the prospective teacher these become isolated and appear unrelated one to the other. If there is a single cornerstone most basic to the present [Chatham] program, it is that of integration."¹⁰ But integrated courses are not brand new. Evenden and Butts of Columbia University had this to say in 1942: "Whereas these students were formerly required to take separate courses in the history of education, philosophy of education, educational psychology, general methods, special methods, and practice teaching, the new program weaves the elements of these separated approaches into an integrated whole."¹¹

¹⁰ M. J. Fulton, "Experimental Program in Teacher Education at Chatham College, *Journal of Teacher Education*, IX (September, 1958) p. 363.

¹¹ E. S. Evenden and R. Freeman Butts, *Columbia University Cooperative Program for the Pre-service Education of Teachers*. New York: Bureau of Publications, Teacher College, Columbia University, 1942, p. 36.

There are two general methods which are followed in integrating courses. First, a number of closely related courses with interlocking content can simply be combined into one newer, "heavier" course. When this technique is applied, the content comprising the original individual courses loses its individuality and a truly new course emerges. It is rather like the loss of individuality which occurs when meat, potatoes and vegetables are combined into an Irish stew. When most people talk about an integrated course, this is what they mean.

There is, however, another kind of integrated course which is particularly useful when offerings are sequentially related. If a sequence of three two-hour courses is combined into one five-hour course, the original course content retains much of its identity. What happens is that the first third of the new course is devoted to the first course of the original sequence, and so on. The advantage of this kind of integrated course is that it tends to prevent the loss of knowledge which always occurs when sequentially related courses are separated by one or more semesters of other work, for in most colleges it is possible for a student to take the first course in a sequence during the fall semester of a year, but delay in enrolling in the second course until the fall semester of the next.

Obviously, the entire concept of integration can be carried too far, since all professional course work is, in a sense, related. On the other hand, if one may judge by present standards of proliferation, excessive integration is most certainly no immediate worry. Unfortunately, there are no hard and fast rules to guide our efforts as we begin to re-combine our offerings. Most suggestions, like Cottrell's¹² and Moore's,¹³ are little more than mandates to integrate. Some other suggestions, however, are more specific and, for example, recommend combining methods with student teaching¹⁴ or "professional courses in the materials of instruction and techniques for the best use of these materials . . ."¹⁵ On the whole, few suggestions which have been reported in the literature seem particularly useful for general application. It seems perfectly safe to say that there is no general answer to the question: "What courses should be integrated?"

¹² Cottrell, *op. cit.*, pp. 150-56.

¹³ Moore, *op. cit.*, p. 33.

¹⁴ "Summary of Group Discussions," *op. cit.*, p. 131.

¹⁵ *The Professional Standards Movement in Teaching: Progress and Projection*. Report of the Parkland Conference. National Commission on Teacher Education and Professional Standards, National Education Association of the United States. Washington, D. C.: The Association, 1956, p. 48.

The only workable solution would seem to be for every institution to study its own courses and set up its own ground rules, for it seems very true that some integration is long overdue on almost every campus. The logical starting point in any effort to integrate professional course work offerings is to determine those courses which seem to have natural relationships to one another. The closer these relationships, the more appropriate is integration. On many campuses, courses in the history of education and the philosophy of education have already been successfully integrated. Methods courses, observation, shop management, and student teaching are also closely related. Tests and measurement go hand in glove with educational statistics. Analysis courses dovetail with course of study planning and curriculum concepts. And so on.

Once these relationships have been identified, one or two course groupings should be selected for integration. Much as it is needed, it would not seem wise to proceed too quickly, for integrating courses should be considered nothing less than experimental work until a pattern and procedure suitable to a given situation have been developed, tested, and found acceptable.

One integration of professional course work in industrial arts teacher education is mentioned briefly in the literature. Called "industrial arts practicum" it purports to "Study . . . instructional procedures and materials and curriculum planning for industrial arts . . . Observation of actual teaching situations will be discussed in seminars."¹⁶

With reference to integrating professional education courses, the same situation is present that affects any discussion of the five-year program. The question is not whether or not we will integrate a portion of our professional courses, for the forces pulling us in that direction are seemingly too strong to disregard. More importantly, the integration of courses should markedly improve our curricula. The basic question, though, is whether industrial arts teacher educators, as a profession, desire to help establish and lead this development, or whether we will be content to be meandering along at the rear of the crowd.

The Changing Concepts of Professional Laboratory Experiences

Probably no other area of professional education has changed and is changing to the degree which is true for professional laboratory experiences. "The old-fashioned practice teaching, in which a student

¹⁶ W. A. Wockenfuss, "Modern Teacher Training Program," *Industrial Arts and Vocational Education*, XXXVIII (November, 1959), p. 286.

went into a school for a period or so a day whenever he could find some time in his college schedule, is quite unsatisfactory and is fast disappearing.”¹⁷ The current view is that student teaching is only one aspect of an over-all program of professional laboratory experiences and should be viewed as “the climax of laboratory experience rather than the whole of it.”¹⁸

Two aspects of the current conceptual framework of professional laboratory experiences would seem to deserve attention. *First*, we should have some understanding of the possible scope of such a program. *Second*, we should be cognizant of the changes which have been and are now taking place in student teaching itself.

The Scope of the Program

While student teaching is still the most important single aspect of professional laboratory experiences, the scope of the over-all program extends far beyond such narrow confines. In a sense, professional laboratory experiences ought to be as broad as the program of professional education itself, for every professional course can and ought to have direct contact, in a real-life way, with appropriate situations in classrooms, schools, and communities.¹⁹ If skillfully handled, the theory taught in the professional course on the college campus can be integrated with meaningful experiences in these actual situations through school visitations, community studies and surveys, and other special projects.²⁰ Such integration of direct experience with that of more abstract quality in the regular classroom not only enhances a professional course from the standpoint of student interest, but is as vital to a successful program as are the laboratory experiences in physics and chemistry.

Professional laboratory experiences ought to begin early. City College in New York City includes school visitations in its initial professional course. Another aspect of this course requires that each student be employed two hours per week as a school aide.²¹ Professional laboratory experiences of this type when offered early in the teacher education curriculum should prove an effective device for both screening and motivating. In addition, such experience could well provide a

¹⁷ Beery, *op. cit.*, p. 208.

¹⁸ Armstrong, *op. cit.*, p. 240.

¹⁹ Cottrell, *op. cit.*, p. 222.

²⁰ Armstrong, *op. cit.*, p. 240.

²¹ J. J. Carter, “Improvement of Teacher Education at the City College,” *Journal of Teacher Education*, IX (March, 1958), p. 45.

student with a useful frame of reference as he pursues the remainder of his course work in professional education.

Another aspect of professional laboratory experiences which is becoming increasingly common is the community service requirement. In an effort to force the student to participate in certain kinds of community service so that, in turn, he may derive some very useful experience, many colleges and universities require a student to devote a certain number of hours during some specific quarter or semester to leadership activities in YMCA's, Girls' Clubs, CYO groups, and so on. Generally, these organizations are happy to have the services of these students and utilize them as crafts instructors, counselors, coaches, and group leaders of all kinds. However, such a program calls for a great deal of organizational effort, for jobs must be found for each student in terms of his teaching major, and sufficient supervision must be available to work with the student, assist him in his undertakings, and, of course, evaluate his services. On the other hand, if really good working relationships can be established with these various community organizations, it has been found that many of them are more than willing to accept responsibility for much of the supervisory role themselves.

Cottrell lists five criteria for high quality offerings in professional laboratory experiences. These would seem to apply whether the activity in question is a field trip, a special project, a job as a crafts instructor for a Boys' Club, or student teaching itself. While general, these criteria can serve as a useful device by which professional laboratory experiences on any campus can be evaluated. In his opinion, professional laboratory experience (1) should be challenging, (2) should provide for involvement, (3) should provide for guidance and assistance, (4) should provide for intellectualization, and (5) should be satisfying.²²

Student Teaching

Forty years ago, it was not uncommon to require students to "practice teach" on a full-time basis for six weeks, twelve weeks, or even for an entire semester at some away-from home and off-campus location. Naturally, this required the student to live in the town in which he was practice teaching and become, if only for a short time, a real part of that town and its school system. Difficulties of college supervision and other factors caused this plan to be abandoned, but the resurgence of this concept in recent years has been one of our most interesting and

²² Cottrell, *op. cit.*, pp. 192-97.

useful developments. Actually, the resurgence of this concept was inevitable once we began increasing the credit hour requirement in student teaching and advocating student teaching in regular public school situations.

A good current example of such an approach is the one employed at the State University of New York, College of Education at Oswego. Under this program each student teaches on a full-time basis for nine weeks at one school and then shifts to a totally different kind of school for another nine weeks. The schools which are utilized for student teaching are selected for the quality of their program and the quality of the supervising teacher and are located throughout the State. Supervisors from Oswego "travel the circuit," visiting each student for half a day at least twice during each nine-week period. When necessary, of course, more visits are made. Obviously, a program of this kind requires a heavier investment of staff time than many institutions are in a position to make, but it is an excellent example of the kind of program which can be developed.²³

While it is generally assumed that a methods course ought to precede student teaching, many schools are now experimenting with a three-part sequence. This sequence still leads off with a methods course and continues with a block of student teaching. But it concludes with a follow-up seminar designed to extract the last ounce of learning from the student teaching experiences as well as to tie together as many loose ends as possible. Such a sequential approach has much to recommend it, particularly when the same professor teaches the methods section, supervises the student teaching of the students in that section, and then leads the same persons in their follow-up seminar. While such a longitudinal approach calls for rotating the assignments of several professors, it does result in a very practical and useful integration of approach and content which is vital to this important sequence.

While this three-part sequence is gaining favor in many quarters, an alarming counter-trend is also making headway. Essentially, this counter-trend calls for the removal of all student teaching (and the supervision that goes with it) from the concerned departments and urges its centralization in what might best be called the department of student teaching. This department is usually responsible for selecting the schools and the supervising teachers, supervising the student teacher, evaluating his progress and, finally, issuing grades. Thus, the

²³ Helsby, *op. cit.*, pp. 388-9.

major department has little, if any, actual, effective control over the student teaching experience. Presumably, this is done in the name of efficiency, integration, and consolidation. It is to be hoped that very real administrative benefits accrue from such a reorganization, for it seems obvious that any such reorganization contains within it the seeds of profound and fundamental educational difficulties. Unfortunately, this plan seems to be but one more example of the sort of error one encounters when good and useful concepts and trends (in this case, course consolidation) are carried to what seem like logical conclusions without the application of common sense evaluation. Actually, such a reorganization would seem to fragment our programs rather than consolidate them, for it does succeed admirably in wrenching away the student teaching experience from its methodological foundations.

Summary

The development of an adequate program of professional laboratory experiences is of importance to every industrial arts teacher educator. Much progress in this area has been made by our profession: school visitations, community relationships, and other special projects of this nature seem to be in our blood — they are certainly a part of our education. Nevertheless, there is still a great deal that we can do to improve the professional laboratory experiences in each of our courses, for all of us recognize that we are far from perfection.

Specifically, though, we must work to keep the control of student teaching within the industrial arts teacher education curricula, for only in this way can proper integration of content and approach be assured. Administering and supervising student teaching from a centralized office would seem to be retrogression rather than progress. Finally, we should heed Micheels' mandate that we think creatively about student teaching.²⁴

The Improvement of Instruction in Professional Education

The concept of improving college instruction in the field of professional education is normally taken to mean an improvement in the actual skills and techniques of classroom teaching. The approach means better lectures, better demonstrations, better discussions, and more vigorous classroom leadership. Such improvement is important.

²⁴ W. J. Micheels, "Industrial Arts Teacher Education in 1970," *Industrial Arts and Vocational Education*, XXXXVII (February, 1958), p. 31.

The traditional critical view has held that the level of instruction in professional education course work has been particularly poor. Thus, it was that some wag took the old saying: "Those who can, do; those who can't, teach" and "improved" it by adding a final phrase: "but those who can't teach, teach others how to teach." This attitude is fairly typical of the reaction of many people to professional education course work, for the poor quality of instruction has been one of the chief criticisms of the program.²⁵

On the other hand, if one looks at the problem logically, it is difficult to understand why the level of instruction in professional education course work should be low. By everything that is right and reasonable, the level of instruction ought to be the highest on campus. Consider for a moment some circumstantial evidence: (1) sound experience in public school teaching is usually one of the criteria employed in selecting persons to teach in teacher education curricula; (2) most teacher educators were considered good teachers by their principals, superintendents, or supervisors; (3) teacher educators are not only well-rounded persons, but, in addition, can be considered real students of the "art of teaching"; and (4) teacher educators, as a group, are very professionally minded.

Thus, it is not only shocking but seemingly inconsistent to find a strong body of opinion that rates the level of instruction in professional education as mediocre or worse. The objective observer must question why the theme of "poor instruction" as a vigorous criticism seems exclusively reserved for professional education classes. Throughout the literature runs this theme of "poor instruction" and with it, of course, goes the thought that something ought to be done about it.

Exactly what should be done about it is seldom expressed, however. Consequently, one is forced to ask whether these criticisms are valid as such, or whether they are manifestations of other problems. We know that the effect of redundancy and overlap in our professional course work has given rise to feelings on the part of our students that the courses themselves are a waste of time — a mere rehash of what has been done previously. Does it not seem reasonable to assume that the dry lectures, uninspiring discussions, and boring classes — in essence, the "poor instruction" — result from this redundancy and overlap? After all, it is difficult to make any subject interesting and vital if it has already been chewed over several times!

²⁵ Bush, *op. cit.*, p. 5.

As industrial arts teacher educators we must do everything in our power to make our professional course work stimulating and challenging. Methods courses must so sparkle that students will endeavor to teach as we teach, and not merely to teach as we say they should teach. Lectures, discussions, demonstrations and field trips must be planned as models to be copied as well as vehicles of instruction. This "model function" of our professional course work has not received sufficient attention.

Yet, the basic problem would not seem to be one of teaching competency, but rather, one of curricular and course review to insure that the overlap and redundancy of content are held to an absolute minimum if they cannot be eliminated altogether. This, of course, harks back to the concept that professional courses must be integrated and consolidated and is an excellent example of how these problems and emerging trends are interrelated.

Relating Professional Course Work to Subject Matter Specialization

While everyone has long recognized that course work in professional education, particularly the specialized offerings, should be related to the appropriate academic field,²⁶ this has not always been easy to do. Consider the matter. In most fields of teacher education, the subject matter specialization is entirely accomplished in an academic department operating within a college of liberal arts or its equivalent. Therefore, there is little, if any, organizational encouragement to the establishment of close working relationships between the teacher curriculum on the one hand, and the subject matter department on the other. In some less fortunate situations, an actual antipathy may develop.

Fortunately for us in industrial arts teacher education, both the professional education offering and the technical course work have in most cases been organized within a college of education. Consequently, between the shop instruction and the professional course work, there has never been the feeling of competition which has developed in other fields. Also, there is a strong tendency in our field for professors to teach *both* technical and professional courses. These factors have resulted in a close relationship between the professional and technical offerings which is virtually unknown in the academic areas.

²⁶ Cottrell, *op. cit.*, p. 169.

Because of this close relationship, a very real correlation exists between what is done in the shop and what is discussed in professional courses. The professional courses do relate to the subject matter specialization. On the other side of the coin, the technical courses tend to become professionalized.

Professionalizing a shop course means nothing more than that the shop instructor passes along, as these seem appropriate, various hints and suggestions which would help in teaching that subject. Thus, the instructor of a general metalworking course includes in his teaching certain information of a professional nature which should prove helpful to the persons attempting to teach general metalworking in a junior or senior high school situation. In our field, such attempts to professionalize a shop course are only natural, for most of our shop instructors have had solid backgrounds in public school teaching themselves and are, therefore, in an excellent position to pass along advice on how to teach their subject. While such professionalization is generally good and is to be encouraged, it must be recognized that it also contains potential areas of difficulty. *First*, it leads to the very real possibility of overlap in that students are all too apt to receive "how to teach" information long before they enroll in any methods course.

Second, the suggestions made by shop instructors may not represent up-to-date methods and techniques. This represents a conflict of educational methodology on the part of the staff and may lead to absolute confusion on the part of the student.

Third, the professionalization of shop courses is, at this time, a highly variable commodity. Much more of this is done by some instructors than by others. The same instructor will do more professionalizing in one section of a particular class than he will to another.

The solution to these difficulties would seem to lie in some form of control. Attempts to ban the professionalizing of shop courses would seem to be doomed to defeat at the outset, for the students themselves encourage these practices. To be effective, any form of control must first recognize that the tendency to professionalize exists and, within limits, is to be encouraged. The actual ground rules for controlling this practice ought to be developed jointly by the shop instructors and the professional education instructors in terms of three guidelines:

First, professional information given to students in shop courses must be recognized as an integral part of the total program of professional education and hence must be correlated with it.

Second, professional information given to students must be up to date and in terms of the current best practices. This implies that every

shop instructor must remain cognizant of the professional aspect of industrial arts teacher education and cannot devote himself exclusively to his technical area.

Third, professional information given to students in shop courses must be included in the course of study for that particular subject to insure that every section is exposed to exactly the same information.

The Greater Involvement of "Outside Persons" In Curriculum and Course Revision

Rightly or wrongly, the prevailing opinion seems to be that teacher education curricula have been constructed from too narrow a vantage point. The feeling is that teacher educators meet "in committee" with other teacher educators and emerge with a curriculum founded on no broader a base than that provided by the teacher educators themselves. This is thought to be much too narrow an approach which can lead only to perpetuating existing philosophies and practices. One of the nine goals adopted for teacher education programs at the Parkland conference speaks specifically to this issue. There must be, it was stated, "recognition of the task of improving a teacher education program as a cooperative responsibility involving professors of education and subject matter courses, personnel of state departments of education, public school personnel, and representatives of lay groups."²⁷ Similarly, Trump and Baynham have said, "The education and development of professional teachers will be the shared responsibility of many more persons than are involved today."²⁸ We are enjoined, it seems, to involve many "outside persons" as we plan our teacher education programs.

Actually, the concept of involving representatives of the various interested groups and organizations is not new, for many institutions have attempted this many times. The problem seems to be to secure the right sort of involvement at the appropriate time and for the proper purpose. Traditionally, this involvement has amounted to little more than seating all of the so-called concerned people around a conference table and then proceeding to discuss the courses which ought to be included in the curriculum. This would not seem to be a fruitful approach, for it fails to recognize the specific strengths and weaknesses of the several groups involved. In short, it does not utilize these "out-

²⁷ *The Professional Standards Movement in Teaching: Progress and Projection*, op. cit., p. 48.

²⁸ J. Lloyd Trump and Dorsey Baynham, *Guide to Better Schools*, Chicago: Rand-McNally and Company, 1961, p. 51.

side persons" in effective ways for those aspects of curriculum development in which they can be helpful.

First of all, we must recognize that we, as professional industrial arts teacher educators, must take the lead in revising our own programs. We know more about industrial arts teacher education than any other group that could be assembled; consequently, we must assume the responsibility for interpreting any useful suggestion into curriculum and course content. We cannot and should not allow outsiders to call the tune.

Second, certain categories of outside groups are particularly valuable in helping us sketch in the broad picture of what an industrial arts teacher ought to be and do. In this sense they help us frame, but only in a broad and general sense, job descriptions. Hiring officials, personnel of state departments of education, and representatives of lay groups usually fit this category.

Third, classroom teachers, and particularly graduates of our own institution, are especially valuable to point out defects in the present curriculum and suggest certain specific additions and deletions to course content.

Fourth, professors in other subject matter areas such as English, chemistry, and history can be most useful in suggesting how we can get the most educational mileage out of our general education requirements.

As industrial arts teacher educators who are assuming the leadership in revising and improving our own curriculum, it is up to us to draw from all of these special interest groups the pertinent information. This does not imply, however, that we must employ a conference table and face-to-face relationships to obtain this involvement. A questionnaire-survey approach may be perfectly adequate in some situations to deal with hiring officials, state department people, and representatives of lay groups. A continuing follow-up study, if properly conceived and conducted, is in many respects the best means of obtaining information from graduates. Only in the on-campus meetings with professors of other fields would there seem to be general advantage to the conference table approach, and the basic advantage here is only one of simplicity.

Once we have gathered all of this information and suggestions, it is up to us to revise the curriculum and/or courses. Once accomplished, this revised curriculum and/or courses of study can and should be resubmitted to these same groups for their evaluation. Since a curricu-

lum or course of study is sometimes fairly meaningless to the lay person, it is a sensible procedure to attach a short informative statement outlining what was done and why.

It is to be noted that this section has emphasized the involvement of "outsiders" in the revision of a total curriculum, rather than discussing their involvement in a revision of the professional courses. The latter approach does not seem particularly effective, because the curriculum as a whole is tied together and should not be revised on a piecemeal basis. Sometimes, of course, it may be desired to revise only a course or two, and in such situations, a fragmentary approach may be entirely justified. In any event, the same basic approach would apply.

It is also to be noted that the key personnel in any curriculum revision in teacher education are usually the instructors of the professional education sequence. It is, therefore, largely up to them to set the stage and get the ball rolling, for more than any other group of professors, these persons are concerned with the success of the teacher as a total person in an actual school situation. Since professional education is the heart of any teacher education curriculum, curriculum revisions ought also to begin at that point.

Changing Concepts of Certification

Certification requirements were originally implemented to insure minimum standards of teacher education. This concept has never changed. The significance of the present emerging trends is to be found in a shift of emphasis: What kind of standards are best?

Stinnett believes that teacher education is between two eras. The past was characterized by quantitative factors, whereas the future will be characterized by qualitative ones.²⁹ This attitude is, in a very real sense, indicative of the changes which are taking place in certification requirements, for the trend is seemingly away from a counting of hours and courses and toward requirements which are stated in broad areas of competency.³⁰

The reason for this change in attitude is clear. Robert C. Woellner, Director of Vocational Guidance and Placement at the University of Chicago, gave us the basic reasoning as he asked this question: "Although credit for courses in educational psychology, methods of instruction and practice teaching are commonly required for teacher

²⁹ Stinnett, *op. cit.*, p. 388.

³⁰ L. O. Andrews and Roy Harvey Pearce, "Toward the End of the Beginning," *The Education of Teachers: Curriculum Programs*, *op. cit.*, p. 17.

certification by the States, what specific concepts or skills should develop in the applicant for a certificate is not indicated.”³¹ A reporting of credit hours taken tells us little about the course content and nothing about what the student actually got out of the course. A far better approach would be to recommend certification upon the completion of an entire program rather than upon completion of certain prescribed courses.³² In addition, “certification of the teacher should, in part, be based on successful performance as a teacher with a group of students.”³³ In some states this is, in a sense, being done today by delaying the issuance of a permanent certificate for several years. Usually, though, such permanent certificates are secured without too much difficulty, and with little real measure of teaching success.

As certification shifts from a course counting operation in a state department of education to a recommendation based upon the completion of an entire program of study, it seems inevitable that a certain amount of decentralization will occur with a corresponding increase in the responsibility of each college and university. “The easiest step in a justifiable decentralization of the certification process is to center responsibility for developing acceptable programs of teacher education upon the colleges and universities authorized to engage in preparing teachers, and to base the issuance of a legal teaching license largely upon the recommendation of the preparing institution.”³⁴

It seems clear that these changes should prove of real benefit to teacher education. *First*, they should result in a greater flexibility of certification procedures, which in turn will permit greater flexibility in the handling of professional course work. This should be helpful.³⁵

Second, these changes should insure a certification process that is much simpler. Some, at least, of the above efforts have been made with that in mind.³⁶

Consequently, every industrial arts teacher educator should support these changes and should be willing to work toward these ends. Each of us must be cognizant, however, of the very real, heavy responsibilities which will accrue to every college and university having a teacher

³¹ Robert Carlton Woellner, “Current Practices in Professional and Subject Matter Preparation,” *The Education of Teachers: New Perspectives*, *op. cit.*, p. 316.

³² Andrews and Pearce, *op. cit.*, p. 17.

³³ Moore, *op. cit.*, p. 35.

³⁴ T. M. Stinnett, “New Horizons in Certification of Teachers,” *The American Association of Colleges for Teacher Education*, Eleventh Yearbook, Chicago: The Association, 1958, p. 136.

³⁵ Fowlkes, *op. cit.*, p. 194.

³⁶ Stinnett, “New Horizons in Certification of Teachers,” *op. cit.*, p. 134.

education program. No longer will we be able to justify the existing courses by merely saying "the state certification code requires it," for in time, the responsibility will be exclusively ours. Then, too, with no state code to keep us in line, we must beware of making changes more rapidly than is warranted by our knowledge and study. It seems likely that the certification ball will be passed to us, but if we fumble it, we may rest assured that the old rigid requirements of so many hours of this and so many hours of that will be back, and will be back to stay; and teacher education will have another black eye.

While it seems inevitable that the present certification procedures will be changed in a manner consistent with our beliefs, this is not likely to happen suddenly. Rather, it seems more likely that we are entering a time when the old rigid requirements will one by one pass by the board, while at the same time there will be a gradual increase in the responsibilities of the colleges and universities. This is probably all for the best, for it will permit us to become adjusted to our new role in the certification picture in a rather reasonable manner. Such a gradual shift seems advisable from several standpoints and it certainly deserves our wholehearted support.

CHAPTER SEVEN

Guiding Principles

A tempting means to pull together the various trends and practices which have been previously reported is to construct an "ideal" program of professional education studies for industrial arts teacher education. While such an approach has peculiar appeal, it is not particularly practical, for all of us know only too well that every college and university faces different problems as a part of a specific situation. Consequently, there is no "ideal" solution; every college and university must solve its own professional education problems in its own way.

As we look into the future, however, there are a number of overriding principles which ought to govern our actions as we review and revise our programs of professional education. These constitute those things for which we must stand. This chapter is devoted to a listing and brief discussion of these principles.

Principle No. 1: Professional Education Must Be Designed in Terms of A Specifically Defined End Product

Before we can revise curricula, integrate courses, build learning sequences, or do anything else, it is absolutely essential that we have a clear idea of exactly what we are trying to accomplish. We must, therefore, have a job description from which to work. A better term, perhaps, would be a "profile of the proposed graduate." This profile, which may well vary from institution to institution depending on its clientele (some institutions will have more than one such profile), must be couched in action terms and must speak to three issues: what kind of person the graduate *is*, what he *knows*, and what he *can do*. Such an approach has been rather frequently utilized by industrial arts teacher educators to determine the required technical preparation, but its use for professional education purposes has been much more limited.

To be noted in this regard is the research and writing of G. Harold Silvius. Yet, without such a profile, we have little rationale upon which to base any of our professional course work, and, as a consequence, it can be exceedingly difficult for us to justify what we are doing.

There is a strong tendency among most of us to believe that we have such a "profile of the proposed graduate" — the specifically defined end-product — firmly in mind. Unless these profiles are actually written down in clear, specific fashion, the firmness of the concept is open to question. Anyone who has ever had responsibility for advising doctoral candidates on their dissertation knows full well that at some point in time every candidate says, "I know exactly what I want to do." We then spend several or more months helping him work out his statement of the problem, for the problem which was so well-defined mentally proved altogether too fuzzy when it became necessary to write it out. The parallel is quite exact: We have no useful "profile of the proposed graduate" to work from unless we can and do write it out in clear, specific, detailed fashion.

Again, a mentally-defined profile may, when spelled out in specific terms, be found to be completely unacceptable by colleagues and other concerned persons. Classroom teachers, hiring officials from school systems, state department of education representatives, and even lay leaders ought to be involved in developing this profile, too. This is one point where involvement is important, for once a profile receives general approval it becomes the basis of all that follows: it becomes the justification for the selection of all course content in professional education.

**Principle No. 2: A Five-Year Program of Industrial Arts
Teacher Education Consisting of Four Years
of Preservice Education and One Year
of In-Service Education is Inevitable**

The "profile of the proposed graduate" must be interpreted into specific professional education requirements for a planned five-year curriculum. While the five-year curriculum has not really "arrived" as yet, it is senseless to delay packing our suitcase until the train is at the station.

The professional education course work of the first four years, the preservice portion, must be geared to provide those skills and knowledges which are absolutely essential in terms of the job entry requirements of industrial arts teachers. The fifth year should provide those skills and knowledges which, while an essential part of the education

of any adequately prepared teacher, are not included in the job entry requirements. This fifth year of education can be designed as either a fifth academic year or as a program of studies to be pursued over several summers. As now, the preservice education should result in a bachelor's degree, and the fifth year of study in a master's degree.

Lastly, our five-year curriculum must be recognized and advertised as a planned five-year approach — a rather different concept from the present scheme of organization. In our catalog analyses, our public relations releases, our speeches, and our writings, we must inform people of what we are doing, how we are doing it, and why.

Principle No. 3: A Soundly Based, Common-Sense Approach to Our Professional Education Course Work is Essential

Professional education course work within the four-year, preservice program should exhibit a number of very practical characteristics:

First, a minimum of 20% of the time should be devoted to professional education course work.

Second, professional education course work should be offered throughout the four years of preservice education. While this course work may be concentrated in the junior and senior years, it should not be limited to these two years.

Third, approximately one-third of the total time spent in professional education course work should be devoted to foundation courses; another one-third should be devoted to materials and methods courses; and the remaining one-third should consist of student teaching. If this "balanced-thirds" approach is skewed at all, it should be skewed in favor of student teaching.

Fourth, professional laboratory experiences (other than student teaching) should be a part of every professional course. Further, a community service requirement should be a part of every teacher education program.

Fifth, both generalized and specialized professional education courses should be offered. The decision as to whether a particular course is either generalized or specialized ought to be determined by a common-sense analysis of the course itself. In most cases the decision is obvious. In those institutions where specialized course work in professional education is rare, a well-built profile of the proposed graduate should be of real value.

Sixth, integrated course blocks with heavier credit hour weights should replace the present proliferation of two-hour courses. By elim-

inating overlap and redundancy of content, we should be able to cover more content in less time and with more effective organization and instruction. It is not at all clear, however, on what grounds this integration and consolidation of courses will take place. To avoid embarrassing conflicts of concept — such as the one apparently shaping up in the reorganization of student teaching — it would seem advantageous for us to begin integrating our course offerings without delay.

Seventh, the professionalization of technical courses should be recognized and accepted as an integral part of the total offering in professional education. In an effort to improve effectiveness and eliminate undue redundancy of content, each shop instructor should be required to include in his course of study whatever professional education instruction he normally provides. In this way, the professionalization of technical courses can be coordinated with the rest of the program.

Eighth, the involvement of "outside persons," particularly graduates of the institution, in the planning of the professional course work would seem essential to insure a practical and useful offering.

Principle No. 4: An Adequate Professional Sequence Demands A High Level of Instruction in All Professional Course Work

The level of instruction in professional courses must be so high that it is not only recognized as outstanding teaching but will also serve as a model after which our students can pattern their teaching. While it seems clear that much of the criticisms of our teaching will pass away when we have eliminated from our professional courses excessive overlap and redundancy of content, it seems equally clear that we, as a profession, have not devoted enough time and effort to this "model function" of our teaching. If we agree with the old adage that "we teach as we were taught" — and most of us do agree with it — it seems mandatory that we accept the implications of this "model function" and plan our instruction accordingly. There is no room in professional course work for instructors who preach but do not practice.

Summary

Building the professional education aspect of an industrial arts teacher education curriculum is not so esoteric a task that the general methodology and approach cannot be understood by the intelligent layman. This is not to say that laymen can actually put together the professional education course work, but it does mean that the layman

who can understand football while quite unable to play the game himself is equally able to understand what we are doing as we construct a program of professional course work.

If we construct this program in a logical way by proceeding from a defined end-product (the profile of the proposed graduate), through the desired type of curriculum pattern (the two-part, five-year approach), to the specific courses which meet the needs, we "make sense" to the nonprofessional and are able through a point-by-point presentation of what we did, how we did it, and why, to justify not only our program in general but also every aspect in particular. Thus, when questions arise (as they will) concerning what we are doing, we are in an excellent position to meet our critics headon.

CHAPTER EIGHT

Some Immediate Tasks

The tasks which must be undertaken by our profession in terms of the development of professional education course work can be inferred rather easily from Chapters V, VI, and VII. After all, those things for which we must stand also constitute those things for which we ought to work. However, there are several tasks which, because of their importance, their public relations value, or their naturalness as "first steps," ought to be undertaken immediately, and it is to these tasks that this chapter is devoted.

Task No. 1: Build the Profile of the Proposed Graduate

The importance of this step has been discussed previously; yet it is difficult to overemphasize its importance because almost everything in the industrial arts teacher education curriculum ought to reflect directly this profile. This profile of the proposed graduate actually serves as a sort of flesh-and-blood objective for us to work toward; consequently, the educational value of such a profile is tremendous.

As mentioned in Chapter VII, a well-written profile must exhibit a number of specific characteristics. First, it should be phrased in action terms. Then, too, it must speak specifically to the sort of person the graduate *is*, what he must *know*, and what he must be able to *do*. In length it should be like a woman's skirt: long enough to cover the subject but short enough to be interesting.

The specific format used is not particularly important. What is important is that the profile be complete and clear — so clear that there can be no misinterpretation of what is meant. Since many different persons possessing widely differing mental images of what constitutes the ideal graduate will be involved in developing this profile, clarity is critical, for everyone must know exactly what has been agreed to.

There is no "right" way to proceed with the building of the profile, but it seems evident that as a first step full use should be made of materials which have already been developed. Many school systems—particularly the larger ones—already have job descriptions for industrial arts teachers. These should be reviewed. Various educational groups have from time to time studied the question "What constitutes the good teacher?" and these materials, too, can be useful. Naturally, the traditional "review of the literature" should also be made. Now these materials will not result in a "profile of the proposed graduate," but they will provide a broad base of resource data which should prove useful as we move ahead.

All of us recognize that profiles of proposed graduates will not be the same unless the end objective is approximately the same. Therefore, it only seems logical that the profile for an industrial arts teacher in an elementary school would not be the same as that for an industrial arts teacher on the junior college level. Consequently, any college or university engaged in preparing industrial arts teachers may find that several such profiles are necessary. This does not imply that a separate college curriculum must be set up for each profile. What is implied, however, is that particular attention must be paid to the concept of "variations on a theme" so that once a student has completed the professional core required of all industrial arts education majors, he may elect those specialized courses which will meet the needs of a particular profile.

"Outside persons" can be very useful in building this profile. Laymen, hiring officials, representatives of state departments of education, and graduates of the institution should be utilized. It must be recognized, however, that these "outsiders" are not utility infielders who can be easily utilized in all positions, but, rather, are persons with specific backgrounds and training. Care must be taken, therefore, to insure that it is the appropriate background and training which is being tapped.

While the building of an adequate profile is of critical importance, it is certainly not "showy." There is often pressure, therefore, to rush through the building of the profile so that time may be devoted to tasks yielding more concrete and dramatic results. Regardless of the time that is consumed, we must resist every effort to cut corners, for few other tasks that are undertaken in teacher education have such basic value. We must remember that the construction of any edifice is no better than its foundation, and the profile of the proposed graduate

must be the foundation of the total curriculum for industrial arts teacher education as well as the professional education course work.

In all this, we must never forget that it is up to us, the industrial arts teacher educators, to furnish the leadership required to build this profile. Job descriptions from city systems, educational studies, and conferences with outside groups all have their value, but the responsibility for seeing the job through, for actually building the profile, rests with us. If we do not do it, no one else will.

Task No. 2: Organize and Implement a Regular Follow-up Study of All Graduates

In a sense, such a follow-up study ought to be carried out simply to help us build a better profile of the proposed graduate. Certainly, such information can be of real assistance in this task. Yet, such a follow-up study has more meaning than this.

First, it is clear that this information can prove useful in other ways long before the force and usefulness of the profile is felt. An adequate follow-up study will, in rather direct fashion, point out the strengths and weaknesses in our present offerings of professional course work as well as in the over-all industrial arts teacher education curriculum. While the results of the follow-up study are probably an insufficient basis for a complete re-working of our present program, this same information is more than adequate to "tune up" our offerings. In short, these results, when applied, should help us do a better job of what we are now doing.

Second, since such a follow-up study should be conducted annually, the results should permit us to check the efficacy of our program on a regular basis. Indeed, in the years ahead, this same information should be of assistance in keeping our profile up to date. It is critical that this follow-up study be conducted on a regular, annual basis rather than as a one-shot sort of thing.

Third, since follow-up studies are recognized by most persons as valid and practical devices for checking the adequacy of curricular offerings, and since some of the findings can be immediately applied, there is often a "professional showiness" about them which can have real public relations value. Because of this, it may be a good idea to combine the development of the profile with the follow-up study itself. In this way, some immediate results can be obtained as well as the basic data needed for future revisions.

**Task No. 3: Improve the Level of Instruction
in Professional Courses**

While it is true that the key to improving our instruction seems to lie in eliminating overlap and redundancy, and while it seems equally true that completing this task will require a tremendous amount of course revision, there would seem to be no sound reason why some improvement could not be obtained far more quickly. While there is a limit to how much overlap and redundancy of content can be eliminated without a thoroughgoing study, a careful inspection and appraisal of our present course offerings ought to result in cutting out some repetition. This should help to improve the level of instruction.

Similarly, while it is dangerous to begin integrating courses until a sound rationale for such integration has been developed, there may be cases where the need for integration is so obvious that this task can be undertaken immediately. This, too, should help improve instruction.

On another front, improvement of instruction can go forward at full speed, however. As has been mentioned previously, the "model function" of our professional course work has not received its due emphasis. It would seem only sensible for each and every one of us to so teach our courses that they can easily serve as a pattern for any student to study and copy. Discussions, lectures, demonstrations, field trips, and other aspects should all sparkle and be so well taught that anyone could tell he was witnessing a class in professional education simply because of the quality of the instruction.

**Task No. 4: Develop a "Down-to-Earth" Philosophy
and/or Justification for Industrial Arts**

This subject has not been mentioned previously, yet it seems imperative that it be included. It is often necessary for a teacher, particularly in a smaller community, to justify his existence not in actions alone but through some down-to-earth philosophy or justification which can be readily understood by the laymen who comprise his board of education. Most of our teachers, particularly our younger ones, seem unable to do this effectively without resorting to a vocational or pre-vocational approach. Discussions with some of our younger teachers have shown that many are at sea if someone really tries to "take them apart" philosophically. This is an extremely unfortunate situation — unfortunate for the teacher, the students, and the profession.

Some of our more recent writings are recognizing this fact and are beginning to discuss such things as course justification. Such a trend

would seem to be much needed, and it is to be hoped that it will not only continue, but will expand to broader and more significant proportions.*

If we as industrial arts teacher educators really believe that industrial arts is necessary, good, and justifiable — that it is neither a "fad" nor a "frill" — we must also recognize that we have a heavy responsibility to our students. We must be certain that every graduate is able to defend industrial arts competently in the philosophical realm. Regardless of what has been written, taught, or done in the past, it seems clear that many of our graduates have not adequately assimilated the necessary information. The need for a sound philosophical background represents one of the truly great challenges to our profession as we move into the future.

* As an example of such material see G. Harold Silvius and Ralph C. Bohn, *Organizing Course Materials for Industrial Education*, Bloomington, Illinois: McKnight & McKnight Publishing Company, 1961.

SECTION IV

Technical Education

Delmar W. Olson

Coordinator, Graduate Study in Industrial Arts

Kent State University

Kent, Ohio

CHAPTER NINE

Bases for Preservice Technical Preparation

Assumptions to underlie the pre-service technical preparation of teachers of industrial arts have rarely been clearly identified in the literature. Readers could assume that the purpose of industrial arts is to teach for skill in the use of tools and materials. From this they could assume further that whatever was done in the name of pre-service technical preparation of the teacher would logically equip him to accomplish this purpose.

If one is to attempt a derivation of assumptions to underlie this level of technical preparation, he might wonder about the order of his search. Should the assumptions be drawn from the objectives, goals, functions of present industrial arts or should they be the origins of the purposes of industrial arts? The writer chose the latter means to gain clear focus on a "new" industrial arts. The use of the descriptive adjective suggests a reconceiving of industrial arts. To be as free as possible from the influences of the old in a search for the new it is appropriate to go back to the starting place, take a new bearing, and map a new course. This starting place was found to be in the acceptance of work as being educative, especially work with tools. Origins of this concept can be traced to the very beginnings of tools when early man accumulated the first elements of a technology to be passed on to his young. No attempt is made herein to reconsider industrial arts as it is currently known. Further, there is no concern here for extending or expanding traditional concepts into broadened concepts. This break is made from tradition because what has been in industrial arts is not seen as a guide to what should be.

The willingness to search for the new or unknown is not without its penalties. Problems arise in experimenting with new programs which

test both the experimenter and the subjects. These problems should not deter us from making the attempt. The ties to the past in industrial arts are so secure for most of us that anything which might tend to loosen them triggers a blast of censure. However, if industrial arts will have a great future it must grow from our common willingness to project a new program from new pads.

The underlying assumptions to be sought are considered to be those premises, hypotheses, principles by which and from which a program of technical instruction for industrial arts teachers can logically and soundly be developed. They are seen as bases from which to project and as guides to the direction of the projection. Much of the proposal is developed from concepts appearing in an earlier study by this writer.¹ It was not considered feasible to reproduce the content of this reference herein. Instead, the reader is referred to the original from time to time.

From a series of fundamental assumptions which comprise two postulates, technological and human, the study evolves through several steps. There is a background statement which sets out a brief but enlarged concept of technology. This is followed by an interpretation of industrial arts which defines a general direction, presents its technical function, and identifies representative areas of technical competences and curricular components for industrial arts. With these guides a set of assumptions is offered as underlying the technical function. The assumptions in turn become the guides for the development of the projected program of pre-service technical preparation. Finally, this program is described.

The Technological Postulate

Since this prospectus involves a conception of industrial arts with its origins in technology, there must properly be a technological postulate to support its development. A first step to such a formulation is to define or interpret "technology" because the term has varied meanings according to its wide usage. The interpretation given in this work is a broad one as used by anthropologists and sociologists, and it implies considerably more than a study of the technical.

Technology is the Composite of Man's Achievements with Mind, Materials, and Energies.

"Technology" is considered to be synonymous with the term "material culture." Within this meaning "technology" is considered to be

¹ Delmar W. Olson, *Technology and Industrial Arts*, Columbus, Ohio: Epsilon Pi Tau, 1957.

man as he controls and uses nature. It is man as he controls what happens to man in the hands of nature. He tailor makes the weather within his buildings. Also, he controls flood waters and turns them to good use. He holds back the sea which otherwise would destroy his cities. He is fighting successfully against many diseases and damaging insects. He is gaining control over nature-caused forest fires and can reforest the area more quickly than nature when left to do it by herself. He can sail through storms and fly over them with increasing control. With an advance warning system he is able to gird himself for the hurricane and to resist its pressures. He is able to gain an advantage over nature as he takes her materials and converts them into new materials and then into new products. He draws on nature's energies and changes them into usable forms. It may be that his technological controls even affect human nature. Certainly the developments in communications from the printed word through electronic picturization and the ease of transporting himself to any point on the earth have encouraged the growth of friendliness and understanding in some places where fear and suspicion had dominated.

Technology is Man Creating His Own Environment.

With his ability to utilize materials and energies, man has replaced forests and plains with cities and highways. The vast network of highways in America permits him to change his geographical position in a matter of minutes. Air travel adds a third dimension to his environment. He builds lakes where he wishes, moves mountains, changes the course of rivers, finds a living beneath the earth, solves mysteries at the bottom of the sea. The entire nation is rapidly becoming the home of each American as he moves from one location to another in the course of working and recreating.

Technology is Man at Work Civilizing Himself.

Man raises the level at which he lives by eliminating drudgery and slavery to existence. The highest levels of civilization have been reached through the highest level of technological development. As man is able to solve easily his material problems, he is freed to grow to the full stature of human goodness. In this latter growth his technology gives him an additional assist through material achievements. He has books and all the forms of the graphic arts through which to find inspiration and ideas; he has musical instruments through which to find self-expression. For all of his discretionary time technology provides him means for its utilization in the process of recreating himself.

The act of developing technology is civilizing in itself; the utilization of technology can facilitate the civilizing process.

The American Culture is Distinctly Technological.

America's facileness with materials and machines so determines the way we live that our very culture is different because of it. The whole complex of our customs, manners, mores, beliefs, institutions, and achievements is open to change. Technological developments become pressures to change. The structure of present-day home and family living is influenced by the products of industry. The automobile has become a means of fostering greater understanding in the sense that it brings the ends of the continent closer together. Technology has brought with it a concern for convenience which is reflected in contemporary architecture, in the planning of the home, in the re-planning of cities. The changing concept of work as a human institution is traceable to technological advance. Technology makes it possible for us to be better informed people. Science exposes myths and mysteries and reveals new knowledge, and technology keeps us so informed. Technology can thus be considered an external cause for changes in the internal workings of society, and, as such, it both shapes and colors our culture.

Today's culture is by no means easier to understand even with all of the technological aids. The place of the individual within it has not become increasingly clear with all of the technological advance. This fact undoubtedly may account for the current mass drive for security: physical, social, political, economic, spiritual. We in industrial arts are aware of the bewilderment of young America as it seeks its directions. There was a time not so many years ago when paths from youth to adulthood with its work opportunities were fairly visible to the young. But today's technology changes futures, obliterating some and disclosing others at such rate as to puzzle even its creators. It is interesting to note that industrialists and scientists seem increasingly to find their own orientation in philosophy and religion as they search for meaning in what they are creating. Patterns of consistency as routes to security are goals of every generation. They are truly difficult to identify in this day. Each person needs to understand the role of technology in cultural change if he will live intelligently with it. To understand it, he must study it.

The Spirit of Technology is the Key to an Understanding of Technology.

The spirit of technology is the spirit of man expressing himself, expressing his human potential. Where this spirit is missing, technology is static and relatively unproductive. It is the spirit which simply states that *there is a better way*. It is this spirit which accounts for that constant in American technology — change. It is this spirit which set our own Industrial Revolution and the subsequent Nuclear-Space Age in motion. It is this spirit that effects increasingly finer products in greater quantities for us to use. But this is not really all the effects of this spirit. Its impact, while rather fully felt in materials, has had a lesser effect in our nonmaterial living. Yet, this changing technology is making its impact felt on the whole of our social structure and institutions even though they tend to resist the change. The lag between them and the ever-changing technology is responsible for many of the great national problems. An advancing technology reveals weaknesses in society. At this moment in history, for example, we are finding that great problems originate in an excess of leisure time used unwisely or unproductively. Technology makes time available to us in great quantity, but man himself must learn to use it well.

Industrial Arts in a Technological Society.

Volumes have been written by philosophers, sociologists, and educators on the role of the school in society. One thread is especially common: that the primary purpose of the school in any society is to acquaint the young with the culture of which they are a part. It is not the intent here to develop this concept but to accept it as fundamental and then to project from it. Now what is the nature of American culture? Cultures are frequently identified as agricultural or as industrial and technological. American culture is distinctly industrial and technological. Within a few decades agriculture itself has become so industrial that today it is also included in the institution of industry. The term "technological" is preferred here to "industrial" in describing American culture because of its stronger sociological and economic implications. The term "industrial" has often a very restricted meaning, especially to us in industrial arts. Without attempting to prove the statement, which is actually axiomatic, it is accepted here that American culture is distinctly technological.

If we accept the contention that it is the primary purpose of the school in a society to acquaint the young with the nature of the culture

of which it is a part and then that the American culture is distinctly technological, we can deduce almost algebraically that it is the function of the American school to acquaint the young with the nature of the technological culture. If this conclusion is sound, and it is only as sound as the bases from which it is drawn, industrial arts has laid before it an invitation to assume a fundamental role in American education: to acquaint American youth with the technological culture. Behind the call for a new industrial arts is this concern for an acceptance of the responsibilities and privileges involved. Industrial arts need no longer be classed as a special subject for a few or as nice to have but not necessary.

The Human Postulate

Any program of education has human bases because education is for human beings. Industrial arts, no matter how sterile, artificial, or mechanistic it may have been at any time, still had its bases in human concerns. When we debate over the nature and purposes of industrial arts and even the teaching methodology and the physical plant, the origins of the argument can be traced to conflicting concepts of human concerns. Where school administrators do not agree that industrial arts is essential education for all of young America, it stems from disagreement on these same concerns. The first block in the foundation for any program of industrial arts is that which includes the accepted human references. The following statement includes several which are considered as primary. Together they make up the human postulate for the proposed curriculum. The elaborations are by no means complete; they are indicative only.

By Nature Man is Rational.

Man is capable of reasoning and of comprehending reason. He has a discretionary facility by which he employs selective judgment. With this rationality he is capable of meeting problems and solving them. In contrast, for example, an animal shies away from that which he cannot best. Man's rationality is capable of development and growth; he is knowledgeable. He is able to discover meanings, implications, and applications, and then of evaluating them.

By Nature Man is Creative.

Man is capable of finding solutions to problems, of finding new problems, and of finding problems in solutions. Facile in the process of ideation, he is capable of conceiving in his imagination that which

has not yet come into existence. He has a facility for questioning, visualizing, exploring, experimenting, inventing, and producing the unexpected. He is inspirable and thus is able to conceive of higher goals and greater good and better ways. It is here accepted that all men are creative but not necessarily to the same degree. Through expression of his creativeness man becomes distinctly individual.

By Nature Man is a Tool User.

Born equipped with hands and feet for grasping and manipulating, their use is, of course, normal and expected. With his facility for rationality and for creativity he developed tools and then machines, and eventually, a great technology as evidence of his tool-conceiving and tool-using aptitudes.

By Nature Man is a Builder.

Man's earliest attempts at tool using were probably destructive rather than constructive as he cracked nuts, opened mussels, or killed animals with the aid of a rock held in his hand. However, when he learned to combine available materials, as a stick tied to a rock for a handle, he became a builder, a creator. From this time on his building has been extended into all of the world, and at the moment he is literally attempting to bridge outer space.

Man with These Gifts Was Placed in an Environment of Materials and Energies for the Master Purpose of Releasing All of His Kind from Lower Levels of Enslavement.

While the preceding assumptions are essentially self-evident, this one may be controversial. To me, however, it is as primordial as is religion in any culture. Expressed as it is, it gives reasons for technology and at the same time raises it above the level of materialism. It conceives of technology as being at least humanistic and therefore capable of the dignification of man. Expressed as it is, it contributes to a reason for man's very existence, a question as old as thinking man. From this assumption is gathered support for proposing industrial arts as means to *advancing technology*. All together these concerns constitute the human postulate for this study.

Industrial Arts: An Interpretation

The following statement seeks to identify an industrial arts reflective of technology. In itself it is a premise advanced as true and accepted as a guiding interpretation for industrial arts as herein conceived.

Industrial arts is a study of technology: its origins and developments, its technical, consumer, occupational, recreational, social, and cultural nature through experimenting, creating, designing, inventing, constructing, and operating with industrial materials, processes, and products for purposes of acquainting the student with his technological environment and aiding him in the discovery and development of his own human potential therein.

This industrial arts is seen as having a mission including six functions one of which is the technical. The six functions, also called "Objectives and Guiding Principles," defined in the *Ohio High School Standards for Industrial Arts Education for Junior and Senior High Schools*, are essentially those as accepted for this study. They are: The Orientation Function; the Technical Function; the Avocational Function; the Consumer Function; the Social Function; and the Cultural Function. Their content is described in the following statements:

The Orientation Function.

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

The Technical Function.

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

The Avocational Function.

Industrial arts also provides opportunities to cultivate a wide variety of useful, wholesome, and enduring leisure time, interests, and activities. Collec-

tion and appreciation is involved in addition to manipulation. The importance of this function is increasing. There is now almost as much time for leisure as for labor and sleep together. Increased leisure time affords not only an educational opportunity but it also becomes a liability and a responsibility with which the school must cope.

The Consumer Function.

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

The Social Function.

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

The Cultural Function.

Experiences in industrial arts should help the individual enjoy a finer culture as regards materials in an involved technological society. This means helping him develop and use his material inheritance. For example, the pupil can learn to know style or design in architecture, furniture, rugs, pottery, silverware, glass, dress, china, printing, machinery, and other items of common use, and appreciate the forces that have influenced them. With a cultured taste, he is prepared to surround himself with those things from which he can derive life-long satisfaction.²

The above functions were reconsidered and presented in extended outline form in chapter four of the study cited earlier. In their reconsidered form the occupational function replaces the orientation function and the avocational function becomes the recreational function. The reader who wishes to study these six functions in greater detail is referred to the pages cited below.³

² Ohio State Department of Education, *Ohio High School Standards, Industrial Arts Education for Junior and Senior High Schools*, Columbus: Ohio State Department of Education, 1947, pp. 10-12.

³ Olson, *op. cit.*, pp. 77-106.

The detailing of the technical function to follow sets the pattern for the development of the curriculum proposal.⁴

In order for an industrial arts to reflect technology, the technical competences needed by its teachers are those abilities which are derived through a full involvement of the human being's native resources for reasoning, problem solving, ideating, creating, and constructing; thus resulting in a mastery of materials and processes and an understanding of their meaning within the whole of the material culture. The technical function is seen as a source of such competences. They can be grouped into twelve distinct categories. Together they become the technical mission for an industrial arts representative of technology.

1. How industry discovers, mines, refines, manufactures, classifies, and distributes materials.
2. How industry employs technical processes and scientific principles to convert materials into products.
3. How industry designs, develops, produces, uses, and services machines.
4. How industry provides housing for industry, business, government, schools, and homes.
5. How industry provides transportation for materials, products, and people.
6. How industry produces, transmits, and utilizes power.
7. How industry provides, operates, and services communications media and systems.
8. How industry employs research in the development of materials, processes, products, industries, and management.
9. How industrial products are used, operated, maintained, serviced in industry, business, school, home, and by the individual.
10. How industry employs organization, management, personnel, records, and controls in the production of goods and services.
11. How the student can convert materials into products and projects by means of representative processes with tools and machines.
12. How the student can employ industrial materials, processes, products in the development of ideas and in the solution of problems.

⁴ Olson, *op. cit.*, pp. 79-83.

These twelve groups of technical competences originating from within the technical function may be used as bases for a derivation and projection of a curriculum to provide the technical preparation for teachers. The subject matter for this new industrial arts also contains units of competences.

Subject Matter as a Source of Technical Competences

The source of subject matter for the new industrial arts is the industrial categories drawn from analysis of the whole of American industry. These are manufacturing, power, transportation, construction, electronics, research, services, and management.⁵ Resolution of these industries reveals areas for study which are at the same time areas for concentration of technical competences. They are known as curricular components. Following is a list of curricular components considered typically representative of an industrial arts reflective of technology.

1. Basic Materials		
Types	Qualities	Manufacture
Sources	Standards	Use
2. Basic Processes		
Hand	Chemical	Electrical
Mechanical	Thermal	Natural
3. Basic Products		
Design	Distribution	Use
Manufacture	Development	Service
4. Industries		
Types	Origin	Production
Locations	Development	Structures
5. Basic Services		
Power	Communication	Security
Transportation	Recreation	Household
6. Industrial Design		
Engineering	Styling	Models
Psychology	Re-design	Evaluation
7. Presentations of Ideas		
Drawings	Models	Cut-aways
Photographs	Mock-ups	Charts

⁵ Olson, *op. cit.*, pp. 44-49.

8. Standards		
Interchangeability	Measures	Limits
Modular units	Symbols	Tolerances
9. Structures		
Joints	Fastenings	Strengths
Frames	Unitizing	Loads
10. Construction		
Fitting	Assembly	Testing
Fastening	Inspection	Modification
11. Mechanisms		
Generation	Motion	Machines
Transmission	Controls	Mechanics
12. Circuits		
Regulating	Amplifying	Visual
On-off	Audio	Power
13. Formulae		
Mathematical	Mechanical	Empirical
Chemical	Electrical	Recipes
14. Manufacturing		
Materials	Assembly	Testing
Parts	Finishing	Shipping
15. Inspection		
Types	Procedures	Test
Standards	Evaluation	Salvage
16. Systems		
Hydraulic	Thermal	Pneumatic
Electronic	Cooling	Automated
17. Operation		
Control	Regulation	Capacity
Safety	Utilization	Limitations
18. Housing		
Legislation	Types	Construction
Standards	Structures	Services

Technical competences are not to be derived from the technical alone. Because they are abilities of humans they have human origins. From within the pattern of the technical function and the framework of subject matter as identified can be drawn a series of groups of com-

petences which are essentially peculiar to humans but which have their expression in the technical.⁶

Aesthetics	Evaluation	Presentation
Analysis	Hobbies	Principles
Chemistry	Ideation	Problem Solving
Conservation	Imagining	Psychology
Construction	Inspection	Reasoning
Creation	Integration	Records
Decoration	Invention	Recreation
Design	Investigation	Refining
Development	Legislation	Research
Diagnosis	Management	Safety
Discovering	Occupations	Selecting
Drawing	Operation	Servicing
Editing	Organization	Study
Engineering	Physics	Test
Experiment	Planning	Theories

The above can be considered as areas of competences, or as blocks; they are likewise considered to be curricular components. In no sense are they given as a complete list; rather they are typical of subject matter and competences to be drawn from industrial analyses.

⁶ Olson, *op. cit.*, p. 169.

CHAPTER TEN

Assumptions Underlying Preservice Technical Preparation

Postulates, technological and human, underly a concept of the new industrial arts. Necessarily, they are basic to the construction of an appropriate technical curriculum for teacher education. From these are drawn several assumptions which are given as guides for technical curriculum development and which are expressive of the technical function of industrial arts.

Industrial arts had a beginning, but we cannot be sure just where or when. It began with an assumption. This was the assumption that work was educative and especially that work with materials and tools was educative. Through the years teachers have tried to prove it so. In attempting to substantiate this assumption by project, test, logic, psychology, philosophy and such, we have been so fully occupied that we have lost sight of what was happening with materials and tools in the world of work. Around us has been developing this gigantic enterprise of men, minds, materials, and machines called technology which has not only changed materials and machines and the products thereof, but it also has changed man and his mind and his concept of the purpose of work. Although this purpose was originally for subsistence, it later acquired the role of dignification as it assumed personal and social values. During the past half century, work has assumed a purpose of elevation, for it has become a means to social prestige and to finer living. At the moment a strange new purpose of work is emerging. Here the purpose of work is leisure. Within this changing concept of work, which has come upon us largely through a changing technology, it may now be less easy for us to assume that work is educative when that work is reflective of an earlier nature and purpose. This is to say that the original assumption may have by now

served its usefulness and that it may be well for us to employ the previously presented technological postulate as one point of departure for industrial arts if this instruction is to become accepted as educative for the decades ahead.

The origin of this new industrial arts subject matter is in technology. Considering the interpretation of technology as already presented, this assumption is by no means identical with the one which holds that the origin of industrial arts is in work.

The primary purpose of education in any society is to acquaint youth with the culture of which they are a part. The society may be primitive or it may be advanced, but this primary purpose of its system of education remains the same. This assumption by anthropologists, sociologists, and educators is essentially a social-cultured axiom, so fundamental as to need no proof. Now, if the new industrial arts is to be educative, if it is to be a part of fundamental education in this country, its primary purpose seems rightly to be to acquaint the young with the nature of the technological culture of which they are a part. The American culture is distinctly technological. Accordingly, it becomes the unique mission of industrial arts to teach modern technology.

It is further assumed that the explanation of our technological culture cannot be complete or effective when the technical from which it evolves is omitted from the education of youth. If industrial arts has a technical function, and it is assumed here to have, it is reasonable to conclude that it will be to acquaint the young with this technological culture by achieving a technic-rationality with energies, materials, processes, products, tools, machines, services, and industries. A technology-centered industrial arts should logically lead to an understanding of technology. Until Americans understand their technology they will likely continue to abuse it. Seven assumptions are seen as underlying the pre-service technical preparation of teachers of industrial arts. Their development follows.

Industry is the Economic Institution Charged with Producing and Advancing Technology.

In this capacity industry must be thought of broadly as including all of the establishments engaged in lines of economic activity, or any branch of trade, business, production, or manufacturing.

Industrial arts as an educative field draws its subject matter for the study of technology from industry. In the industrial arts envisioned herein the study of American industries falls into several categories:

manufacturing, construction, power, transportation, electronics, research, management, and services, as previously indicated.

The study of the sciences does not necessarily explain technology; it explains science and the scientific principles involved. Technology employs science and scientific principles in working relationships and evolves technological principles and applications. In this sense the study of today's technology includes the study of science. In actuality technology had existed for centuries before the arrival of science, and it can be considered as having made science possible. It provided the materials, tools, machines, devices needed in the pursuance of the study of science. When technology adopted the experimental approach to solving its problems, it became scientific. This has occurred in great part within the present century, and especially since World War II. The inclusion of research as an industrial category for study recognizes the emergence of this industry of discovery, privately financed and directed and growing extensively each year.

The Body of Technological Subject Matter is in Continual Change.

If industrial arts is to be representative of technology, it should logically reflect contemporary technology. The danger is that we will attempt to specify and organize subject matter so carefully as to make it static. Freezing the fundamentals, as it were, will only effect a technological lag which eventually will reduce a new industrial arts to the same state of impotency and rejection it is enduring at this writing. The record of technology in America reveals its one constant: change.

With a changing subject matter there will be a changing of the fundamentals. The technical fundamentals are found in the materials, processes, products, and services. For example, although in an earlier technology riveting was a key process for the fastening of metals, this does not mean that in today's technology it holds the same importance. With a changing technology the search for subject matter fundamentals can never be complete.

The New Industrial Arts will Contribute to an Advancing of Technology.

An academic understanding of technology is not sufficient in the new industrial arts. This point requires emphasis because of reactions to the proposal for an industrial arts to represent technology. A not uncommon conclusion has been that with the magnitude of the subject matter seemingly overwhelming, academic treatment alone is possible in a teaching situation. This reaction may be logical only with a first

glance at the new industrial arts. To say, however, that this kind of treatment is not enough is not to minimize its academic, scholarly consideration. Rather, the way to understanding technology is like a multi-laned avenue. In addition to the lectures, the discussions, the films, and the like which are common means to academic comprehension, there is the lane for the experimental, the gaining of understandings through experiencing. This typically involves the student in projects which demonstrate technological as well as technical comprehension and control.

For an industrial arts to contribute to an advancing of technology it must be concerned with a search for meaning in that technology. In the last analysis such advancement comes through individuals who are able to think bigger and better about things technological, and for particular application to this paper these persons must be able to find better ways in the technical. Consequently, it becomes imperative that industrial arts assist the student to discover his technical talents and aid him in their fullest development which eventually, at least, should enable him to contribute to this advancing of technology.

**In the New Industrial Arts the Creative Imagination
is of Greater Consequence than Knowledge.**

This assumption was not a part of the base in the early industrial arts. While the work was largely technical it was scarcely creative. The mastery of tool processes had pedagogic priority and typically the instruction did not go beyond this. This probably explains why the layman of today when he sees industrial arts sees it as instruction in processes, and generally with wood. For the first half of the century we have assumed a relatively fixed body of knowledge of industrial arts. Its content in woodwork, metalwork, and mechanical drawing is largely unchanged. This, of course, has enabled us to concentrate on perfecting its organization and teaching. In the meantime American technology has advanced to the Scientific Age, and in the processes great and significant bodies of new knowledge have been discovered in all fields. In keeping with the spirit of technology knowledge is but the beginning of new knowledge. But the creative imagination is the discoverer of new knowledge. It peers into the unknown like eyes which can see in the dark to find new solutions, better ways. Technology originated within the creative imagination. The continuing technological change is born of a continuing creativeness.

Current research into creativity as a human gift is rapidly increasing what is known about this most unique of talents. For the most part this research began at about the midpoint of the present century and is already beginning to offer evidence to support an expanded concept of giftedness and intelligence. The Intelligence Quotient as commonly determined is not considered to include measures of creativity except perhaps incidentally. Research and experiment tend to show that the correlation between giftedness as identified by the I.Q. and creativity approaches zero. The increasing awareness of creativity as a unique human gift, and perhaps the most valuable of all, is prompting this expanded concept of giftedness which sees it as including more than academic intelligence. In fact, the creative imagination is considered by some to be the highest level of the human intellect. Now, we in industrial arts who have deplored the fact that we get few, if any, of the so-called gifted students, may find that the students we have been especially wanting are those who may not necessarily score high in IQ but who have an abundance of creativeness. At this writing tests for the identification and measurement of this trait are still in the pioneering stage. One deduction from the studies is rather commonly agreed to by authorities in the field. It states that all humans possess a measure of the creative imagination but not necessarily the same measure.

When the technical in industrial arts is exposed to the full creativeness of both teachers and students, its level as we have held to it for decades is bound to change. With this the technical fundamentals will be reconsidered and the teaching methodology for the technical redirected. The exercise of the human imagination can be as full and as liberating with materials as it can with words. Imagination is capable of conceiving in materials that for which no words are available.

The Project is the Involvement of the Human with His Talents for Reasoning, Problem Solving, Creating, and Constructing with Materials, Processes, and Energies.

The student project in the new industrial arts is more than making something; it is more than mastering certain processes or structures. It is primarily an expression of human involvement with materials in a search for better ways. When fully functioning the project is neither means nor end alone; it is both. It is a means to human growth and development as well as a measure of it. Through the project the student achieves the purposes of industrial arts, receives its values, and enables

it to accomplish its functions. Thus, the project is seen as of capital significance in the new industrial arts. When the project was synonymous with exercise the emphasis was on the manipulative, the dextrous control of tool and material. Educative respectability was reached for by the addition of "related information." Both exercise and related information existed as separate formal entities assumedly comprising the whole except as the teacher was mindful of "effort and attitude." Performance in these three became the measures of the student's grade and to him the index of his success. All of this reached the student from beyond and from without. Imposed on him by his enrollment in the class, the depth and breadth of his involvement in projects was virtually specified and limited by the number of them required.

The issue of depth versus breadth is still with us in industrial arts. The issue commonly reduces to arguments on specialization and generalization. Depth is commonly seen as specialization or concentration through narrowing of the field of study. Whatever the designation the common purpose has seemed to be that it is best for the student when he acquires a high degree of skill in a limited field rather than a smattering of this and that. Those who champion breadth refer to exploration as the major value, to give the student a broad look, a wide exposure. Once again it appears that we seem to be arguing for the sake of arguing, rather than for the good of the student and industrial arts.

The project in the new industrial arts is seen here as first involving the student in a depth study. With depth comes understanding and then meaning. With depth comes consummation of the student. The greater the depth, the greater the implications of the study. With implications breadth begins. Exploration and orientation as objectives in the interests of breadth do little more than open doors and windows leaving the student as a spectator. The new project proposes to make of each student a participant in the over-all goal of advancing technology through an advancing toward his own personal potential. Within the new project the student finds that research, development, experiment, invention, design, planning, creativity, constructing, testing are all involved in the search for a better idea. The new project then may not necessarily appear finally as a material thing. It may exist as a better idea that grows out of the fullest development of the material project to that time.

Originally the industrial arts project was the material thing. When completed to the satisfaction of the teacher the appropriate values accrued to the teacher and to the student. The making was the means

to its values. The conceiving, the researching, the developing, the inventing, and all of the rest were not a part of it for the student. This had already been done by the teacher or by someone from whom the teacher had borrowed. Ideally, project selection in the new industrial arts is as wide as technology. There are no areas of it in which better ideas cannot be found. While the project has given industrial arts a uniqueness among disciplines, the new project adds uniqueness to this new industrial arts.

Technical Preparation will Include the Intellectual, the Creative, the Scientific, the Industrial, the Constructive.

The constructive alone in the sense of the manipulative, the making of things, cannot effect the full values in the new industrial arts. It is not big enough for the job. The processes of reason and problem solving being essentially intellectual, it seems that industrial arts must first of all be intellectual. Now this is frequently deprecated in industrial arts circles. However, one of the great problems in industrial arts through the years has been the tendency to divorce the intellectual from the manipulative and then to concentrate on teaching for the latter. Perhaps unknowingly this is our contribution to the general misunderstanding and abuse of the technology which we decry. Attaching our full hopes to the manipulative may explain the declining acceptance of industrial arts in the public schools. Educators wonder about the educative values in just making things especially when there are so many demands on student time. Presumably this making of things is not enough. Once again logic suggests that if industrial arts is concerned with the maximum growth and development of the student it will involve him in a maximum of utilization of his intellectual facilities as well as of his other talents.

The processes of ideation, of thinking imaginatively on things technical may be considered as intellectual. Here, however, the creative imagination is considered apart for purposes of emphasis as well as to insure that this gift is accounted for. The expanded concept of giftedness which was mentioned earlier recognizes a differentiation between the intelligence as indicated by the I.Q. and creative thinking ability. The search for a better way begins in the minds of men. In the new industrial arts the student is confronted with the task of finding better ways. This takes on form in his project development. It is not enough to offer him opportunity to search if he wishes. It is for him to assume that when he enrolls in industrial arts he is automatically in on such

searching; it is the way the new program operates. And this then becomes a unique quality for industrial arts.

To make industrial arts scientific is to make it different from what we have known. Generally, the technical problems are solved by rule of thumb. In fact, the good project as we have known it has the problems already solved before it is given the student. Consequently, there is call neither for the intellectual nor for the scientific. When greater precision than possible with rule of thumb is required, as in cutting a thread on a machine lathe, the details are provided by a handbook or wall chart. Cookbook industrial arts may be appropriate when the concern is for the project only. In the baking of a cake, the cake is the goal. In concentrating on "how" we have overlooked "why."

The employment of the scientific involves the study and application of laws, theories, and principles basic to such engineering fields as the mechanical, aeronautical, electrical, electronic, ceramic, chemical, architectural, and others. Applications from such fields can be made to any level of industrial arts instruction and project development. Chemistry and physics serve as backgrounds for study and application. The technical in technology, while originally a rule of thumb mastery through test by usage, has in the current century gone scientific. Engineering which developed into bodies of knowledge from trial-and-error experimentation (witness the aeronautical) has become highly scientific within a relatively few decades.

The technical, without the intellectual, the creative, the scientific, and the engineering, in industrial arts is reduced to purely making things as process exercises. At this point the technical in industrial arts is beneath the educative level of most American students and becomes a means of occupying the mentally deficient. The practice of offering such courses on the collegiate level as "shop math" for the mathematical grounding of industrial arts teachers, while proposed with the best of intentions, has tended to reduce mathematics to a few rules for application in specific technical situations. It has done little to reveal to the student the potential of mathematics as means to discovering new technical knowledge, or as means to greater scientific applications of it, or as a way of thinking.

The new industrial arts must be distinctly reflective of industry, and the emphasis in subject matter must be on contemporary industry. Since Richard's challenge in 1904 for an "industrial" arts the term has been accepted, but it is questionable if industrial arts has ever been representative of the industry of its day. Today's industrial arts is most

truly representative of industry within the Crafts Age, 1400-1769, during which processing was by hand tool and the common material was wood. In its advanced development industrial arts has reached into the Machine Age, 1769-1890.

This assumption may be questioned by many of us who interpret it to mean that the industrial arts facility must accommodate within its walls the latest of industrial equipment, even including the automated. Because we doubt the feasibility of such implementation, we reject the assumption. However, if it is a good idea, someone can make it work. Why duplicate an industry or a series of industries in school. Rather, study industry where industry is. Billions of dollars are spent annually by private industry on research to produce tremendous amounts of information some of which should be applicable and useful for industrial arts when it is directed to the study of industry. Of the millions of people employed in industry there must be thousands available as consultants and resource persons on whom industrial arts can draw. There must be better machines and other physical facilities for representing industry than those currently in use in our programs. Should we not involve experts from within our own ranks in research and development on the needed facilities? Until we do we will find it difficult, if not impossible, to create an appropriate technological and industrial environment for our work in the school. The search for technical fundamentals drawn from industry, science, and engineering is our responsibility as it is likewise our responsibility to keep them contemporary.

The technical in industrial arts is incomplete without the constructive. Since the constructive involves a human in situations calling for the fullest expression of his intellectual and creative resources with materials and processes, it is apparent that this quality implies more than making things. We assume that to construct is a natural human talent, but we have little evidence in industrial arts to show that we also assume that man has natural attributes for the intellectual, creative, and scientific with materials. The constructive here is the attention given to the development of ideas from abstractions to realities. When this involves the creative, the scientific and the industrial, constructivity is fully functioning.

The Nature of Skill is in the Process of Change.

The primary objective of industrial arts from the beginning has no doubt been that of skill. We call it by many names: technical com-

petence, tool mastery, manipulative dexterity, and such; but mostly we just call it skill. By it we mean simply an ability with tools. The industrial arts teacher when appraising a student project or a colleague's program or exhibit looks first for evidence of this kind of mastery. Now excellence is a noble and worthy objective and as appropriate to industrial arts as to any educative field, but it is the nature of this excellence which needs our study. The command of a hand tool with a material was at one time the *sine qua non* of industry. This is not to say that it is unimportant in today's industry. We do know, however, that this technical competence is today built into the machine and is employed by machines in doing their work. The heights of excellence demanded in much of current production can be attained only through machines with their built-in excellence.

In the days of the Crafts Age the craftsman, the worker, required no more than an assortment of hand tools with which to do his work. By contrast in today's industry the worker will typically have no hand tools but will be in charge of a machine or a system of machines representing an investment of tens or even hundreds of thousands of dollars. Compare the nature of the worker skills involved. The one is essentially a tool competence; the other is a machine competence involving a sense of machine rationality. The one is a skill in manipulation; the other is an ability to keep the machine or the system of machines in operation and in which an entirely different form of manipulative ability is required. Today's skill is becoming increasingly intellectual and technical as the worker is no longer required to make something.

It would seem that skill as we have taught for in industrial arts will necessarily require rethinking if industrial arts is to be reflective of technology. As the technical goes beyond the making of things a new pattern of excellence will unfold. Incidentally, as this happens industrial arts will no longer be the haven for boys who want to get away from reading and study. The skill as in the making of things is still important in the new industrial arts, but there are even greater heights of excellence for which we should teach.

With the changing nature of skill comes a changing concept of work. It appears that the ultimate purpose of work in today's living is leisure. Work in industry is such that the work week still continues to decline. At present on a national average the worker spends approximately 22 percent of his total week at his job. With this abundance of discretionary time the recreational function of industrial arts —

recreation through technology — must come into play. As it does the type of activity which characterizes industrial arts at present will find its greatest usefulness, except that instructional methodology must necessarily change if the program will be recreative. With but one function to emphasize, this program will be unique among the offerings of industrial arts.

CHAPTER ELEVEN

A Proposed Program of Preservice Technical Education

The sources for curricula in the technical preparation of teachers of industrial arts are inherent in the interaction of man and his technology. This is in the manner of a subsumption to the underlying assumptions earlier identified. The elements of this technical preparation then are to be drawn from analyses of industry and the curricular components representative of the human postulate. The underlying assumptions stand as guides to the development of this technical curriculum. At the same time they contain implications for the teaching methodology to be employed as well as for the facilities needed to implement the program.

The proposal to follow for a program of preservice technical education and training for industrial arts teachers is built upon the total of the preceding discussion. And since it is, the continuing lack of concern for curricular antecedents is becoming increasingly apparent. Any resemblance to typical teacher education programs is coincidental rather than intentional. The hope would be that existing programs resemble the proposed because it would be indicative of their timeliness. Any program of technical preparation must lead to both technical comprehension and competence. As it provides this technical background it must facilitate the acquisition of a technological rationality. The technical without this rationality is likely to become enslaving rather than liberating in the educative sense. Two sequences of courses are proposed: Block I and Block II. Block I provides for the study of what is called Fundamentals of Technology. Block II provides for increasing breadth as well as for penetration and enables the student to acquire at least three major areas of concentration.

Block I. The Fundamentals of Technology

Courses in this sequence are intended to introduce the student formally to technology and then to acquaint him with it. Together they provide the necessary orientation and familiarization as a background for a technologically directed industrial arts. These courses are necessarily general, and yet very early they give to the student the direction for his over-all technical preparation. At the same time concern for the discovery of student potential within this atmosphere of technology is emphasized in order that he may be aided in the selection of his fields for study in Block II.

Block I: A. Technology and the Material Culture (5 quarter hours)

Technology: its origins
its development
its forces
its relation to science
its international aspects
and industrial arts education

The purpose of this course is to acquaint the student with the concept of technology as America's material culture, to point out the impact of technology on American culture and on other cultures, and to identify the role of the individual in advancing technology. It deals with concepts and introduces the student to the magnitude and to the cultural significance of industrial arts when it is reflective of technology.

Block I: B. Technology and American Industry (5 quarter hours)

American industry: its origins
its development
its organization and structure
its leadership
its international aspects
its problems and solutions
and the individual
and industrial arts education

This course identifies the relationships of industry and technology and points out the role of industry in today's technology. It studies industry as an American economic institution, points out the role of the individual within it, and proposes an effective liaison between industry and industrial arts education.

Block I: C. Technical Research and Development (10 quarter hours)

Technical graphics: principles and application

Technical research: attitude, methods and procedures

Technical design: principles, practices, evaluation

Product-project development

Two or more courses are included in this area. Here the student learns the use of technical drawing both as graphic communications and as graphic solutions to technical problems. Fundamentals of research, including the attitude of research, techniques, procedures, and its applications are included. Principles of technical design as in engineering are studied and applied. Procedures for project development including creative thinking, engineering, experimenting, inventing, and constructing are studied and implemented.¹

Block I: D. The Manufacturing Laboratories (30 quarter hours)

<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>
Ceramics	Metals	Graphic Arts
Plastics	Woods	Paper
Chemicals	Electrical	Textiles
Rubber	Tools & Machines	
Foods		

The manufacturing laboratories are both courses and facilities for the study of manufacturing materials and processes and their applications as well as representative industries. The laboratories may be grouped according to related industries. The combination suggested above includes three such laboratories; other combinations may be arranged.²

Block II. Advanced Technology

Courses in Block II, Advanced Technology, provide for both an extension and a penetration in study at the same time that the student increases his proficiency in the areas of his concentration. There are seven fields for concentration. From these the student is expected to select at least three.

¹ Delmar W. Olson, *Technology and Industrial Arts*, Columbus, Ohio: Epsilon Pi Tau, 1957, pp. 161-164.

² *Ibid.*, pp. 107-137.

Block II: A. The Production Laboratories (10 quarter hours)

Ceramics	Plastics	Tools & Machines
Graphics Arts	Textiles	Woods
Metals		

The production laboratory is both course and facility in which industrial methods are employed in the quantity production of items. The laboratory is seen as being one, two, or more separate facilities. The eight industries suggested could be eight individual laboratories or they could be combined into related groups. The items carried into production are considered to have originated in the research and development laboratory. In the production laboratories they are adapted to production and then with the necessary tooling they are manufactured. Production planning, scheduling, materials control, and such components of management may well be handled by students who have completed the course in Management.

Block II: B. The Power and Transportation Laboratory (10 quarter hours)

Power Plants	Airways
Power Transmission	Spaceways
Power Controls	Highways
Power Utilization	Railways
Fuels	Seaways
Servicing	Other

Instruction in power and transportation is concentrated in an appropriate laboratory. The course acquaints the student with the nature of power, its production, control, and utilization. Similarly, it acquaints him with today's transportation, its means and systems and their control, operation, and servicing. Instruction in the operation of power and transportation media is provided.³

Block II: C. The Construction Laboratory (10 quarter hours)

Architectural elements
Engineering elements
Construction elements

This course gives representation to the huge construction industry which produces housing for the individual, business, industry, school,

³ *Ibid.*, pp. 141-156.

government, and such. It acquaints the student with the nature of research, design, development as employed in the industry as well as with the applications of science and engineering in the production of housing.⁴

Block II: D. The Electronics Laboratory (10 quarter hours)

Industrial developments, applications, production
Communications developments, applications
Home-consumer applications
Research developments and applications

This course concentrates on the field of electronics and its utilization. It follows the course in electricity included in the fundamentals of technology sequence. The student is instructed in theories and principles and their applications as made in such areas of industry as production, communications, business, home services, government, and research.⁵

Block II: E. The Management Laboratory (10 quarter hours)

Industrial organization, structures
Management systems
Production planning, scheduling, controls
Industrial economics
Management and the worker
The role of the consumer

The course in management recognizes the nonproductive side of industry. It involves the study of people in industry. It acquaints the student with the nature, structure, and organization of typical industries as economically productive institutions.⁶

Block II: F. The Research and Development Laboratory (10 quarter hours)

Advanced technical graphics
Technical research and reporting
Engineering and scientific principles, theories, applications

⁴ *Ibid.*, pp. 137-141.

⁵ *Ibid.*, pp. 156-158.

⁶ *Ibid.*, pp. 158-60.

Industrial research as resources
Project research and development

This is the course or courses which presents to the student the industry of discovery and which provides the student with an opportunity to develop his own talents for ideation, creating, reasoning, problem solving, and constructing in an environment of experimentation and an atmosphere of inquiry. He gets further instruction in technical graphics as well as in research reporting. He studies engineering and scientific theories and principles and their applications. He becomes acquainted with research as carried on in industry and learns to use research data as resources. All of the preceding finds its way into the student's individual project researches and development.⁷

Block II: G. The Recreation Laboratory (10 quarter hours)

Industrial arts as recreation
Industrial arts as liberal arts
Industrial arts as therapy

The recreation laboratory is the course or courses which acquaints the student with the nature of recreation through materials. It supplements the other courses in both blocks and draws on them for applications to purposes of recreation and for applications in recreation programs. It likewise acquaints the student with the contributions of industrial arts to the so-called liberal arts at the university level. Industrial arts as a medium of therapy for use in hospitals and institutions also is studied.⁸

The industrial arts teacher with this technical preparation would be grounded in the materials, processes, problems, techniques, and products of contemporary industry. He also would be knowledgeable of the technology and his role in it. An adequate program can provide for no less.

⁷ *Ibid.*, pp. 161-164.

⁸ *Ibid.*, pp. 90-101.

SECTION V

Selection of Students

Howard F. Nelson
Acting Chairman, Industrial Education Department
University of Minnesota
Minneapolis, Minnesota

CHAPTER TWELVE

The Selection of Students for Industrial Arts Teacher Education

The Problem

Very few aspects of the future of higher education will test the resourcefulness and ingenuity of admissions officers of colleges and universities more than the coming crisis of rising enrollments. All fields of higher education will be involved and must make themselves ready for the influx. Thus industrial arts teacher education will share in the flood of students and in the resultant difficulties and must be prepared to admit all who apply or attempt to select those with the greatest potential.

One must agree with the report from *U. S. News and World Reports*¹ which indicates that, "The crisis is one of too little money, too few teachers, and a shortage of classrooms to handle the flood of young men and women who soon will be beating at the doors of all institutions of higher learning." In attempting to search out the techniques and plans by which the colleges and universities might assume to match the number of students to the existing facilities, this report summarizes collected suggestions in the statement, "Higher standards, as a result, are going to be set as a means of holding enrollments down to capacity. Entrance requirements, already going up, will be raised even higher. Colleges will be far more selective in choosing students."²

¹ "Crisis in the College," *U. S. News and World Reports*, XXXXII (June 14, 1957), pp. 48-50.

² *Ibid.*, p. 53.

In complete agreement with these conclusions, Arthur Traxler³ feels that, ". . . it is imperative that the best possible means of selecting college students be used, not only to make sure that individuals are evaluated fairly and thoroughly, but also to promote our national and social welfare." Millett⁴ on the other hand raises the economic issues of the situation with the pronouncement, ". . . restrictive admission avoids the economic wastefulness of providing facilities and personnel for students who are poor educational risks and will not complete college work." Pax⁵ agrees with every letter of this statement while Thompson⁶ raises questions about the wisdom of restricting the amount of college to the student's ability. Horn⁷ reminds us that they are coming and we had better get on with our responsibilities for educating them.

None of these writers has a suggestion to improve the process of selection and admission except to elevate the standards. While Traxler⁸, Pax⁹, Snyder¹⁰, Getzels¹¹ and others have appealed for more complete use of tests, personal data, principal's recommendations, high school rank, high school record and similar long-used practices in addition to the usual entrance tests, these represent nothing really new.

One cannot depreciate the use of generally accepted tests of competence as a requisite for admission, placement or guidance purposes; these must remain until better ones are found or devised. But, assuming for a moment that the thresholds for admission will be raised as a means of improving student selection, what would happen if "standards," whatever that means, were elevated?

³ Arthur E. Traxler, "What Methods Should Be Employed in Selecting Students?" *Current Issues in Higher Education*. Washington, D. C.: Association for Higher Education, 1955, pp. 49-50.

⁴ John D. Millett, "Restrictive Admission in State-Supported Higher Education," *Journal of Higher Education*, XXVII (April, 1956), p. 178.

⁵ The Reverend Walter T. Pax, "Admissions Procedures," *Current Issues in Higher Education*. Washington, D. C.: Association for Higher Education, 1956, pp. 92-93.

⁶ Ronald B. Thompson, "Rising Educational Needs," *College and University*, XXIX (July, 1954), pp. 556-563.

⁷ Francis H. Horn, "Who Should Go to College?" *Current Issues in Higher Education*. Washington, D. C.: Association for Higher Education, 1955, p. 38.

⁸ Traxler, *op. cit.*, p. 50.

⁹ Pax, *op. cit.*, p. 93.

¹⁰ Rixford K. Snyder, "Admissions Procedures: Effective Means of Selection," *Current Issues in Higher Education*. Washington, D. C.: Association for Higher Education, 1956, pp. 87-92.

¹¹ J. W. Getzels, *The Coming Crisis in the Selection of Students for College Entrance*. Washington, D. C.: A.E.R.A. Bulletin, 1960, p. 23.

Some present-day writers are advocating that the fiftieth percentile be made the cut-off point for the A. C. E. Psychological and the Cooperative English tests as one important improvement in standards.

Being uncertain of the wisdom of this action, Dean Smith¹² set about to learn what would have happened had this cut-off been employed. After studying an entire class which entered Kansas University in 1955, Smith concluded that every other avenue should be investigated first before this kind of raise is installed. He counted among those who would have been lost, fifty-nine graduates from the College of Liberal Arts and Sciences, thirty-seven from the School of Business, forty from Education, twenty-two from Engineering, twenty-four Fine Arts, five Journalism, seven Law, seven Medicine and seven from Pharmacy.

At about the same time, the writer made a request for an intensive study of University of Minnesota Industrial Education majors to locate, if one existed, a pattern of data from the official student personnel records which would prove helpful in admitting to the Department. Joseph Schnitzen¹³, a college counselor for these majors, made a study of freshmen admitted over a five-year period. After assembling all available facts, and using successful completion of the program and graduation as the criterion, he found no clear-cut pattern of factors worthy of use for our counseling purposes.

In an approach similar to Smith's Kansas study, the group was studied against a raise in the threshhold for admission. While all of these students would have been in the upper sixty percent of their graduating class to be admissible in the first place, Schnitzen tried raising the lower limit to the fiftieth percentile and then to the sixtieth. Either change would have eliminated just as many who later completed the program successfully as it admitted those who subsequently failed it. He concluded that this kind of approach produced nothing which might be used with confidence in selecting or advising students in Industrial Education.

The whole situation grows in complexity with the questions of Getzels¹⁴, who expresses deep concern lest highly creative students with high native ability be excluded from higher education because of

¹² George Baxter Smith, "Who Would Be Eliminated? A Study of Selective Admission to College," *Kansas Studies in Education*, VII (December, 1956), pp. 1-28.

¹³ Joseph Schnitzen, "A Five-Year Study of Industrial Education Freshmen," University of Minnesota, College of Education, Student Personnel Office, 1955 (typewritten).

¹⁴ Getzels, *op. cit.*, p. 23.

entrance tests. He warned that these widely used measures were biased in favor of the "convergent intellects" and that they mitigated against the "divergent intellects," who after all, might develop into the most highly creative persons in the end. Torrance¹⁵ has raised essentially the same serious questions about the typical I. Q. tests.

Should we be concerned about this situation? Are there outstanding freshmen who are lost to industrial arts teacher education because certain tests mitigate against them?

The current rate of college drop-out bears discussion. The facts are practically the same no matter which college or university's record of student retention is examined. Iffert's¹⁶ recent summaries suffice to illustrate the situation. About one-fourth of all new students are lost by the end of the first year; forty per cent or less continue through graduation. Many who are lost are fully capable of continuing in the programs to which they were admitted or they would not have been admitted in the first place. However, under the conditions of trial and error admission practices, the ultimate total losses of talent, time, money, instructional responsibility and facility use are enormous.

Students of the Department of Industrial Education at the University of Minnesota fare better, when once admitted, than most students in the College of Education. In a recent study by Wilk and Glotzbach¹⁷, in which seven curriculums were examined, the persistence of these majors was found to rank next to highest with over forty-nine percent of freshmen admitted retained through graduation.

The staff of Industrial Education admits to the exercise of careful admission practices. The record of retention seems to support the wisdom of this decision. At the same time, instructors are not satisfied with present procedures because of the obvious inadequacies which have been described thus far.

Coincident with these developments, the departmental staff recognized that the selection of students and the improvement of instructional programs must go hand in hand. Being thoroughly convinced that the curriculum, content and instructional aspects of the prepara-

¹⁵ "The Creative Child," *Look*, XXV (November 7, 1961), pp. 111-114.

¹⁶ Robert Earl Iffert, "Drop-outs: Nature and Causes; Effects on Student, Family, and Society," *Current Issues in Higher Education*. Washington, D. C.: Association for Higher Education, 1956, pp. 94-102.

¹⁷ Roger E. Wilk and Charles J. Glotzbach, *An Initial Report of Persistence in the Four-Year Curriculums of the College of Education*. University of Minnesota: Bureau of Educational Research, BER-59-9, p. 14.

tion of teachers needed a complete rebuilding, they undertook the task of developing an entirely new one.

Although not influenced by Taylor¹⁸ who advocated, ". . . scrapping our present system of instruction and inventing a new one," they might well have been. From weekly staff meetings over a two-year period emerged a plan designed to prepare teachers capable of teaching in the schools of the future.

*The Minnesota Plan For Industrial Arts Teacher Education*¹⁹ envisions graduating a teacher, well grounded in a mathematics and science core of learning, a design core and a technology core, who can help youth to use tools, materials and ideas to solve his learning problems. This teacher will be able to help youth gain command over the basic principles and concepts, the important aspects of the structure of learning as clearly delineated by Bruner²⁰ in a recent publication. A wiser selection of students under this projected program of preparation seems of paramount importance.

A research study completed by Bradley²¹ furnished the initial impetus for a fresh approach to the problem of selecting students for industrial arts teacher education. Bradley used the *Minnesota Vocational Interest Inventory*²² to study the interest patterns of printing students and skilled craftsmen in printing. Completed profiles of the two groups looked like carbon copies, an outcome which excited this writer to immediately contact Dr. Kenneth Clark, the author, about the advisability of using the M. V. I. I. with Industrial Education majors. Although possessed of no information on these students, Clark displayed intense interest in having them scored on the Inventory.

If students in programs which trained men to become printers exhibited interest patterns very similar to those interest patterns shown by men in the trade, then, surely, there must be an identical situation among students who wished to become teachers of industrial arts when

¹⁸ Harold C. Taylor, "The World of the American Student," *Current Issues in Higher Education*. Washington, D. C.: Association for Higher Education, 1956, pp. 21-22.

¹⁹ William J. Micheels and Wesley E. Sommers, *The Minnesota Plan for Industrial Arts Teacher Education*. Bloomington, Illinois: McKnight & McKnight Publishing Company, 1958.

²⁰ Jerome S. Bruner, *The Process of Education*. Cambridge, Massachusetts: Harvard University Press, 1960, p. 18.

²¹ Arthur Bradley, "Estimating Success in Technical and Skilled Trade Courses Using Multivariate Statistical Analysis," Unpublished Ph.D thesis, The University of Minnesota, 1958.

²² Kenneth E. Clark, *The Minnesota Vocational Interest Inventory*. Unpublished to date.

compared with experienced teachers. The M. V. I. I. appeared to offer an untried avenue of investigation which might prove profitable with the selection of potential students.

The Measurement of Interests

The writer has long known of the persistence of interests and of the stability of them throughout youth into adult life. It seems logical to hypothesize that industrial arts teachers and students in preparation for this work do not differ significantly from people in general with respect to interest persistence. Thus, research might reveal that they are possessed of interest patterns more distinct and homogeneous than other selected groups.

After testing one thousand liberal arts freshmen, Berdie²³ reported ". . . that vocational interest tests differentiate better among curricular groups that do most kinds of tests, and the prediction of which curriculum a student will graduate from can be made better with an interest test than either aptitude or achievement tests." Since existing testing procedures for initial admission serve only to select those who have the capabilities for college work, and they do virtually nothing for specific curriculum areas, the measurement of interests seemed to offer greatest aid in the selection of students for industrial arts teacher education.

On the matter of interest persistence, the monumental research of Strong²⁴, the supporting work of Trinkhaus²⁵, the excellent resource of information provided by Super²⁶, the interpretations assembled by Clark²⁷, the test re-test research of Powers²⁸ and Stordahl²⁹, and the

²³ Ralph F. Berdie, "Aptitude, Achievement, Interest and Personality Tests: A Longitudinal Comparison," *Journal of Applied Psychology*, XXXIX (April, 1955), pp. 103-114.

²⁴ Edward K. Strong, Jr., *Vocational Interest 18 Years After College*. Minneapolis: University of Minnesota Press, 1955.

²⁵ William K. Trinkhaus, "The Permanence of Vocational Interests of College Freshmen," *Educational and Psychological Measurement*, XIV (Winter, 1954), pp. 641-646.

²⁶ Donald E. Super, *Appraising Vocational Fitness By Means of Psychological Tests*. New York: Harper, 1949, pp. 431-436; 459-460; 728; and 732.

²⁷ Kenneth E. Clark, *Vocational Interests of Non-Professional Men*. Minneapolis: University of Minnesota Press, 1961.

²⁸ Mabel K. Powers, "A Longitudinal Study of Vocational Interests During the Depression Years," Unpublished Ph.D. thesis, University of Minnesota, 1954.

²⁹ K. E. Stordahl, "The Stability of Strong Vocational Interest Blank Patterns for Pre-College Males," Unpublished Ph.D. thesis, University of Minnesota, 1953.

summarizing statements of Carter³⁰ are all in agreement with Darley and Hagenah³¹ who conclude that,

We read the weight of evidence to indicate that there is substantial stability or permanence in measured interest patterns over short or long intervals. The commonly held view that interests change capriciously or under spur of exposure or with the impact of experience is not borne out in the research studies that are available in the literature.

In the face of overwhelming evidence favoring persistence of interests, the question arises as to which kinds of vocational interest expression should be assessed. The writer took a clue from Carter³² who believes that, "Vocational interests, like traits, should not be confused with any of the specific indicators or manifestations." In other words, a researcher should not depend upon overt expressions such as, "I want to be a lawyer, a teacher, a carpenter." Rather than accept these replies, he must obtain measures of a variety of indicators consisting of values, feelings or beliefs associated with the characteristic of selected vocations. Herein lies the unique approach to interest measurement employed in the present study.

Upon turning to the research in industrial arts teacher education, one immediately faces a stinging rebuke from Fuzak³³ who experienced extreme frustration in his search for genuine research effort in this field beyond that completed for degree requirements. The writer's examination of these produces little help or guidance for the problem of selecting students for industrial arts teaching.

Barnhart³⁴ added another to the series of Kansas University studies of freshmen, and concluded that, (1) selective admission cannot be safely practiced on the basis of instruments currently used, and (2) the scores on placement tests used in the study may be helpful in counseling students provided that the limitations of this usage of scores are clearly understood by both the counselor and the counselee.

³⁰ Harold D. Carter, "The Development of Interest in Vocations," *Forty-Third Yearbook*. N.S.S.E., Part I, 1944, pp. 255-276.

³¹ John G. Darley and Theda Hagenah, *Vocational Interest Measurement, Theory and Practice*. Minneapolis: University of Minnesota Press, 1955, p. 73.

³² Carter, *op. cit.*, p. 255.

³³ John A. Fuzak, "Research by Industrial Arts Teacher Education," *Research in Industrial Education. Yearbook IX*. A.C.I.A.T.E., Bloomington, Illinois: McKnight & McKnight Publishing Company, 1960, pp. 44-45.

³⁴ E. L. Barnhart and Kenneth E. Anderson, "A Study of the Relationships Between Grade-Point Averages, Placement-Test Scores, Semester Hours Earned, and Area of Major Interest for the Group Who Entered the University of Kansas in the Fall of 1954," *Kansas Studies in Education*, XI (January, 1961), pp. 1-36.

In a discussion of the needed research in this area, Bauer³⁵ devoted nearly twelve pages to a discussion of needed research, but allocated but a few lines to the issues having to do with selecting students with the best potential for teacher education.

Jarvis³⁶ explored the procedures and critically examined the entrance tests given at Stout State College and then developed regression equations based on six measures with which he made very satisfactory predictions of success in academic and total scholarship areas. While this study does not involve interest measurement, it parallels the present research in its main objective of estimating the staying power of students.

From the supervisor's standpoint, Ketcham³⁷ summarized the areas of needed research, and while concerned that high type teachers be available, provided no suggestions regarding the initial selection of students.

A rather exhaustive review of the literature fails to produce research studies which duplicate or even bear close relationship to the present problem. This may be due primarily to the unique approach to interest measurement which was used here by comparison with the more or less standard procedures employed by others.

The writer's rather arbitrary decision to attempt an entirely new investigation into interest assessment does not in any way deny the existence or importance of standard inventories^{38 39 40}. However, because of the attempt to develop a new angle, the research from these standard instruments was not reviewed except with respect to the persistence of interests.

While a great many educators have spoken to the problem of limiting enrollments in higher education, a summary of their recommenda-

³⁵ Carlton E. Bauer, "Needed Research in Industrial Arts Teacher Education," *Research in Industrial Education, Yearbook IX*. A.C.I.A.T.E., Bloomington, Illinois: McKnight & McKnight Publishing Company, 1960, pp. 102-113.

³⁶ John A. Jarvis, "Student Survival Factors in the Stout Institute," Unpublished Ph.D. thesis, The University of Minnesota, 1953.

³⁷ G. Wesley Ketcham, "Needed Industrial Arts Research from the Viewpoint of the Supervisor," *Research in Industrial Education, Yearbook IX*. A.C.I.A.T.E., Bloomington, Illinois: McKnight & McKnight Publishing Company, 1960, pp. 114-118.

³⁸ Edwin A. Lee and Louis P. Thorpe, *Occupational Interest Inventory*, Advanced Series. Los Angeles, California: California Test Bureau.

³⁹ Edward K. Strong, Jr., *Strong Vocational Interest Blank for Men, Revised*. Palo Alto, California: Consulting Psychologist Press.

⁴⁰ G. Fredric Kuder, *Kuder Preference Record - Vocational*. Chicago: Science Research Associates.

tions boils down into one very simple expedient; raise the standards. It is most difficult to comprehend the reasonableness of this proposal when higher education presently loses a huge number of able students through the drop-out route. What evidence is there to suggest that this record of student retention will be improved after the standards are raised?

Students in industrial arts teacher education represent an extremely small segment of this total population although they will be affected, yes governed, by the same regulations as are specified for all people in higher education. None of us in this branch of teacher education should ask to have the thresholds for admission lowered or altered for our majors because we must have many of the most able students and must settle for nothing less.

After puzzling over these issues for quite some time, this writer concluded that something very important must be lacking in the admissions criteria which are used. These are the same criteria which the leaders in higher education are proposing to enforce with greater rigor in order to limit enrollments. For industrial arts majors, the standard admission criteria, the entrance tests, high school rank and similar items offer no special help except to exclude those who appear to be incapable of carrying the academic work of higher education; they give us no estimate of fitness for industrial arts teacher education. This situation accentuated the need for a thorough investigation of other possibilities.

Virtually nothing has been done with the measurement of interests of industrial arts teachers in a way which would permit comparison of these with the interests of beginning students. The writer, intrigued with the hypothesis that incoming freshmen, in addition to meeting the general admission requirements, might possess some measurable interest patterns which could be compared with those of our finest teachers, decided to investigate. Interest measurement appeared to offer the greatest potential as a worthy avenue of pursuit.

With no specific research of the type contemplated to refer to, it became patently clear that this venture would involve research in unexplored territory.

Purposes Of The Study

Major Objectives

To provide better criteria and to improve or refine existing criteria by which students are selected or admitted to programs of industrial arts teacher education, and;

To maximize teacher and department effectiveness and efficiency by attempting to minimize the number of new students admitted who will drop out or change objectives prior to completion of the program.

Method of Procedure

1. Using the *Minnesota Vocational Interest Inventory* as the criterion instrument, study (1) experienced teachers in graduate programs of industrial arts teacher education, (2) seniors about to graduate, (3) freshmen upon admission to programs, and (4) freshmen drop-outs as they occur.
2. Develop scoring keys based on an analysis and comparison of the answer sheets of all experienced industrial arts teachers in graduate programs with Clark's "Tradesmen in General" population.
3. Cross-validate the experienced teacher keys with a second administration of the M. V. I. I. to a comparable group of experienced teachers.
4. Score all answer sheets and tabulate by pre-selected distributions.
5. Calculate tests of significance of differences in means of selected groups.
6. Develop and provide cumulative frequency distributions and scores based upon an analysis of M. V. I. I. scores of freshmen and upon analysis of personal information derived from the blanks completed by each testee.
7. Refine and develop modified scoring keys following an item analysis of all answer sheets of freshmen who have clearly indicated satisfaction with the industrial arts teacher education program, and the answer sheets of those who have clearly indicated dissatisfaction with it.
8. Analyze the personal information blanks for all freshmen, the high scoring, the low scoring and the drop-outs, to isolate additional factors worthy of use in counseling.
9. Study a random sample of freshman drop-outs to determine changes in the M. V. I. I. scores, reasons for leaving the program, the number who re-enter college with changed objectives, the fields of concentration elected upon re-entry, and the vocations entered when further college is rejected.
10. Develop and provide cumulative frequency distributions and scores based upon an analysis of M. V. I. I. answer sheets of seniors and upon analysis of personal information derived from the blanks completed by each testee.

11. Study a random sample of seniors five years after graduation to determine changes in the M. V. I. I. scores with teaching experience, the changes in job status over that period, and obtain measures of the stability of interest patterns for them.

Population Studied

The Criterion Group (N = 199)

All experienced teachers in graduate programs of industrial arts teacher education on the campuses at the University of Missouri, Stout State College, Western Michigan University and the University of Minnesota during the summer session, 1958.

Sub-group, Outstanding (N = 105)

Those graduate students rated by instructors as exhibiting over half of eleven characteristics descriptive of "one of our finest teachers."

Sub-group, Mill-Run, (N = 94)

Those graduate students not rated as above and, therefore, assumed to be mill-run.

The Cross-Validation Group (N = 103)

All experienced teachers in industrial arts teacher education programs on the campuses of Stout State College, Western Michigan University, Iowa State University and the University of Minnesota during the summer session, 1961.

Seniors (N = 314)

All available seniors just prior to graduation during the academic years, 1958-59, 1959-60, 1960-61 on the campuses at San Diego State College, St. Cloud State College, Stout State College, Western Michigan University and the University of Minnesota.

Freshmen (N = 467)

All available freshmen upon admission to programs during the academic years, 1958-59, 1959-60, 1960-61 on the campuses at San Diego State College, St. Cloud State College, Stout State College, Western Michigan University and the University of Minnesota.

Sub-Groups, Satisfied and Dissatisfied

Except for the cross-validation graduate group, all other groups were divided into two sub-groups — those who expressed satisfac-

tion with industrial arts teacher education and those who expressed dissatisfaction with it.

Recapitulation — Groups Compared

Outstanding Graduate, Satisfied
Outstanding Graduate, Dissatisfied
Mill-Run Graduate, Satisfied
Mill-Run Graduate, Dissatisfied
Seniors, Satisfied
Seniors, Dissatisfied
Freshmen, Satisfied
Freshmen, Dissatisfied
Cross-Validation Graduate

Statistical Analysis of Data

For each comparison between the groups, the means, standard deviation, variance, standard error of the difference in means, Bartlett test for homogeneity of variances and the "t" statistic were calculated. In the cross-validation comparison, the percentage of overlap (Tilton) was calculated.

The writer specified a probability of .05 as a reference for this study. Any test of significance which yielded a value of from .05 to .01 was regarded as significant and the null hypothesis was rejected. When a probability of less than .01 was obtained, the finding was regarded as very significant and the null hypothesis was rejected with greater confidence. In cases where a probability greater than .05 was obtained, the null hypothesis was accepted.

Acceptance or rejection of the hypothesis was based on the "t" statistic and decisions to accept or reject were made by reference to Fisher's tables with the appropriate degrees of freedom.

Major Hypothesis Tested

There is no significant difference between the means of the scores on the M. V. I. I. for the groups and sub-groups above.

Findings and Conclusions

The statistical analyses of data used in this study seem to warrant the following findings and conclusions:

1. In all tests of significance of differences in means, the Bartlett test for homogeneity of variance reveals no significant differences in

variance between the groups compared.

2. In cross-validating the experienced teacher key, the percentage of over-lap (Tilton) between the criterion group and the cross-validation group was found to be 76 per cent.

Interpretation

This figure means that 76 per cent of the criterion group scores are matched by scores from the cross-validation group, an outcome expected, adequate and acceptable.

3. Outstanding graduate students, seniors and freshmen who express dissatisfaction with industrial arts teacher education programs differ very significantly from those who express satisfaction with them.
4. Outstanding graduate students, satisfied, differ very significantly from seniors, satisfied and freshmen, satisfied.
5. Outstanding graduate students, dissatisfied, differ significantly from seniors, dissatisfied.
6. Mill-run graduate students, satisfied, differ very significantly from seniors, satisfied and freshmen, satisfied.
7. Mill-run graduate students, dissatisfied, differ very significantly from freshmen, dissatisfied.
8. Outstanding graduate students, satisfied, do not differ significantly from mill-run graduate students, satisfied.
9. Outstanding graduate students, dissatisfied, do not differ significantly from mill-run graduate students, dissatisfied.
10. Mill-run graduate students, satisfied, do not differ significantly from mill-run dissatisfied.
11. Mill-run graduate students, dissatisfied, do not differ significantly from seniors, dissatisfied.
12. In the light of findings reported in numbers 8, 9 and 10 above, all outstanding and mill-run graduate students were combined into one population, the criterion group.
13. Freshmen, aged 18 years or less, differ very significantly from freshmen 19, 20 or 21 years of age. Older students are progressively stronger.
14. Freshmen who report their most interesting hobby to be participation in team-type sports differ very significantly from those who report having one consisting of a skilled-type activity. The latter are stronger.
15. Freshmen who report their most interesting hobby to be customiz-

- ing cars or rebuilding "hot rods" differ significantly from those who report the skilled-type of hobby. The latter are stronger.
16. A tentative cut-off score of 26 on the Inventory (using both the experienced teacher key and the freshmen satisfied-dissatisfied key) will isolate 56.5 per cent of the dissatisfied freshmen and those additional freshmen who have interest patterns comparable to the dissatisfied freshmen.
- At the same time this cut-off score of 26 will eliminate 8.5 per cent of the remaining freshmen in the group.
17. Until more data are obtained and processed, this cut-off score of 26 appears to isolate the greatest number of the dissatisfied freshmen and those having interest patterns like them with the least sacrifice of other students.

Without question, among the 8.5 per cent of other students eliminated above are some who will suffer elimination because of scholastic standards so that the actual loss may be considerably less than 8.5 per cent.

Discussion

1. As a group, competent, professional industrial arts teachers possess clear-cut patterns of interests which are markedly homogeneous; these can be identified by the use of an appropriate interest inventory.
2. These patterns are sufficiently distinct to permit a researcher to clearly differentiate industrial arts teachers from other selected groups.

In the development of the criterion key which was used throughout the study, it became apparent almost immediately that industrial arts teachers were markedly different from Dr. Clark's reservoir of "Tradesmen in General" population. The casual reader, upon noting the title of this group, might surmise that the men included were primarily tradesmen. While Clark has studied many men from the trades, the above group of T. I. G. was composed essentially of young Navy men who were attempting to qualify for highly specialized training programs in electronics, radar, machine shop and similar fields.

The description of key development involves long and detailed explanation beyond the scope of this present report. For those who wish to know more about this topic, *The Vocational Interests of Non-professional Men*⁴¹ will provide the necessary detail.

⁴¹ Clark, *op. cit.*

As the Inventory choices of industrial arts teachers were carefully analyzed against the choices of the T. I. G. group, this researcher found that the former were decidedly and uniquely similar in their interest patterns as well as distinctly different from the comparison group. This fact enabled the writer to construct the criterion key by skimming off the very top discriminating items for inclusion and rejecting all others which were not razor sharp.

Typically, accepted practice of building keys for interest inventories allows the researcher to incorporate items which begin to discriminate 12 per cent or better between compared groups. Many have been developed beginning at this level.

However, in the criterion key developed for this study, only items which discriminated 24 per cent, with a maximum power of 52 per cent for the strongest items, were included. This decision provided a manageable key having forty-eight items and caused the discard of nearly 350 items which discriminated 12 per cent up to 24 per cent. From this explanation, one can appreciate the sharpness with which industrial arts men may be differentiated from other selected groups.

3. Interest inventory items which should appeal to a mechanic, tinkerer, or person who wants to be "handy with his hands" will not serve to identify an outstanding industrial arts teacher.

An average lay person, if asked, would characterize an industrial arts teacher as some kind of mechanic, a tinkerer, or one who would be handy with his hands. Yet, the discriminating items incorporated in the criterion key dispute this description and actually appear to be diametrically opposed to it. The best of our industrial arts graduate students reject in a wholesale manner all inventory choices which would appeal to and be selected by the mechanic, tinkerer, or person who is handy with his hands.

Fundamentally, the best industrial arts teachers *are not* tinkerers, mechanics, persons who want to be "handy with their hands" as many believe.

4. Outstanding teachers are a group, quite apart, and they can be described and characterized by reference to the highly discriminating items incorporated in the M. V. I. I. keys developed especially for this study.

According to an analysis of the criterion key items, professional industrial arts teachers are a most unique group, unusually homo-

geneous in their patterns of interests, possessed of many fine qualities worthy of emulation, a team of men with whom one likely would be proud to be associated.

Nearly every aspect of this description can be "read" directly from the keyed items on the M. V. I. I.; others emerge when inferences are drawn from the separate replies, and the remainder are derived from close observation of and association with a substantial number of outstanding, high-scoring teachers who are known personally.

First and foremost, these men are competent, professional teachers in the finest connotation of the term. They are interested in helping youth to grow and mature, they consider it their responsibility to provide guidance and counseling for youth and to help them to make wise choices of all kinds. Many are artistic and capable of doing fine work in design, and, certainly, great numbers of them are truly creative. In addition, many possess a fairly high degree of manipulative skill in one or more areas of craftsmanship. Skill, however, always constitutes a part of the total pattern of teaching competence since these men reject the development of skill for skill's sake.

The most powerful discriminating items from the Inventory clearly show that industrial arts teachers are markedly socially-oriented men who are interested in people and desirous of giving them leadership. It seems quite evident that these teachers want to associate with and work in activities involving groups as opposed to those areas of interest in which they function alone.

These men are inquisitive, full of native curiosity, willing to accept the challenge of a new pursuit; obviously, independent thinking suits them because they enjoy reading, listening to talks and explanations about all things mechanical and technical; many express interest in writing "how to" kinds of articles.

Precision work involving close tolerances seems to have special appeal for them since strong patterns develop along these lines. However, skills are favored only to the extent that they become teaching tools and useful attainments with which to excite youth to learn. For example, the men exhibit no interest in the activity of taking a machine apart and reassembling it again to see how it works, but they do select this kind of activity as a learner's requirement.

Strong evidence suggests that repetitive work at a machine or in a business pursuit holds no inducement for them; neither does keeping the books, writing reports, checking calculations and similar tasks. On

the other hand, most would help systematize or organize a laboratory situation or draw plans for almost anything. A large majority cannot resist such a challenge.

If given the option of choosing, these men would teach arithmetic or chemistry in preference to English; they select basketball over poker or checkers; they want to help young people select their vocations more than to teach mathematics or perform chemical analysis.

The aims and goals of these outstanding teachers are centered pretty close around the business of teaching, but one must also admit that their goals have a long-range perspective about them. We know the best of the men as being introspective concerning teaching, understanding of youth, dedicated and interested in all people and the practitioners of the true art of teaching.

5. Students, whether experienced teachers, seniors, or freshmen, who express satisfaction with industrial arts teacher education programs differ sharply from those who express dissatisfaction with it.

Table I, which follows, provides a summary of data for all groups scored on the M. V. I. I. and illustrates the distinct differences in means between those students who expressed satisfaction and those who wrote of dissatisfaction with industrial arts teacher education. Since a large majority of these differences are statistically significant, it is interesting to the discussion to report that an intensive study of the literature of psychometrics fails to reveal studies in which significant differences have been observed between people described as satisfied and another group classified as dissatisfied.

Because the ultimate purpose of the present study was to obtain some insight into the problem of selecting freshmen, or helping them to locate themselves in those programs where they really belonged and where they might expect to experience success and happiness, the obtained differences in interest patterns of satisfied and dissatisfied freshmen proved especially enlightening and rewarding of the effort involved.

Further examination of Table I indicates that the M. V. I. I. performed remarkably well with all levels of students, but with unusual keenness among freshmen. Although the means of the several groups differed significantly as reported under *Findings and Conclusions*, the variability among the groups was not significantly different, so that no suspicion might arise from that aspect when comparing the separate

groups. These findings suggest that the obtained differences are genuine differences in interest patterns.

As a consequence, it appears that some real progress has been made in keying an interest inventory in a manner which will begin to prove helpful in identifying and selecting freshmen students for industrial arts teacher education.

Table I

INDUSTRIAL EDUCATION MAJORS; MEANS,
STANDARD DEVIATIONS OF SCORES ON THE
MINNESOTA VOCATIONAL INTEREST INVENTORY

	<i>x</i>	<i>s</i>
Outstanding Graduate		
<i>Satisfied</i>	37.51	4.64
<i>Dissatisfied</i>	33.96	4.57
Mill-Run Graduate		
<i>Satisfied</i>	36.22	5.12
<i>Dissatisfied</i>	33.50	5.48
Seniors		
<i>Satisfied</i>	34.30	5.15
<i>Dissatisfied</i>	30.28	6.03
Freshmen		
<i>Satisfied</i>	30.02	6.32
<i>Dissatisfied</i>	23.87	7.22
<i>Total Groups</i>	<i>N</i>	<i>x</i>
Outstanding Graduate	105	36.73
Mill-Run Graduate	94	35.73
Cross-Validation Grad.	103	33.14
Seniors	314	33.75
Freshmen	467	29.32
	<hr/>	<hr/>
	1083	

6. Dissatisfied freshmen are "like peas in a pod", distinctly different from our typical freshmen students, probably possessed of good potential, but definitely not for industrial arts teaching.

When large differences in mean scores of satisfied and dissatisfied freshmen became evident, this researcher immediately developed a second major key, labeled the *Freshman Satisfied-Dissatisfied Key*. As was done in preparing the criterion key earlier, this second key was built by making an item by item analysis of the six possible choices for each of the one hundred and ninety items and identifying those choices

which discriminated between the two groups. Here again, as was done with the criterion key, only item choices having discriminating power of from 24 per cent to 52 per cent were included. This standard of excellence of items resulted in a key containing twenty-two points.

The scores obtained for satisfied freshmen using the new key provided a distribution which can only be described as abnormally leptokurtic as well as negatively skewed toward the high scores. By contrast, the distribution of scores for dissatisfied freshmen proved to be platykurtic with no resemblance whatever to a normal distribution.

Thus, the Freshman Satisfied-Dissatisfied Key appeared to function especially well in separating the two groups, and after more research has been conducted on it, might serve for the selection process instead of the original criterion key developed on graduate students.

In the meantime, an intensive study of the interest expressions which constitute the discriminators between those satisfied and the other section enabled the writer to construct a thumb-nail sketch of the dissatisfied freshman, and others just like him, who have written that they "want out" of industrial arts teacher education.

Four hundred sixty seven freshmen from six campuses having industrial arts teacher education programs were asked, "If you could start all over again, would you still take the program of preparation for industrial arts teaching?" One out of every eight replied, "No."

When the answer to this question was, "No," the student completed the inquiry by stating what he would have done. These written replies included, "I want to be a coach," "Become a surgeon," "Go into business," "Be an engineer," and "Any field so long as it isn't teaching industrial arts." These are representative replies taken verbatim from student information sheets which were completed prior to taking the Minnesota Vocational Interest Inventory.

Freshmen who expressed dissatisfaction with or unhappiness in teacher education and wrote in another choice of preparation were classified as *dissatisfied* freshmen.

On the other hand, when students replied to the same question with a forthright statement. "Yes, I want to become an industrial arts teacher," they were classified as *satisfied* freshmen.

Dissatisfied freshmen are like peas in a pod; so are the satisfied freshmen, but the two groups are markedly different.

A careful, item by item analysis of the differences in interest patterns of satisfied and dissatisfied freshmen on the Minnesota Vocational Interest Inventory reveals a most interesting picture of the two groups.

What are the characteristics of this dissatisfied student who has told us he is leaving our programs as quickly as possible? What does he want? What is he like? How can we identify him? By analyzing the patterns of likes and dislikes expressed on the answer sheets for the M. V. I. I. it becomes possible to construct a vivid description of this student who "wants out" of industrial arts teacher education, and, when these characteristics are summarized, it also becomes quite evident that teacher educators don't want *him* either.

This student is interested primarily in developing a marketable skill provided it doesn't involve a long period of preparation or considerable amounts of work for him. He shows strong interest patterns slanted toward rather inconsequential attainments. The sharpest discriminating items in the Inventory develop because he wants to learn to run an office comptometer, a bookkeeping machine, a cash register, adding machine or typewriter. These choices are rejected wholesale by satisfied freshmen.

The goals of a dissatisfied freshman are shallow indeed; he doesn't want to go very far. His interest patterns indicate that he would be content in doing repetitive kinds of work such as sorting mail, checking figures, inspecting goods for damage in shipment or in operating a machine which makes parts.

Numerous items from the Inventory show that he doesn't care to make decisions, and this manifestation suggests that he would be content working under close supervision. Apparently, he does not like to solve problems, to study things out for himself or to use ingenuity. The challenge of independent thinking is not to his liking. He seems to lack curiosity for anything of importance which is assumed significant for industrial arts teachers.

He's a passive individual who likes to be entertained, but he can't get excited enough to contribute to the performance. He likes to listen to jazz recordings but he does not wish to hear a technical talk. He wants to help manufacture machine tools, but he does not care to design them.

He likes to "operate," "add columns of figures," "type," "inspect," or "sort," but does not choose to "supervise," "read about," "work out," "devise," "help select," "help another," "systemize," or "learn how to calculate with a slide rule."

And, perhaps most important of all, there is no evidence from the Inventory to suggest that he has any of the characteristics of a socially-oriented person who enjoys helping others, showing them how to do something or otherwise giving leadership.

Since this description of dissatisfied freshmen has been constructed by identifying the differences in interest patterns of satisfied and dissatisfied students, every comment about the latter may be reversed to characterize the men who are happy in and satisfied with industrial arts teacher education.

7. When all other conditions of freshman admission have been met, potential candidates for industrial arts teacher education can be identified with a high degree of confidence by studying the extent to which they exhibit the same interest patterns of competent, professional teachers.

Table II provides a cumulative frequency distribution of freshman scores on the M. V. I. I. using the original criterion key. An inspection of this table shows the number and per cent of the satisfied freshmen who would be eliminated at selected cut-off scores in order to identify dissatisfied freshmen or others like them.

For example, a criterion cut-off score of 15 would cause the loss of less than one per cent, but it will isolate almost 16 per cent of those who are leaving the program by their own admission. A criterion score of 20 will pin-point 22.2 per cent of the dissatisfied with a possible loss of 5.5 per cent of those who, ostensibly, appear satisfied. While this identification seems quite sharp, it becomes much keener when the Freshmen Satisfied-Dissatisfied Key has been applied.

8. Freshmen who harbor the characteristics of dissatisfied students may be identified with a fairly high degree of certainty by reference to selected M. V. I. I. cut-off scores.

Table III, which follows, provides a statistically defensible redistribution of the same students shown in Table II on the basis of a second scoring with the *Freshman Satisfied-Dissatisfied Key*. Those students tabulated under the Dissatisfied heading include all who have indicated in writing a desire and plan for leaving industrial arts teacher education and those who exhibit interest patterns just like them.

Now it will be observed that no satisfied freshman would be eliminated if a cut-off score of 18 were selected. At the same time, this score would identify about 13 per cent of those who are leaving the program or have interest patterns like them. The score of 26 will now isolate about 57 per cent of the dissatisfied students with a possible loss of about 8.5 per cent of the other group. This score seems to identify the largest number of dissatisfied people at a minimum loss among the remaining students.

Table 2
 CUMULATIVE FREQUENCY OF ALL FRESHMAN SCORES
 ON THE MINNESOTA VOCATIONAL INTEREST INVENTORY
 SATISFIED AND DISSATISFIED WITH I. A. TEACHER EDUCATION

Satisfied				Dissatisfied			
Score	Number	Cum. Total	Percent	Score	Number	Cum. Total	Percent
43	4	308	100.0				
42	1	304	98.7				
41	4	303	98.4				
40	4	299	97.1				
39	4	295	95.8				
38	12	291	94.5	38	1	63	100.0
37	13	279	90.6	37	0	62	98.4
36	18	266	86.3	36	1	62	98.4
35	18	248	80.5	35	1	61	96.8
34	18	230	74.7	34	0	60	95.2
33	22	212	68.8	33	4	60	95.2
32	31	190	61.7	32	3	56	88.9
31	22	159	51.6	31	4	53	84.1
30	16	137	44.5	30	4	49	77.8
29	20	121	39.3	29	4	45	71.4
28	20	101	32.8	28	2	41	65.1
27	15	81	26.3	27	3	39	61.9
26	11	66	21.4	26	2	36	57.1
25	4	55	17.9	25	5	34	54.0
24	13	51	16.6	24	2	29	46.0
23	6	38	12.3	23	4	27	42.9
22	6	32	10.4	22	4	23	36.5
21	9	26	8.4	21	5	19	30.2
20	6	17	5.5	20	2	14	22.2
19	3	11	3.6	19	1	12	19.0
18	2	8	2.6	18	0	11	17.5
17	2	6	1.9	17	0	11	17.5
16	2	4	1.3	16	1	11	17.5
15	0	2	0.6	15	4	10	15.9
14	1	2	0.6	14	1	6	9.5
13	0	1	0.3	13	2	5	7.9
12	0	1	0.3	12	0	3	4.8
11	0	1	0.3	11	2	3	4.8
10	0	1	0.3	10	0	1	1.6
9	0	1	0.3	9	0	1	1.6
8	0	1	0.3	8	0	1	1.6
7	1	1	0.3	7	0	1	1.6
6	0	0	0.0	6	1	1	1.6
5				5	0	0	0.0

Table 3
 CUMULATIVE FREQUENCY OF ALL FRESHMAN SCORES
 ON THE MINNESOTA VOCATIONAL INTEREST INVENTORY
 SATISFIED AND DISSATISFIED WITH I. A. TEACHER EDUCATION
 SCORED WITH THE FRESHMAN SATISFIED-DISSATISFIED KEY

Score	Satisfied			Dissatisfied			Percent
	Cum.	Number	Total	Score	Number	Cum.	
43	4	224	100.0	43			
42	1	220	98.2	42			
41	3	219	97.8	41	1	147	100.0
40	4	216	96.4	40	0	146	99.3
39	4	212	94.6	39	0	146	99.3
38	12	208	92.9	38	1	146	99.3
37	12	196	87.5	37	1	145	98.6
36	16	184	82.1	36	3	144	97.9
35	16	168	75.0	35	3	141	95.9
34	17	152	67.9	34	1	138	93.8
33	20	135	60.1	33	6	137	93.2
32	30	115	51.3	32	4	131	89.1
31	17	85	37.9	31	9	127	86.4
30	11	68	30.4	30	9	118	80.3
29	13	57	25.4	29	11	109	74.1
28	17	44	19.6	28	5	98	66.7
27	8	27	12.1	27	10	93	63.3
26	4	19	8.5	26	9	83	56.5
25	2	15	6.7	25	7	74	50.3
24	5	13	5.8	24	10	67	45.6
23	1	8	3.6	23	9	57	38.8
22	1	7	3.1	22	9	48	32.6
21	4	6	2.7	21	10	39	26.5
20	1	2	0.9	20	7	29	19.7
19	1	1	0.4	19	3	22	15.0
18	0	0	0.0	18	2	19	12.9
17				17	2	17	11.6
16				16	3	15	10.2
15				15	4	12	8.2
14				14	2	8	5.4
13				13	2	6	4.1
12				12	0	4	2.7
11				11	2	4	2.7
10				10	0	2	1.4
9				9	0	2	1.4
8				8	0	2	1.4
7				7	1	2	1.4
6				6	1	1	0.7
5				5	0	0	0.0

While this writer believes that the score of 26 should be used with the present amount of data, any one using the Inventory should select a cut-off score in keeping with department philosophy and practices of student selection. When more data are obtained and analyzed, it may be possible to sharpen selected cut-off scores and increase their usefulness.

9. While the tests of significance have shown important differences between the various graduate, senior and freshmen groups, the most noteworthy aspect involves the intra-freshmen group comparisons.

One of the important findings reported in the *Findings and Conclusions* dealt with the magnitude of scores at various ages of freshmen. The reader will recall that the 18 year old student (actually 18 or less) ranked as weakest when compared with those one, two or three years older.

In interpreting this particular finding, the data shows consistent evidence that the strongest students for teacher education are those with greater maturity, which one would associate with increased age. Above the age of twenty-one, Inventory scores tend to level off quickly. A word of caution should be introduced at this point because there may be other reasons for this outcome.

It could be possible, although not very probable, that an age-maturity factor may have been built into the criterion key inadvertently. If this were true, it could mitigate against the younger student and consequently favor the older student. The manner in which the Inventory has functioned so far, however, would make this conclusion suspect and difficult to assess without more extensive research.

In addition to mean scores by ages, the writer collected data covering fifty additional pieces of rather precise information about each student. There are data about most interesting hobbies pursued, organizations joined, offices held in groups, experience with youth groups, kind of work experience, and of course, satisfaction with industrial arts teacher education. By combining selected elements and circumstances from this information, an endless number of additional comparisons can be made with data now on file. This has not been done to date pending the arrival of additional data covering more cases.

In spite of somewhat limited numbers in certain sub-groups, there appear to be several very interesting trends worthy of mention. The amount of education of either or both parents doesn't seem to have any bearing on student scores. Freshmen who pursue hobbies largely in-

dividual in nature seem to be considerably stronger than those who favor team-type sports. With respect to organizations joined, it doesn't seem to make any difference what they join or if they join at all.

When assessing the implications related to elective offices held by freshmen, one cannot assume that peer election connotes a recognition of leadership qualities. The criterion key with its strong social-orientation provides a fairly clear measure of leadership attributes, but scores of freshmen who have held office and those who have never been chosen for anything are almost equal. This outcome deflates a secret hypothesis of the writer who believed that election to an office meant recognition of leadership in some form or other.

On the basis of data on file, it appears that certain types of work experience are significant. For example, freshmen who have worked as camp counselors score especially high while those who report only ordinary, menial work experience are noticeably weaker. One of the most intriguing set of scores is for men whose major work experience has been in the service. The mean scores of these men surpass every other single group of freshmen tested. Thirteen individuals constitute this group. All have completed Navy service and have entered programs of teacher education on the West Coast.

And finally, of course, the sharpest separation arose as a result of replies to the question of satisfaction with teacher education. With substantial numbers and large differences in means, this naturally became the first of the major comparisons completed, and in the long run, may well become the most significant outcome derived from the research itself.

10. It seems appropriate to assume that some progress has been made in the direction of developing an instrument which will aid in the process of selection of students for industrial arts teacher education.

If the study of over a thousand industrial arts majors has produced research findings of value in identifying potential teachers for this area, then an application of them should show some positive results.

One such attempt was made with predictions about the future of selected students from one campus. The reader should keep in mind that this particular group was a biased selection in that it was picked according to scores obtained on the two keys which have been used. A better test of the predictive value of the M. V. I. I. using these keys would have involved advance predictions for a rigorously selected, random sample of students from the scored population rather than just one

selected first on the basis of scores obtained. However, for whatever interest it generates under these conditions, one such attempt at prediction has been made and recorded here.

In reading this initial attempt at prediction as well as all of the preceding discussion, the reader should remember that a low score on either key means that the student does not demonstrate interest patterns or select items which are characteristic of satisfied freshmen or our best, experienced teachers in graduate programs. When the score ranks high in either case, this means that the person exhibits interest patterns which are comparable to those expressed by the satisfied and the experienced men.

An Initial Attempt At Prediction Using Two Keys:

Scores on The M. V. I. I. Graduate Student Key,

Scores on The M.V.I.I. Freshman Satisfied-Dissatisfied Key

In a report to one of the colleges which cooperated on this study, an attempt was made to provide some predictions about selected freshmen who were scored on the M. V. I. I. Five lists of freshmen were developed and a statement of prediction was made about them. These lists and the predictions follow with a final report on the various students from the college.

List 1. Prediction:

"There are *very serious doubts* about these men. Those *starred* (*) are the poorest. Most will drop out or change their objectives. Few will become industrial arts teachers." 12 Students in the starred list.

Method of selection of group: All made lowest scores on the Inventory, both keys. Scored 0 to 5 on the Freshman Satisfied-Dissatisfied Key, and 0 to 10 on the Graduate Student Criterion Key.

Report by College

- 8 developed an unsatisfactory record or were dropped
- 2 the records were lost; *presumably, the students were too*
- 1 in serious academic difficulty
- 1 apparently doing all right

List 2. Prediction:

"There are *very serious doubts* about these men. Most will drop out or change their objectives. Few will become industrial arts teachers." 48 students in this group.

Method of selection of group: All scored low on the Inventory, both keys. Scored from 6 to 11 on the Freshman Key, and 11 to 15 on the Graduate Key.

Report by College

- 10 dropped by the College
 - 12 left of their own accord
 - 9 in very serious academic difficulty
 - 9 in serious academic difficulty
 - 8 apparently doing all right
-

48

List 3. Prediction:

"These are good men, but all will leave industrial arts." 11 students in this group.

Method of selection of group: All scored very low on the Freshman Key, and very high on the Graduate Key.

Report by College

- 3 were dropped by the College
 - 3 left of their own accord
 - 3 in very serious academic difficulty
 - 2 in serious academic difficulty
-

11

List 4. Prediction:

"These are *very good men, but not your best.*" 28 students in this group.

Method of selection: All scored fairly high on both Keys.

Report by College

- 4 dropped by the College
- 4 left of their own accord
- 1 in academic difficulty

19 apparently doing all right

—→

28

List 5. Prediction:

"These students are *some of your very best.*" 9 students in this group.

Method of selection of group: These 9 students scored very high on both Keys.

Report by College

4 apparently doing all right

2 left of their own accord

2 on probation; one gone from the campus

1 dropped by the College

—
9

In summary, humaneness alone dictates that prospective teacher education students should be fairly and thoroughly selected. The press of rising enrollments and scarcity of qualified teacher education staff add urgency to the need for the employment of effective student selection procedures.

Most selection procedures that are used to "raise admission standards" are arbitrary and exclude both prospective graduates and potential drop-outs. However, there are significant differences in the interests of "successful" and "unsuccessful" industrial arts teacher education majors. These differences can be measured by an available test and the test results can be employed to identify applicants who should be discouraged from seeking careers in teaching industrial arts or else should be denied admission.

SECTION VI

Implications for Program

Howard F. Nelson

Acting Chairman, Industrial Education Department

University of Minnesota

Minneapolis, Minnesota

CHAPTER THIRTEEN

Implications for Program

A summary of a recent research study which added light to the relatively unilluminated topic of student selection has been presented in Section V. Through use of the Minnesota Vocational Interest Inventory it was established that industrial arts teachers differ from other selected groups in unique ways. Substantial evidence was given to suggest that these interesting and discriminating differences in basic interest patterns may provide a clue to better student selection and, in the long run, may prove to be one of the most important considerations in the business of industrial arts teacher education.

Section VI of the present Yearbook incorporates the essence of the recommendations for general, professional and technical education from Sections II, III and IV in a form assumed to serve as a curriculum guide to the appropriate collegiate learning experiences in teacher education for industrial arts. This section posed a formidable task, not because of the lack of excellent materials from earlier sections in which to anchor ideas, but formidable in the sense that much more than curricular organization seems to exercise a powerful influence on the preparation of a classroom teacher.

Within the concern for appropriate kinds of general, professional and technical study for the education of industrial arts teachers we are cautioned by Woodring, "We have never known, with any certainty, how liberal, specialized, or professional education affects a teacher's classroom performance," or ". . . what kind of professional courses are really justified in terms of their long-range influence on the teacher's performance in the classroom." We lack the information because, ". . . traditional patterns of teacher education have rarely been the subject of definitive evaluation."¹ Beyond this, we also must be reminded to watch for and to take advantage of important subject matter

¹ Paul Woodring, *New Directions in Teacher Education*. New York: The Fund for the Advancement of Education, 1957, p. 68.

interrelationships and guard against keeping general, professional and technical courses in almost antiseptic isolation. We must continually seek ways to motivate students to aspire to the highest level of expectancy consistent with their capabilities and must always remember the significance of teacher-learner relationships. Specific curriculum patterns likely will be affected little by each of the above concerns, but they must be considered as we design the total learning experiences for the prospective teacher.

In approaching the assignment of preparing Section VI, it was decided that except for a few isolated illustrations, it would be folly to employ specific course titles, because to do so would make the proposed curriculum unique to a campus and virtually useless elsewhere. Also, if the assumption was correct that many factors other than actual courses affect the education of teachers, then, certainly, the total program must be described as learning experiences rather than as course titles.

In constructing the format and content of the proposed curriculum in terms of learning experiences, almost immediately an impelling need was identified for a guide to the development of these experiences. Statements for this specific purpose appear in the *Minnesota Plan for Industrial Arts Teacher Education*.² These statements are so important and appropriate as to be worthy of complete duplication at this point. In addition, it would profit the reader to review carefully and to take guidance from four additional sections of this publication: Assumptions Related to the Social, Economic, and Technological Forces at Work;³ Assumptions Related to Education, Including Teacher Education;⁴ Assumptions Related to General or Liberal Education;⁵ and Assumptions Related to Industrial Education.⁶

Guiding Precepts for the Development of Learning Experiences

1. Learning experiences should be related to and grow out of the working theses and established objectives for the curriculum.
2. Learning experiences must be selected so that each makes a maximum contribution to the total goals for the curriculum.

² William J. Micheels and Wesley S. Sommers, *The Minnesota Plan for Industrial Arts Teacher Education*, Bloomington, Illinois: McKnight & McKnight Publishing Company, 1958.

³ *Ibid.*, pp. 12-15.

⁴ *Ibid.*, pp. 16-20.

⁵ *Ibid.*, pp. 21-22.

⁶ *Ibid.*, pp. 23-26.

3. To the extent possible, learning experiences should be selected which will provide for development of multiple outcomes. This means that the learning experiences in the industrial arts curriculum ought to be related to the other experiences which the student is receiving in his undergraduate training.
4. Learning experiences ought to be devised and organized according to our present understanding of how people learn.
5. The various learning experiences should be related and reinforcing.
6. The learning experiences should be integrated and integrating.
7. The learning experiences should be realistic and important to the learner as a future teacher of industrial arts.
8. To the extent possible, learning experiences should be built upon the past learning of the student.
9. Problem-solving attitudes and skills can be developed only by participation in many meaningful problem-solving activities.
10. There is need for learning experiences which are primarily concerned with problem solving such as design courses and independent study programs.
11. The best approach to an initial understanding of industrial tools, materials, and processes is to present the basic scientific principles which relate to the use of tools and materials.
12. Careful attention must be given to the selection of learning experiences which provide opportunity to analyze and apply these principles in a laboratory-type environment.
13. Provision must be made for problem-solving activities related to industry, such as industrial design (where the functional and aesthetic aspects of problems have to be solved in terms of tools, materials, and processes that are available).
14. Beginning with the first course in the department, there is an urgent need to make the student constantly aware of the fact that the primary goal of his education is to become a competent teacher, contributing to the overall goals of education as best he can.
15. To the extent possible, each course in the curriculum should make provisions for the student to participate in the teaching activities of the class. In most classes these activities will be a small part of the total number of experiences. In every class there is need to stress the fact that the student is preparing to be a teacher.
16. Besides the professional courses in education and teaching methods, there should be many opportunities to observe and evaluate actual situations.
17. As early as possible, the student should be involved in activities which introduce him to the kinds of planning and evaluating which a teacher must do. (A curricular challenge here and in several of the points mentioned above is to provide brief learning experiences

- which will not detract from the subject matter being covered, but which orient the student to the process of teaching.)
18. An understanding of industrial production and practices should be developed by reading, discussion, visual aids, field trips, and mock laboratory production experiences as well as by actual industrial experience.
 19. Each student should receive problem-solving experience in designing and producing a limited quantity of a product for a limited market.
 20. To the extent possible, such experience should build on the previous work with tools and materials and be integrated with social science courses related to economics and the development of industry in our culture.
 21. Teachers of technical and professional courses should strive constantly to relate the learning experiences in their domain to the general education courses which the students are taking. The liberal and cultural elements of industrial arts subject matter has been sadly neglected in the past.
 22. In this connection each instructor should endeavor consciously to provide readings and other activities which will provide a breadth of experiences for the student and show him the relationship between a particular subject and all segments of our culture.⁷

These precepts should be used assiduously in guiding the development of learning experiences in each of the three major divisions of industrial arts teacher education — the liberal, the professional, and the technical. It would seem highly probable that if these precepts were further reinforced by the six important recommendations of Phillips (Chapter IV), the guiding principles provided by Sherman (Chapter VII), and the seven significant assumptions of Olson (Chapter X), the improvements in the education of our teachers would be tremendous indeed.

Since Chapter XIII consists of a synthesis of materials by three previous writers into a proposed curriculum, the most obvious plan was to make a graphical portrayal within which all of these materials might be clearly envisioned. This graphical arrangement, shown in Figure 1, assumes to provide for sufficient flexibility and adjustment to allow the incorporation of all suggested materials without seriously restricting or promoting any one portion. As will be noted, lines between years of education and between main divisions of liberal, professional and technical education have been broken to indicate that there are

⁷ *Ibid.*, pp. 33-35.

no sharp boundaries separating them. Teacher education should be viewed as a continuum from the freshman year through the senior year and, in many cases, as being relatively fluid with reference to the major areas.

Graphical Portrayal of Four-Year Curriculum for Industrial Arts Teacher Education

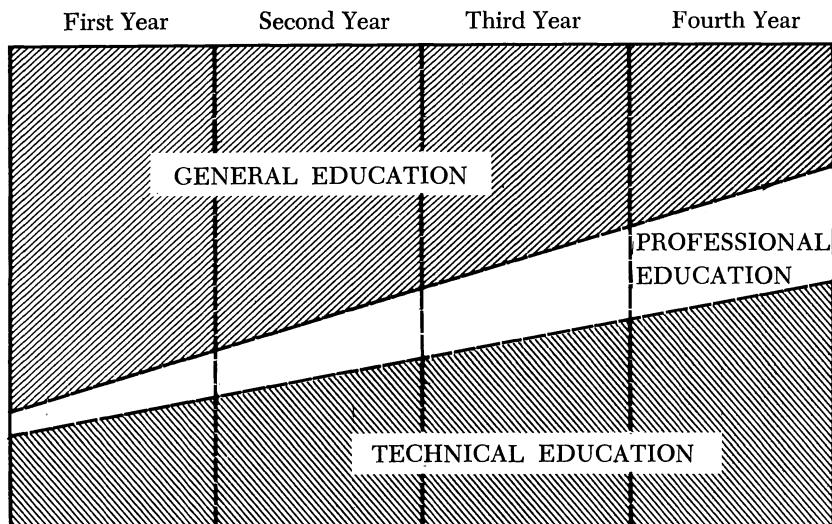


Figure 1

In its present form, the graphical arrangement encompasses the typical four-year scheme which most institutions follow today. This does not in any way imply that the five-year concept so well described by Sherman (Chapter VI) fails to warrant promotion at this time. On the contrary, the facts seem clear that we are moving inevitably in that direction, and soon we must give serious consideration to the necessity of planning for the five-year program. For the present, the immediate task is one of bringing all programs throughout the country up to the minimum specifications proposed for the four-year scheme outlined here, and, with this, a giant forward step will have been taken.

The three main divisions of credit in teacher education are shown on the chart with suggested amounts of concentration in each area. These amounts of credit conform quite closely to those advocated by

Phillips, Sherman, and Olson and provide a balanced, well-rounded program of studies from all three areas.

General education, which involves about one-half of the baccalaureate degree requirements, begins in the freshman year and continues throughout the entire four-year span. In terms of existing programs, this means about 93 quarter hours or 62 semester hours of credit. A major concentration must be carried in the freshman year and lessening amounts in the remaining years. Throughout the first year, freshmen must develop foundational competencies which will enable them to derive maximum advantage from subsequent courses. At a very early point they must have basic education in English, mathematics, sciences, and perhaps other areas in order to be able to cope with and make satisfactory progress in the rest of the program. To do otherwise is simply unrealistic. Therefore, the requirement of work in these areas must be strong in the early stages.

The area of professional learning experiences, including selected education courses, begins for all freshmen at the time of admission and increases in amount and intensity toward the end of the four-year program. This special area involves about one-sixth of the total requirement or 31 quarter hours or approximately 20 semester hours.

The technical preparation also begins during the first year and continues through all four years, with major emphasis and concentration coming in the later years of the program. This division takes approximately one-third of the entire requirement and comes to about 62 quarter hours or close to 40 semester hours. Since there are differences between campuses with respect to interpretation, classification and placement of certain courses, these credit suggestions may be elevated or lowered depending upon campus practice. For example, on the University of Minnesota campus, student teaching classifies as an education requirement rather than an industrial education requirement; on many campuses the reverse would be true. These kinds of interpretations would alter the basic credit distributions shown on the chart and also make the task of exact specification impossible.

General Education

This division involves about 93 quarter hours or 62 semester hours of credit. The *four major elements* as proposed by Paul Dressel are:

1. knowledge, a broad acquaintance with the cultural heritage
2. intellectual abilities and skills embracing the ability to use the major methods of the various disciplines in seeking for and

- organizing information as a basis for making wise judgments
3. skills of communication, and
4. a well-developed sense of values.⁸

The broad areas:

- | | |
|---------------------|-------------------|
| 1. communications | 4. social science |
| 2. humanities | 5. arts |
| 3. natural sciences | 6. mathematics |

Its characteristics:

1. Necessitates rather heavy concentration in the freshman year, but diminishes toward the senior year; continues throughout the entire baccalaureate program.
2. Based upon a wide selection from within the major areas.
3. Interesting, stimulating, challenging and integrating; beyond the introductory level in nature; oriented away from the narrow disciplines rather than leading into them.
4. Rich in exciting learning experiences in which factual matter serves as a means, seldom as an end.
5. Possessed of interdisciplinary relationships which are consciously fostered and encouraged.
6. Selected as often because of its instructor as for its content.
7. Aimed at the development of abilities in critical and creative thought; evaluated in terms of this objective.
8. Requires constant use and improvement in the skills of communication.
9. Seeks in new and ingenious ways to develop basic values.
10. Conducted on a small-group seminar basis and perhaps under team-teachers, or whatever arrangement will enhance the inter-relationships of the content.

Professional Education

This area involves about one-sixth of the baccalaureate program or approximately 31 quarter hours or 20 or 21 semester hours of credit. Its *purposes* are outlined by Sherman (Chapter V). He states that professional education ought to:

⁸ Paul L. Dressel, "What Should Be the Content of the Liberal Arts Curriculum?" *Current Issues In Higher Education*. Washington, D. C.: Association for Higher Education, 1960, p. 64.

1. be concerned with developing understandings in such broad areas as the role of the school in modern society, the nature and development of children and young people, and the role of the teacher in American education.
2. be concerned with developing those skills and techniques which are required to do such things as manage classrooms, teach a lesson, prepare instructional material, and evaluate achievement.
3. provide each student with an opportunity to integrate all of these skills, techniques, and understandings — usually through a program of student teaching and other forms of laboratory experiences — into what can best be called the “art of teaching.”

The broad areas:

1. foundation courses
2. methods and materials
3. laboratory and field experiences

Its characteristics:

Learning experiences envisioned and incorporated into the program should reflect the philosophy and guidance of the six recommendations of Phillips, the guiding principles of Sherman, the seven significant assumptions of Olson, and the twenty-two precepts from the Minnesota Plan.

Technical Education

This division involves about one-third of the baccalaureate program or approximately 62 quarter hours or 41 or 42 semester hours.

The basic premise from Olson (Chapter IX) is as follows:

Industrial arts is a study of technology: its origins and development, its technical, consumer, occupational, recreational, social, and cultural nature through experimenting, creating, designing, inventing, constructing, and operating with industrial materials, processes, and products for purposes of acquainting the student with his technological environment and aiding him in the discovery and development of his own potential therein.

The broad areas

Olson (Chapter IX) indicates that the technical mission for industrial arts consists of:

1. How industry discovers, mines, refines, manufactures, classifies, and distributes materials.
2. How industry employs technical processes and scientific principles to convert materials into products.
3. How industry designs, develops, produces, uses, and services machines.
4. How industry provides housing for industry, business, government, schools, homes, and the like.
5. How industry provides transportation for materials, products, and people.
6. How industry produces, transmits, and utilizes power.
7. How industry provides, operates, and services communications media and systems.
8. How industry employs research in the development of materials, products, industries, and management.
9. How industrial products are used, operated, maintained, serviced in industry, business, school, home, and such.
10. How industry employs organization, management, personnel, records, and controls in the production of goods and services.
11. How the student can convert materials into products and projects by means of representative processes with tools and machines.
12. How the student can employ materials, processes, and products in the development of ideas and in the solution of problems.

The plans and visions of the editor and the committee responsible for the Eleventh Yearbook have been brought together into this proposed curriculum for industrial arts teacher education. While every effort has been made to allow the ideas, proposals and materials by the four contributing authors of this issue an equal opportunity to be reflected in the plan, the reader must be fully cognizant of the whole content of the Yearbook before he can be appreciative of the separate parts of the curriculum plan itself.

The objective for this Yearbook has been attained, but much remains to be done. In Chapter VIII has been posed one of the really significant tasks for the profession. Had we writers possessed a profile of the proposed graduate and had we known the separate and distinct educational needs of this graduate, our task might have been made easier and more profitable.

The nearest approach to one element of a profile of the graduate comes from the research reported in Chapter XII. In this chapter a thumbnail sketch of the outstanding, experienced teacher was constructed from the replies of over 300 teachers to the Minnesota Vocational Interest Inventory. Perhaps a recombination of the 350 discriminating items with the forty-eight incorporated in the criterion key might provide initial insight into Sherman's proposed investigation. At least, it would reveal a profile of interests as a starting point.

Up to this point, a good deal of what has been written has been done on the basis of best judgment of the authors, and until we have more conclusive evidence from research this must suffice as a starting point. However, in a profession having the sophistication of industrial arts teacher education, the time has come to get more concrete evidence through rigorous research.

Every contributing author has mentioned the necessity of improving instruction given to neophyte industrial arts students because the evidence indicates that this one improvement will have as much to do with how they actually perform in their own classrooms as anything required of them in the curriculum. However, in concluding this chapter, it would be grossly unfair to close without recognizing the excellent work which has been done by industrial arts teacher educators in the past. They have a justifiable right to assume a share of the findings of McGrath and Russell who assessed undergraduate programs on a wide scale and, with respect to graduates, concluded that "The majority, however, when they leave their undergraduate institutions, are able, dedicated and informed members of an ancient and noble profession."⁹

⁹Earl J. McGrath and Charles H. Russell, *Are School Teachers Liberally Educated?* New York: Teachers College, Columbia University, Bureau of Publications, 1961, p. 27.

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