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AT COLLEGE AND SECONDARY LEVELS
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A STUDY OF FUNCTIONAL COMPETENCIES NEEDED BY THAI
BEGINNING TEACHERS OF INDUSTRIAL ARTS
AT COLLEGE AND SECONDARY LEVELS

By
Preang Kitratnee

A DISSERTATION
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ABSTRACT

A STUDY OF FUNCTIONAL COMPETENCIES NEEDED BY THAI BEGINNING TEACHERS OF INDUSTRIAL ARTS AT COLLEGE AND SECONDARY LEVELS

by

Preang Kitratnee

The investigator's purpose in this study was to ascertain functional competencies that teachers and chairpersons as faculty at college and secondary levels perceived to be important for Thai beginning teachers for effective teaching. These functional competencies, implicit in the objectives of the preservice industrial arts teacher preparation at pranakorn, were classified into the following established categories: (1) planning of instruction and materials, (2) classroom and laboratory management, (3) teaching methods and techniques, (4) interpersonal relations, and (5) student evaluation and evaluation techniques. Another purpose was to provide information and recommendations, based on the findings in this study, for improving the preservice industrial arts teacher preparation at Pranakorn.

In framing the main hypotheses, it was assumed that the differences in the perceptions of faculty, chairpersons and teachers, at college and secondary levels would be due to the differences in their

roles, status and the level at which they taught. The responses, therefore, were classified in terms of two independent variables: namely, (1) types of respondents, and (2) levels and kinds of institutions. Dependent variables were the five competency categories.

After the list of eighty-two functional competencies had been revised by an evaluative jury and by a group of Thai educators, the final edition of the instrument with a five-point Likert scale was sent, together with the demographic data sheet and a letter of introduction, to the respondent population. A list of 235 respondents teaching at college and secondary levels was obtained from a Pranakorn pilot follow-up study. The respondent teachers were those who had taught in either rural and comprehensive secondary, or in teacher college programs for at least two academic years and had completed the preservice industrial arts teacher preparation at Pranakorn. In addition, respondent chairpersons selected were those who were current incumbents and had worked with industrial arts graduates.

In the final treatment of the data, usable returns of more than 84 percent were received from 31 college chairpersons, 97 college teachers, 31 secondary chairpersons, and 39 secondary teachers. A multivariate analysis of variance was computed for testing the three main hypotheses. An alpha .05 level was used as the criterion for significance. When any hypothesis was supported by the analysis of the data, univariate F ratio was further conducted. Additional analyses were conducted to determine the greatest differences in each competency. In a one-way analysis, the significance of differences was considered at the .01 level of confidence.

Agreement or disagreement shown by respondent population was classified by arithmetic means and rank orders. Also, the functional competencies were tabulated, compared, and ranked in order of importance under each of the five established categories for four respondent groups. Spearman's rank order coefficient of correlation was used to calculate the correlation between the rank orders of functional competencies as indicated by the two respondent groups at each program level.

Based on the results of the data gathered and analyzed in this study, it was concluded that:

1. The beginning college teachers have more significant competency needs for effective teaching than do the beginning secondary teachers.
2. Both the beginning college teachers and the beginning secondary teachers have the first most competency needs in the category of classroom and laboratory management.
3. Both the beginning college teachers and the beginning secondary teachers have the second most competency needs in the category of teaching methods and techniques.
4. The beginning college teachers have more significant competency needs in the category of teaching methods and techniques and the category of planning of instruction and materials than do the beginning secondary teachers.
5. The beginning college teachers have the least competency needs in the category of student evaluation and evaluation techniques, while the beginning secondary teachers have the least competency needs in the category of interpersonal relations.

6. The beginning college teachers have more significant competency needs in utilizing community resources for instruction and in establishing course objectives and instructional goals than do the beginning secondary teachers.

7. Both the beginning college teachers and the beginning secondary teachers have more competency needs in demonstrating technical skills than in incorporating industrial functions into instructional programs.

The investigator recommended that teacher educators and administrators should use the results of this study to plan, evaluate and improve those very phases of the preservice industrial arts teacher preparation at Pranakorn.



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CHAPTER I

THE PROBLEM

Introduction

Most successful individuals bring to the tasks in which they are engaged adequate knowledges, skills, and attitudes in order to perform them well. The set of elements that contributes to the effective performance may be termed a competency. The researcher's concern with competency, therefore, has necessitated that he be concerned with the individual's ability in employing knowledge, skill, and attitude to produce results. Persons are competent when they can rapidly perform without errors assigned tasks that experts recognize as essential. In order to expand one's understanding of the environment, scientists have continually attempted to define competency in as tangible terms as possible. Yet it must be recognized that this competency cannot be as concretely identified as the results of physical sciences, for teacher competencies are matters dealing with a teacher's ability to function adequately in the teaching profession--a notion that has defied mathematical formulation. In this connection, Dodl notes that if a definition of competency emphasizes teaching functions, the

specifications of competencies must be recognized in terms of the following three major purposes:

(1) it describes or defines the desired product of the program; (2) it establishes major goals for the instructional program; and (3) it serves as a principal basis for student assessment providing evidence upon which to base recommendations for certification.¹

Even though the interest and involvement of experts and researchers in teacher competencies has been very great, only a few studies of these competencies in the field of industrial arts have been so far published. In their competency studies Silviu,² Giachino³ and Miller⁴ were concerned with all aspects of the teacher's professional duties, teaching responsibilities and extra-curricular duties. They believed that teachers should possess these competencies in order to function effectively in industrial arts classroom and laboratory instructions. Functional competencies used in the above cited studies are defined as "those competencies which apply to practical situations, the essential principles and techniques of a particular subject matter field."⁵ The researcher's review of literature has indicated that local programs of industrial arts instruction which influence the desired formulation of teacher competencies have changed to a great extent since the 1960's. A major emphasis since has shifted to the preparation of teachers in order that they may develop and cultivate functional competencies needed to perform their tasks effectively in the classroom and laboratory. It is essential, therefore, that in attempting to develop teacher education programs, functional competencies that contribute to the effective performance of teachers need be identified and validated.

The Need for the Study

To comprehend the significance of this study, it is important to realize in the words of Biddle and Ellena that " . . . No approved method of measuring competence has been accepted and no methods of promoting teachers adequately have been widely adopted."⁶ Furthermore, the statement by Pranorm Keawkamnerd, Deputy Director-General of Teacher Department, in a speech at the Annual Industrial Arts Teacher Seminar at Pranakorn reflects the state of affairs with regard to the competency of the industrial arts teachers:

. . . Thai society has more faith in Chinese laborers than in teachers because teachers lack knowledge, skills and self-confidence . . . teachers have no technical skills and/or practical experiences even though they know theories. As a result, students are not interested and do not enroll in industrial arts classes.⁷

Saroj Buasri further supported this viewpoint when he wrote, " . . . due to the teacher training level, academic staff are often recruited from young graduates who lack the academic experience and training in teacher education."⁸ Some of the young teachers to whom he refers graduated from Pranakorn, underlining the need of this study and its application to the Pranakorn program of industrial arts teacher education.

Regarding industrial arts teachers at the college level, a study by Ekaraj Utara in 1977 reported a need for greater development in different areas of functional competency. Specifically, he cited technical knowledge, classroom and laboratory management and utilization of teaching aids.⁹

In Thailand at the secondary level, examination of the research revealed that no information existed pertaining to the identification

of functional competencies needed by beginning teachers. However, Vitoon Upathamp, a supervisor of industrial arts in the Department of General Education, in a speech at the Annual Industrial Arts Teacher Seminar at Pranakorn recently stated:

. . . Teachers pay no attention to their duties and make no effort to supplement their knowledge. They also lack practical experience; functional competency needed to perform their teaching profession . . . However, beginning teachers should obtain practical training prior to teaching in the use and care of tools and equipment¹⁰

It has become apparent that new and updated functional competencies are increasingly important and urgently needed. This leads the researcher to conclude that the preparation of industrial arts teachers, particularly in technical skills, poses a significant problem. Because the need for better prepared teachers is obvious, it is important to determine functional competencies necessary to perform adequately in teaching at both the secondary and college levels. Gadda further supported the notion that preservice teacher programs need to be based on consideration of the competencies needed by beginning teachers.¹¹

The Researcher's Purpose in the Study

The researcher's primary purpose in this study will be to ascertain the functional competencies needed by beginning teachers for effective teaching, as perceived by chairpersons and teachers (faculty members),* at both the secondary and college levels. Specifically, the researcher hopes this study will contribute to the improvement of the preservice program of industrial arts teacher

*See Definition of Terms p. 17

education. The following specific objectives are proposed in order to attain this goal.

1. To compare all five categories of functional competency needed by beginning teachers, as implicit in the objectives for the preservice program at Pranakorn, as perceived by:
 - a. faculty members at the college level and faculty members at the secondary level;
 - b. chairpersons at both college and secondary levels and teachers at both college and secondary levels.
 These five categories of functional competency are: (1) planning of instruction and materials, (2) classroom and laboratory management, (3) teaching methods and techniques, (4) interpersonal relations, and (5) student evaluation and evaluation techniques.
 Based upon their perceptions it will be determined whether the effects of interaction between the types of respondents and levels and kinds of institutions at which they teach will be explored.
2. To compare the rank order of importance of competency items identified under each of the five categories of functional competency as perceived by:
 - a. chairpersons and teachers at the college level;
 - b. chairpersons and teachers at the secondary level.
3. To determine correlations in the ranked perceptions of functional competency identified under each of the five categories between:
 - a. chairpersons and teachers at the college level;
 - b. chairpersons and teachers at the secondary level.
4. To determine what categories and statements of functional competency are most needed by beginning teachers at the college and/or secondary levels.

The respondents are chairpersons and teachers who teach in either rural and comprehensive programs (secondary level) or college programs. The program levels and kinds of institutions at which the respondents teach are identified since these differences may account for some differences in their perceptions. The respondents will be asked to rate each item of functional competencies needed by beginning teachers for effective teaching. Their competency ratings will provide the data to be analyzed by statistical procedures to obtain the findings of

the study from which conclusions will be drawn.

Research Hypotheses

Three hypotheses are generated from the first of the previously identified objectives. In framing these hypotheses, it is assumed that the differences in the perceptions of chairpersons and teachers at college and secondary levels will be due to the differences in their roles, status and the level at which they are teaching. The following three hypotheses are examined.

1. There will be a difference between faculty members who teach a college level and those who teach at secondary level in their perceptions of all five categories of functional competency needed by beginning teachers.
2. There will be a difference between the perceptions of teachers and chairpersons at college and secondary levels of all five categories of functional competency needed by beginning teachers.
3. There will be an interaction between the types of respondents and the levels and kinds of institutions at which they teach in their perceptions of all five categories of functional competency needed by beginning teachers.

These main hypotheses will be tested by a multivariate analysis of variance. The significant difference will be determined at the .05 level of confidence.

Statistical procedures such as the means, rank orders of importance and Spearman's rank order coefficient of correlation will be employed in the descriptive data for the second and third objectives. Finally, in respect to the fourth objective, the findings and interpretations of results based on the preceding analyses of the data will be used to determine what competency statements and categories are most needed by Thai beginning teachers at college and/or

secondary levels.

Background of the Study

Preservice teacher education programs in the United States and Thailand are largely similar, with understandable differences arising out of the respective cultures of the two countries. In order to appreciate the present state of Thai industrial arts teacher education, one must understand the historical background of the program in Thailand.

In 1955 the first industrial arts teacher education program was established at the Bangkok Technical Institute under the Department of Vocational Education. Prospective teachers were recruited mostly from among students graduating with a "higher certificate" of vocational education. In the United States this certificate would be equivalent to an associate degree from a post secondary institution. An additional year of professional training was offered to these students to enable them to teach at the elementary and secondary levels.

In 1966 the industrial arts teacher education program was transferred to Pranakorn Teacher College under the Department of Teacher Training. Since 1966 students have been recruited from graduates of M.S. 5 (grade 12) or those who have obtained the "lower certificate" of education. The latter followed another two-year course which qualifies them to teach in lower secondary classes to M.S. 3 (grade 10).

Since 1968 the first degree granting courses for industrial arts teachers have been offered in connection with the two-year course for higher certification. The certification at this level is a

Bachelor of Science degree in industrial arts education. During the period 1968-1974 the program was conducted under a contractual agreement between Pranakorn and Prasanmitr (Srinakharinwirot University). In the contract Pranakorn offered the program and provided laboratory facilities, but Prasanmitr had authority over curriculum instruction and activities.

Beginning in 1974 the teachers colleges themselves, under the auspices of the Department of Teacher Training, were allowed to offer their own programs leading to a Bachelor's Degree in education. Previously these colleges could offer only a Certificate of Education and the Higher Certificate of Education. As a temporary measure the colleges followed the Bachelor of Education curriculum of Prasanmitr, but the Department of Teacher Training appointed a committee to plan a new B.Ed. curriculum exclusively for teacher training utilizing academic requirements set by the Bureau of State Universities. In the program that resulted courses were classified into three major areas: (1) general education, (2) specialized subject and (3) professional training for teachers. This new teacher curriculum is aimed at producing teachers who have competencies which lead to a better understanding of their own roles and duties in the classroom and community. They should be able to apply their competencies to improve education in the country in a manner compatible with existing situations and constraints of the nation.

Since 1975 the industrial arts teacher education program conducted at Pranakorn has offered the Bachelor's Degree in industrial arts education. Specific objectives of the preservice program are to

prepare industrial arts teachers who are able to:

1. Gain a basic understanding of occupational knowledge and specialized subject-matters in order to teach at the elementary, junior and senior secondary levels.
2. Discover and develop talents, aptitudes, interests and potentialities of students in such a way as to guide them appropriately into particular fields.
3. Assess students' ability levels as a basis for learning, teaching, counseling and disciplining appropriately.
4. Utilize community resources for instruction as much as possible.
5. Identify important tasks and responsibilities of their teaching profession.
6. Demonstrate effective use and care of tools, equipment and machines.
7. Maintain an organized, well-managed and safe industrial arts laboratory.¹²

The adequacy of beginning teachers' degree of proficiency in functional competencies must therefore be defined in terms of the above cited objectives. Hence, the objectives of Pranakorn's pre-service industrial arts teacher education program must also reflect the above criteria of competency. It is expected that these functional competencies can be grouped into the following established categories: (1) planning of instruction and materials (2) classroom and laboratory management, (3) teaching methods and techniques, (4) interpersonal relations, and (5) student evaluation and evaluation techniques.

As presented in Table 1, the size of the program (Pranakorn and Prasanmitr) can be shown by the number of degree graduates during the period covered by this study.

Table 1
Numbers of Industrial Arts Graduates in
Thailand For 1968-69 to 1976-77

Academic Years	No. of Graduates
1968-69	28
1969-70	30
1970-71	36
1971-72	40
1972-73	35
1973-74	30
1974-75	34
1975-76	33
1976-77	55

It had been reported by Pichai Siritusnakul¹³ that 134 teachers who had graduated from Pranakorn during the period 1968 to 1972 were employed by the following programs and institutions:

1. (11) in the College of Education (Prasanmitr and Pranakorn);
2. (106) in Teachers Colleges under the Department of Teacher Training;
3. (5) in Comprehensive and Rural secondary programs under the Department of General Education;
4. (12) in others.

In the college programs offered under the Department of Teacher Training all prospective teachers must elect courses from industrial

arts and they may also obtain a minor. In addition, comprehensive and rural secondary programs which were permanently established in 1960 and 1974 have industrial arts instruction. It is reasonable to assume that these contemporary programs have influenced the preparation of industrial arts teacher education.

Since the Department of Teacher Training formerly offered better fringe benefits and rewards than the others, it is not surprising that a large proportion of teachers were found at the college level. Actually, the primary purpose of teacher training is preparation for secondary teaching. Since 1973 applications for secondary teaching have gradually increased. In a 1977 pilot study conducted by a director of Pranakorn Teacher's College,¹⁴ it was discovered that over sixty-five graduates were employed at the secondary level. At the present time a large number of degree graduates are serving as chairpersons and/or teachers at the two program levels (secondary and college). These persons, by reason of their long experience and qualification, form a group eminently qualified to make judgements about effective performance in teaching. They represent in Thailand a core of expertise for determining the functional competencies which beginning teachers should have at a particular program level of industrial arts instruction. Their perceptions of the functional competency needs of beginning teachers provide the focus for this study.

The system implicit in the preceding description of the pre-service education program was stated by Bies in the following words:

The industrial arts Competency-Based Teacher Education (CBTE) program is a supra system made up of many subsystems-- a technical instruction subsystem, professional sequence

subsystem and general education subsystem. In actuality, the supra system is a subsystem of all teacher education. Furthermore, the instructional subsystems are supra systems for the specific units of instruction within.¹⁵

Based upon Bies's analysis of the system, the preservice program at Pranakorn could be the instructional subsystems described as a supra system for the units of instruction within it. Also, this program operates with four component elements: (1) input, (2) operation, (3) output and (4) feedback. For this information, the "input" represents students recruited for the industrial arts teacher education program. Before these students enter specific instructional units, they undergo assessment for entry-level competencies. The "operation" is graduated industrial arts teachers who become teachers in the secondary and college programs. Data gained from these teachers become the "feedback" information on competency needs which can be analyzed and used to improve program operation. Leap recently noted:

Once competencies have been validated, the next step is to determine: (1) which competencies are prerequisites to others, (2) which subsystems or departments in the universities should be involved in helping students attain a particular competency and (3) the most appropriate delivery system for a given competency.¹⁶

This three-element approach might be used to facilitate program development at Pranakorn. The concept received further support from Bies:

After analysis, the system may or may not produce the expected output. If it does, the system will continue. If it does not, there are three options: first, the system should adjust itself to produce the expected product; second, the expectations for the product should be changed to accommodate the system; or third, the system should be terminated.¹⁷

In this application, the system refers to preservice program content and operation. It is hoped that the results of the study will provide feedback from which insights can be developed to improve the preservice program at Pranakorn, and that the improved program operation will produce more competent (beginning) teachers.

Limitation of the Study

The study is limited to the preservice program of industrial arts teacher education at Pranakorn. Thus, the conclusions cannot be generalized to other institutions or to other preservice programs within the institution. No attempt will be made to evaluate the preservice program; the researcher will deal only with the functional competencies needed by beginning teachers which are grouped into five established categories. Data to rate each competency item are obtained from the respondents in the college programs under the Department of Teacher Training and from the respondents in the rural and comprehensive secondary programs under the Department of General Education. Both departments are under the direction of the Ministry of Education.

The respondents in this study included both teachers and chairpersons of industrial arts at the particular program levels mentioned earlier. The researcher will be directly concerned with a group of teachers who had completed their preservice preparation at Pranakorn between 1969 and 1976, during which some minor changes were made in the program. In addition, chairpersons selected are current leaders of the teachers in the programs of industrial arts in which they teach.

The list of functional competencies needed by beginning teachers is limited by the following criteria:

1. Each functional competency is stated in the form of general objectives.
2. The functional competencies can be detected in the beginning teachers' performance in a particular program of instruction.
3. The functional competencies must fit under one of the five established categories.
4. The functional competencies are selected and analyzed from related studies according to the objectives of the preservice program at Pranakorn.
5. The list of functional competencies is reviewed and revised by an evaluative jury of teacher educators in industrial education.
6. The final revision of functional competencies is validated by selected Thai teacher educators and supervisors in industrial arts education.

Basic Assumptions

The following basic assumptions served as guides for this study:

1. It is assumed that the instrument can be used as an indicator of the functional competencies needed by beginning teachers.
2. It is assumed that establishment of the functional competencies can affect the quality of beginning teachers.
3. It is further assumed that the respondents must be aware of the functional competencies needed by beginning teachers.
4. Finally, it is assumed that the respondents will answer questionnaire items frankly and carefully.

Research Method

The research method used in this study is a descriptive survey.

Good stated that:

Descriptive studies may include present facts or current conditions concerning the nature of a group of persons, a number of objects or a class of events and may involve the procedures of instruction, analysis, classification, enumerations or

management. The terms survey and status suggest the gathering of evidence relating to current conditions.¹⁸

Good further listed three purposes of descriptive survey studies

They can be used:

(1) to secure evidence concerning an existing situation or current condition, (2) to identify standards or norms with which to compare present conditions, in order to plan the next step, (3) to determine how to make the next step (having determined where we are and where we wish to go).¹⁹

In this study chairpersons and teachers will be asked to rate each item of functional competencies needed by beginning teachers in order to perform effectively in local programs of industrial arts instruction. Findings, conclusions and recommendations will then be drawn from the data as analyzed by subsequent statistical procedures.

Definition of Terms

The following terms are defined in the context in which they are used in this study.

Areas of functional competency. The categories into which related groups of functional competency are assembled. In this study the terms "areas and categories" are used interchangeably.

Beginning teacher. A teacher having less than two years of experience teaching industrial arts in either a rural, comprehensive secondary school or a Teacher's College. In addition, the beginning teacher had completed preservice preparation at Pranakorn and initially entered this field in a full-time position.

Chairperson. An industrial arts teacher with experience who plays a leadership role in industrial arts management and administration in addition to teaching duties.

Degree of importance. The term "degree of importance" is used to indicate the perceived value of each statement of functional competency needed by beginning teachers.

Effective teaching. Planned educational instruction or presentation which causes a desired change in the learner's behavior.²⁰ Teaching is effective to the extent the teacher exhibits attitudes and behaves in ways that are favorable to the development of expected and desired cognitive, affective and psychomotor learnings.

Functional competencies. Those abilities needed by beginning teachers in order to perform adequately in a particular program of industrial arts instruction.

Faculty members. The body of personnel responsible for industrial arts instruction. In this study it refers to and includes both chairpersons and teachers. When the terms "chairpersons and teachers" are used it indicates each group is being considered separately.

Industrial education. A generic term which includes all types of education related to industry, including industrial arts education, vocational industrial education (trade and industrial education) and other such technical education.²¹

Industrial arts education that which provides opportunities for all students from elementary through higher education to develop an understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical and cultural aspects of industry and technology. Furthermore, it is a field wherein students acquire industrial-technical knowledge and competencies involving such activities as experimenting, planning, designing, constructing, evaluating and using tools, machines, materials and processes.²²

Perception. The mental process by which the nature of an object is recognized through the association of memory of its other qualities with special senses bringing it at the time to consciousness.²³

Preservice program. The program of training (Pranakorn) that a prospective industrial arts teacher receives before entering the teaching profession.

Secondary school program (the secondary level). Rural and comprehensive secondary programs which have industrial arts curriculum instruction at similar levels. Thailand also has general secondary schools, but programs such that they are not pertinent to this study. All secondary school programs in Thailand are directly attached to the Department of General Education.

Teacher college (the college level). An institution of public higher education composed of a variety of education programs. There are thirty-six of these colleges in Thailand; of which one is Pranakorn. These are directly attached to the Department of Teacher Training.

Teacher. A teacher of industrial arts who has been teaching in either the secondary school or the teacher's college for at least two academic years. This teacher had completed the preservice program at Pranakorn and entered this field as a full-time position.

Summary and Overview

The dissertation will be organized into five chapters, followed by appendices.

In Chapter I the investigation has described the problem of defining effective or competent teachers that may reflect the preservice industrial arts teacher education. The results of this study may

significantly influence the direction and objectives of future teacher training programs. The author's purpose with relation to the identified population and the areas of functional competency were also described. The need for the study, the purpose of the study, research hypotheses, limitation of the study, basic assumptions, research method and definition of terms were included as well.

Chapter II will contain a review of the literature related to the following areas of inquiry that are pertinent to the problem of this study: the professional competencies of (beginning) teachers, the assessment of teacher competencies and recommendations to improve teacher preparation. In Chapter III the methods and procedures will be established by an explanation of the pilot follow-up study, the instrument development, design of the study and plan for data analysis. The findings and interpretations of the results, based on the analysis of research data, will be presented in Chapter IV. The fifth and final chapter will cover a summary of the study, discussions, conclusions of the findings and recommendations for preservice program and further research.

CHAPTER I -- FOOTNOTES

¹Norman R. Dodl, "Selecting Competency Outcomes for Teacher Education," Journal of Teacher Education 24, No.3, (Fall, 1973), p. 194.

²G. Harold Silvius, "Instructional Units for Professional Courses in Undergraduate Industrial Arts Teacher Education," (unpublished Doctor's dissertation, Pennsylvania State College, 1946).

³J. W. Giachino, "An Analysis of the Success Qualities that should be Emphasized in the Training of Candidates to become Competent Teachers of Industrial Education," (unpublished Doctor's dissertation, Pennsylvania State College, 1949).

⁴James Arthur Miller, "Functional Competencies Needed by Industrial Arts Instructors to Adequately Perform in Contemporary Industrial Arts Laboratory/Classrooms," (unpublished Doctor's dissertation, University of Northern Colorado, 1971), p. 151.

⁵Carter V. Good, Dictionary of Education (New York: McGraw Hill Book Company, Inc., under auspices of Phi Delta Kappa, 1973), p. 115.

⁶Bruce J. Biddle and William J. Ellena, Contemporary Research on Teacher Effectiveness (New York: Holt, Rinehart and Winston, Inc., 1964), p. 2.

⁷Panorm Keawkamnerd, "Aims and Programs of Industrial Arts for a Major and Minor," In a Speech at the Annual Industrial Arts Teacher Seminar at Pranakorn (Summary Report in Thai, March 10, 1977), p. 4.

⁸Saroj Buasri, An History of Thai Education: the Ministry of Education (printed at Kurusapha Press by Nai Khamthon Sathirakul, April, 1976), p. 97.

⁹Ekaraj Utara, "A Follow-Up Study of Industrial Arts Graduates Working in Teachers Colleges," (unpublished Master's thesis in Thai, Srinakharinwirot University, March 3, 1977), p. 67.

¹⁰Vitton Upathamp, "Aims, Programs and Problems of Industrial Arts Instruction," In a Speech at the Annual Industrial Arts Teacher Seminar at Pranakorn (Summary Report in Thai, March 10, 1977), pp. 1-4.

¹¹Hilding Waldemar Gadda, "An Evaluation of the Preservice Program of Teacher Education in Agriculture at South Dakota State College," (unpublished Doctor's dissertation, Michigan State University, 1963), p. 76.

¹²Pranakorn Teacher's College, "Industrial Arts Curriculum Instruction of Teacher Education," (unpublished Materials, Thai Language, 1976), p. 1.

¹³Pichai Siritusnakul, "The Program of Industrial Arts Teacher Education Related to the Need of Comprehensive Secondary Project," (unpublished Materials in Thai, the College of Education Prasanmit, 1973), p. 72.

¹⁴Director of Pranakorn Teacher's College, "A Survey of Industrial Arts Working in Various Programs," (between July and September, 1977).

¹⁵John D. Bies, "Engineering Systems Analysis: Applications to Competency-Based Teacher Education," Competency-Based Industrial Arts Teacher Education (26th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1977), pp. 149-50.

¹⁶Franzie L. Loep, "Implementing a Preservice C/PBTE Program in Industrial Arts Teacher Education," Competency-Based Industrial Arts Teacher Education (26th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1977), p. 203.

¹⁷Bies, op. cit., p. 150.

¹⁸Carter V. Good, Essentials of Educational Research (New York: Appleton-Century Crofts, 1966), p. 192.

¹⁹Ibid.

²⁰Good, Dictionary, op cit., p. 589.

²¹Committee on Publications, Definitions of Terms in Vocational Technical and Practical Arts Education (Washington D.C American Vocational Association, Inc., 1964), p. 11.

²²Donald E. Moon, A Guide to the Planning of Industrial Arts Facilities (24th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1975), p. 16.

²³L. E. Hinsie and R. J. Campbell, Psychiatric Dictionary (New York: Oxford University Press, 1973), p. 533.

CHAPTER II

REVIEW OF RELATED LITERATURE

The researcher's intent in this chapter is to review literature relating to the problem of defining the functional competencies needed by beginning teachers for effective teaching. Studies and writings concerning the identification and development of teacher competencies are discussed in order to provide pertinent insights into this study.

The review is divided into three areas of inquiry that are applicable to the problem of this research. The inquiry focuses on (1) literature relating to professional competencies of (beginning) teachers, (2) literature pertaining to the assessment of teacher competencies, and (3) literature concerning recommendations to improve teacher preparation. A brief summary of the literature concludes the chapter.

Literature Relating to the Professional Competencies of (Beginning) Teachers

The studies and writings in this area have been grouped into two sections. The first section comprises studies of the competencies of beginning teachers. The second section includes competencies for experienced teachers. Additionally, both sections concentrate on the

manner of teacher performance.

Competencies of Beginning Teachers. It is evident that pre-service teacher preparation programs need to be based on a consideration of the functional competencies needed by beginning teachers.¹

Horton states that, "elements of the preservice program can be defined as general education, professional education and specialized education"²

In the area of general education, Massey and Vineyard along with other professionals in this field, agree that the most effective teacher will possess a wide range of interests, knowledge, understandings, skills, attitudes and appreciations.³ Furthermore, Lux characterized the role of general education in the industrial arts programs. His five-fold conclusions were:

1. The industrial arts major 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.⁴

With respect to professional education, Lux recognizes the following five views of the basic theoretical considerations underlying

the professional education of industrial arts teachers:

1. Industrial arts teacher education is an integral part of the total field of 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.⁵

Vineyard and Massey partly supported the preceding notion of professional education when they said, ". . . These include basic understandings of children, learning process, methodology, the role of school in society and philosophies and objectives governing educational practices."⁶

Specialization is based upon general education and it is apparent that the prospective teachers should possess a high degree of competence in one or more teaching fields. Three categories are identified in specialized education by Horton:

The first may be considered a core of technologies regardless of what taxonomy of industry or technology is used, it seems that an identified content area common to all teachers in industrial arts is desirable

A second category supplements the core and may be considered a highly specialized segment of the core. This is the concentration or specialty which the teacher-in-preparation decides he wishes to teach

Coordinated experiences in industry can be considered a third phase of the technical experiences of the program. This experience should ideally complement the concentration mentioned above.⁷

In the preceding discussions three elements are implicit in the functional competencies of beginning teachers. In addition, these

functional competencies can be broadly grouped into different categories. To support this viewpoint, Andreyka and Briley⁸ indicate several major categories of teacher competencies for beginning teachers in Florida. A detailed list of the preservice industrial education teacher competencies and criteria was revised and validated by a statewide advisory committee. As a result of the committee's work, findings were divided as follows:

1. Human Relations: (1) determine needs and interests of students, (2) relate to students as individuals, (3) assist students in developing self-discipline, (4) employ reinforcement techniques in interpersonal relations, (5) demonstrate the ability to communicate with students, other teachers, administrators and laymen, (6) demonstrate an understanding of working interpersonal relations.
2. Instructional Planning: (1) identify instructional objectives, (2) develop instructional lesson plan.
3. Teaching Methods: (1) select an appropriate teaching method, (2) employ oral questioning techniques, (3) present information through an illustrated talk using models, real objects, chalk boards and overhead projectors, (4) conduct group discussions, (5) present a related lesson, (6) present a manipulative lesson and (7) direct problem-solving activities.
4. Shop and Classroom Management: (1) organize and maintain the . . . laboratory, (2) establish and maintain a filing system, (3) manage equipment and supplies in the laboratory, (4) establish and maintain a student progress record, (5) provide for the safety and first aid needs of students.
5. Evaluation: (1) identify or assess student performance in the classroom and shop/laboratory, (2) determine student grades, (3) develop an awareness of accountability in terms of job placement, continued training
6. Professional Development: (1) demonstrate an understanding that industrial education courses are established and combined labor based market needs and other economic conditions, (2) demonstrate knowledge of various professional organizations and the services they provide for the beginning teacher, (3) demonstrate awareness of district and school policy and organizational structure.⁹

In another study conducted by Snider and Butefish, specific prospective teacher behaviors which could indicate success in

teaching situations were identified in the following 16 teaching competency goals:¹⁰

(1) open and flexible teaching personality, (2) proper perspective of teaching-learning situations, (3) adequate health and validity, (4) effective voice and speech patterns, (5) ability to work cooperatively with other staff members, (6) ability to profit from feedback, (7) maturity of judgment and ability to make realistic decisions, (8) command of subject matter, (9) competence in preparing effectively for lessons, (10) competence in classroom management, (11) competence in performing a variety of critical teaching tasks, (12) competence in evaluating students, (13) competence in motivating learners, (14) fair and just attitude in dealing with students, (15) competence in the clinical approach to misbehavior and (16) commitment to student teaching.¹¹

In a study about general qualities desirable in hiring industrial arts teachers, Scherer listed ten behavior characteristics which were then incorporated into a rating scale for his survey instrument. These behavior characteristics, based upon competencies needed by beginning teachers, were as follows:

(1) enthusiasm for his work, (2) effectiveness of his instruction, (3) ability to maintain shop, tools, equipment and supplies, (4) ability to establish and maintain high standards of workmanship, (5) mastery of knowledge and skills in the field, (6) exemplification of professional attitudes and habits, (7) ability to inspire and motivate students, (8) ability to handle and get along with students, (9) ability to get along with fellow teachers and (10) ability to get along with administration and faculty.¹²

Rutherford was also concerned with the characteristics needed in beginning teachers. He surveyed California practices in the selection, placement and guidance of beginning teachers. The results of his study seem pertinent to this study since Rutherford has made recommendations for major improvements in the areas of professional education and student teaching.¹³

In his article, "Why Teachers Fail," Bass brought out one characteristic of beginning teachers that relates to the enthusiasm discussed by both Rutherford and Scherer:

It is certainly a rarity to find a beginning industrial education teacher who does not have idealistic expectations for improving the teaching of his subject and the learning of his students. The industrial education teacher comes from the teacher education institution with new ideas for instructional reform, with theories about curriculum revision and with admirable intentions to improve the education of students in a general way. Such idealism is naturally accompanied by a high level of enthusiasm for the tasks to be faced as a new teacher. As a result, his first year in teaching is often characterized by careful, detailed planning for lessons, demonstrations, laboratory activities and management of the laboratory. He is also often critical of his new colleagues in industrial education whose enthusiasm and efforts are less than his own.¹⁴

Based upon the preceding introductory point, Bass further discusses this matter of teaching failure. He finds that beginning teachers are not only deficient in preparation for successful lesson presentations, but they are also disappointed by fellow teachers and the school organization. As a result, these circumstances cause them to lose their idealism and enthusiasm. In a summary of the possible solutions, Bass proposed, ". . . correction of teacher education deficiencies and improvement of conditions in the school environment which would reduce the condition for failure and enhance the conditions for success."¹⁵

In this vein, Morgan, Head of the Industrial Arts Department, South Colorado State College, summed up the characteristics of a successful beginning teacher:

. . . If we are successful in our efforts, we should develop a beginning teacher who possesses poise, confidence and teaching ability. He should understand the total education system, should possess a philosophy of industrial arts, should

be able to identify objectives of his field, to organize instructional materials, to evaluate effectively, to stimulate students, to organize learning activities and to teach like a professional.¹⁶

Competencies of Teacher. In his book entitled Methods of Good Teaching, Stewart wrote:

If your personality is such that you maintain cordial relationships with your pupils; if you have the good judgment to induce appropriate interest techniques; if you encourage thinking and develop understanding, and if you introduce appropriate repetition, where necessary, for fixation, then I can only predict that you are on the high road to your avowed goal of becoming a good teacher.¹⁷

In another study Mansfield was more specific when he identified the basic qualifications which the effective industrial arts teacher should possess:

(1) personality, (2) intelligence, (3) ability to get along with students, (4) physical coordination, (5) mechanical aptitude, (6) initiative and drive, (7) inspirational influence, (8) resourcefulness, (9) participatory experiences and (10) professional preparation.¹⁸

Turner, a past President of the National Education Association, seems to echo some of Mansfield's findings when he states that the characteristics of a superior industrial arts teacher are his ability to be a stimulator of creativity, a good team worker, an efficient organizer, an understanding person, and well informed educationally and academically and be professionally well prepared.¹⁹

Roberts and Becker recently conducted a study of classroom behavior among industrial arts teachers. As a result of their findings, they concluded:

While no doubt each teacher has a somewhat unique style of teaching, the "best" teachers were characterized by being very dynamic, by having superior delivery skills, by spending a great amount of time in direct contact with their students

and by creating a present social-emotional environment through the use of praise and banter.²⁰

Donovan, a shop teacher in the Cranston school, Rhode Island, stated that a shop teacher should possess the skills of a manager, a supervisor and an instructor to do a better job and become a more effective teacher. Specifically, the three roles of the shop teacher as described by Donovan are:

1. Manager of Administrative Activities: (1) develop course of study, (2) evaluate instruction, (3) establish shop policies, (4) prepare shop budget, (5) write report to administration and (6) order shop equipment and tools.
2. Instructor of Student Oriented Activities: (1) instruct students in class theory, (2) demonstrate shop jobs, (3) evaluate student progress, (4) enforce safety rules, (5) make visual aids, (6) control discipline, (7) make tests, (8) insure rotation of work stations and (9) improve methods of instruction.
3. Supervisor of Program Continuity Activities: (1) supervise student activities in shop, (2) insure materials and supplies, (3) control tool and equipment use, (4) select equipment or arrange for repair, (5) organize student work stations, (6) make progress charts, (7) plan jobs and records, (8) supervise house keeping activities, (9) keep student records and reports, (10) control lateness and absenteeism and (11) enforce shop policies.²¹

Donovan's notion that the teacher's role in instructional systems is a multiple one was further emphasized by Buffer, who wrote:

The teacher's role has changed from a transmitter of knowledge to that of a manager who utilizes management technology to "mediate" instruction. He is a planner, organizer, supervisor, coordinator and evaluator of the teaching learning process²²

Stadt and Kenneke supported in part the preceding notion when they stated, "the teacher of the 1970's will be a classroom and laboratory supervisor rather than a classroom lecture or shop foreman" ²³ They further emphasized that the primary duties of a supervisor should

be to assure that (1) instructional materials are selected, (2) learning experiences are appropriately spaced, (3) quality educational standards are achieved and maintained and (4) expenses are kept to a minimum.

In addition to the multiple facets of his professional role, the industrial arts teacher must keep abreast of technological advances on two fronts: education and industry. According to Pautler, industrial arts teachers must integrate two complex and overlapping disciplines:

First, major components of content are derived from an analysis and synthesis of technological functions of industry. Second, the laboratory approach to learning provides a dynamic atmosphere that is characteristic of the world of work! Therefore, industrial arts teacher has a professional obligation to keep up with technical advances in industry and to translate the appropriate technology into a classroom and laboratory presentation.²⁴

Hence, both the abilities to cope effectively in a many-faceted role and to deal effectively with a dual discipline are inherent in the functional competencies needed by (beginning) industrial arts teachers. Nelson and Sargent, in their chapter, "Contemporary Industrial Arts Programs and Teacher Effectiveness," identified some criteria of industrial teacher effectiveness drawn from various aspects of modern industry. Their criteria are unique in that they show how standards used to evaluate industrial processes and products can be appropriately applied to teacher evaluation.

1. One aspect of our modern industrial complex that seems to lend itself as a criterion for teacher evaluation is the ability of industry to adapt quickly to changing conditions
2. A second aspect of modern industry that could serve as a criterion for assessing the effectiveness of an industrial educator is its organizational competency
3. A third aspect of today's industry that might be used as a criterion by industrial educators who are interested

in determining their effectiveness as teachers is the creative thought with which industry approaches various problems

4. There are other aspects of modern industry that could serve equally well as criteria for evaluating teacher effectiveness in industrial education. Knowledge and utilization of new materials, awareness of new trends in design and consciousness of occupational trends are some of these²⁵

Householder has best summarized the entire spectrum of desirable characteristics of (beginning) industrial arts teacher competencies, as they had been developed and finalized by previous writers, when he asserted that a teacher:

1. must understand the role of industrial arts in the educational process, yet remain open-minded and cognizant of current problems, issues, needs and developments in industrial arts;
2. must also continually develop consistency in his personal philosophy of industrial arts education, and be able to use his philosophy as a guide to curriculum development and teaching practices;
3. must understand the industrial institution and its functions, the role of technology in man's cultural evolution and current industrial developments and trends;
4. must be able to maintain excellent relationships with the community and with industry;
5. must be able to define his objectives precisely, identify and select new content, organize courses to meet the specific purposes of his program, design appropriate educational experiences, and obtain and utilize resource materials
6. must be able to organize and maintain the industrial arts laboratory;
7. must be able to teach effectively, using a variety of methods, in an activity-oriented environment;
8. must be capable of evaluating the achievement of educational objectives and able to conduct appropriate action research;
9. must be safety conscious, and have basic competencies and technical knowledge in the major technical areas of industrial arts;
10. should have some depth of competency in one or two technical areas, and should be capable of acquiring new knowledges and skills as they are needed.²⁶

Literature Pertaining to the Assessment of Teacher Competencies

The following selected studies reported on topics of interest to educators conducted during the period 1946 to 1977. More specifically, the topics dealt with purposes, criteria, techniques and procedures in assessing teacher competencies.

In 1946 a study conducted by Silvius identified the activities which an industrial arts teacher should be able to perform effectively.²⁷ One hundred and sixty activities were evaluated by seven hundred and fifty teachers of industrial arts throughout the United States and were classified and ranked by order of importance into twelve major groups of activities:

- (1) pertaining to the physical plant and supplies,
- (2) determining content for a course of study, (3) pertaining to relationships with students, (4) relating to professional and personal development, (5) relating to course of study aims, (6) teaching the course of study, (7) pertaining to relationships with school staff, (8) recording information about students, (9) evaluating instructional program, (10) planning for the instructional program, (11) pertaining to relationships with the school community and (12) relating to extra-classroom activities.²⁸

Silvius further reported that 40 out of the total 160 activities were ranked as being "most important." A large number of the 40 activities was specifically related to the performance of industrial arts teachers in the classroom and laboratory.

In the same decade, Giachino conducted a study to analyze the success qualities of competent teachers of industrial arts.²⁹ A list of 95 success factors pertaining to industrial arts teachers was compiled and sent to 500 supervisors of industrial arts in 48 states. They were asked to rank each item according to its degree of

importance. An analysis of the differences between the rankings of these items by the supervisors and the importance attached to them by teacher educators was conducted. It was discovered that a high positive correlation existed between the general opinions of supervisors and teacher educators. However, a closer analysis of the individual items found a definite lack of agreement between these two groups of respondents. Success factors listed under "Shop Management" were highly rated by 50 percent or more of the teacher educators but were not considered "very important" by the supervisors. Further, those success factors which dealt with the "Professional and Cultural Education" were ranked well below the fiftieth percentile by the respondents.

In 1955 a study conducted by Newhouse in California focused on the roles and competencies of teachers in industrial arts education.³⁰ He identified six roles the teacher has in promoting student growth as: (1) a director of learning, (2) a counselor and guidance worker, (3) a member of the school community, (4) a mediator of the culture, (5) a link with the community and (6) a member of the profession.

Competency groups within each role were compiled and used as a basis for indication as to how well industrial arts teacher educators and coordinators were aware of the importance of the six identified roles. Based upon the analysis of the data, significant findings were as follows:

1. Teacher educators with twenty-five years or more college teaching experience perceived role number two, "Counselor and Guidance Worker," as significantly more important than did the educators with less experience.

2. Industrial arts coordinators perceived the role, "Mediator of the Culture," as significantly more important than did teacher educators.³¹

In 1959 another study conducted by Reese evaluated teacher education programs in Trade and Industrial Education.³² He developed a checklist of factors which underlies the potential problems of beginning teachers. The checklist was validated by a jury of specialists. A study group of 240 Ohio trade and industrial education teachers checked those factors which related to the problems they found in their early years of teaching. Furthermore, they indicated whether they were helped to handle those problems by a preservice program or not. Twenty-four important factors in the teacher training program were identified, based upon expressed needs of the beginning teachers. From 64.5 to 100 percent of the teachers who responded to each factor reported receiving help in that area in the preservice program, but the extent or quality of help was not disclosed. It was determined that the programs did not devote sufficient attention to those problems of beginning teachers which result from personal characteristics. One of Reese's recommendations was that the preservice programs should be based upon the individual problems of beginning teachers.

In 1960 Walsh conducted a study for the United States Department of Health, Education and Welfare which determined 107 competencies required for effective teaching in trade and industrial classes.³³ A committee of experts was engaged to identify a list of the competencies which they considered important and necessary. The final list was compiled by using inquiry forms. As a result, professional and functional competencies were divided into two areas: (1) those which involved knowledge or understanding, (2) those which

involved ability to do or use manipulative skills and techniques.

Seven categorical headings were further delineated as follows:

- (1) orientation to public education, (2) interpersonal and group relations, (3) understanding the student and the learning situation, (4) developing functional curriculums, (5) selecting, developing and using instructional materials, (6) teaching methods and (7) shop and classroom organization and management.³⁴

An instrument containing the 107 competency items was sent to a respondent group comprising 514 successful teachers of trade and industrial subjects, 228 state and local supervisors, and 120 trade and industrial teacher educators. They were asked to rate the importance of each item. Significant findings in this study were:

1. There was a high degree of association between the ratings of the 107 competencies by successful teachers, state and local supervisors and teacher educators.
2. Competencies in the category of teaching methods and techniques were most often rated high in importance, while competencies in the category of shop and classroom organization and management were rated low in the scale.
3. The teachers considered "most important" and "very important" those competencies which expressed ability to do something rather than those indicating knowledge or understanding.³⁵

In 1965 a study directed by Silvius and Ford was undertaken to determine practices and policies concerning qualifications for industrial education teachers in Michigan.³⁶ An interview form of 29 questions was developed to obtain the opinions of 56 people who were: (1) teachers, (2) counselors, (3) administrators, (4) professors of industrial education, and (5) representatives of business, labor, community colleges and technical institutes. The findings of their study show that some institutions, particularly those concerned with industry, business and education, placed too much emphasis on professional education courses. The findings that

seemed pertinent to the present study concerned desirable characteristics for industrial arts teachers in junior high schools. The researchers reported that a successful industrial arts teacher:

(1) has an interest in children--including participation in out-of-school activities, (2) likes to work with tools and materials, (3) has an adequate technical background--a real command of each subject area to be taught, (4) possesses a generalized education--has an appreciation for the humanities, (5) has real concern and a knowledge of counseling and guidance practices.³⁷

Based upon the preceding results, Silvius and Ford drew the following conclusions:

1. A limited amount of supervised industrial work experience should be an integral part of the teacher's preparation for teaching industrial arts in junior high schools.
2. Persons preparing to teach at the junior high school level should have a better understanding and knowledge of other subject areas, particularly the basic sciences and their application in industrial activities.³⁸

In 1967 a study conducted by Meosky investigated the nature of the relationship between certain aspects of personality and teaching success, as indicated by principals' and industrial arts supervisors' ratings.³⁹ Graduates of the industrial arts department of Trenton College who were teaching at the secondary level in New Jersey were used as subjects for the study. The instruments used were Cattell's Sixteen Personality Factor Questionnaire and a rating scale for industrial arts teachers. The statistical procedures used were a comparison of mean score differences and Spearman's rank coefficient of correlation. Based upon an analysis of the data, Meosky reported:

1. The scores of the most successful group of industrial arts teachers and the least successful teacher group would seem to indicate that the Sixteen Personality Factor Questionnaires did not tend to significantly differentiate between the mean scores of the two groups.
2. Ten of the twelve rating scale items for the most successful teacher group showed significant correlation with

principal ratings . . . when correlated nine of the twelve items on the rating scale were significant with principal ratings for the least successful group.⁴⁰

In the same study, Meosky concluded that principals and supervisors tended to look at personality factors in a similar manner when rating teachers.

In 1968, another study done by Margules and Keith determined supervisors' ratings of the most and the least effective industrial arts teachers on three competency dimensions.⁴¹ The three dimensions used were: (1) interpersonal relations, (2) teaching techniques and (3) technical proficiency. When the judgments of teacher effectiveness were correlated with scores on these dimensions, it was found that teachers judged most effective were in terms of competency technically proficient. Those judged as least effective had greater deficiencies in interpersonal relations and teaching techniques. However, one of their recommendations was that, "explanation should be undertaken to seek ways of formally structuring into the teacher education curriculum programs which are intended to enhance positive interpersonal relations."⁴²

In 1971 a survey study conducted by Miller ranked functional competencies needed by instructors in contemporary industrial arts programs.⁴³ A list of functional competencies was compiled by analysis of related studies and writings based on reflection upon the goals for contemporary industrial arts programs. Further, an evaluative jury of specialists was engaged to develop competency statements. As a result, seventy-five competency items which an industrial arts instructor should be able to perform effectively were

listed under the following six categories:

(1) teaching methods and techniques, (2) laboratory and classroom management, (3) organization of instructional materials, (4) technical knowledge and manipulative skills, (5) student evaluation and (6) personal qualities and behavioral characteristics.⁴⁴

The instrument then was sent to industrial arts educators and supervisors throughout the United States, Canada, and the District of Columbia. Responses from 483 or 78.2 percent of the total sent were used in an analysis of data according to Spearman's rank coefficient of correlation. As a result of his study, Miller reported that:

1. Close agreement existed between teacher educators and supervisors concerning the rank order of importance for the functional competencies
2. Personal qualities and behavioral characteristics generally were rated the most important competencies needed by the industrial arts instructor
3. . . . The functional competencies pertaining to teaching methods and techniques were more important than those competencies in course content and related information⁴⁵

It was found that the stated competency, that demonstrates safe operational procedures of machines and equipment, was identically ranked in the top seventy-five functional competencies by both teacher educators and supervisors. Miller also concluded that valid methods and techniques should be found for screening prospective teachers to help determine whether they possess important personal characteristics and qualities.

In 1975 a study conducted by Perkins ascertained the professional competencies needed by trade and industrial teachers as perceived by teachers, supervisors, administrators and educators.⁴⁶ One hundred and sixty-nine respondents were asked to rank 164 competencies in order of their importance. Statistical treatment of the data included the

Point-Biserial Correlation, Kendall's Rank Correlation and the Students' T-Test. Based upon the analysis of the data, Perkins reported a significantly high degree of agreement (at the .01 level of confidence) among the teachers, supervisors, administrators and educators. Further, he reported that competencies needed by prospective teachers could be delineated in a rank order of importance and that they could then be grouped into clusters of (1) essential preservice competencies, (2) important inservice competencies, and (3) the competencies to be developed when time permitted. One of his recommendations was that the teachers should develop competencies in the following areas before they begin teaching:

- (1) developing and maintaining a teaching specialty,
- (2) constructing a course of study, an instructional unit, a lesson plan and an occupational analysis,
- (3) planning safety instruction,
- (4) using live work in the laboratory for learning experiences . . .
- (5) establishing criteria for evaluating student performance,
- (6) selecting textbooks and reference materials,
- (7) demonstrating personal appearance and behavior appropriate for a professional teacher,
- (8) providing for individual differences,
- (9) knowing . . .⁴⁷ facility standards and
- (10) using craft advisory committee.

In 1976 a study directed by Florida State University determined competencies important to Florida's industrial arts teachers at the middle and high school level.⁴⁸ The development of the instrument was validated by a jury consistent with a sample of the Leon County industrial arts teachers, State Department of Education personnel, and selected industrial arts faculty members. The questionnaire contained 77 competency statements and was distributed by mail to industrial arts teachers throughout Florida during 1975-1976. They were asked to rank each statement of competency in order of importance. A t-test was employed to determine if there were any significant

differences in the mean importance ratings between the middle and high school teachers. Based upon an analysis of data from returned instruments, it was reported that a large number of professional competencies important to the middle and high school industrial arts teachers were somewhat similar. Of the 77 competencies, only four received a greater mean importance rating according to the six-point rating scale. These competency statements were listed as follows:

(1) organize and operate an industrial arts club; (2) present information with televised materials; (3) conduct team teaching and (4) provide bilingual instruction to meet the needs of students with language difficulty.⁴⁹

It was further concluded that these competency statements dealt with directing student study, use of bulletin boards and the use of role playing and simulation.

In a 1977 study entitled "Industrial Arts Teacher Education: Competencies for the Future,"⁵⁰ Bilbo conducted a two-phase research: (1) a list of competencies needed by future teachers validated by a selected nation-wide panel of leaders in industrial education, (2) and he employed the statements of competency from the initial phase of the study to evaluate Texas industrial arts teacher education program. Participants in the second phase of the study were the department head from each industrial arts teacher education program in Texas and a faculty member representing each institution. Each survey participant was asked to rank each competency statement on two scales: (1) an importance scale based on his perception of the importance of each competency to future programs and (2) a degree of development scale based on his perception of how well the competency is developed in his program. Based on an analysis of

the data, selected findings and conclusions were reported as follows:

1. The validation panel representing various innovative programs from across the nation perceive future industrial arts teacher educators
2. . . . no test revealed a significant difference between faculty members' and department heads' perceptions of future program content.
3. Similarly, the department heads and faculty members estimate the degree to which the current programs develop the competencies very closely
4. A strong correlation existed between the perceived importance of a competency and the degree to which that competency is developed in current industrial arts programs.⁵¹

Literature Concerning Recommendations to Improve Teacher Preparation

Studies and writings which reflect the direction and objectives of current teacher education programs are discussed in this area.

In a study designed to identify effective teaching in industrial arts, Mansfield drew significant conclusions regarding teacher education.

1. Teacher educators should apply or utilize more positive procedures which would develop greater ability in involving and maintaining better teacher-student relationships.
2. Teacher educators should aid prospective teachers in the development of concrete methods by which they could achieve more satisfactory discipline.
3. Teacher educators should stress the importance of keeping records, making reports and other business routines.
4. Teacher educators should stress the various techniques of successful teaching.⁵²

Jensen too supported the preceding conclusions when he stated that the teacher educator should be, ". . . superior in organizational ability, enthusiastic about teaching, a skill analyst and adept at interpersonal relations."⁵³

In another study Svendsen, in part, concluded that, "more emphasis should be placed upon teacher-pupil relationships in the teacher education program."⁵⁴ In addition, Kampsnider indicated that affective competencies in teacher preparation can be identified in two major categories.

1. Pupil-centered affective competencies which can be subdivided into subcategories:
 - (1) Basic communication skills--these skills center around the ability to enhance the communication process during the delivery of a lesson
 - (2) Group process skills--these skills focus on the student's understanding of group dynamics as they occur in a normal classroom setting
 - (3) Behavior management of individual pupil--these competencies center on classroom management through the control of individual pupil problems
2. Teacher-centered affective competencies which can be subdivided into subcategories:
 - (1) Self-awareness and behavioral self-definition Self-evaluation activities such as encounter groups and personal counseling would usually extend beyond those areas which are pertinent to the teaching role
 - (2) Modeling teacher and self-role behaviors The emphasis is placed upon skills in sharing personal feelings as they might be translated through the teaching methods
 - (3) Giving and receiving feedback The long range goals of these skills is aimed at teacher ability to give and receive feedback from prospective pupils in order to improve teaching effectiveness⁵⁵

The need for preparing industrial arts teachers to interpret industry has been well recognized. Streichler and Ray have asserted that the content of teacher preparation programs should be derived from "acceptable interpretations and definitions of industry and technology."⁵⁶ Wolansky further indicated that the development of technical skill in industrial arts must contribute to an appreciative understanding of industry and technology.⁵⁷ Therefore, the industrial arts teacher must be prepared to provide for his students an extension

of appreciations, meaning and implications of technology in an industrial society.

In his study, Popovich stated that ". . . technical competencies are unique to teaching area."⁵⁸ Concerning the goals of developing technical competencies for industrial arts teachers, Moeller states that the teacher ought:

1. To become oriented to the basic areas of industrial arts in both hand and machine operations and essential technical information of industry; (and)
2. To develop depth competence in selected areas of industrial arts through independent research, planning and execution of units or projects that provide for the application of scientific or technological principles through problem-solving.⁵⁹

In a study entitled "The Application of John Dewey's Philosophy to Industrial Arts Teacher Education," Baird supported, in part, the preceding notion when he concluded:

In the industrial arts teacher education laboratory students should have the opportunity to experiment with ideas relating tools, materials and processes as well as techniques of teaching The curriculum should induce activities of problem-solving, experimentation, investigation, critical thinking, intensive planning, research and creativity. The materials of our industrial society should be used and studied in terms of these activities.⁶⁰

The industrial arts teacher preparation programs must be designed to provide the content, methods and techniques which reflect contemporary industry. To pursue further this point, Schmitt stated that:

Instructional content as taught in the industrial arts laboratory should relate more directly to modern industrial developments and the basic problems of industry What the student does in the industrial arts laboratory ought to be related to the significant technical problems such as mass production, improvement of product design, research and development, new machine and processes, use for new materials, safety and communications⁶¹

More than twenty years ago, Brasted, the director of the education department of the National Association of Manufacturers, in addressing a national convention of the American Industrial Arts Association stated:

Industrial arts teacher training, at least on the undergraduate level, should be conducted in close cooperation with industry. Student teachers should have an opportunity to develop their skills to the maximum by actual work in industry. They should have an opportunity to get a clear working understanding of industrial organization, management and operation. Teachers of industrial arts need a realistic knowledge of the conditions their students will work under when they leave school; they need to know first hand about labor management problems. They must know the facts about production requirements and industrial economics⁶²

Brasted's statement has contributed to one's understanding of the development of teacher training. In support of his thinking, activities such as travel and work experience become a part of all forms of teaching.⁶³ In this regard, Micheels has stated:

AS a part of their training, industrial arts teachers will be required to have more direct work experiences in industry. This will be supplemented by planned and organized visits to industry as a part of the curriculum program.⁶⁴

In light of the foregoing discussion, Walansky suggested that "one area of teacher training that must be given greater consideration is industrial internship."⁶⁵ He further pointed out that:

. . . Active participation in industry will provide the industrial arts teacher with a better perspective of industry, its methods, organization, influence, growth and status. An industrial arts teacher must have first hand experiences with the internal activities of industry and also develop an awareness of the external relationships of industry to culture. He cannot possibly interpret accurately the social impact of industry on our patterns of culture without some first hand experiences within industry⁶⁶

Stadt and Kenneke authored a monograph critiquing the current impact of technology upon man and his environment. Important implications were put forth for improving industrial arts teacher education in the following conclusions:

1. Content changes in industrial arts must be as rapid and frequent as possible, but major changes in the process and technology of instruction must be introduced if learning is to be compatible with the foreground of the student's world, and if the educational enterprise is to keep pace with other elements of productive society.
2. . . . Occupational education must concentrate its effort upon commonalities about the organization of men, money, materials and machines for the production and distribution of goods and services
3. . . . General understanding and acceptable attitudes rather than specified units of content and work skills should be the intent of occupational programs
4. Industrial arts should assume responsibility for informing youth and ill-fitted adults about contemporary work and technology. . . .⁶⁷

Many teacher educators agree that industrial arts is concerned with tools, materials, machines, processes, products, people and their problems.⁶⁸ More specifically, industrial arts is concerned with industry of the technological society based upon a review of its literature. It is expected that industrial arts teachers will become professional students of the technological aspect of our culture. According to DeVore and Lauda, the changes needed to reflect the new technologies in education and industry are:

1. acceptance of technology as the discipline base and the study of technology as the base for curriculum and instructional design;
2. the name of the discipline must reflect the change of the cultural reality; hence the name "technology education" should be adopted;
3. the content of the discipline must move from the interpretation of . . . industry to a study of technology and society and the content apparent in this context;
4. new learning environments must be designed to provide for authenticity in the study of technology;

5. new instructional strategies must be designed to provide for authenticity in the study of technology;
6. teacher education institutions must alter their programs and take the lead in preparing new teachers and providing inservice education for current teachers;
7. professional organizations must provide leadership to advance the study of technology.⁶⁹

With regard to the preceding conclusions, it may be stated that two major changes must be effected in industrial arts teacher education programs: (1) they must be altered in order to prepare teachers capable of teaching new contents and utilizing appropriate instructional strategies, and (2) inservice education must be provided to current teachers if we expect them to keep abreast of technology and the changing environment.

In a discussion on the status of future teacher training programs, Starkweather recently indicated four directions for change:

- (1) the role of the teacher will change to that of a learning coordinator, (2) the utilization of media will become the focal point of instruction, (3) the classroom teacher will be supported by para-professionals and (4) the teacher will emerge in the form of an entrepreneur or teacher-scholar with the capability of understanding a technological society and its effect on people.⁷⁰

In the 26th yearbook of American Council on Industrial Arts Teacher Education entitled Competency-Based Industrial Arts Teacher Education, it is asserted that change is imperative to meet the competency needs of future teachers.⁷¹ According to Wright, Competency-Based Education is defined as, "a system of education designed to develop pre-specified, role-relevant competencies in those who are products of the system."⁷² In addition, Hauenstein stated that, "the system is characterized as an entity that has three major parts: inputs, processes and outputs. A CBTE program also has

these three parts."⁷³ Based upon this three-part system, Hauenstein further stated that:

Inputs to a CBTE program include: (1) knowledge, (2) people, (3) finance and (4) industrial and service resources
 The processes of the system include: (1) managing, (2) researching and developing, (3) preparing for instructions, (4) teaching and (5) evaluating
 Outputs of the system include: (1) competence teachers, counselors, administrators and other educational personnel and (2) effective and efficient learning system. Together these outputs have a discernible impact upon the preservice teacher, the quality of industrial arts programs⁷⁴

Many teacher education programs are now implementing Competency-Based Teacher Education. Conant⁷⁵ and Koerner⁷⁶ noted that there are many shortcomings in the traditional teacher education programs. They listed several reasons for change to a CBTE approach: (1) the curriculum based for teacher education is not consistent with the actual work requirements, (2) instruction is not provided to meet individual needs, and (3) evaluation of the educational product is not adequately systematic.

Houston and Brown indicated that all teacher education programs could benefit from implementing Competency-Based Teacher Education. One of the prime advantages of CBTE would be the relevancy of curricular content because the objectives (1) are clearly stated, (2) are in terms of learner outcomes, and (3) are made available to the learner.⁷⁷

In his review of competency programs, Trivett extrapolated several adaptations from the concepts of behavioral objectives, mastery learning and testing for competence:

1. From behavioral objectives, the idea that instructional goals should be specified clearly prior to instruction;

2. that appropriate learning experiences can be chosen after the instructional objectives have been specified;
3. the outcomes of student learning should be verified by other competent persons than those proposing the objectives;
4. that varying degrees, outcomes of student learning can be specified in behavioral terms; i.e., should be demonstrated by what students can do.
5. From mastery learning, the idea that students should be expected to learn and can master materials at a high level of accomplishment if the instruction provided them is efficient;
6. that a variety of instructional approaches will enable students with varied learning styles to learn materials;
7. that incremental levels of accomplishment will be most conducive to long-term learning and perseverances by students;
8. that evaluation of what has been learned can be separated from the learning process itself;
9. that evaluation within the learning process can enable students and instructors to know whether the instruction and learning is being successful;
10. that assessment and grading of students that assumes that achievement is distributed randomly denies the purposeful intent of instruction.
11. From McClelland's notion of testing for competence, the idea that scholastic aptitude as measured by traditional intelligence tests may reflect predictable achievement in school as measured by grades, but that grades do not predict performance in life;
12. that more reasonable testing in the academic world would focus on "criteria sampling," so that behaviors required in tests are samples of actual behaviors required for success in life;
13. that more competencies actually required in life should be ascertained and tested for;
14. that the skills and behaviors required for successful performance on tests should be publicly known in advance to those who will take the tests;
15. that tests should be used more to enable students and teachers to have knowledge of what students need to learn, and then, after instruction, to evaluate what they have learned.⁷⁸

Summary of Review of the Related Literature

Many studies and writings have been discussed in this chapter. Primary interest has been focused on some of the significant findings and conclusions in the three areas which provide pertinent insights

into this study.

It has been found that the professional competencies of (beginning) teachers generally reflect the adequacy of the pre-service teacher training programs. Present patterns of teacher education call for a three-part program: (1) a general or liberal element, (2) a content or subject-matter element (industrial technology) and (3) a method or professional element (educational or instructional technology). Each element of the complete preservice program in industrial arts teacher education is gradually changed to keep abreast of technological advances. However, professional and technical competencies which industrial arts teachers should possess to function have adequately received the most attention. In addition, behavioral and personal characteristics needed for success in teaching situations are included among the professional competencies for beginning and experienced teachers.

A large number of studies dealing with the identification of competencies needed by all teachers has been conducted since the 1940's. More specifically, manipulative and material-centered skills were required from preservice teacher training programs which had to reflect automation and revised industrial arts objectives. Since 1960 a study of industry has influenced the revised goals for contemporary industrial arts programs. Hence, these goals, advocated as unique to industrial arts instruction, are considered in formulating competencies needed by teachers. Furthermore, the interpretations of the industry and technology have been increasingly influential in determining teacher competencies or effectiveness ever since.

The review of literature has revealed that the study of teaching

success and competencies needed for effective teaching is very important. Instruments used in some studies were developed by evaluative juries of specialists in the field. Respondents were largely teachers, supervisors, educators, coordinators, chairpersons, representatives from industry, business and labor. Rating scales were frequently used to determine teacher competencies as perceived by various groups of respondents named.

Teacher educators play an important role in preparing teachers in preservice teacher training programs. As a result, the quality of industrial arts programs is largely dependent on the performance of competent teachers devoted to the teaching situation. The nature of teaching has gradually changed because of technological developments in both education and industry. The content of industrial arts programs tends to be the technology of industry. The preservice programs should not only organize industrial technology effectively, but they should also prepare teachers to utilize technologies appropriate to teaching relevant knowledge and skills. Furthermore, the teaching and learning situations should be based upon direct experiences from the industrial environment. Since teaching involves human relationships, it should be recognized that it is a highly complex phenomenon. One is left with the conclusion that the rapid rate and magnitude of changes affect educational programs and that such changes present serious problems to the classroom teacher specifically, to the teacher educator. One of the solutions is inservice education if these teacher educators and teachers are to keep pace with technological and environmental changes taking place in the classroom and laboratory instruction.

There seems to be general consensus that Competency-Based Teacher Education is more advantageous than traditional teacher education programs. To fulfill the purposes of instruction programs behavioral objectives, mastery of learning and testing for competence are used in the Competency-Based Teacher Education. However, results of CBTE are not known publicly.

From the overall summary of the studies and writings the following implications are considered the most pertinent to the present study.

1. It is apparent that the curriculum content for industrial arts has changed from emphasizing material-centered skills to a study of industry and industrial technology.

2. The improvement of teacher education programs depends largely upon the identification of teacher competencies needed for effective teaching and/or teaching success.

3. Preservice preparatory programs in industrial arts should provide for the development of technical competencies through appropriate methods and experiences i.e., field trips and industrial internships.

4. Preservice teacher education programs in industrial arts should design their curricula to include training in human relations for prospective teachers.

5. Programs need to be designed to develop modern technological competencies in order to help current teachers acquire them through inservice programs in industrial arts.

6. Competency-Based Teacher Education should be critically

studied as an approach for developing teacher education programs in industrial arts.

In Chapter III the methods and procedures will be established by an explanation of the pilot follow-up study, the instrument development, data collection, design of the study and plan for data analysis.

CHAPTER II -- FOOTNOTES

- ¹ Hilding Waldemar Gadda, "An Evaluation of the Preservice Program of Teacher Education in Agriculture at South Dakota State College" (unpublished Doctor's dissertation, Michigan State University, 1963), p. 76.
- ² George R. Horton, The Character of a Complete Program," Components of Teacher Education (20th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1971), p. 38.
- ³ Harold W. Massey and Edwin E. Vineyard, The Professional of Teaching (New York: The Odyssey Press Inc., 1961), p. 2.
- ⁴ Donald G. Lux (ed.), Essentials of Preservice Preparation (11th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1962), p. 55.
- ⁵ Ibid., p. 6.
- ⁶ Massey and Vineyard, op. cit., p. 3.
- ⁷ Horton, op. cit., p. 43.
- ⁸ Robert E. Andreyka and Thomas S. Briley, "Competency-Based Teacher Education for Industrial Teachers. Phase I: Competency and Criteria Identification and Validation for Preservice Education" (Tallahassee: Florida State University, 1975), 114 p.
- ⁹ Ibid., pp. 9-13.
- ¹⁰ Sarah J. Snider and William L. Butefish, "Student Teaching Behaviors Identified by a National Jury as Indicators of Success in Sixteen Competency Areas," Paper Presented at the Annual Meeting of the Association of Teacher Educators (56th St. Louis, Missouri, February 1976), 23 p.
- ¹¹ Ibid., pp. 3-4.
- ¹² Harlan L. Scherer, "Procedures and Factors Involved in the Selection of Industrial Arts Teachers and Their Relationships to Related Teaching Success" (unpublished Doctor's dissertation, Missouri University, 1960), p. 65.
- ¹³ William E. Rutherford, "Personnel Relations: A Study of the Selection, Placement and Guidance of Beginning Industrial Arts Teachers in California Secondary School," Dissertation Abstracts International (Ann Arbor, Michigan: University Microfilms, May 1963), p. 4199.

¹⁴Ronald E. Bass, "Why Teachers Fail," Journal of Industrial Teacher Education 11, No. 1 (Fall, 1973), p. 74.

¹⁵Ibid., p. 79.

¹⁶J. B. Morgan, "Preparing the Undergraduate Industrial Arts Teachers for the Future," (American Industrial Arts Association 23th Annual Convention at Dallas, 1972), pp. 510-13.

¹⁷W. F. Stewart, Methods of Good Teaching (no publisher given, Columbus, Ohio, 1950), p. 210.

¹⁸Robert Theodore Mansfield, "Competencies Desired With Respect to Teachers of Industrial Arts" (unpublished Doctor's dissertation, Ohio State University, 1959), pp. 48-70.

¹⁹Edwald Turner, "What I Would Look for in an Industrial Arts Teacher," Industrial Arts and Vocational Education 51, No. 7 (September 1962), pp. 24-25.

²⁰Churchill L. Roberts and Samuel L. Becker, "A Summary Report of Communication and Teaching Effectiveness," (Florida Department of Education, June 1974), p. 15.

²¹Thayer Donovan, "The Many Faceted Role of Shop Teacher," Journal of Industrial Education 65, No. 7 (September, 1976), p. 33.

²²James J. Buffer, "Theoretical Base of Instructional Method," Components of Teacher Education (20th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1971), p. 25.

²³Ronald W. Stadt and Larry J. Kenneke, Teacher Competencies for the Cybernated Age, Monograph 3 (Washington, D.C.: American Council on Industrial Arts Teacher Education, 1970), p. 25.

²⁴Albert J. Pautler Jr., "Curriculum Implications in a Technological World," Man/Society/Technology (May/June, 1976), p. 235.

²⁵Lloyd P. Nelson and William T. Sargent (eds.), Evaluation Guidelines for Contemporary Industrial Arts Programs (16th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1967), p. 24.

²⁶D. L. Householder, "Industrial Arts Teacher Education: Intellectual Perspective and Developmental Focus," Journal of Industrial Teacher Education 4, No. 2 (December, 1966), p. 53.

²⁷G. Harold Silvius, "Instructional Units for Professional Courses in Undergraduate Industrial Arts Teacher Education" (unpublished Doctor's dissertation, Pennsylvania State College, 1946).

²⁸ Ibid.

²⁹ J. W. Giachino, "An Analysis of the Success Qualities That Should Be Emphasized in the Training of Candidates to Become Competent Teachers of Industrial Education" (unpublished Doctor's dissertation, Pennsylvania State College, 1949), pp. 55-56.

³⁰ Glenn Irving Newhouse, "The Roles and Competencies of Teachers of Industrial Arts Education in California" (unpublished Doctor's dissertation, Stanford University, 1955), p. 74.

³¹ Ibid., pp. 90-93.

³² Robert M. Reese, "An Evaluation of the Ohio Teacher Education Program for Trade and Industrial Education," Dissertation Abstracts International (Ann Arbor, Michigan: University Microfilms, 20/01, 1959) pp. 217-220.

³³ John P. Walsh, Teacher Competencies in Trade and Industrial Education, U.S. Department of Health, Education and Welfare, Vocational Division Bulletin, No. 285 (Washington D.C.: U.S. Government Printing Office, 1960), p. 3.

³⁴ Ibid.

³⁵ Ibid., pp. 43-44.

³⁶ G. Harold Silvius and Andrew F. Ford, The Michigan Study of Industrial Teacher Competencies (Detroit: Wayne State University, 1965), 127 p.

³⁷ Ibid., p. 22.

³⁸ Ibid.

³⁹ Paul Richard Meosky, "A Study of the Relationship of Personality to Teaching Success in Industrial Arts of the Secondary School Level," Dissertation Abstracts International (Ann Arbor, Michigan: University Microfilms, 29/01, 1968), p. 171-A.

⁴⁰ Ibid.

⁴¹ Morton Margules and Virginia M. Keith, "A Study of Supervisors' Ratings of Most Effective and Least Effective Industrial Arts Teachers on Three Competency Dimensions," Journal of Experimental Education 37, No. 4 (Summer, 1969), pp. 37-44.

⁴² Ibid., p. 43.

⁴³James Arthur Miller, "Functional Competencies Needed by Industrial Arts Instructors to Adequately Perform in Contemporary Industrial Arts Laboratory/Classrooms" (unpublished Doctor's dissertation, University of Northern Colorado, Greeley, 1971), 197 p.

⁴⁴Ibid., p. 178.

⁴⁵Ibid., pp. 151-52.

⁴⁶Lawrence H. Perkins, "Competencies of Trade and Industrial Teachers as Perceived by Teachers, Supervisors, School Administrators and Teacher Educators" (Pensacola: University of West Florida, July 1975), 67 p.

⁴⁷Ibid., p. 13.

⁴⁸Florida State University, "Exemplary Competency-Based Vocational Teacher Education. Industrial Arts Component. Competency Identification Phase: Professional Competencies for Middle and High School Industrial Arts Teachers in Florida" (Spons Agency Florida State Department of Education, Tallahassee, 1976), 52 p.

⁴⁹Ibid., pp. 36-37.

⁵⁰David Lee Bilbo, "Industrial Arts Teacher Education: Competencies for the Future," Dissertation Abstracts International (Ann Arbor, Michigan: University Microfilms, May 1978), p. 6576-A.

⁵¹Ibid.

⁵²Mansfield, op, cit., pp. 243-46.

⁵³Glenn Jensen, "Preparing Competent Teachers of Teacher," Journal of Educational Leadership 30, No. 5 (February, 1973), p. 248.

⁵⁴Clarence Roger Svendsen, "Effective Personal Control Practices Employed by Industrial Arts Teachers in the Secondary School Classrooms of the Metropolitan Areas of Colorado," Dissertation Abstracts International (Ann Arbor, Michigan: University Microfilms, 31/05, 1970) p. 2150-A.

⁵⁵John J. Kampsnider, "Affective Teacher Education in a Competency/Performance-Based Program," Competency-Based Industrial Arts Teacher Education (26th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, 1977), pp. 67-70.

⁵⁶William E. Ray and Jerry Streichler (eds.), Components of Teacher Education (20th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1971), p. 26.

⁵⁷William Wolansky, "Considerations for Development in Industrial Arts Teacher Preparation," Journal of Industrial Teacher Education 3 (Fall, 1965), p. 29.

⁵⁸John N. Popovich, "A Validation of Selected Teaching Competencies for Industrial Teacher Education," Paper Presented at the Annual Meeting of the American Educational Research Association (59th, Chicago, Ill., April, 1974), p. 16.

⁵⁹Carl A. Moeller, "Aims for Undergraduate Industrial Education: A Study of Projected Aims and Supporting Principles as Evaluated by Selected Representatives of Labor and Industry" (unpublished Doctor's dissertation, Wayne State University, 1961).

⁶⁰Ronald James Baird, "The Application of John Dewey's Philosophy to Industrial Arts Teacher Education" Diss. Abstracts International, (Ann Arbor, Mich.: University Microfilms, No. 22, 1962) p. 2298.

⁶¹Marshall L. Schmitt and Friends, Industrial Arts: An Analysis of 39 State Curriculum Guides, 1953-58. (Washington, D. C.: Office of Education, 1961), pp. 68-69.

⁶²Kenneth F. Brasted, The Understanding Citizen in Our Industrial Civilization (Conference Report, American Industrial Arts Association Convention, Cincinnati, 1950), p. 4.

⁶³Kendall N. Starkweather, "A Study of Potential Directions for Industrial Arts Toward the Year 2000 A.D." Journal of Industrial Teacher Education 13, No. 2 (Winter, 1976), p. 68.

⁶⁴William J. Micheels and Staff, The Minnesota Plan for Industrial Arts Teacher Education (McKnight Publishing Company, Bloomington, Ill., 1958), p. 25.

⁶⁵Wolansky, "Considerations for Development," p. 30.

⁶⁶Ibid.

⁶⁷Stadt and Kenneke, op. cit., p. 28.

⁶⁸Wolansky, op. cit., p. 26.

⁶⁹Paul W. DeVore and Donald P. Lauda, "Implications for Industrial Arts," Future Alternatives for Industrial Arts (25th Yearbook ACIATE: McKnight Publishing Company, Ill., 1976), p. 160.

⁷⁰Kendall N. Starkweather, "Prologue: The Teacher in the Future Industrial Arts Classroom," Future Alternatives for Industrial Arts (25th Yearbook ACIATE: McKnight Publishing Company, Bloomington, Ill., 1976), p. 19.

⁷¹Jack C. Brueckman and Stanley E. Brooks (eds.), Compentency-Based Industrial Arts Teacher Education (26th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1977), 308 p.

⁷²Lawrence S. Wright, "Foundations of Competency-Based Education," Competency-Based Industrial Arts Teacher Education (26th Yearbook of ACIATE: McKnight Publishing Company, Bloomington, Ill., 1977), p. 37.

⁷³A. Dean Hauenstein, "Florida International University: A Case Study," Competency-Based Industrial Arts Teacher Education (26th Yearbook of ACIATE: McKnight Publishing Company, Ill., 1977), p. 120.

⁷⁴*Ibid.*, pp. 120-21.

⁷⁵J. B. Conant, Education of Teacher (New York: McGraw Hill, 1963).

⁷⁶J. D. Koerner, The Miseducation of American Teachers (Mifflin: Boston, Houghton, 1963).

⁷⁷Robert W. Houston and Kenneth W. Brown, "Competency-Based Education--Past, Present and Future," Journal of Industrial Teacher Education 12, No. 4 (Summer, 1975), p. 6.

⁷⁸David A. Trivett, Competency Programs in Higher Education (Washington, D. C.: American Association for Higher Education, 1975), pp. 8-9.

CHAPTER III

METHODS AND PROCEDURES

An attempt was made to analyze data collected from chairpersons and teachers of industrial arts at the college and secondary levels. They were asked to rate competency items which beginning teachers should develop to enable them to effectively perform in a particular program of industrial arts instruction. Questionnaires sent through the mail and delivered personally were used to collect the data. A description of the population, instrument development, an evaluative jury, construction and validation, data collection, design of the study and plan for data analysis have been provided in this chapter (III). Findings of the study are presented in Chapter IV; conclusions and recommendations are given in Chapter V.

Description of the Population

During July and September 1977, a pilot study was conducted by a Pranakorn official¹ to locate and survey industrial arts graduates teaching at various levels in Thai educational institutions. This attempt was made to locate a group of teachers who had completed the preservice program in industrial arts teacher education at Pranakorn during 1968-69 and 1975-76. A large proportion of degree teachers were found to be working at the college and secondary levels under the

Departments of Teacher Training and General Education.

Geographically, every college and secondary school in which they teach is located in the big city or district in a province (changwad) of the country as shown in Figure 1. At the college level, there were many graduates working in thirty-six teacher colleges; of which one is Pranakorn. At the secondary level, the graduates were found to be teaching in twelve of twenty comprehensive secondary programs and twenty-eight were teaching in the eighty-two rural secondary programs. It was estimated that more than 90 percent of 117 teachers graduated between 1968 and 1971 were employed by the Department of Teacher Training to teach more teachers. Since 1973, however, graduates employed in secondary industrial arts institutions have significantly increased.

The respondent population was employed as faculty members (chairpersons and teachers) in 35 teacher colleges and 40 secondary school programs (12 comprehensive and 28 rural programs). The identified population consisted of chairpersons and teachers at these two program levels. More specifically, the chairpersons selected were current leaders of teachers in local programs of industrial arts instruction. In addition, teachers used in this study were those who had completed the industrial arts preservice program at Pranakorn. The list was provided by a Pranakorn director from the schools' pilot study. Along with the names, types and locations of schools, the level of teacher education and years of teaching experience were also provided. On the basis of this information, the faculty members were classified into the four groups shown in Table 2.

Figure 1

Locations of 36 Teacher Colleges and 40 Secondary Schools in Provinces (Changwards) in Thailand

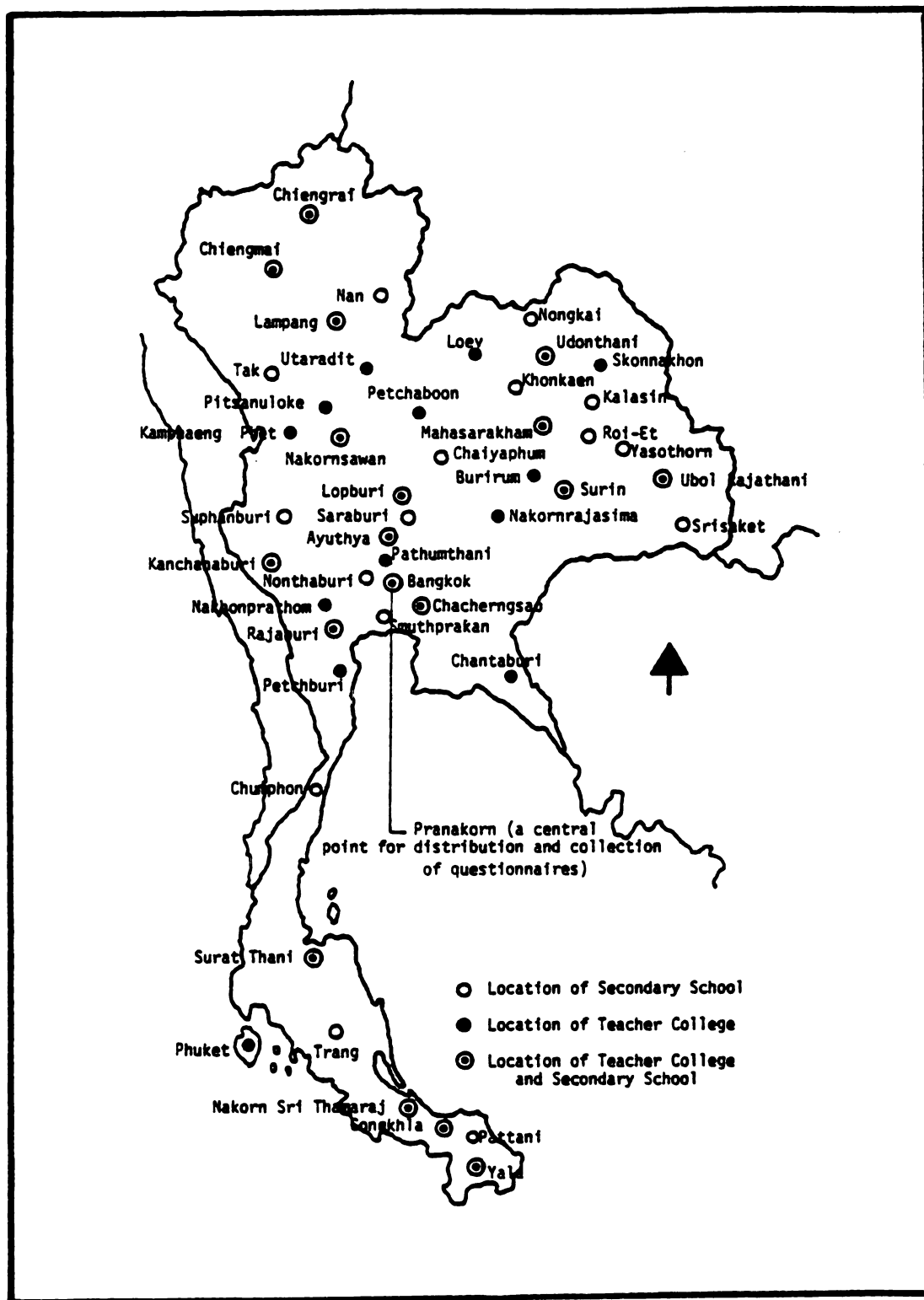


Table 2

Numbers of Industrial Arts Faculty Members in Secondary Schools
and Teacher Training Colleges Classified by (1) Levels
and Kinds of Institutions (2) Types of Respondents

Levels and Kinds of Institutions	Types of Respondents		Total
	Chairpersons	Teachers	
Teacher College	35	115	150
Secondary School	40	45	85
Total	75	160	235

Teacher College refers to all 35 teacher colleges (except for Pranakorn) in which industrial arts graduates from Pranakorn teach.

Secondary School refers to 12 comprehensive and 28 rural secondary programs in which industrial arts graduates from Pranakorn teach.

Faculty Members refers to and includes both the chairpersons and the teachers of industrial arts. Specifically, the chairpersons selected are current leaders of teachers.

To facilitate computation and statistical analysis, a number was assigned to every teacher and chairperson in the identified population, and it was expected that the percentage of returned responses would be high. Even if the percentage was low, homogeneity of the population might still provide valid results. Since most faculty members were government officers, their jobs and routines were similar. The homogeneity of this population minimized the bias.

Instrument Development

The instrument used in this study is a questionnaire listing functional competencies needed by beginning teachers. Respondents were asked to rate the need they perceived for each competency item on a five-point Likert scale. This scale measured the perceived need from one to five as follows: (1) urgently needed, (2) much needed, (3) somewhat needed, (4) little needed and (5) not needed.

The list of 171 functional competencies grouped into five broad areas were selected and drawn from the following sources: (1) the investigator's teaching experience,² (2) the objectives of the preservice program at Pranakorn,³ (3) books^{4,5,6} and periodicals specifically related to industrial arts education^{7,8,9} and (4) related studies in industrial education.^{10,11,12,13}

After it was developed, the preliminary list of 171 functional competencies was reviewed and revised by an evaluative jury. Following this, all comments were taken into consideration by the investigator and a final draft was prepared for selected teacher educators and supervisors of industrial arts in Thailand. They were asked to validate each statement by rating the appropriateness of the competency

the statement represented for Thai beginning teachers.

An Evaluative Jury

As indicated above, the preliminary list of 171 functional competencies was revised by an evaluative jury. A group meeting was held at Eastern Michigan University on the 20th of April, 1978. In addition to the investigator, the jury comprised two industrial teacher educators from Michigan State University and another from Eastern Michigan University (see Appendix A).

For convenience, the list of 171 functional competencies was submitted to the evaluative jury for review a week prior to the meeting date. Instruction and explanation accompanied the initial list which was divided into the following five areas: (1) planning of instruction and materials, (2) classroom and laboratory management, (3) teaching methods and techniques, (4) interpersonal relations and (5) student evaluation and evaluation techniques. To facilitate evaluation, predetermined criteria were used to enable the jurors to better analyze the statements of functional competency (see Appendix B).

In the meeting the group was asked to evaluate each category and assist in refining identified statements of functional competency. Jury members provided a significant input in the development of the instrument. After this first revision the instrument contained a total of 82 competency statements. The evaluative jury concluded that these 82 competency statements appeared to have a significant face validity (see Appendix B). The expectation of developing five

established areas or categories of functional competency statements was realized.

After this initial revision by the evaluative jury a draft was prepared for submitting to a group of selected teacher educators and supervisors of industrial arts in Thailand for input final revision of the instrument.

Construction and Validity

The identified population in this study is made up of Thai teachers of industrial arts. The language used by them is Thai. The instrument then had to be translated into Thai. The translation, done by the researcher, was verified by five Thai students enrolled at Michigan State University who have had a background in education and teaching (see Appendix A).

During the last week in May 1978, the Thai instrument of 82 functional competencies and a cover letter was mailed to two teacher educators at Chiangmai University, eleven teacher educators at Pranakorn Teacher's College and three supervisors of industrial arts in the Department of General Education (see Appendix A). It was assumed that they were aware, not only of the shortage of teachers, but also of the need for beginning teachers who had had the best possible preparation for teaching.

These teacher educators and supervisors were asked to validate each competency statement by rating its appropriateness for Thai beginning teachers of industrial arts. The following scale was used: (1) strongly agree, (2) agree, (3) disagree and (4) strongly disagree. By computing responses one and two as assertions of appropriateness

and three and four as those of inappropriateness, the appropriateness of competency statements was rated by teacher educators and supervisors as shown in Table 3.

An analysis of the ratings shows that a high percentage of the raters found most of the statements of functional competency appropriate. Only five of eighty-two statements were rated as appropriate by 12 raters or 75 percent of the teacher educators and supervisors. In addition, only one statement was supported by less than 75 percent of the raters. That statement was found appropriate by only 11 raters or 68.75 percent. Competency statements that received ratings under 87.50 percent needed to be reconstructed in accordance with the comments of the raters. The investigator along with three Thai students recorrected some unclear statements, but not a single statement was eliminated. Correspondingly, the final edition of the instrument which contains 82 competency statements was determined to have had adequate validity.

Table 4 shows the appropriateness ratings for each of the five areas of functional competency. Even though the category of planning of instruction and materials had the lowest ratings compared to the other four areas, an 87.50 percent appropriateness rating was still regarded as adequately high. The conclusion might be drawn that the evaluative jury did an excellent job of revising and screening the initial list of 171 functional competencies. They also organized competency statements into five general categories, but no category headings were used in the final edition of the instrument.

Table 3

The Percentage of Appropriateness of 82 Competency
Statements By the Ratings of 16 Teacher
Educators and Supervisors

Teacher educators and supervisors (N = 16)	Percent of respondents who rate statements appropriate	No. of competency statements (82)
16	100.00	25
15	93.75	28
14	87.50	16
13	81.25	7
12	75.00	5
11	68.75	1
		66

Table 4

Competency Statements Within Each of the Five Categories
Validated by the Ratings of 16 Teacher
Educators and Supervisors

Five areas of functional competency	Percent of appropriateness ratings	No. of competency statements
1. Planning of instruction and materials	87.50*	17
2. Classroom and laboratory management	94.64	14
3. Teaching techniques and methods	90.00	20
4. Interpersonal relations	97.32	14
5. Student evaluation and evaluation techniques	91.91	17

Data Collection

Pranakorn served as a central point for the distribution and collection of questionnaires, because all industrial arts chairpersons and teachers are familiar with its location. The final edition of the instrument, along with a letter and a stamped, pre-address return envelope, was mailed to the agent distributing and collecting questionnaires in each school and college during the second week of October, 1978 (see Appendix C). No problems in distribution were expected because most of the respondents received their questionnaires through personal contact by the agent. To encourage each agent, postcards with a personal message were mailed by the investigator. Each was asked to gather all questionnaires from respondents and mail them back to Pranakorn as soon as possible. Approximately four weeks after the initial mailing a follow-up letter (see Appendix C) was sent to increase the percentage of response. The follow-up letter and a second instrument and return envelope were sent to all who had not responded. Because of the difficulty of transportation and uncertainty of the mail, it was anticipated that the initial percentage of return might be low. Therefore, some additional weeks were allocated for data collection and it was expected that all returns would be collected by the month of December, 1978.

Design of the Study

The design of this study presented in Table 5 was described as a multivariate analysis of variance. The two independent variables were: (1) the types of respondents and (2) the levels and kinds of institutions. The dependent variables were the following five

Table 5

Design of the Two Independent Variables: (1) Types of Respondents
and (2) Levels and Kinds of Institutions. The Five
Dependent Variables are the Five Areas
of Functional Competency

Levels and kinds of institutions	Types and numbers of respondents	S's	The five categories of functional competency				
			C ₁	C ₂	C ₃	C ₄	C ₅
Teacher College	Chairpersons n = 35						
	Teachers n = 115						
Secondary School	Chairpersons n = 40						
	Teachers n = 45						

S's = Subjects C₁ = Planning of instruction and materials
 C₂ = Classroom and laboratory management
 C₃ = Teaching methods and techniques
 C₄ = Interpersonal relations
 C₅ = Student evaluation and evaluation techniques

competency categories: (1) planning of instruction and materials, (2) classroom and laboratory management, (3) teaching methods and techniques, (4) interpersonal relations and (5) student evaluation and evaluation techniques.

The investigator's primary purpose in this study was to determine the functional competencies needed by beginning teachers for effective teaching as perceived by chairpersons and teachers at both the college and secondary levels. Based upon the design of the this study, the following specific objectives were proposed to attain this goal.

1. To compare the five categories of functional competency needed by beginning teachers, as implicit in the objectives for the preservice program at Pranakorn, as perceived by:
 - a. faculty members at the college level and faculty members at the secondary level;
 - b. chairpersons at both the college and secondary levels and teachers at both the college and secondary levels.

Based upon their perceptions it would be determined whether the effects of interaction between the types of respondents and levels and kinds of institutions at which they taught would be explored.
2. To compare the rank order of importance of competency items identified under each of the five categories of functional competency as perceived by:
 - a. chairpersons and teachers at the college level;
 - b. chairpersons and teachers at the secondary level.
3. To determine correlations in the ranked perceptions of functional competency identified under each of the five categories between:
 - a. chairpersons and teachers at the college level;
 - b. chairpersons and teachers at the secondary level.
4. To determine what categories and statements of functional competency are most needed by beginning teachers at the college and/or secondary levels.

The respondents were chairpersons and teachers who taught in either rural and comprehensive programs (secondary level) or college

programs. The program levels and kinds of institutions at which the respondents taught were identified because these differences might account for some interactions in their perceptions.

Research Hypotheses

Three hypotheses were generated from the first of the previously identified objectives. In framing these hypotheses, it was assumed that the differences in the perceptions of chairpersons and teachers at college and secondary levels would be due to the differences in their roles, status and the level at which they were teaching. The following three hypotheses were examined.

1. There would be a difference between faculty members who taught at college level and those who taught at secondary level in their perceptions of all five categories of functional competency needed by beginning teachers.
2. There would be a difference between the perceptions of teachers and chairpersons at college and secondary levels of all five categories of functional competency needed by beginning teachers.
3. There would be an interaction between the types of respondents and the levels and kinds of institutions at which they taught in their perceptions of all five categories of functional competency needed by beginning teachers.

These main hypotheses would be tested by a multivariate analysis of variance. The significant difference would be determined at the .05 level of confidence.

Statistical procedures such as the means, rank orders of importance and Spearman's rank order coefficient of correlation would be employed in the descriptive data for the second and third objectives. Finally, in respect to the fourth objective, the findings and interpretations of results based on the preceding

analyses of the data would be used to determine what competency statements and categories were most needed by Thai beginning teachers at college and/or secondary levels.

Plan for Data Analysis

After the respondents rated competency items in accordance with the need they perceived for it, a five-point weighted scale was used in computation. However, each competency item rated as "urgently needed," "much needed," "little needed," or "not needed" would be assigned a weight of five, four, three, two or one respectively.

Each competency item was computed by multiplying the number of times it occurred by a five-point weighted scale. The results were computed in accordance with the following criteria:

1. The three hypotheses based upon the first objective would be tested by the multivariate analysis of variance.¹⁴ The validity of the hypotheses would be determined by the .05 level of significance. When any hypothesis was supported by the analysis of the data, the five categories or areas would be tested by the univariate F ratio.

2. Statistical procedures such as the mean and rank order of importance (the competencies, according to mean value, were then arranged in rank order of importance) would be employed in the descriptive data for the second objective.

3. According to the third objective, the Spearman's rank order coefficient of correlation would be applied to determine the degree of agreement between the two identified groups of respondents at each program level.^{15,16}

4. In respect to the fourth objective, the findings and interpretations of results based on the preceding analyses of data would be used to determine competency statements and categories which were most needed by beginning teachers at the college and/or secondary levels.

The computations were done on the CDC 6500 Computer at the Michigan State University's Computer Center.

Summary of Methods and Procedures

A list of respondents teaching secondary and college levels was obtained through a Pranakorn pilot follow-up study. The population focus was groups of respondents comprised of chairpersons and teachers at these two levels. A number was assigned to every respondent in the identified population and no sampling procedures were used in this study. The primary purpose of the researcher was to ascertain the functional competencies needed by beginning teachers for effective teaching as perceived by these respondent groups.

The initial list of functional competencies was largely drawn from the relevant literature in accordance with the objectives of the preservice program at Pranakorn. After a revised list of competency statements was deemed satisfactory by an evaluative jury, the 82 statements were translated into the Thai language. The Thai instrument was then sent to 16 teacher educators and supervisors of industrial arts education. They were asked to validate it by rating the appropriateness of its items for Thai beginning teachers. Although it was revised, no single competency statement was eliminated and the instrument was found to have adequate validity. The final edition

of the instrument with a five-point Likert rating scale was distributed to the four groups of respondents in the identified population. The descriptive data along with objectives and hypotheses were presented as a whole. Graphic presentation will be made where it is considered appropriate and warranted by a significant interaction of the data.

CHAPTER III--FOOTNOTES

¹A Pranakorn Director "A Survey of Industrial Arts graduates Working in Various Programs," (between July and September, 1977).

²The investigator had completed the preservice program of Industrial Arts Teacher Education at Pranakorn and had taught at Ayuthya Teacher's College from 1969 to 1973 in the Program of Industrial Arts for Lower and Higher Certificates of Education under the Department of Teacher Training.

³Pranakorn Teacher's College, "Industrial Arts Curriculum Instruction of Teacher Education," (unpublished materials, Thai Language, 1976), p. 1.

⁴Committee on Teacher Competencies, The Florida Catalog of Teacher Competencies (Florida State Department of Education, Tallahassee, January 1, 1973), 435 p.

⁵Revision of Committee, A Guide to Improving Instruction in Industrial Arts (4th revision; Washington, D. C.: American Vocational Association, 1968), pp. 9-11.

⁶Jack C. Brueckman and Stanley E. Brooks (eds.), Competency-Based Industrial Arts Teacher Education (26th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1977), 308 p.

⁷Robert E. Andreyka, "The Florida Way: Identification and Validation of Competencies for Trade and Industrial Education Teacher," Journal of Industrial Teacher Education 14, No. 1 (Fall, 1976), pp. 21-27.

⁸Harry A. Pederson, "Industrial Arts Teacher Competencies," Industrial Arts and Vocational Education XLIX, No. 10 (December, 1955), pp. 318-19.

⁹Kendall N. Starkweather, "A Study of Potential Directions for Industrial Arts Toward the Year 2000 A.D." Journal of Industrial Teacher Education 13, No. 2 (Winter, 1976) pp. 64-70.

¹⁰James Arthur Miller, "Functional Competencies Needed by Industrial Arts Instructors to adequately Perform in Contemporary Industrial Arts Laboratory/Classroom" (unpublished Doctor's dissertation, University of North Colorado, Greeley, 1971), pp. 49-54.

¹¹L. H. Perkins, "Competencies of Trade and Industrial Teachers as Perceived by Teachers, Supervisors, School Administrators and Teacher Educators," (Pensacola: University of West Florida, July, 1975), pp. 17-29.

¹²Richard J. Bain, "Houston Needs Assessment System. Needs Assessment Results, Teacher Competency Analysis, Dallas Independent School District." (Houston University, Texas, April, 1973), 134 p.

¹³Florida State University, "Exemplary Competency-Based Vocational Teacher Education Project. Industrial Arts Component. Competency Identification Phase: Professional Competencies for Middle and High School Industrial Arts Teachers in Florida. Serial No. 2." (Spons. Agency-Florida State Department of Education, Tallahassee, 1976), pp. 33-36.

¹⁴Jeremy D. Finn, A General Model for Multivariate Analysis (New York: Holt, Rinehart and Winston, Inc., 1974), 423 p.

¹⁵William L. Hays, Statistics for the Social Sciences (2nd. edit., Holt, Rinehart and Winston, Inc., 1973), pp. 788-92.

¹⁶Leonard A. Marascuilo and Maryellen McSweeney, Nonparametric and Distribution Free Methods for the Social Sciences (Brooks and Cole Publishing Company, Monterey, California, 1977), pp. 431-34.

CHAPTER IV

ANALYSES AND RESULTS

The investigator's primary purpose has been to ascertain the functional competencies that faculty members (chairpersons and teachers) at college and secondary levels perceive to be the functional competencies needed by Thai beginning teachers for effective teaching. A corollary to the primary purpose has been to provide information and recommendations for improving the preservice industrial arts teacher education preparation at Pranakorn.

The researcher has attempted to analyze data collected from chairpersons and teachers at college and secondary levels. Their perceptions of the functional competency needs of beginning teachers has framed the material data for this study. The respondent population was asked to rate competency items which beginning teachers should possess to effectively perform as teachers in a program of industrial arts instruction. Questionnaires sent by the mail and delivered personally were used to collect the data.

During the first week of February, 1979, all returned responses were tabulated. Responses to the perceived needs of beginning teachers were coded 5, 4, 3, 2, 1, corresponding to the respondents'

ratings as urgently needed, much needed, somewhat needed, little needed, and not needed respectively. Coding systems for all demographic data were also created and used to record information. Next, all data cards were punched. Each card contained information on group identification, demographic data, and item scores for perceived needs of beginning teachers.

A multivariate program which was adapted for use on the CDC 6500 at the Computer Center, Michigan State University was used to compute the correlations, means, standard deviations, and multivariate and univariate analyses of variance.

In this chapter the data collected for this study are reported and arranged in an order that is related to the results of the statistical analysis presented in six separate sections.

In the first section the descriptive data and some demographic results are discussed.

The second section deals with the analysis of the perceived needs. The hypotheses of interest were tested by a multivariate analysis.

The third section tabulates and compares the ranking of the functional competencies in each of the five categories by the two groups of the population divided into chairpersons and teachers at college and secondary levels.

The fourth section records the correlations of the ranking of the functional competencies between chairpersons and teachers at each program level.

The fifth section summarizes and identifies the functional competencies that have been perceived to be needed most by beginning teachers at college and/or secondary levels.

The final section records the results of additional analysis of the greatest differences in each competency item, as tested by one-way analysis of variance.

The Descriptive Data

The description of the population as to the types or groups they belong to was discussed in the preceding chapter. More than 85 percent of the questionnaires were returned by all groups of the identified population presented in Table 6. In the final analysis a total of 198 usable returns represented 84.26 percent of the 235 questionnaires distributed. It was discovered that the respondents were comprised of 31 college chairpersons, 97 college teachers, 31 secondary chairpersons, and secondary teachers. Out of the total of 198, only four respondents were women. Men respondents constituted 97.98 percent of the population, and women respondents, 2.02 percent. The subject areas in which all the four groups of respondents have teaching skills in order of the highest to the lowest are: (1) Electricity, (2) Design and Drafting, (3) Wood Working, (4) Mechanics, (5) Metal Working, (6) Ceramics, and (7) Arts and Crafts, (see Appendix D).

On an average, as shown in Table 7, a chairperson's length of teaching experience and age were higher than those of a teacher at each program level. At the college level, the average number of students taught by a chairperson each term worked out to be 94 which was lower than the average of 111 students taught by a teacher. At

the secondary level, on the other hand, a chairperson to students ratio of 1:224 was higher than a teacher to students ratio of 1:201.

Table 6
Classification of Returned and Usable
Questionnaires in this Study

Level and kind of institution	Type and number of respondent	Total returns Number	Total returns Percent	Usable returns Number	Usable returns Percent
College	Chairpersons n = 35	32	91.43	31	88.57
	Teachers n = 115	102	88.70	97	84.35
Secondary	Chairpersons n = 40	34	85.50	31	77.50
	Teachers n = 45	41	91.11	39	86.67
Total	N = 235	209	88.94	198	84.26

Note: Total number of unusable returns = 9 or 3.83%

Table 7

Averages of Respondents' Years of Teaching, Years of Age, Numbers of Student Teaching Each Term in College and Secondary Programs

Levels and kinds of institutions	Types and no. of respondents	Years of teaching	Years of age	Numbers of students
College	Chairpersons n = 31	11.81	34.94	93.74
	Teachers n = 97	6.76	29.99	111.05
Secondary	Chairpersons n = 31	9.55	32.45	224.42
	Teachers n = 39	4.64	26.97	200.92

Table 8

Number and Percent of Respondents Who Have Had Their
Workshop/Seminar, Field Experience, and
Higher Degree (Master's Degree)

Types of updated teaching skills	College		Secondary	
	Chairpersons n = 31	Teachers n = 97	Chairpersons n = 31	Teachers n = 39
Workshop/seminar about teaching methods, curriculum and evaluation	16 51.61%	44 45.36%	24 77.41%	23 58.97%
Field experience in industry (field trip in and/or out the country)	5 16.12%	5 5.15%	1 3.22%	1 2.56%
Higher degree (master's degree) in teaching methods, curriculum and educational administration	2 6.45%	8 8.24%	No	No

Note: No master's degree program of industrial arts education in Thailand

Table 8 shows the percentage of each respondent group who had had the opportunities to update their teaching skills since they have been employed. The group updated their professional competence through workshops/seminars, field experience, and graduate degree:

1. Seventy-seven percent (77.41) of 31 secondary chairpersons attended workshops or seminars about teaching methods, curriculum development or evaluation.

2. Sixteen percent (16.12) of 31 college chairpersons have had field experience in industry.

3. Eight percent (8.24) of 97 college teachers held master's degrees in teaching methods, curriculum development, or educational administration.

The Analysis of Perceived Needs

Before the analysis, the correlation among the five categories or dependent variables of perceived needs of beginning teachers should be examined (see Table 9). All correlations were high, ranging from .68 between scores of C_2 (classroom and laboratory management) and C_5 (student evaluation and evaluation techniques), to .84 between scores of C_1 (planning of instruction and materials) and C_3 (teaching methods and techniques).

All summary data, means and standard deviations of the five categories of competency scores are organized in Table 10. The general profile illustrates the means of the four respondent groups on the planning of instruction and materials, classroom and laboratory management, teaching methods and techniques, interpersonal relations, and student evaluation and evaluation techniques.

Table 9
Correlation Matrices Among Five Categories
of Functional Competency Scores

Categories	C_1^1	C_2^2	C_3^3	C_4^4	C_5^5
1 C_1	1.00				
2 C_2	.75	1.00			
3 C_3	.84	.72	1.00		
4 C_4	.78	.72	.74	1.00	
5 C_5	.82	.68	.75	.72	1.00

C_1 = Planning of instruction and materials
 C_2 = Classroom and laboratory management
 C_3 = Teaching methods and techniques
 C_4 = Interpersonal relations
 C_5 = Student evaluation and evaluation techniques

In general, the highest mean for the perceived needs which each of the four respondent groups (college chairpersons, secondary chairpersons, college teachers, secondary teachers) had rated was 4.048, 4.046, 4.025, and 4.001 respectively. The perceived needs belonged to the category of classroom and laboratory management. The chairpersons' mean on each of the five categories were higher than that of the teachers at each program level. Among the four groups of the population, the higher mean for each of the five categories was recorded by the two college groups. The only exception was a group of college teachers who had a mean of 4.025 for the category of classroom and laboratory management which was slightly lower than the mean, 4.046, recorded by a group of secondary

Table 10

Means and Standard Deviations of Five Categories
of Functional Competency Scores

Level and kind of institution	Type of respondent and number	S's	The five categories of functional competency				
			C ₁	C ₂	C ₃	C ₄	C ₅
College	Chairpersons n = 31		3.968 .392	4.048 .354	4.016 .415	3.993 .376	3.841 .388
	Teachers n = 97		3.866 .390	4.025 .415	3.958 .382	3.934 .427	3.769 .434
Secondary	Chairpersons n = 31		3.852 .376	4.046 .468	3.924 .398	3.855 .452	3.736 .384
	Teachers n = 39		3.710 .459	4.001 .397	3.814 .379	3.809 .534	3.661 .441

S's = Subjects C₁ = Planning of instruction and materials
 C₂ = Classroom and laboratory management
 C₃ = Teaching methods and techniques
 C₄ = Interpersonal relations
 C₅ = Student evaluation and evaluation techniques

chairpersons. Finally, the mean scores of all four respondent groups ranked the following categories in the falling order: (1) classroom and laboratory management, (2) teaching methods and techniques, (3) interpersonal relations, (4) planning of instruction and materials, and (5) student evaluation and evaluation techniques.

As mentioned earlier, the three main hypotheses were tested by a multivariate analysis of variance. An alpha .05 level was used as the criterion of significance. In addition, when any hypothesis was substantiated by the analysis of the data, the five variables (C_1 , C_2 , C_3 , C_4 , C_5) were tested by the univariate F ratio.

Hypothesis 1 stated:

There would be a difference between faculty members who taught at the college level and those who taught at the secondary level in their perceptions of all five areas of functional competency needed by beginning teachers.

Hypothesis 1 was substantiated by the analysis of the data. As indicated in Table 11, the Teaching Level main effect (college vs secondary) was found to be at the .05 level of significance (multivariate $F = 2.314$ with 5 and 190 degrees of freedom, $P < .0454$).

Since the retention of the hypothesis I was indicated, univariate F test for Teaching Level main effect was further performed. As shown in Table 12, both C_1 (planning of instruction and materials) and C_3 (teaching methods and techniques) were significant at the .05 level (univariate F of 5.327 and 4.505 with 1 and 194 degrees of freedom, $p < .0221$ and .0351 respectively).

Hypothesis 2 stated:

There would be a difference between the perceptions of teachers and chairpersons at both the college and secondary levels of all five areas of functional competency needed by beginning teachers.

Table 11
Multivariate Analysis of Variance of all five
Areas of Functional Competency Needs

Sources	DF	F	P less than
STATUS (chairperson vs teacher)	5 & 190	0.766	.5756
TLEVEL	5 & 190	2.314	.0454*
T X S	5 & 190	0.141	.9825

* Significant at the .05 level

DF = Degrees of Freedom
F = F ratio
P = Probability

TLEVEL or T = Teaching Level
X = Interaction
S = Status

Table 12

Univariate F Test for TLEVEL Main Effect

Variables	DF	Mean Squares	F	P less than
1 C ₁	1	.8643	5.327	.0221*
2 C ₂	1	.0108	0.063	.8015
3 C ₃	1	.6818	4.505	.0351*
4 C ₄	1	.7233	3.623	.0585
5 C ₅	1	.4953	2.793	.0964

*Significant at the .05 level
(Degree of freedom for error term = 194)

C₁ = Planning of instruction and materials
 C₂ = Classroom and laboratory management
 C₃ = Teaching methods and techniques
 C₄ = Interpersonal relations
 C₅ = Student evaluation and evaluation techniques

Hypothesis 2 was not supported by the analysis of the data. As shown in Table 11, Status main effect (chairperson vs teacher) was not significant at the .05 level (multivariate $F = 0.766$ with 5 and 190 degrees of freedom, $P < .5756$). Since the multivariate hypothesis was not retained, no univariate F test was conducted.

Hypothesis 3 stated:

There would be an interaction between the types of respondents and the levels and kinds of institutions in which they taught in their perceptions of all five areas of functional competency needed by beginning teachers.

Hypothesis 3 was not supported by the analysis of the data. As presented in Table 11, Interaction between Teaching Level and Status was not found to be at the .05 level of significance (multivariate $F = .141$ with 5 and 190 degree of freedom, $p < .9825$). Since the multivariate hypothesis was unsupported by evidence, no univariate F test was performed.

A Comparison in the Ranked Perceptions

This section records and compares the ranks of the functional competencies perceived by chairpersons and teachers at college and secondary levels. The competencies listed under each of the five categories, according to mean value, were then arranged in rank order of importance from high to low. A high ranking indicates a small number which has been converted from the high mean score. Accordingly, the highest mean score will be the first rank. As mentioned earlier, a detailed ranking, as perceived by the population, of the competencies is tabulated in Tables 13 through 17.

Table 13

A Tabular Comparison Between Chairpersons and Teachers at College and Secondary Levels of the 17 Competencies Needed by Beginning Teachers Ranked from High Mean Scores to Low Under the Category of Planning of Instruction and Materials

Competency item	College				Secondary			
	Chairpersons Mean Rank		Teachers Mean Rank		Chairpersons Mean Rank		Teachers Mean Rank	
43	4.58	1.0	4.40	1.0	4.07	4.5	4.05	3.0
18	4.29	2.0	4.17	2.0	4.10	2.5	4.08	2.0
2	4.23	4.0	4.10	3.0	4.26	1.0	4.18	1.0
5	4.23	4.0	4.02	6.0	4.07	4.5	4.00	4.0
28	4.23	4.0	4.05	5.0	3.97	7.0	3.80	8.5
80	4.19	6.0	4.08	4.0	4.10	2.5	3.85	5.0
52	4.03	7.0	3.80	11.0	3.77	12.0	3.77	10.0
72	4.00	8.0	3.91	8.0	3.81	11.0	3.49	13.0
30	3.97	9.0	3.93	7.0	3.87	10.0	3.67	11.0
49	3.94	10.0	3.65	14.0	4.03	6.0	3.28	16.0
45	3.81	11.0	3.77	12.0	3.90	8.5	3.82	6.5
36	3.77	12.5	3.66	13.0	3.58	16.0	3.44	14.0
38	3.77	12.5	3.90	9.0	3.90	8.5	3.80	8.5
66	3.74	14.0	3.88	10.0	3.71	13.0	3.82	6.5
42	3.71	15.0	3.63	15.0	3.61	14.5	3.56	12.0
63	3.58	16.0	3.58	16.0	3.61	14.5	3.39	15.0
8	3.39	17.0	3.20	17.0	3.13	17.0	3.13	17.0

Competency item 43--Plan for and use appropriately the resources of the community in classroom and laboratory instruction.

This competency item was ranked 1.0 or at the top of the seventeen by both college groups. There was a variation of .18 in the means (4.58 and 4.40) of these groups. It was also ranked at 4.5 by secondary chairpersons and 3.0 by secondary teachers. The two means (4.07 and 4.05) for the two groups of secondary teachers were almost identical. When comparing the means and ranks of all four groups, the highest perception of need for this competency in beginning teachers was found in the two college groups.

Competency item 18--Develop and plan instructional materials.

Even though Competency item 18 was identically ranked at 2.0 by the two college groups, the mean (4.29) for chairpersons was higher than the mean (4.17) exhibited by teachers. At the secondary level, chairpersons ranked this competency at 2.5 and teachers gave it a rank of 2.0. In addition, not much difference in the two means (.03) for these two groups was found. According to this information, all four groups of the population highly supported Competency item 18 as being one needed by beginning teachers.

Competency item 2--Plan for appropriate use of physical facilities, equipment and supplies needed for specific programs.

College groups ranked this competency at 4.0 and 3.0 with means of 4.23 and 4.10 respectively while both secondary groups ranked it 1.0 with the means of 4.26 and 4.18. In fact, higher means and ranks were found among the two groups of secondary teachers.

Competency item 5--Use evaluative results effectively to improve instructional planning and lesson organization.

All four groups of the population ranked this item in the top six of seventeen. In general, college groups ranked this competency at 4.0 and 6.0 with the means of 4.23 and 4.02, while secondary groups supported it at positions of 4.5 and 4.0 with means of 4.07 and 4.00 respectively.

Competency item 28--Organize teaching materials before, during and after their use.

There was a little difference in the rank scores between the two groups in each program. This competency was ranked in the top five by the college groups and in the top nine by the secondary groups. From this information, the groups in college teaching placed a higher degree of importance upon Competency item 28 than did other groups.

Competency item 80--Prepare teaching plans to provide experiences that include both enjoyment and knowledge.

College groups ranked this competency at 6.0 and 4.0 with means of 4.19 and 4.08 while secondary groups supported it at positions 2.5 and 5.0 with the means of 4.10 and 3.85. From this examination, a greater disagreement between the two groups of secondary teachers was found on Competency item 80.

Competency item 52--Organize activities into a developmental sequence of experiences.

A difference of .23 in the means for the two groups of college teachers was found. These two groups also ranked this competency at 7.0 and 11.0 while the two groups in secondary teaching ranked it at 12.0 and 10.0. Accordingly closer agreement on Competency item 52 was

apparent between the two secondary groups.

Competency item 72--Establish course objectives and instructional goals to effect desired changes in students' behavior.

Both college groups ranked this competency identically at 8.0 with a difference in the means of .09. Variations of .32 in the means and 2.0 in the ranks for the two secondary groups were found on Competency item 72. The inference is that the two groups in college teaching placed a higher degree of importance upon this competency than did other two groups.

Competency item 30--Read, interpret and utilize current professional literature in planning and instruction.

This competency was ranked at 9.0 and 7.0 by the two groups in college teaching, but there was a difference of .04 in the means (3.97 and 3.93) for these two groups. At the secondary level, chairpersons placed Competency item 30 in position 10.0 with a mean of 3.87 while teachers ranked it 11.0 with a mean of 3.67. In comparison, a higher degree of perceived needs was found among the college groups or college faculty.

Competency item 49--Participate in planning and implementing a systematic and exploratory program of occupational clusters.

There were variations of .29 in the two means (3.94 and 3.65) for college groups and of .75 in the two means (4.03 and 3.28) for secondary groups. The greatest degree of disagreement between the two groups in secondary teaching was found on Competency item 49.

Competency item 45--Provide individualized projects and assignments, taking into consideration the needs of each student.

The two groups of secondary teachers placed more importance upon Competency item 45 than did the college teachers. In general, the two means (3.81 and 3.77) were exhibited by the groups in college teaching. In addition, the college groups ranked this competency 11.0 and 12.0 while the secondary groups ranked it 8.5 and 6.5 respectively.

Competency item 36--Develop immediate and long-range plans for the total class which take individual needs and plans into account.

Competency item 36 was generally supported by all four groups in the population. For instance, the two groups of college teachers ranked this competency at 12.5 and 13.0 while the other two groups ranked it at 16.0 and 14.5.

Competency item 38--Select appropriate textbooks and materials that contribute to the instructional objectives.

The college groups ranked this competency 12.5 and 9.0 with means of 3.77 and 3.90, but the secondary groups gave it a ranking of 8.5 with means of 3.90 and 3.80. From this information it was evident that the secondary groups placed a higher degree of importance upon Competency item 38 than did the other groups.

Competency item 66--Prepare bulletin boards and/or displays appropriately related to industry and technology.

When ranks were compared between the two groups in each teaching program, the greater disagreement on Competency item 66 was found between the two groups of secondary teachers. For instance, the two groups of college teachers placed this competency

at 14.0 and 10.0 while the other two groups ranked it 13.0 and 6.5.

Competency item 42--Use the students' background experiences in planning appropriate educational activities.

This competency was ranked at 15.0 by both college groups while it was ranked at 14.5 and 12.0 by the secondary groups. It was generally agreed that Competency item 42 was in the bottom five of seventeen competencies.

Competency item 63--Develop instructional objectives and lesson plans.

Both college groups supported this competency with a rank of 16.0 and a mean of 3.58. On the other hand, differences of .5 in the ranks and .22 in the means were found between the groups in secondary teaching. As a result, it was evident that the college faculty placed a higher degree of importance upon Competency item 63 than did the secondary groups.

Competency item 8--Use knowledge of home situations in planning instructional activities.

All four groups in the population supported this competency at the rank of 17.0. Accordingly, the majority of the population considered Competency item 8 as being one little needed by beginning teachers.

Competency item 21--Maintain tools and laboratory equipment in usable condition.

This competency was ranked highly at 1.0, 2.0, 1.5 and 2.0 by the four groups in the population. In comparing the groups, a high mean of 4.68 for the college chairpersons and a low mean of 4.42 for the secondary chairpersons were found on Competency item 21. From this information, these four groups placed strong emphasis upon this com-

Table 14

A Tabular Comparison Between Chairpersons and Teachers
at College and Secondary Levels of the 14 Competencies Needed
By Beginning Teachers Ranked from High Mean Scores to Low
Under the Category of Classroom and Laboratory Management

Competency item	College				Secondary			
	Chairpersons Mean Rank		Teachers Mean Rank		Chairpersons Mean Rank		Teachers Mean Rank	
21	4.68	1.0	4.52	2.0	4.42	1.5	4.46	2.0
33	4.52	2.0	4.54	1.0	4.42	1.5	4.51	1.0
12	4.36	3.0	4.26	3.0	4.16	5.0	4.08	6.5
67	4.29	4.0	4.13	7.0	4.10	6.0	4.28	4.0
6	4.23	5.0	4.16	4.5	4.26	3.5	4.33	3.0
64	4.16	6.0	4.07	8.0	4.00	9.0	3.95	9.0
35	4.10	7.0	4.14	6.0	4.03	8.0	4.08	6.5
61	4.03	8.0	4.16	4.5	4.07	7.0	4.15	5.0
10	3.90	9.0	4.02	9.0	4.26	3.5	4.03	8.0
39	3.84	10.0	3.74	12.0	3.81	13.0	3.46	13.0
9	3.81	11.5	3.85	10.0	3.84	11.5	3.90	10.0
76	3.81	11.5	3.72	14.0	3.84	11.5	3.69	12.0
44	3.68	13.0	3.84	11.0	3.90	10.0	3.80	11.0
4	3.29	14.0	3.22	14.0	3.55	14.0	3.31	14.0

petency as one which beginning teachers should possess to function effectively in their teaching.

Competency item 33--Maintain a safety and accident prevention program in compliance with safety rules and regulations.

All four groups of respondents closely agreed with the substantially high rank (2.0, 1.0, 1.5 and 1.0) given Competency item 33. In general, this emphasis was comparable to that given the preceding Competency 21. It was evident that the majority of the population felt this competency was highly important.

Competency item 12--Organize and conduct appropriate laboratory house-keeping practices.

The two groups of college teachers supported this competency with the ranking of 3.0 while the other two groups ranked it 5.0 and 6.5 respectively. In addition, the two means (4.36 and 4.26) for the college groups were higher than the means (4.16 and 4.08) exhibited by the two groups in secondary teaching. From this information it was evident that the college groups placed a higher degree of importance upon Competency item 12 than did the other two groups.

Competency item 67--Make the classroom and laboratory attractive and interesting.

The two college groups ranked this competency at 4.0 and 7.0 with the means of 4.29 and 4.13, while the other two groups supported it at the ranks of 6.0 and 4.0 with means of 4.10 and 4.28. From this information, Competency item 67 was placed in the upper middle of the range as ranked by all four groups of the population. In addition, there was not much difference in the ranking data and mean scores for the four groups of two teaching programs.

Competency item 6--Maintain an inventory of supplies, tools and equipment.

A high degree of agreement between chairpersons and teachers at each program level was found on Competency item 6. The college groups gave this competency rankings of 5.0 and 4.5 while the secondary groups ranked it at 3.5 and 3.0 respectively. As can be seen, the two secondary groups placed a higher degree of importance upon Competency item 6 than did the other two groups.

Competency item 64--Prepare purchase orders for instructional materials, supplies and equipment.

This competency was ranked at 6.0 and 8.0 by the two college groups while it was ranked at 9.0 by both groups of secondary teachers. This indicated that the group of college chairpersons (with a rank of 6.0) placed more emphasis upon Competency 64 than did other three groups of the population.

Competency item 35--Demonstrate consistency and objectivity in classroom and laboratory management.

All four groups in the identified population supported Competency 35 at a near middle position in the range of the 14 competencies. The two college groups ranked this competency at 7.0 and 6.0 while the two secondary groups gave it rankings of 8.0 and 6.5 respectively.

Competency item 61--Demonstrate and provide appropriate safety apparel and devices for hazardous activities.

The greater disagreement on this item was apparent between the college groups. In general, the two college groups ranked this competency at 8.0 and 4.5 with the means of 4.03 and 4.16, while the other two groups ranked it at 7.0 and 5.0 with means of 4.07, 4.15 respect-

ively. There was a variation of 3.5 in the two rankings (8.0 and 4.5) for the college groups on Competency 61.

Competency item 10--Prepare a budget for facilities, equipment and materials needed in each program unit.

Both college groups ranked this competency at 9.0 while the other two groups ranked it at 3.5 and 8.0. The greater disagreement was apparent between the two groups in secondary teaching. It was concluded that the group of secondary chairpersons (with a ranking of 3.5) placed more emphasis upon Competency 10 than did the other three groups.

Competency item 39--Plan for physical plant facilities, supplies and equipment consistent with program objectives.

The two college groups ranked this competency at 10.0 and 12.0 with the means of 3.84 and 3.74 while the other two groups ranked it at 13.0 with means of 3.81 and 3.46. From this information, the two groups of college teachers placed Competency 39 in the bottom five of the 14 competencies but the other two groups gave it even less emphasis next to the bottom.

Competency item 9--Create an organized classroom environment conducive to learning.

General agreement among four groups in the identified population was found on Competency 9. Each group ranked this competency in the bottom five of the 14 competencies. There was a difference of 1.5 in the two ranks (10.0 and 11.5) of the two groups in each teaching program. The content of this competency is similar to the preceding Competency item 67 (make the classroom and laboratory attractive and interesting). However, the majority of respondents placed more emphasis

Table 15

A Tabular Comparison Between Chairpersons and Teachers at College and Secondary Levels of the 20 Competencies Needed by Beginning Teachers Ranked from High Mean Scores to Low Under the Category of Teaching Methods and Techniques

Competency item	College				Secondary			
	Chairpersons Mean Rank		Teachers Mean Rank		Chairpersons Mean Rank		Teachers Mean Rank	
34	4.45	1.0	4.61	1.0	4.52	1.0	4.46	1.0
7	4.32	2.0	4.31	3.0	4.10	7.0	4.36	2.0
16	4.29	3.0	3.93	10.0	3.94	11.5	3.90	8.0
68	4.26	4.5	4.18	6.0	4.10	7.0	4.00	5.0
79	4.26	4.5	4.41	2.0	4.36	3.0	4.21	3.0
23	4.16	6.0	4.30	4.0	4.42	2.0	4.18	4.0
19	4.13	7.0	4.19	5.0	4.26	4.5	3.80	10.5
22	4.10	8.0	3.99	8.0	4.26	4.5	3.97	6.0
59	4.07	9.0	4.12	7.0	4.10	7.0	3.95	7.0
47	4.03	11.0	3.80	14.5	3.77	14.0	3.62	14.5
69	4.03	11.0	3.97	9.0	3.97	10.0	3.74	12.5
70	4.03	11.0	3.83	12.5	3.58	16.0	3.59	16.5
57	3.94	13.5	3.91	11.0	4.00	9.0	3.85	9.0
62	3.94	13.5	3.74	17.0	3.48	18.0	3.46	19.0
77	3.87	15.0	3.83	12.5	3.55	17.0	3.74	12.5
32	3.81	16.5	3.79	16.0	3.74	15.0	3.62	14.5
74	3.81	16.5	3.70	18.0	3.94	11.5	3.59	16.5
60	3.77	18.0	3.80	14.5	3.87	13.0	3.80	10.5
27	3.71	19.0	3.54	19.0	3.45	19.0	3.49	18.0
20	3.36	20.0	3.22	20.0	3.10	20.0	2.97	20.0

upon Competency 67 than Competency 9.

Competency item 76--Devise an effective system of collecting and recording laboratory fees.

The two college groups ranked this competency at 11.5 and 13.0 while the other two groups ranked it at 11.5 and 12.0. From this information, all four groups of the population placed Competency item 76 in the bottom three of the 14 competencies.

Competency item 44--Maintain an effective balance of freedom and safety in the classroom and laboratory.

This competency was ranked at 13.0 and 11.0 by the two college groups while it was ranked at 10.0 and 11.0 by the other two groups. The group of secondary chairpersons placed more emphasis on Competency 44 than did the other three groups, even though all four groups ranked it in the bottom four of the 14 competencies.

Competency item 4--Prepare appropriate student accident report forms.

Based upon an analysis of the data, all four groups placed Competency 4 at the bottom of fourteen competencies.

Competency item 34--Demonstrate safe operation of machines and equipment.

The greatest agreement was apparent among four groups of the population when the means and the ranking data were compared for this competency. All groups ranked Competency 34 at the top of the 20 competencies. From this information it was evident all four groups of the population strongly agreed that beginning teachers should, above all things, be able to demonstrate safe operation of machines and equipment in their chosen teaching profession.

Competency item 7--Use graphic materials and educational displays of real objects to aid instruction.

The two college groups ranked this competency at 2.0 and 3.0 but the other two groups ranked it at 7.0 and 2.0 respectively. Disagreement upon Competency 7 was apparent between the two groups in secondary teaching. It was concluded that the college groups placed a higher degree of importance upon this competency than did the two secondary groups.

Competency item 16--Provide situation which encourage students to think and work independently and creatively.

The two college groups ranked this competency at 3.0 and 10.0, while the other two groups ranked it at 11.5 and 8.0. No agreement was apparent between the two groups of college teachers. More specifically, the college chairpersons (with a ranking of 3.0) placed more emphasis upon Competency 16 than did the other three groups.

Competency item 68--Select and utilize instructional materials compatible with course objectives.

The two college groups supported this competency at the rankings of 4.5 and 6.0 while the other two groups ranked it at 7.0 and 5.0. There was not much difference in the means of all four groups but a slightly higher mean (4.26) for college chairpersons was found on Competency 68.

Competency item 79--Use laboratory demonstration effectively in teaching.

The two college groups ranked this competency at 4.5 and 2.0 while the other two groups ranked it at 3.0. The highest mean (4.41) belonged to college teachers and the lowest mean (4.21) was

found for secondary teachers. As can be seen, the majority of respondents emphasized Competency 79 as one which beginning teachers should possess to function effectively in their teaching tasks.

Competency item 23--Relate course content to every personal, family living and occupational experiences.

The two college groups ranked this competency at 6.0 and 4.0 while the other two groups ranked it at 2.0 and 4.0 respectively. There was a variation of 2.0 in the ranks for the two groups in each teaching program. The secondary groups placed greater importance upon Competency 23 than did the college groups.

Competency item 19--Conduct lessons that result in student mastery of specialized objectives.

The two college groups ranked this competency at 7.0 and 5.0 while the two secondary groups ranked it at 4.5 and 10.5 respectively. From this information, it was evident that greater disagreement between the two groups in secondary teaching was found on Competency 19. The secondary teachers placed less emphasis upon this competency than the other three groups of respondents did.

Competency item 22--Provide experiences to help students understand and develop their own values.

This competency was ranked at 8.0 by the two college groups while it was ranked at 4.5 and 6.0 by the secondary groups. When comparing the mean scores and the ranks, the highest mean (4.26) and rank (4.5) were found for the group of secondary chairpersons. As can be seen, this group of secondary chairpersons placed more emphasis upon Competency 22 than did the other three groups.

Competency item 59--Utilize a variety of teaching techniques and methods to reach instructional objectives.

Three groups of respondents supported this competency in position 7.0 while the group of college chairpersons ranked it only 9.0. According to this information, all four groups placed a degree of emphasis upon Competency 59 in the upper middle of the range of the 20 ranked competencies.

Competency item 47--Apply appropriate principles of learning to teaching methods.

The two college groups ranked this competency 11.0 and 14.5, while the other two groups supported it at the ranks of 14.0 and 14.5 respectively. This indicated that all four groups placed Competency 47 in the lower middle of the range of the 20 ranked competencies.

Competency item 69--Select activities and teaching techniques on the basis of individual abilities and interests.

The two college groups supported this competency, ranking it 11.0 and 9.0 while the other two groups ranked it 10.0 and 12.5. Comparing them, the majority of respondents placed more emphasis upon Competency 69 than the preceding Competency 47 (Apply principles of learning to teaching methods).

Competency item 70--Make effective use of individualized instructional methods.

The two college groups ranked this competency 11.0 and 12.5 with means of 4.03 and 3.83, while the other two groups ranked it 16.0 and 16.5 with means of 3.58 and 3.59 respectively. It was evident that the two college groups placed more importance upon Competency 70 than did the other two groups.

Competency item 57--Select opportunities for students to work together in groups of varying sizes and tasks.

The two groups in college teaching supported this competency with rankings of 13.5 and 11.0 but both groups of secondary teachers ranked it 9.0. It was indicated that the secondary groups had a greater degree of agreement on Competency 57 than did the college groups.

Competency item 62--Engage students in identifying, seeking out and evaluating resources.

The two college groups ranked this competency in the position of 13.5 and 17.0 while the two secondary groups gave it rankings of 18.0 and 19.0. Even though close agreement was apparent between the two groups in secondary teaching, a higher degree of importance was placed upon Competency 62 by the college groups.

Competency item 77--Design learning experiences which include opportunities for inquiry, discovery and experimentation.

The two college groups ranked this competency in the positions of 15.0 and 12.5 with means of 3.87 and 3.83, while the two secondary groups ranked it 17.0 and 12.5 with the means of 3.55 and 3.74. When the means and the ranks were compared, the two groups in college teaching placed more emphasis upon Competency 77 than did the other two groups.

Competency item 32--Incorporate modern industrial processes and principles into the instructional programs.

The college groups supported this competency in the positions of 16.5 and 16.0 with means of 3.81 and 3.79, while the two secondary groups ranked it at 15.0 and 14.5 with means of 3.74 and 3.62. As

indicated, all four groups of the population placed Competency 32 in the bottom five of the 20 ranked competencies.

Competency item 74--Organize group projects which depict industrial situations.

The two college groups ranked this competency 16.5 and 18.0 with means of 3.81 and 3.70 while the two secondary groups gave it the positions of 11.5 and 16.5 with means of 3.94 and 3.59. When the means and the ranking data were compared, the majority of respondents commonly placed Competency 74 close to the bottom 20 competencies.

Competency item 60--Conduct group counseling sessions related to understanding of career opportunities in industry.

The two college groups ranked this competency at 18.0 and 14.5 with means of 3.77 and 3.80, while the two secondary groups supported it with ranks of 13.0 and 10.5 and with the means of 3.87 and 3.80. This competency was comparable to the preceding Competencies 32 and 74. The rankings of these competencies are also related to "Industry" which the majority of respondents placed low among the abilities of beginning teachers to perform in their teaching function.

Competency item 27--Develop interest and understanding in the problems and processes of mass production.

The majority of respondents supported this competency next to the bottom of the 20 competencies. There was general agreement among four groups that Competency 27 was "somewhat" needed by beginning teachers.

Table 16

A Tabular Comparison Between Chairpersons and Teachers at
College and Secondary Levels of the 14 Competencies Needed
by Beginning Teachers Ranked from High Mean Scores to Low
Under the Category of Interpersonal Relations

Competency item	College				Secondary			
	Chairpersons Mean Rank		Teachers Mean Rank		Chairpersons Mean Rank		Teachers Mean Rank	
51	4.42	1.0	4.19	1.0	3.94	5.0	4.18	1.0
11	4.29	2.0	4.18	2.0	4.03	1.0	4.03	3.0
55	4.16	3.0	3.98	6.0	3.77	10.5	3.92	5.0
71	4.07	4.0	4.01	4.5	3.90	7.5	3.95	4.0
81	4.03	5.5	3.92	8.0	3.90	7.5	3.59	12.5
82	4.03	5.5	4.02	3.0	3.60	12.5	4.05	2.0
24	3.97	7.5	3.86	11.0	3.94	5.0	3.82	7.0
29	3.97	7.5	3.84	12.0	3.97	3.0	3.85	6.0
50	3.94	9.0	3.01	4.5	3.94	5.0	3.72	8.0
15	3.90	10.0	3.65	14.0	3.65	14.0	3.59	12.5
78	3.87	11.0	3.89	9.0	3.81	9.0	3.56	14.0
40	3.81	12.0	3.93	7.0	4.00	2.0	3.69	10.0
58	3.77	13.0	3.87	10.0	3.77	10.5	3.69	10.0
14	3.68	14.0	3.75	13.0	3.68	12.5	3.69	10.0

Competency item 20--Skillfully use large and small group discussion teaching methods.

All four groups in the population supported this competency with a ranking of 20.0. It was concluded that the four groups strongly agreed that Competency 20 was little needed by beginning teachers for effective teaching.

Competency item 51--Accept suggestions for self-improvement without reacting defensively, becoming hostile or withdrawing.

This competency was ranked 1.0 by both college groups while it was ranked 5.0 and 1.0 by the two secondary groups. The highest mean score was 4.42 for the college chairpersons and the lowest mean score (3.94) was found for the secondary chairpersons. In summary, the college groups or college faculty members placed a higher degree of importance upon Competency item 51 than did the other two groups.

Competency item 11--Exhibit a fair, consistently firm, friendly tolerant and understanding attitude.

The two college groups supported this competency in position 2.0 with the means of 4.29 and 4.18; the other two groups ranked it 1.0 and 3.0 with identical means of 4.03. When the rank data and means were compared for this Competency, all four groups in the population placed Competency 11 in the top three of the 14 competencies.

Competency item 55--Demonstrate the ability to communicate with students, other teachers, administrators and laymen.

The two college groups supported this competency at the ranks of 3.0 and 6.0 with means of 4.16 and 3.98. The other two groups ranked it 10.5 and 5.0 with means of 3.77 and 3.92. In general, the two means for the college groups were higher than the means exhibited by the

secondary groups. This indicated that the two groups of college teachers more generally agreed upon Competency item 55 than did the other two groups.

Competency item 71--Function as a facilitator, rather than a director, in the learning process.

This competency was ranked at 4.0 and 4.5 with means of 4.07 and 4.01 by the two college groups. The two groups of secondary teachers ranked it at 7.5 and 4.0 with the means of 3.90 and 3.95. When the ranking data and the means were compared, greater agreement upon Competency 71 was found for the two college groups.

Competency item 81--Recognize patterns of human inter-relationships as they exist in a classroom and laboratory.

This competency was ranked at 5.5 and 8.0 with means of 4.03 and 3.92 by the two college groups while the other two groups ranked it 7.5 and 12.5 with means of 3.90 and 3.59 respectively. According to this information, considerable disagreement was apparent between the two groups in secondary teaching.

Competency item 82--Demonstrate appreciation of the dignity and worth of the individuals.

The two college groups supported this competency at the ranks of 5.5 and 3.0 with close means of 4.03 and 4.02, but the other two groups ranked it at 12.5 and 2.0 with the means of 3.68 and 4.05. Upon this examination, the greatest disagreement was apparent between the two groups in secondary teaching.

Competency item 24--Stimulate and maintain interest throughout the instructional process.

The two college groups supported this competency at ranks of 7.5 and 11.5 with means of 3.97 and 3.86, but the other two groups ranked it 5.0 and 7.0 with means of 3.94 and 3.82. There was not much difference in the four means even though a greater variation of 3.5 in the two ranks was apparent between the college groups. As can be seen, the majority of respondents commonly placed Competency 24 near the middle of a ranking of the 14 competencies.

Competency item 29--Provide opportunities for students to develop qualities of leadership and self-direction.

The two college groups ranked this competency 7.5 and 12.0 with means of 3.97 and 3.84, while the other two groups ranked it 3.0 and 6.0 with means of 3.97 and 3.85. From this information, there was not much difference in the four means, but the rankings for the two groups of secondary teachers were higher than the rankings by the two groups in college teaching.

Competency item 50--Encourage students to develop more positive attitudes toward learning, self, teachers and peers.

The two college groups supported Competency 50 at ranks of 9.0 and 4.5 with means of 3.94 and 4.01. The two secondary groups ranked this competency 5.0 and 8.0 with means of 3.94 and 3.72. There was a greater deviation (4.5) in the two rankings for the college groups but a greater difference was found (.22) in the two means for the secondary groups. In summary, closer agreement was not apparent between the two respondent groups of each teaching program.

Competency item 15--Demonstrate attitudes, opinions and emotions which encourage others to express themselves honestly and openly.

Both the college teachers and the secondary chairpersons ranked Competency 15 at 14.0 with a mean of 3.65. The college chairpersons gave this competency a ranking of 10.0 and a mean of 3.90 but the secondary teachers ranked it 12.5 with a mean of 3.59. It was evident that the majority of respondents generally agreed upon placing Competency 15 at the bottom of fourteen competencies.

Competency item 78--Demonstrate an understanding of working interpersonal relationships within the school organization.

The two college groups ranked Competency 78 11.0 and 9.0 with means of 3.87 and 3.89. The two secondary groups supported this competency at the rankings of 9.0 and 14.0 with means of 3.81 and 3.56. As indicated, a greater degree of disagreement was apparent between the two secondary groups. In general, the majority of the population placed Competency 78 close to the bottom of the 14 ranked competencies.

Competency item 40--Develop an atmosphere in which students are willing to cooperate in group activities.

The two college groups ranked Competency 40 at 12.0 and 7.0 with means of 3.81 and 3.93. The two secondary groups gave this competency the rankings of 2.0 and 10.0 with means of 4.00 and 3.69. From this information it is evident there was no agreement on Competency 40 among the four groups of respondents.

Table 17

A Tabular Comparison Between Chairpersons and Teachers at
College and Secondary Levels of the 17 Competencies Needed
by Beginning Teachers Ranked from High Mean Scores to Low
Under the Category of Student Evaluation
and Evaluation Techniques

Competency item	College				Secondary			
	Chairpersons Mean Rank		Teachers Mean Rank		Chairpersons Mean Rank		Teachers Mean Rank	
3	4.23	1.0	3.77	9.0	3.97	3.0	3.72	6.0
13	4.13	2.0	4.01	2.0	3.90	4.5	3.82	2.0
1	4.03	3.0	3.77	9.0	4.13	1.0	4.00	1.0
46	3.90	4.0	4.00	3.0	3.90	4.5	3.62	9.5
26	3.87	5.5	3.58	16.0	3.77	7.5	3.64	8.0
73	3.87	5.5	3.78	6.0	3.81	6.0	3.80	3.5
65	3.84	7.0	3.59	15.0	3.55	14.0	3.54	15.0
56	3.81	8.5	3.91	4.0	3.77	7.5	3.74	5.0
75	3.81	8.5	3.78	6.0	3.42	17.0	3.80	3.5
53	3.77	10.5	3.71	11.0	3.58	12.0	3.59	11.5
17	3.77	10.5	3.69	12.5	3.65	11.0	3.51	16.0
25	3.74	13.0	3.66	14.0	3.74	9.5	3.62	9.5
41	3.74	13.0	3.78	6.0	3.55	14.0	3.44	17.0
48	3.74	13.0	3.69	12.5	3.55	14.0	3.56	13.5
54	3.71	15.0	3.55	17.0	3.48	16.0	3.56	13.5
37	3.67	16.0	4.02	1.0	4.00	2.0	3.69	7.0
31	3.65	17.0	3.77	9.0	3.74	9.5	3.59	11.5

Competency item 58--Assist the school in creating an atmosphere in which democratic leadership can grow and flourish.

This competency was ranked 13.0 and 10.0 by the two college groups and was closely ranked 10.5 and 10.0 by the other groups. It was evident that a large portion of respondents placed Competency 58 in the bottom ten of the 14 ranked competencies.

Competency item 14--Help students perceive and deal with each other as human beings of intrinsic worth.

The two college groups supported this competency with rankings of 14.0 and 13.0 while the other two groups ranked it 12.5 and 10.0 respectively. From this information, the majority of respondents placed Competency 14 close to last among fourteen competencies.

Competency item 3--Assess students' progress on the basis of formulated, long-range instructional goals.

The two college groups ranked Competency 3 at 1.0 and 9.0 with means of 4.23 and 3.77. The other two groups supported this competency rankings of 3.0 and 6.0 and means of 3.97 and 3.72. Considerable differences of 8.0 in the rankings and .46 in the means, for the two college groups, were found on Competency 3. It was evident that greatest disagreement on this competency was between the two college groups.

Competency item 13--Construct manipulative and written examinations which reliably measure student achievement.

The two college groups ranked this competency in position 2.0 with mean of 4.13 and 4.01 while the other two groups gave it in the rankings of 4.5 and 2.0 with means of 3.90 and 3.82. From this infor-

mation it was evident Competency 3 was placed in the top two by the three groups but only in the top five of the 17 competencies by the group of secondary chairperons.

Competency item 1--Evaluate learning experiences in terms of planned goals and objectives.

The two college groups ranked this competency 3.0 and 9.0 with means of 4.30 and 3.77, but both secondary groups supported it with the highest ranking of 1.0 with means of 4.13 and 4.00. The secondary groups placed a higher degree of emphasis upon Competency 1 than did the college groups.

Competency item 46--Use a variety of evaluative techniques in assessing students' learning.

This competency was ranked 4.0 and 3.0 by the two college groups but the other two groups ranked it 4.5 and 9.5 respectively. The greatest disagreement was apparent between the two groups in secondary teaching when the ranking data were compared for Competency 46. In summary, the two college groups placed a higher value upon this competency than did the secondary groups.

Competency item 26--Evaluate facilities, equipment and materials needed for specialized instruction.

This competency was ranked 5.5 and 16.0 by the two college groups, while it was closely ranked at 7.5 and 8.0 by the two secondary groups. It was concluded that the two groups of secondary teachers agreed more on Competency 26 than did the two college groups.

Competency item 73--Analyse his own teaching style and behavior in its effect upon the teaching learning environment.

The two college groups generally supported this competency, ranking it 5.5 and 6.0 with means of 3.87 and 3.78. The other two groups ranked it 6.0 and 3.5 with means of 3.81 and 3.80. General agreement was apparent among the four groups in the population when the ranking data and the means were compared for Competency 73.

Competency item 65--Interpret the results of tests administered in each unit of instruction.

The two college groups ranked this competency 7.0 and 15.0 with means of 3.84 and 3.59, while the other two groups ranked it 14.0 and 15.0 with means of 3.55 and 3.54 respectively. When the ranking data and the means were compared for Competency 65, a lack of agreement was apparent between the two groups in college teaching.

Competency item 56--Use a variety of instruments and techniques to keep students informed of their progress.

The two college groups ranked this competency 8.5 and 4.0 with means of 3.81 and 3.91, while the other two groups ranked it 7.5 and 5.0 with means of 3.77 and 3.74 respectively. As indicated, the majority of respondents placed Competency 56 near the middle of the ranked range of the 17 competencies but close agreement was apparent between the two secondary groups.

Competency item 75--Use systematic observation techniques to analyze the effectiveness of instruction.

This competency was ranked 8.5 by the college chairpersons and 6.0 by the college teachers, while it was ranked 17.0 by the secondary chairpersons and 3.5 by the secondary teachers. Greater

disagreement was apparent between the two groups in secondary teaching.

Competency item 53--Develop standards for scoring progress and reporting of student achievement.

The two college groups ranked this competency 10.5 and 11.0 but the other two groups ranked it 12.0 and 11.5. As can be seen, all four groups placed this competency in the lower middle of the 17 ranked competencies. More specifically, the college groups slightly placed greater importance upon Competency 53 than did the secondary groups.

Competency item 17--Inform students of the basis and guidelines for evaluation.

The two college groups ranked this competency 10.5 and 12.5, while the two secondary groups ranked it 11.0 and 16.0 respectively. It was evident that there was a lack of agreement between the secondary groups and that the college groups placed more emphasis upon Competency 17.

Competency item 25--Construct pre and post evaluative diagnostic instruments.

The two college groups ranked this competency 13.0 and 14.0 with means of 3.74 and 3.69, but the other two groups both supported it in the position of 9.5 with means of 3.74 and 3.62, when the ranking data and the means were compared, all four groups of the population placed Competency 25 below the middle rank of the range of the 17 competencies.

Competency item 41--Provide systematic feedback to students about their performance.

This competency was ranked 13.0 and 6.0 by the two college groups, while it was ranked 14.0 and 17.0 respectively by the

secondary groups. It was evident that Competency 41 was associated with the preceding Competency 53 (Develop students for scoring progress and reporting of student achievement). In comparing them, the majority of respondents, placed more emphasis upon Competency 53; greater apparent agreement was found.

Competency item 48--Determine how to measure cognitive, affective and psychomotor skills.

This competency was ranked 13.0 and 12.5 by the two college groups while it was ranked 14.0 and 13.5 by the two secondary groups. As indicated, the college groups emphasized Competency 48 more than did the other two groups. However, all four groups placed this competency in the bottom five of the 17 competencies.

Competency item 54--Analyze test items for validity and reliability, utilizing accepted statistical procedures.

The two college groups ranked this competency 15.0 and 17.0 while the other two groups ranked it 16.0 and 13.5 respectively. From this information it was evident the majority of respondents placed little importance on Competency 54.

Competency item 37--Evaluate student performance according to objective criteria.

The two college groups ranked this competency 16.0 and 1.0 but the two secondary groups supported it at the ranks of 2.0 and 7.0 respectively. This Competency 37 concerning student evaluation according to objective criteria was generally associated with the preceding Competency item 3 (Assess students' progress) and Competency item 1 (Evaluate learning experiences). The greatest disagreement

among the four groups in the population was found on Competency 37.

Competency item 31--Allow students an important role in the evaluation of their own growth and development.

This competency was ranked 17.0 and 9.0 by the two college groups while the two groups supported it with rankings of 9.5 and 11.5. As can be seen the greatest lack of consensus was apparent between the two groups in college teaching. However, all four groups of the population placed Competency 31 below the middle point of the 17 ranked competencies.

Correlation in the Ranked Perceptions

In connection with the preceding section, the correlation in the ranked perceptions between chairpersons and teachers at college and secondary levels is delineated in this section. Spearman's rank order coefficient of correlation was used to determine the degree of agreement upon competency items listed under each of the five areas or categories mentioned earlier.

Tables 13 through 17 in the preceding section were again used in the calculating of correlation. The summary results of the data treatment are presented in Table 18.

Category 1--Planning of instruction and materials.

There are seventeen competencies identified under this category. As shown in Table 13, there was not much difference between the ranked perceptions of chairpersons and teachers at each program level. The two college groups placed the highest degree of importance upon Competency 43 while the two groups in secondary teaching agreed upon

placing Competency 2 in the top rank of seventeen. All four groups of the population ranked Competency 8 at the bottom of the seventeen. Examination of the differences column reveals the largest deviations in the rank orders on Competency items 52, 49 and 66 for the two college groups, but on Competency items 49 and 66 for the secondary groups. Based on analysis of the 17 ranked competencies in Category 1, correlations of 0.908 for the college groups and 0.784 for the secondary groups were found. Comparing the correlations between the

Table 18

A Comparison Among Five Categories of Functional Competency on Spearman's Coefficient of Rank Correlation between the Degrees of Agreement Perceived by Teachers and Chairpersons at the College and Secondary Levels

Identified categories of functional competency	The Spearman rank correlation coefficients	
	College chairpersons and teachers	Secondary chairpersons and teachers
1. Planning of instruction and materials	0.908	0.784
2. Classroom and laboratory management	0.906	0.919
3. Teaching methods and techniques	0.903	0.892
4. Interpersonal relations	0.715	0.302
5. Student evaluation and evaluation techniques	0.204	0.625

college groups for all five categories, it was discovered that the ranked data in this category received the highest correlation (0.908).

Category 2--Classroom and laboratory management.

Fourteen functional competencies were listed under Category 2. As presented in Table 14, identical rankings were found on Competency items 12, 10 and 4 for the college groups and on Competency items 64 and 14 for the secondary groups. For instance, the lowest ranking was given to Competency 4 by all four groups of the population. In addition, the largest deviation in the paired rankings for the college groups was on Competency 61 and on Competency 10 for the secondary groups. When calculating correlations in this category, the correlation for the secondary groups (0.919) was higher than the correlation (0.906) for the college groups. After comparing the correlations for all five categories, the rankings in Category 2 had the highest correlation (0.919) exhibited by the two groups in secondary teaching. The competency rankings showed the second highest correlation of 0.906 found for the two groups in college teaching.

Category 3--Teaching methods and techniques.

As shown in Table 15, all four groups of the identified population ranked Competency 34 at the top of the 20 ranked competencies. In general, differences of 3.0 or above in the paired rankings were found on Competency items 16, 62, and 60 for the college groups, and on Competency items 7, 16, 19, 77 and 74 for the secondary groups. A coefficient of rank correlation of 0.903 for the college groups and 0.892 for the secondary groups was computed for the 20 ranked com-

petencies in Category 3. In comparison to the other five categories for each teaching program, this category was given the third highest correlation (0.903) by the college groups and given the second highest correlation (0.892) by the secondary groups.

Category 4--Interpersonal relations.

Of the fourteen competencies in Category 4, two competency items (51 and 11) were ranked at the top by both college groups. In general, differences of 4.0 or above were found in the paired rankings on Competency items 24, 29, 50, 15 and 40 for the college groups and on Competency items 51, 55, 81, 82, 78 and 40 for the secondary groups (see Table 16). Rank order correlations coefficients were calculated between the 14 paired rankings established by the two respondent groups at each program level. Correlations of 0.715 were found for the college groups and 0.302 for the secondary groups. It was evident that from the rank order correlations that Category 4 was perceived as the fourth most important by the college groups but as only fifth by the secondary groups.

Category 5--Student evaluation and evaluation techniques.

As indicated in Table 17, there were great differences in the rankings on Competency items 3, 1, 26, 65, 56, 41, 37 and 31 for the college groups and on Competency items 46, 75, 17 and 37 for the secondary groups. When the 17 paired rankings under Category 5 were compared, the greatest disagreement was apparent between the two college groups. This was also reflected in the 0.204 coefficient of rank order correlation which was the lowest indicated for any of the five

categories. For the secondary groups, the rank ordering of these 17 competencies was correlated fourth highest at 0.625.

Summary of Descriptive Data

In the previous sections comparisons among the perceptions of chairpersons, teachers and faculty at college and secondary levels had been reported, summary categories and items of functional competency most needed by beginning teachers are drawn in this section.

As shown in Table 19, the categories were given the same ranking by all groups in the identified population. Even though the faculty refers to and includes both chairpersons and teachers at each program level, there was no difference in their ranked perceptions of each category. This undoubtedly indicates a perfect correlation in the ranked categories. In general, the college groups' mean scores for each of the five categories were slightly higher than those of the secondary groups. Based upon the analysis of mean scores and ranking data, the categories were ranked from high to low in importance as follows:

1. Category 2 = Classroom and laboratory management
2. Category 3 = Teaching methods and techniques
3. Category 4 = Interpersonal relations
4. Category 1 = Planning of instruction and materials
5. Category 5 = Student evaluation and evaluation techniques

It was further asserted that the competency items in Category 2 (Classroom and laboratory management) were perceived as most needed by beginning teachers at both the college and secondary levels. In addition,

Table 19

A Tabular Comparison Among the Perceptions of Chairpersons, Teachers and Faculty Members at the College and Secondary Levels of the Five Categories of Functional Competency Needed by Thai Beginning Teachers

Identified categories	College				Secondary			
	Chairpersons Mean Rank	Teachers Mean Rank	Faculty Mean Rank	Chairpersons Mean Rank	Teachers Mean Rank	Faculty Mean Rank	Chairpersons Mean Rank	Teachers Mean Rank
C ₁	3.968	4.0	3.866	4.0	3.891	4.0	3.852	4.0
C ₂	4.048	1.0	4.025	1.0	4.031	1.0	4.046	1.0
C ₃	4.016	2.0	3.958	2.0	3.972	2.0	3.924	2.0
C ₄	3.993	3.0	3.934	3.0	3.948	3.0	3.855	3.0
C ₅	3.841	5.0	3.769	5.0	3.786	5.0	3.736	5.0

Faculty members are a body of personnel responsible for industrial arts instruction. In this study it refers to and includes both chairpersons and teachers at each program level of instruction. When the terms "chairpersons and teachers" are used it indicates each group is being considered separately.

Numbers of college faculty = 128 (31 chairpersons and 97 teachers) and secondary faculty = 70 (31 chairpersons and 39 teachers)

- C1 = Planning of instruction and materials
- C2 = Classroom and laboratory management
- C3 = Teaching methods and techniques
- C4 = Interpersonal relations
- C5 = Student evaluation and evaluation techniques

Category 3 (Teaching methods and techniques) was perceived as next in importance for beginning teachers. With reference to the calculation of ranked correlations in the preceding section, these two categories had high positive correlation as established by chairpersons and teachers at both program levels.

The ten of eighty-two functional competencies perceived as most needed by faculty members at both college and secondary levels are illustrated in Table 20. It was found that the majority of these ten competencies, for both faculty levels, were from the categories 2 and 3. Competency item 34,--Demonstrate safe operation of machines and equipment, was perceived as having the highest degree of importance by both faculty levels. This competency was found in Category 3. Competency item 21,--Maintain tools and laboratory equipment in usable conditions, and Competency item 33, -- Maintain a safety and accident prevention program in compliance with safety rules and regulations, both were from Category 2 and placed in the top three of the 82 competencies by both groups of faculty. Competency item 43, -- Plan for and use appropriately the resources of the community in classroom and laboratory instruction, and Competency item 2,-- Plan for appropriate use of physical facilities, equipment and supplies needed for specific programs, both from Category 1 were ranked in the top ten by both faculty groups. However, the college faculty members placed more emphasis upon Competency item 43 while the secondary faculty members agreed to place more emphasis upon Competency item 2. Competency item 51,--Accept suggestions for self-improvement without reacting defensively, becoming hostile or withdrawing, and Competency item 11,--

Numbers of college faculty = 128, and secondary faculty = 70

Rank	College faculty members			Secondary faculty members			Rank
	Mean	Identified category	Competency item	Competency item	Identified category	Mean	
1.0	4.58	C3	34	34	C3	4.49	1.0
2.0	4.55	C2	21	21	C2	4.47	2.0
3.0	4.53	C2	33	33	C2	4.44	3.0
4.0	4.45	C1	43	43	C2	4.30	4.0
5.0	4.38	C3	79	79	C3	4.29	5.0
6.0	4.31	C3	7	7	C3	4.27	6.0
7.0	4.28	C2	12	12	C3	4.24	7.0
8.0	4.27	C3	23	23	C1	4.21	8.0
9.0	4.24	C4	51	51	C2	4.20	9.0
10.0	4.20	C4	11	11	C2	4.13	10.0

C₁ = Planning of instruction and materials
C₂ = Classroom and laboratory management
C₃ = Teaching methods and techniques
C₄ = Interpersonal relations
C₅ = Student evaluation and evaluation tec

Exhibit a fair, consistently firm, friendly tolerant and understanding attitude, were both found in the top ten as supported by the college faculty. These two competencies were listed under the Category 4 (interpersonal relations). According to the rank ordering of the top ten competencies, no items from Category 5 were supported by the college faculty and no items from Categories 4 and 5 were supported by the secondary faculty.

Additional Analysis

As indicated earlier, no significant differences were found between chairpersons and teachers at the college and secondary levels; and significant differences were apparent between college faculty and secondary faculty based upon their perceptions of all five categories of functional competency needed by beginning teachers. It was further determined that Category 1 (planning of instruction and materials) and Category 3 (teaching methods and techniques) have been the reason for the significant differences and for retaining the first hypothesis.

In light of the preceding findings, further analyses were done to compare faculty members at the college and secondary levels in their perceptions of functional competencies identified under Categories 1 and 3. A major attempt was made to determine the greatest differences in each competency item. Therefore, a one-way analysis of variance was conducted at the .01 level of significance. The two independent variables were college faculty members and secondary faculty members on the two teaching levels. In addition, the dependent variable was competency item. Mean scores and standard

deviations of each competency item, F ratios testing the difference between faculty groups, and the probabilities of the F ratios are presented in Table 21.

For Category I, Competency item 43,--plan for and use appropriately the resources of the community in classroom and laboratory instruction, and Competency item 72,--Establish course objectives and instructional goals to effect the desired changes in student behavior, were significant at the .01 level ($F = 11.58$ and 8.15 with p less than .001 respectively). In Category 3 only Competency item 62,--Engage students in identifying, seeking out and evaluating resources for learning activities, was significant at the .01 level ($F = 7.54$ with p less than .007).

Moreover, greater mean scores for Competency items 43, 72, and 62 were found to be significant for the college faculty. There were variations of .39, .30 and .32 in the means for these competencies. The greatest variation (.39) in the means (4.45 and 4.06) was found on Competency item 43.

Summary of Analyses and Results

Questionnaires containing a total of 82 functional competencies and a group of questions to elicit demographic data were sent to 235 industrial arts teachers and chairpersons at both college and secondary levels in Thailand. They were asked to rate each competency which beginning teachers should be able to perform effectively in their assigned teaching tasks. The final data represented the opinions of 128 college faculty and 70 secondary faculty members. The first

Table 21

One Way Analysis of Variance Summary Table for Variance: Competency Items 43 and 72
Under the Category of Planning of Instruction and Materials, and Competency Item 62
Under the Category of Teaching Methods and Techniques

The competency items identified under the categories 1 and 3	College level		Secondary level		F	P
	Mean	S.D.	Mean	S.D		
43. Plan for the use appropriately the resources of the community in classroom and laboratory instruction.	4.45	.64	4.06	.96	11.58	.001*
72. Establish course objectives and instructional goals to effect desired changes in student behavior.	3.93	.65	3.63	.80	8.15	.005*
62. Engage students in identifying, seeking out and evaluating	3.79	.79	3.47	.76	7.54	.007*

*Significant at the .01 level

College level = 128 college faculty members
Secondary level = 70 secondary faculty members

descriptive information from the demographic items had been discussed and it was found that the data obtained tended to support the identified population. In general, the correlation matrices among the scores on five categories of functional competency were quite high. A multivariate analysis of variance was employed to test hypotheses concerning the perceived needs of beginning teachers. One of the three major hypotheses was found to be significant at the .05 level. The mean scores indicated that the college faculty members placed more on perceived needs of beginning teachers than secondary faculty members. Based upon the preceding findings, the five categories were further tested by a univariate analysis of variance. It was discovered that the findings on Category 1 (planning of instruction and materials) and Category 3 (teaching methods and techniques) were significant at the .05 level. Upon examination of the rank ordering, close agreement between groups at each program level was apparent in Categories 1, 2, and 3. In addition, the following competency items were placed the highest degree of agreement by the respondent groups.

1. In Category 1 -- Competency items 43, 18, 72, 42, 63 and 8 were ranked at 1.0, 2.0, 8.0, 15.0, 16.0 and 17.0 respectively by the two college groups. Competency items 1, 38 and 8 were ranked at 1.0 and 8.5 and 17.0 respectively by the two secondary groups. It was found that all four groups of the identified population placed Competency item 8 at the bottom of the seventeen items.

2. In Category 2 -- Competency items 12, 10, and 4 were supported at the ranks of 3.0, 9.0 and 14.0 respectively by the college groups. Competency items 64 and 4 were ranked at 9.0 and

14.0 by the secondary groups. Competency item 4 was ranked at the bottom of the fourteen items by all groups of the respondents.

3. In Category 3 -- Competency items 34, 22, 27, and 20 were given rankings of 1.0, 8.0, 19.0 and 20.0 by the college groups. Competency items 34, 79, 59, 57, and 20 were ranked 1.0, 2.0, 7.0, 9.0 and 20.0 respectively by the secondary groups. Two competency items (34, and 20) were supported at rankings of 1.0 and 20.0 by all respondent groups.

4. In Category 4 -- Competency items 51 and 11 were given the ranks of 1.0 and 2.0 respectively by the college groups. There were no identical rankings by the secondary groups.

5. In Category 5 -- Only Competency item 13 was supported at the rank of 2.0 by both the college groups. Competency items 1 and 25 were ranked at 1.0 and 9.5 by the secondary groups.

When the Spearman's coefficient of rank correlation was applied to the functional competencies listed under the five established categories, it was found that Categories 1, 2 and 3 received high positive correlations (above .78).

According to the summary of data pertaining to the skills most needed by beginning teachers, the majority of the ten competencies deemed "most needed" were from Categories 2 and 3. Competency item 34 from Category 3 was supported by all groups in the identified population, as having the highest degree of importance.

Since Category 1 (planning of instruction and materials) and Category 3 (teaching methods and techniques) were found to be significant, additional analyses were performed to compare each

competency item or statement needed by beginning teachers at both program levels. Significant differences, at the .01 level, were found in the mean scores for competency items 43, 72, and 62. It was indicated that college faculty placed significantly greater importance upon these three competencies than did secondary faculty.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The fifth and final chapter is devoted to a summary of the study, discussions and conclusions generated from the analysis of the data described in Chapter IV, and followed by recommendations for teacher preparation and further study.

Summary of the Study

The summary is a brief review of the purpose, hypotheses, instrument, procedures and treatment in this study.

The investigator's primary purpose has been to ascertain the functional competencies that faculty members, chairpersons and teachers at college and secondary levels, perceive as being essential for beginning teachers for effective teaching. These functional competencies, implicit in the objectives for the preservice program at Pranakorn, were classified into the following established categories:

(1) planning of instruction and materials, (2) classroom and laboratory management, (3) teaching methods and techniques, (4) interpersonal relations, and (5) student evaluation and evaluation techniques. The secondary, yet a very important, purpose has been to develop a series of recommendations based on the findings in this study for improving the preservice industrial arts teacher education program at Pranakorn.

In order to accomplish the primary purpose, the three major hypotheses that were tested were as follows:

1. There would be a difference between faculty members who taught at college level and those who taught at secondary level in their perceptions of all five categories of functional competency needed by beginning teachers;
2. There would be a difference between the perceptions of chairpersons and teachers at both college and secondary levels of all five categories of functional competency needed by beginning teachers; and
3. There would be an interaction between the types of respondents and the levels and kinds of institutions at which they taught in their perceptions of all five categories of functional competency needed by beginning teachers.

In framing the foregoing hypotheses, it was assumed that the differences in the perceptions of chairpersons and teachers would be due to the differences in their roles and status. The responses, therefore, were classified in terms of two independent variables: namely, (1) the types of respondents, (2) the levels and kinds of institutions at which they taught. The dependent variables were the five categories of functional competency mentioned earlier. The three hypotheses were tested by the multivariate analysis of variance. An alpha .05 level was used as the criterion for significance. When any hypothesis was supported by the analysis of the data, the five dependent variables (the five categories) were further tested by the univariate F ratio. Additional analyses were conducted individually on each of the competency items the previously supported by the analysis of the data. This measurement was made to determine the greatest differences in each competency. In a one-way analysis of variance, significance was determined at .01 level.

Furthermore, the competencies, as perceived by chairpersons and teachers at each program level, were reduced to a mean value

for each of the five categories and arranged in order of importance. Then Spearman's rank order coefficient of correlation was applied to the competencies listed under each of the five categories. Finally, a summary of descriptive data such as the means, rank orders, and correlations was used to determine the functional competencies in each category that were perceived as most essential for beginning teachers at college and/or secondary levels.

To develop the instrument to measure the perceptions, the list of 171 competencies, which was largely drawn from the literature in the field according to the objectives of the pre-service program at Pranakorn, was revised by an evaluative jury and by a group of Thai educators. After a revised list of functional competencies was compiled, the instrument containing 82 competency statements divided into five categories was adequately tested for validity.

The final edition of the instrument with a five-point Likert scale was sent, together with a demographic data sheet and a letter of introduction, to the respondent population. A list of respondents teaching at college and secondary levels was obtained from a Pranakorn pilot follow-up study. The respondent population numbered 235 and comprised chairpersons and teachers at each program level. The teacher respondents were those who had been teaching at either the rural comprehensive (secondary) or at college levels for at least two academic years and had completed the preservice industrial arts teacher education program at Pranakorn. In addition, chairpersons selected were those who were current incumbents and had worked with industrial arts graduates. These identified respondents represented a core of

expertise in Thailand for identifying the functional competencies which beginning teachers should acquire or possess to succeed in the local programs of industrial arts instruction. Their perceptions of the functional competency needs for beginning teachers formed the main basis for this study. The respondents were asked to rate each of 82 competency items according to the following scale: (1) urgently needed, (2) much needed, (3) somewhat needed, (4) little needed; and (5) not needed at all.

In the final treatment of the data, a total of 198 usable returns represented 84.26 percent of the 235 questionnaires distributed. It was found that the 198 respondents comprised 31 college chairpersons, 97 college teachers, 31 secondary chairpersons, and 39 secondary teachers. More than 97 percent of 198 respondents were male. Responses to the 82 competency items were coded 5, 4, 3, 2, 1 corresponding to their ratings from high need to no need at all. Coding systems for all demographic data were also created and used to record information. Cards were prepared containing information on group identification, demographic data, and item ratings for the perceived needs for beginning teachers. A multivariate program which was adapted for use on the CDC 6500 at the Computer Center, Michigan State University was employed to compute the correlations, means, standard deviations, and multivariate, univariate and one-way analyses of variance.

Discussion of the Findings

The discussion is presented in relation to the results of the data gathered and analyzed in Chapter IV.

On the average, the length of teaching experience and age of the chairpersons and teachers at college were found to be higher than those of the secondary groups. It was found that a large number of teachers who had graduated from Pranakorn in the early years were employed in college teaching programs. The secondary teachers taught an average of 200 students every term, as against the average of 111 students for college teachers. This resulted in a shortage of industrial arts teachers in the secondary teaching programs.

It was found that individuals employed, in either the rural comprehensive secondary or the college programs, had had little opportunity to update their teaching skills. Only five percent of 198 respondents had Master's Degrees and nearly fifty percent of them had never attended any seminars, workshops, fieldtrips or industrial internships.

The correlation matrices among the five categories of competency scores were quite high, ranging from .68 to .84. The fact indicated that there was a relationship among the five competency categories. Perhaps most of the respondents were aware of the inadequacy of the preservice teacher preparation and felt a great need for many competencies required for effective beginning teachers. In addition, it was observed that some of the competency items listed under the five categories were very close in meaning. Conceivably, the respondents might rate such competency items in the same manner and ranked them at the same level. The respondents might have had high expectation that such functional competencies the beginning teachers would be able to acquire easily. Any of the foregoing reasons and a combination of them

might explain high correlations among mean scores of perceived competency categories.

One of the three major hypotheses showed statistically significance. The mean scores for all competency categories showed that the college faculty members placed more emphasis on the perceived needs of beginning teachers than did the secondary faculty members. Since the teacher curriculum at the college level is aimed at producing effective teachers who have a good understanding of their own roles and duties in the teaching profession, very effective (beginning) teachers for teaching prospective teachers are badly needed. By the univariate F test, it was further found that the college faculty placed significantly more importance upon the ability of beginning teachers in functional competencies related to the categories of teaching methods and techniques and planning of instruction and materials than did the secondary faculty. It is evident that beginning teachers ought to go through practical training in these two categories prior to entry into the teaching profession. According to a one-way analysis of variance, the following competency items in these two categories were found to be significant at the .01 level.

- 43.. Plan for and use appropriately the resources of the community in classroom and laboratory instruction.
- 72. Establish course objectives and instructional goals to effect the desired changes in student's behavior.
- 62. Engage students in identifying, seeking out, and evaluating resources for learning activities.

These three competencies were given more emphasis in the college respondents' ratings as an essential aid to the beginning college teachers' ability to teach prospective teachers. Competency item 43

definitely reflects the fourth objective for the preservice program at Pranakorn which states that beginning teachers should "utilize community resources for instruction as much as possible" (see Chapter I, p. 9). Competency item 62 too reflects this objective. In addition, competency item 72 is considered quite important for professional teachers to be able to perform effectively in establishing course objectives and instructional goals. It is important that these functional competencies should be emphasized as the essential need for well prepared teachers of teacher trainees.

Upon examination of the rank order of the competency means listed under each of the five categories, the following specific observations present some of the important findings.

1. With regard to the category of planning of instruction and materials--all respondent groups attached a high degree of importance to the beginning teachers' ability to "plan for the appropriate use of physical facilities, equipment, and supplies needed for specific programs." This competency was not only ranked among the top four of the seventeen competencies in this category, but was also ranked among the top ten of the eighty-two competencies. It is evident that this competency ought to be considered most pertinent as the essential need for better prepared teachers.

2. With regard to the category of planning of instruction and materials--all groups of the population strongly agreed that it was considerably more important that beginning teachers be able to develop and plan instructional materials than it was for them to develop instructional objectives, lessons, immediate and long-range plans. Since

most of the Thai educational institutions lack instructional technology and teaching aids, emphasis is placed on preparing teachers to be competent in developing and planning instructional materials.

3. With regard to the category of classroom and laboratory management--all four groups of the population placed a high degree of emphasis on the beginning teachers' ability to "maintain tools, and laboratory equipment in usable condition"; and in their ability to "maintain a safety and accident prevention program." These two competencies reflect the sixth and seven objectives for the preservice program at Pranakorn (see Chapter I, p. 9). Since considerable sums of money have been spent on expensive machines and equipment from abroad, competent (beginning) teachers are greatly needed to demonstrate effective use and care of these devices. As indicated earlier, a large number of students are enrolled in laboratory activities at each program level. Therefore, an organized, well-managed, and safe industrial arts laboratory is very important.

4. With regard to the category of classroom and laboratory management--all four groups of the population placed a high degree of importance on the beginning teachers' ability to "organize and conduct appropriate laboratory house-keeping practices;" and their ability to "maintain an inventory of supplies, tools, and equipment." It was found that these two competencies were ranked among the top five of the fourteen competencies in this category. In other words, Thai beginning teachers should possess these competencies to function effectively in both college and secondary programs.

5. With regard to the category of teaching methods and techniques--all four groups of the population indicated that it was not as important for the beginning teachers to be able to "incorporate modern industrial processes and principles into the instructional programs" as it was for them to be able to "demonstrate safe operation of machines and equipment." Since Thailand is an agricultural nation, the importance of an industrial society is given a minimal recognition in Thai. For this reason, perhaps, all respondents deemphasized the beginning teachers' abilities relating to industrial functions. Therefore they emphasized technical skills in the beginning teachers.

6. With regard to the category of teaching methods and techniques--all respondent groups placed greater emphasis on the beginning teachers' ability to "provide situations which encourage students to think and work independently and creatively" than to "develop interest and understanding in the problems and processes of mass production." In summary, the beginning teachers should spend not only some time in the organization of group projects and mass production unit, but they should also devote a large portion of instructional time to providing situations which allow students to think and work independently and develop their creative abilities.

7. With regard to the category of interpersonal relations--all four groups of the population placed considerable emphasis on the beginning teachers' ability to "accept suggestions for self-improvement without reacting defensively, becoming hostile or withdrawing." Thai culture associates respect with three types of seniority: age, royalty, and achievement. Subordination to higher authority is accepted without

question. All respondents tended to emphasize this functional competency as one which the beginning teachers should have in their teaching profession.

8. With regard to the category of student evaluation and evaluation techniques--the college groups placed more emphasis on the beginning teachers' ability to "construct manipulative and written examinations which reliably measure student achievement," while the secondary groups tended to place more emphasis on the beginning teachers' ability to "evaluate learning experiences in terms of planned goals and objectives." However, these two competencies were ranked at the top of the seventeen competencies.

When the ranked competencies under each of the five categories mentioned earlier were determined by Spearman's rank order coefficient of correlation, high positive correlations (above .78) were found among Category 2--classroom and laboratory management, Category 3--teaching methods and techniques, and Category 1--planning of instruction and materials. Category 5--student evaluation and evaluation techniques showed the lowest agreement (.204) for the college groups, while Category 4--interpersonal relations recorded the least agreement (.302) for the secondary groups. From the preceding indications, it becomes clear that the chairpersons and teachers at each program level tended to emphasize or deemphasize the same competencies in Categories 1, 2, and 3.

The data pertaining to the skills most needed by beginning teachers has revealed that the majority of the ten competencies rated as "needed most" came from Categories 2 and 3. The analysis of the

mean scores, ranking data, and correlations for each competency category of classroom and laboratory management were perceived as the most needed by beginning teachers at both program levels. In addition, the functional competencies in the category of teaching methods and techniques were perceived as the next most important for beginning teachers. It was further found that competency in "demonstrating safe operation of machines and equipment" was perceived as having the highest degree of importance at both program levels. Finally, it was found that the competencies in the category of student evaluation and evaluation techniques were perceived as of the lowest importance for the beginning college teachers, while the competencies in the category of interpersonal relations were rated as of the least importance for the beginning secondary teachers.

The investigator's review of literature in the United States has indicated that human relations are in general most important for effective teaching. It is recognized that the nature of human relations is affected by the culture of the country, and it is bound to be different from that of the U.S. Young Thais always listen to the elder and expected to be treated with respect. It is assumed that there ought to be no problem of human relations between teachers and students. As a result, the functional competencies in the category of interpersonal relations were perceived as "somewhat needed" by Thai beginning teachers for effective teaching.

Conclusions

The discussion and analysis of the data point to the following specific conclusions.

1. Faculty, chairpersons and teachers at college and secondary levels, tended to support the functional competencies identified in this study as being essential for Thai beginning teachers.

2. The beginning college teachers have competency needs more significantly for effective teaching than do the beginning secondary teachers.

3. Both the beginning college teachers and the beginning secondary teachers have the first most competency needs in the category of classroom and laboratory management.

4. Both the beginning college teachers and the beginning secondary teachers have the second most competency needs in the category of teaching methods and techniques.

5. The beginning college teachers have competency needs more significantly in the category of planning of instruction and materials and in the category of teaching methods and techniques than do the beginning secondary teachers.

6. The beginning college teachers have the least competency needs in the category of student evaluation and evaluation techniques, while the beginning secondary teachers have the least competency needs in the category of interpersonal relations.

7. The beginning college teachers have more significant competency needs in utilizing community resources for instruction and in establishing course objectives and instructional goals than do the beginning secondary teachers.

8. Both the beginning college teachers and the beginning secondary teachers have more competency needs in demonstrating technical skills than in incorporating industrial functions into instructional programs.

9. When the functional competencies that contribute to the effective performance of beginning teachers at college and secondary levels are identified, specific recommendations will be framed for the improvement of industrial arts teacher preparation.

Recommendations for Industrial Arts Teacher Preparation at Pranakorn

The program at Pranakorn operates through the four components presented in Figure 2: (1) input, (2) operation, (3) output, and (4) feedback. The perceptions of the functional competencies by chairpersons and teachers at both levels when fully analyzed becomes the much needed feedback and can facilitate the improvement of preservice teacher preparation.

Based on the analysis of the findings in this study, the following recommendations are made for consideration by people responsible for industrial arts teacher preparation. Under the Thai educational system, teacher preparation is the responsibility of the Teacher Training Department under the Ministry of Education. As indicated in Figure 3, the organization chart shows that all teacher colleges do not have full direct authority in preparing to produce competent beginning teachers. Since the authority is an integral part of the Teacher Training Department, the industrial arts teacher education program at Pranakorn does not have the power to operate

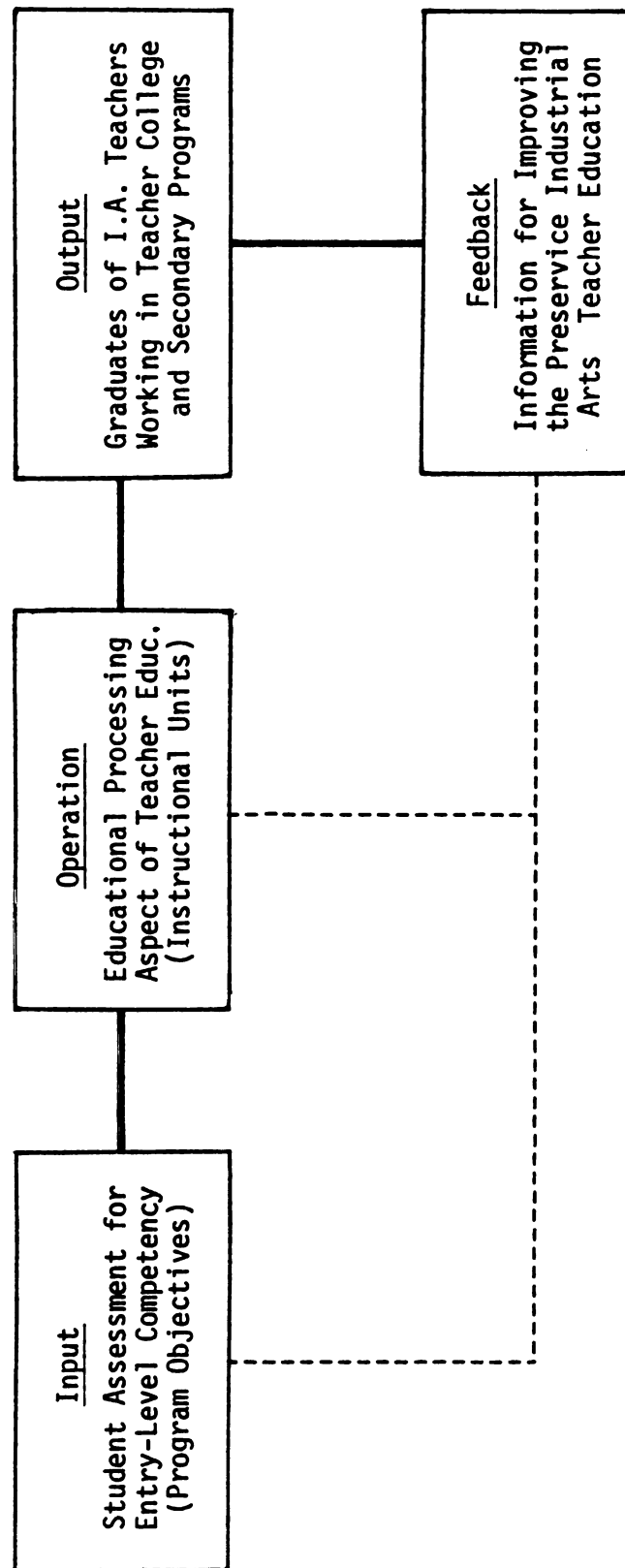


Figure 2 -- An Input-Operation-Output-Feedback Model Applied to Teaching-Learning Situation

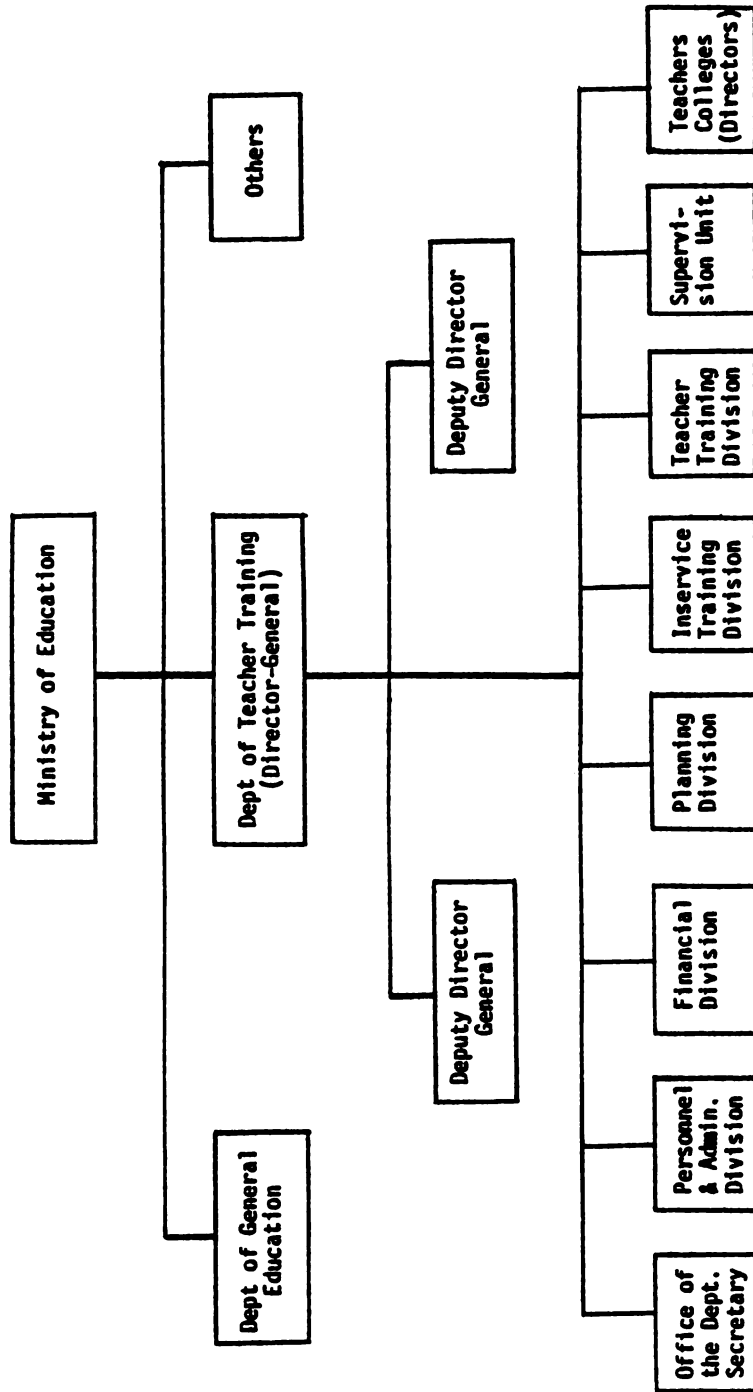


Figure 3 -- An Organization Chart for the Thai Teacher Education System Under the Department of Teacher Training of the Ministry of Education

its program independently. If the preparation of competent teachers is to be expected, commitment and cooperation must be made among people in the organization shown in Figure 4.

Those who work closely with prospective teachers are the director of teacher preparation, the chairperson of the academic department, the heads of subject teaching, and staff members. These heads, chairperson, and staff members are defined as teacher educators. However, the Director-General of the Teacher Training Department is responsible for establishing policy and standards to coordinate teacher preparation. It is strongly recommended that all persons concerned with the educational aspect of teacher preparation should be acquainted with the findings of this study.

The facts which influence the selection of functional competencies are: (1) a high consensus of the respondent population, (2) a high ranking of the respondents, and (3) a high mean of their responses. As a result, the following twenty-nine out of the original eighty-two functional competencies have been determined to be most significantly worthy of recommendations.

1. Demonstrating the safe operation of machines and equipment.
2. Maintaining tools and laboratory equipment in usable condition.
3. Maintaining a safety and accident prevention program in compliance with safety rules and regulations.
4. Using laboratory demonstration effectively in teaching.
5. Using graphic materials and educational displays of real objects to aid instruction.
6. Relating course content to every day personal, family living and occupational experiences.

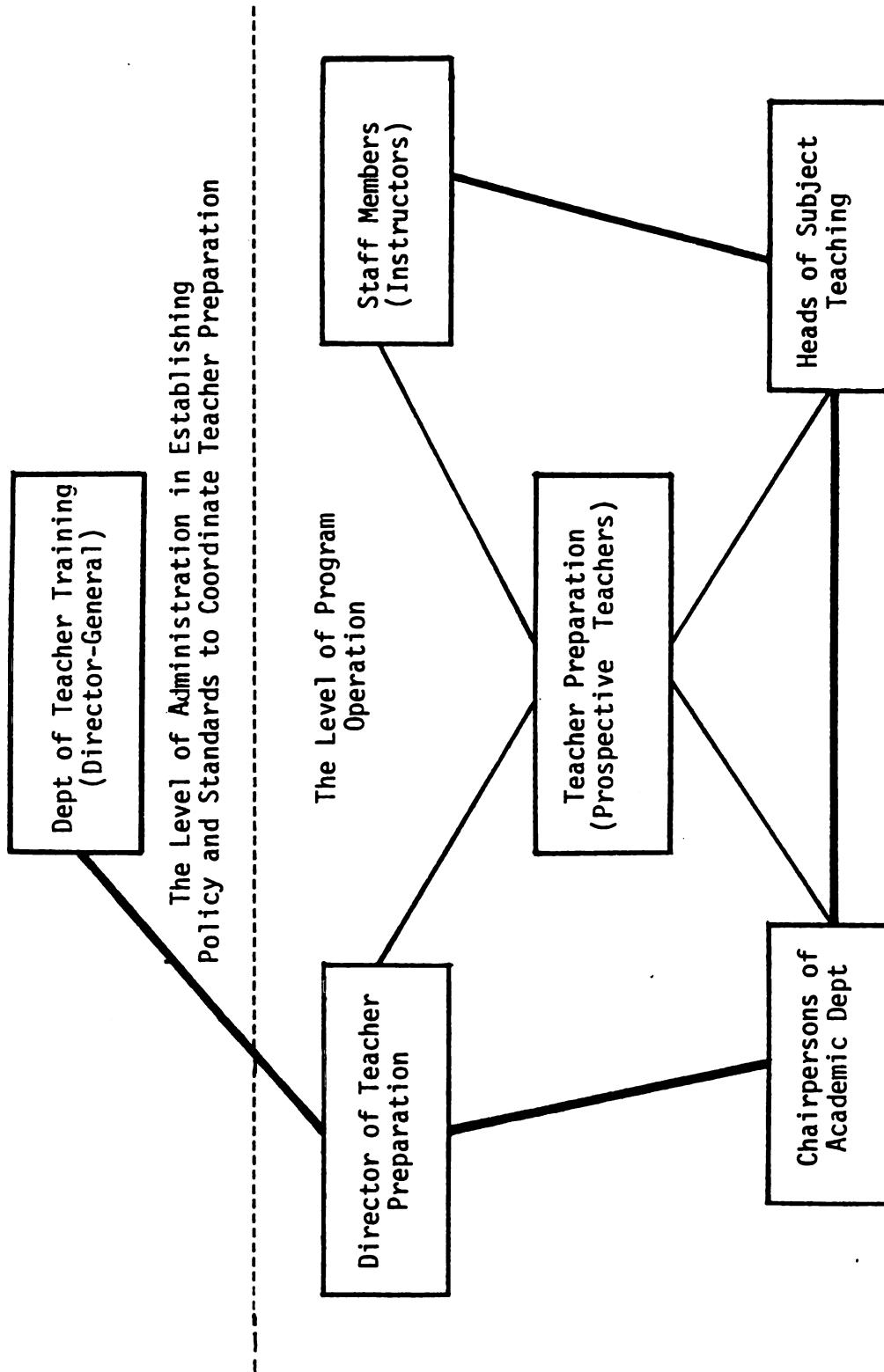


Figure 4 -- Lines of Authority and Commitment Among Persons Concerned with the Educational Processing Aspect of Teacher Training Preparation

7. Planning for and using appropriately the resources of the community in classroom and laboratory instruction.
8. Organizing and conducting appropriate laboratory house-keeping practices.
9. Accepting suggestions for self-improvement without reacting defensively, becoming hostile or withdrawing.
10. Developing and planning instructional materials.
11. Exhibiting a fair, consistently firm, friendly tolerant and understanding attitude.
12. Maintaining an inventory of supplies, tools, and equipment.
13. Planning for appropriate use of physical facilities, equipment and supplies needed for specific programs.
14. Conducting lessons that result in student mastery of specified objectives.
15. Demonstrating consistency and objectivity in classroom and laboratory management.
16. Selecting and utilizing instructional materials compatible with course objectives.
17. Making the classroom and laboratory attractive and interesting.
18. Determining and providing appropriate safety apparel and devices for hazardous activities.
19. Utilizing a variety of teaching techniques and methods to reach instructional objectives.
20. Providing experiences to help students understand and develop their own values.
21. Using evaluative results effectively to improve instructional planning and lesson organization.
22. Providing situations which encourage students to think and work independently and creatively.
23. Preparing a budget for facilities, equipment and materials needed in each program unit.
24. Preparing purchase orders for instructional materials, supplies and equipment.

25. Functioning as a facilitator, rather than a director, in the learning process.
26. Preparing teaching plans to provide experiences that include both enjoyment and knowledge.
27. Constructing manipulative and written examinations which reliably measure student achievement.
28. Organizing teaching materials before, during and after their use.
29. Evaluating learning experiences in terms of planned goals and objectives.

A large number of these 29 competencies are specifically related to the effective performance of beginning teachers in "the classroom and laboratory management," and "the teaching methods and techniques." In most cases, every effort should be made by teacher educators to make sure that prospective teachers acquire adequate control of all the functional competencies through their preservice training. Priority should be given to the preservice development of these functional competencies which have been strongly recommended by the respondents in this study. Such functional competencies are crucial to the effectiveness of beginning teachers.

Teacher educators should be able to use the selected list of functional competencies to construct a rating instrument for the evaluation of prospective teachers. Such an instrument should be used to measure the functional competencies developed in the period of preservice training. In addition, prospective teachers should use the rating instrument to evaluate their own growth and development at various stages of their professional training.

Course outlines for professional education and technical subjects should be evaluated to make sure that they help prospective teachers

acquire these competencies. Curriculum models or instructional tasks, therefore, should be designed primarily to prepare competent teachers. As indicated in Figure 5, the curriculum instruction process could follow the unit approach. Each of the instructional units in teacher education preparation should include some specifically stated competencies in the teaching-learning situation.

The highest ratings by all respondent groups were given to a large portion of the functional competencies in "classroom and laboratory management." It is recommended that teacher educators should give considerable attention to the development of this competency area. Prospective teachers should be observed and evaluated to ascertain how well they have developed in this competency category during their practical training. These functional competencies should also be emphasized in "the classroom and laboratory management" courses related to all technical subjects in the field. In addition, teacher educators should provide for the development of functional competencies in this area through such appropriate methods and experiences as fieldtrips and industrial internships. If beginning teachers are found deficient in these most highly perceived functional competencies, they should be given immediate follow-up instructions. That is, inservice training activities should include conference, workshops, and credit and non-credit courses aimed at improving the functional competencies for those teaching at college and secondary levels.

A significant difference was found in the degree of importance attached to the beginning college teachers' ability in "the planning of instruction and materials," and "the teaching methods and

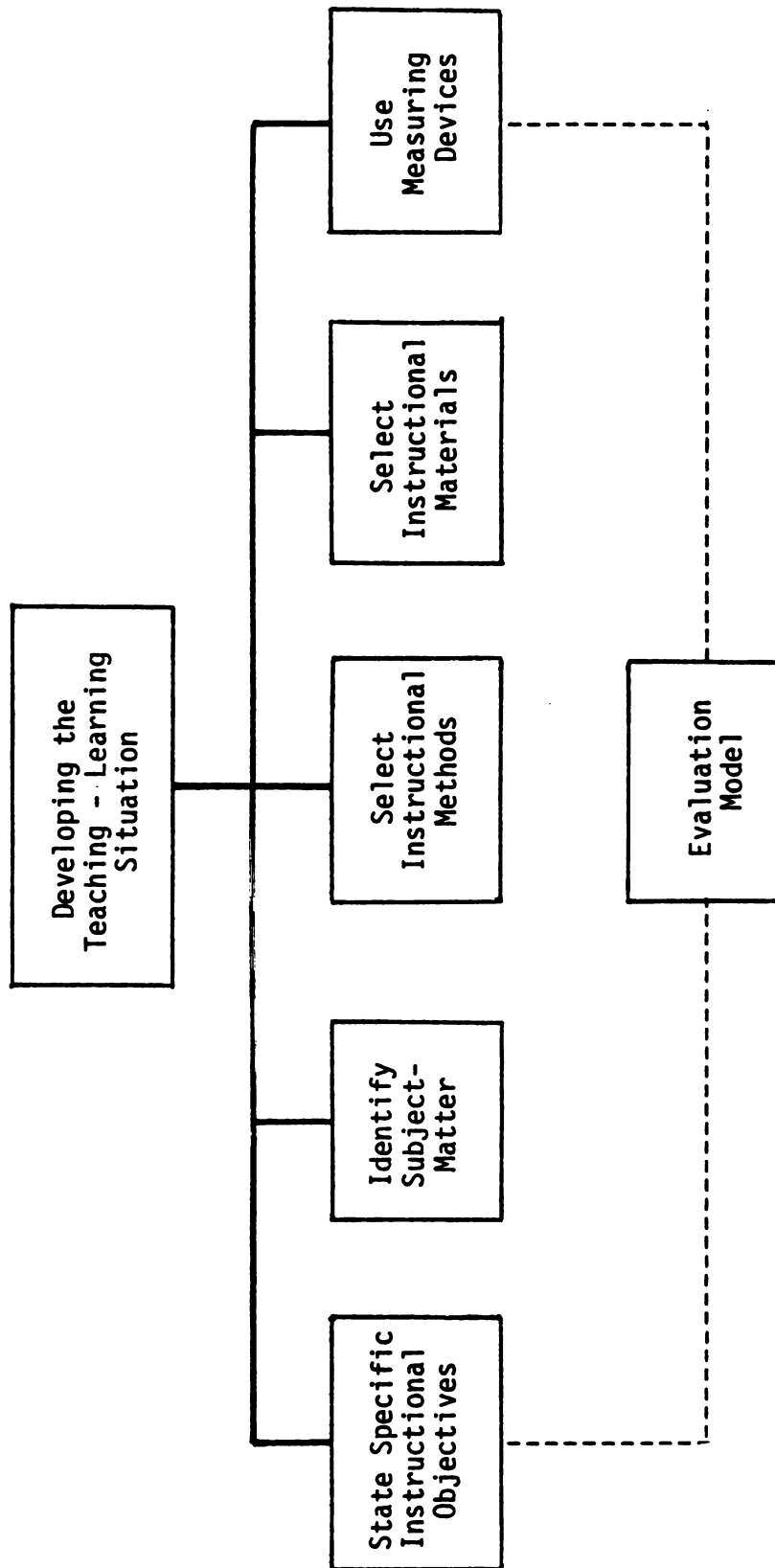


Figure 5 -- Designed Curriculum Instructions in the Preservice Teacher Education Program

techniques." It is recommended that programs need to be designed to develop functional competency in these two areas in order to help current beginning teachers develop them both the preservice training period and the inservice training period. The teacher college is a higher education institution and competent teachers of prospective teachers are badly needed. In fact, there is still no graduate program in industrial arts education to produce more competent teacher in Thailand. Finally, it is further recommended that Master's Degree programs in industrial arts education should be instituted as a means of updating the functional competencies for professional (beginning) teachers.

It is recognized that these recommendations will not be easily implemented because of the traditional slow response of the bureaucracy. However, the recommendations are made in the spirit that they have clearly emerged out of the findings in this study.

Recommendations for Further Study

The findings of this study suggest other problems which may profitably be studied.

1. A study should be conducted to ascertain the level of development that prospective teachers have in each of the functional competencies prior to entry into the preservice training program.

2. A study should be conducted to determine the functional competencies which prospective teachers develop during the preservice training program of industrial arts education.

3. A study should be conducted to determine whether beginning

beginning teachers or experienced teachers place more emphasis on the functional competencies needed in their teaching profession.

4. A study should be conducted to identify the specific competencies needed by beginning teachers to adequately function in the various instructional areas of industrial arts education.

5. A similar study should be conducted to compare the responses of teacher educators and supervisors with those of the industrial arts teachers in the college and secondary teaching programs.

6. A study should be conducted to evaluate the extent to which the preservice training program at Pranakorn is achieving the competency objectives outlines in this study.

This study has been an attempt to ascertain functional competencies needed by Thai beginning teachers of industrial arts at college and secondary levels. A study of this kind had never been undertaken in Thailand until the present project. This study fills that lucana. Its usefulness largely lies in its basic objective that will help the Thai educators and administrators understand the functional competencies required by beginning teachers for effective performance. Furthermore, it would be reasonable to assume that the study would help evaluate the functional competencies developed during the period of preservice industrial arts teacher preparation in the future.

SELECTED BIBLIOGRAPHY

BOOKS

- Biddle, Bruce J. and Ellena, William J. Contemporary Research On Teacher Effectiveness. New York: Holt, Rinehart and Winston, Inc., 1964.
- Bloom, Benjamin S., ed. Taxonomy of Educational Objectives. Handbook I: Cognitive Domain. New York: David McKay Company, Inc., 1956.
- Brueckman, Jack C. and Brooks, Stanley E., eds. Competency-Based Industrial Arts Teacher Education. 26th Yearbook of the American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1977.
- Buasri, Saroj. A History of Thai Education: The Ministry of Education. Printed at Kurusapha Press by Nai Khamthon Sthirakul, April, 1976.
- Committee on Publications. Definitions of Terms in Vocational, Technical, and Practical Arts Education. Washington, D.C.: American Vocational Association, Inc., 1964.
- Committee on Teacher Competencies. The Florida Catalog of Teacher Competencies. Florida State Department of Education, Tallahassee, January 1, 1973.
- Conant, J. B. Education of Teacher. New York: McGraw-Hill, 1963.
- Department of Teacher Training. An Introduction to the Department of Teacher Training. Printed at Chongcharoen Printing Press, Bangkok, Thailand, 1976.
- Finn, Jeremy D. A General Model for Multivariate Analysis. New York: Holt, Rinehart and Winston, Inc., 1974.
- Giachino, J. W. and Gallington, Ralph O. Course Construction in Industrial Arts, Vocational, and Technical Education. Chicago: American Technical Society, 1967.

- Good, Carter V., ed. Dictionary of Education. New York: McGraw-Hill Book Company, Inc., 1973.
- _____. Essentials of Educational Research. New York: Appleton-Century Crofts, 1966.
- Hamachek, Don E. Human Dynamics in Psychology and Education. Boston: Allyn and Bacon, Inc., 1968.
- Hays, William L. Statistics for the Social Sciences. New York: Holt, Rinehart and Winston, Inc., 1973.
- Hinsie, E. L. and Campbell, R. J. Psychiatric Dictionary. New York: Oxford University Press, 1973.
- Koerner, J. D. The Miseducation of American Teachers. Mifflin: Boston, Houghton, 1963.
- Krathwohl, David R.; Bloom, Benjamin S.; and Masia, Bertram B. Taxonomy of Educational Objectives. Handbook II: Affective Domain. New York: David McKay Company, Inc., 1956.
- Lux, Donald G. ed. Essentials of Preservice Preparation. 11th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1962.
- Marascuilo, Leonard A. and McSweeney, Maryellen. Non-Parametric and Distribution Free Methods for the Social Sciences. Brooks and Cole Publishing Company, Monterey, 1977.
- Massey, Harold W. and Vineyard, Edwin E. The Professional of Teaching. New York: The Odyssey Press, Inc., 1961.
- Micheels, William J. The Minnesota Plan for Industrial Arts Teacher Education. McKnight Publishing Company, Bloomington, Inc., 1958.
- Moon, Donald E., ed. A Guide to the Planning of Industrial Arts Facilities. 24th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1975.
- Nelson, Lloyd P. and Sargent, William T., eds. Evaluation Guidelines for Contemporary Industrial Arts Programs. 26th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1977.
- Ray, William E. and Streichler, Jerry., eds. Components of Teacher Education. 20th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1971.

- Revision Committee. A Guide to Improving Instruction in Industrial Arts. 4th Revision. Washington, D. C.: American Vocational Association, Inc., 1968.
- Schmitt, Marshall L. and Friends. Industrial Arts: An Analysis of 39 State Curriculum Guides, 1953-58. Washington, D.C.: Office of Education, 1961.
- Silvius, G. Harold and Bohn, Ralph C. Organizing Course Materials for Industrial Education. McKnight Publishing Company, Bloomington, Ill., 1961.
- Smalley, Lee H., ed. Future Alternatives for Industrial Arts. 25th Yearbook of American Council on Industrial Arts Teacher Education: McKnight Publishing Company, Bloomington, Ill., 1976.
- Stadt, Ronald W. and Kenneke, Larry J. Teacher Competencies for the Cybernated Age. Monograph 3. Washington, D. C.: American Council on Industrial Arts Teacher Education, 1970.
- Stewart, F. W. Methods of Good Teaching. No Publisher Given, Columbus, Ohio, 1950.
- Trivett, David A. Competency Programs in Higher Education. Washington, D. C.: American Association for Higher Education, 1975.
- Walsh, John P. Teacher Competencies in Trade and Industrial Education. U. S. Department of Health, Education, and Welfare, Vocational Division Bulletin, No. 285. Washington, D. C.: U. S. Government Printing Office, 1960.

ARTICLES AND PERIODICALS

- Andreyka, Robert E. "The Florida Way: Identification and Validation of Competencies for Trade and Industrial Education Teacher." Journal of Industrial Teacher Education, 14, No. 1 (Fall, 1976), 21-27.
- Barr, A. S. "Characteristics of Successful Teachers." Phi Delta Kappan, XXXIX, No. 6 (March, 1958), 282-84.
- Bass, Ronald E. "Why Teachers Fail." Journal of Industrial Teacher Education, 11, No. 1 (Fall, 1973), 74.
- Decker, Howard S. "Washington Symposium on Industrial Arts Education." Journal of Industrial Arts Education, XXVII, No. 2 (November-December, 1968), 14-16.

- Dodl, Norman R. "Selecting Competency Outcomes for Teacher Education." Journal of Teacher Education, 24, No. 3 (Fall, 1973), 194.
- Domas, Simeon J. and Tiedeman, David V. "Teacher Competence: An Annotated Bibliography." Journal of Experimental Education, XIX (December, 1950), 101-218.
- Donovan, Thayer. "The Many Faceted Role of Shop Teacher." Journal of Industrial Education, 65, No. 7 (September, 1976), 33.
- Dudley, Arthur J. "The Dual Role of the Industrial Arts Teacher." Industrial Arts and Vocational Education, LI, No. 1 (January, 1962), 18.
- Feirer, John L. "Needed: Qualified Industrial Arts Teachers." Industrial Arts and Vocational Education, LII, No. 6 (June, 1964), 15.
- Giachino, J. W. "Selecting Industrial Education Teachers." Industrial Arts and Vocational Education, L, No. 5 (May, 1961), 66-70.
- Householder, D. L. "Industrial Arts Teacher Education: Intellectual Perspective and Developmental Focus." Journal of Industrial Teacher Education, 4, No. 2 (December, 1966), 53.
- Houston, Robert W. and Brown, Kenneth W. "Competency-Based Education - Past, Present and Future." Journal of Industrial Teacher Education, 12, No. 4 (Summer, 1975), 6.
- Jensen, Glenn. "Preparing Competent Teachers of Teachers." Journal of Educational Leadership, 30, No. 5 (February, 1973), 248.
- Margules, Morton and Keith, Virginia M. "A Study of Supervisors' Ratings of Most Effective and Least Effective Industrial Arts Teachers on Three Competency Dimensions." Journal of Experimental Education, 37, No. 4 (Summer, 1969), 37-44.
- Micheels, William J. "Industrial Arts Teacher Education in 1970." Industrial Arts and Vocational Education, XLVII, No. 2 (February, 1958), 29.
- Miner, Harvey D. "Quality Instruction in Industrial Arts." Industrial Arts and Vocational Education, LIII, No. 2 (February, 1964), 46.
- Pautler, Albert J. Jr. "Curriculum Implications in a Technical World." Man/Society/Technology, (May/June, 1976), 235.
- Pederson, Harry A. "Industrial Arts Teacher Competencies." Industrial Arts and Vocational Education, XLIX, No. 10 (December, 1955), 318-19.

- Smith, Paul G. "The Teacher as a Resource Person and Motivator." Journal of Industrial Teacher Education, 65, No. 1 (January, 1976), 21-22.
- Spence, William P. "Research: Problems of the Beginning Teacher." Industrial Arts and Vocational Education, LI, No. 1 (January, 1962), 14.
- Starkweather, Kendall N. "A Study of Potential Directions for Industrial Arts Towards the Year 2000 A. D." Journal of Industrial Teacher Education, 13, No. 2 (Winter, 1976), 68.
- Streeter, C. Edward. "Teacher Competency and Classroom Use of Educational Media." Audiovisual Instruction, XIX, No. 1 (January, 1969), 60.
- Turner, Ewald. "What I Would Look for in an Industrial Arts Teacher." Industrial Arts and Vocational Education, LI, No. 7 (September, 1962), 24.
- Weisse, Edward B. "Teacher Competition: Agent for Educational Change." The Educational Forum, XXXIV, No. 2 (January, 1970), 247.
- Wolansky, William. "Considerations for Development in Industrial Arts Teacher Preparation." Journal of Industrial Teacher Education, 3, (Fall, 1965), 29.

UNPUBLISHED MATERIALS AND REPORTS

- Andreyka, Robert E. and Briley, Thomas S. "Competency Based Teacher Education for Industrial Teachers. Phase I: Competency and Criteria Identification and Validation For Preservice Education." Tallahassee, Florida State University, 1975.
- Bain, Richard J. "Houston Needs Assessment System. Needs Assessment Results, Teacher Competency Analysis, Dallas Independent School District." Houston University, Texas, April, 1973.
- Baird, Ronald J. "The Application of John Dewey's Philosophy to Industrial Arts Teacher Education." Dissertation Abstracts International, (Ann Arbor, Michigan: University Microfilms, No. 22, 1962), 2298.
- Bilbo, David Lee. "Industrial Arts Teacher Education: Competencies for the Future." Dissertation Abstracts International, (Ann Arbor, Michigan: University Microfilms, May, 1978), 6576-A.

- Brasted, Kenneth F. "The Understanding Citizen in Our Industrial Civilization." Conference Report, American Industrial Arts Association Convention, Cincinnati, 1950.
- Brown, Robert D. "Industrial Arts Competencies Needed by Elementary Teachers." Unpublished Doctor's Dissertation, University of Minnesota, 1955.
- Director of Pranakorn Teacher College. "A Survey of Industrial Arts Graduates Working in Various Programs." Between July and September, 1977.
- Florida State University. "Exemplary Competency-Based Vocational Teacher Education. Industrial Arts Component. Competency Identification Phase: Professional Competencies for Middle and High School Industrial Arts Teachers in Florida." Spons. Agency Florida State Department of Education, Tallahassee, 1976.
- Gadda, Hilding W. "An Evaluation of the Preservice Program of Teacher Education in Agriculture at South Dakota State College." Unpublished Doctor's Dissertation, Michigan State University, 1963.
- Giachino, J. W. "An Analysis of the Success Qualities that should be Emphasized in the Training of Candidates to Become Competent Teachers of Industrial Education." Unpublished Doctor's Dissertation, Pennsylvania State College, 1949.
- Keawkamnerd, Panorm. "Aims and Programs of Industrial Arts for a Minor and Major." In a Speech at the Annual Industrial Arts Teacher Seminar at Pranakorn. Summary Report in Thai, March 10, 1977.
- Manfield, Robert Theodore. "Competencies Desired with Respect to Teachers of Industrial Arts." Unpublished Doctor's Dissertation, Ohio State University, 1959.
- Meosky, Paul Richard. "A Study of the Relationship of Personality to Teaching Success in Industrial Arts of the Secondary School Level." Dissertation Abstracts International, (Ann Arbor, Michigan: University Microfilms, 29/01, 1968), 171-A.
- Miller, James Arthur. "Functional Competencies Needed by Industrial Arts Instructors to adequately Perform in Contemporary Industrial Arts Laboratory/Classrooms." Unpublished Doctor's Dissertation, University of Northern Colorado, 1971.
- Morgan, J. B. "Preparing the Undergraduate Industrial Arts Teachers for the Future." American Industrial Arts Association, 23rd Annual Convention at Dallas, 1972.

- Newhouse, Glenn Irring. "The Roles and Competencies of Teachers of Industrial Arts Education in California." Unpublished Doctor's Dissertation, Stanford University, 1955.
- Perkins, L. H. "Competencies of Trade and Industrial Teachers as Perceived by Teachers, Supervisors, School Administrators and Teacher Educators." Pensacola: University of West Florida, July, 1975.
- Popovich, John N. "A Validation of Selected Teaching Competencies for Industrial Teacher Education." Paper Presented at the Annual Meeting of the American Education Research Association, 59th Chicago, Ill., April, 1974.
- Pranakorn Teacher College. "Industrial Arts Curriculum Instruction of Teacher Education." Unpublished Material, Thai Language, 1976.
- Reese, Robert M. "An Evaluation of the Ohio Teacher Education Programs for Trade and Industrial Education." Dissertation Abstracts International, (Ann Arbor, Michigan: University Microfilms, 10/01, 1959), 217-220.
- Roberts, Churchill L. and Becker, Samuel L. "A Summary of Communication and Teaching Effectiveness." Florida Department Education, June, 1974.
- Rutherford, William E. "Personnel Relations: A Study of the Selection, Placement and Guidance of Beginning Industrial Arts Teachers in California Secondary School." Dissertation Abstracts International, (Ann Arbor, Michigan: University Microfilms, May, 1963), 4199.
- Scherer, Harlan L. "Procedures and Factors Involved in the Selection of Industrial Arts Teachers and Their Relationship to Related Teaching Success." Unpublished Doctor's Dissertation, Missouri University, 1960.
- Silvius, G. Harold. "Instructional Units for Professional Courses in Undergraduate Industrial Arts Teacher Education." Unpublished Doctor's Dissertation, Pennsylvania State College, 1946.
- Silvius, G. Harold, and Ford, Andrew F. "The Report of the Michigan Study of Industrial Teacher Competence." Detroit: Wayne State University, 1965.
- Siritusnakul, Pichai. "The Program of Industrial Arts Teacher Education Related to the Needs of Comprehensive Secondary Project." The College of Education, Prasarnmit, 1973.

Snider, Sarah J. and Butefish, William L. "Student Teaching Behaviors Identified by a National Jury as Indicators of Success in Sixteen Competency Areas." Paper Presented at the Annual Meeting of the Association of Teacher Educators, 56th. St. Louis, Missouri, February, 1976.

Svendsen, Clarence Roger. "Effective Personal Control Practices Employed by Industrial Arts Teachers in the Secondary School Classrooms of the Metropolitan Areas of Colorado." Dissertation Abstracts International, (Ann Arbor, Michigan: University Microfilms, 31/05, 1970), 2150-A.

Upathamp, Vitoon. "Aims, Programs and Problems of Industrial Arts Instruction." In a Speech at the Annual Industrial Arts Teacher Seminar at Pranakorn, Summary Report in Thai, March 10, 1977.

Utara, Ekaraj. "A Follow-up Study of Industrial Arts Graduates Working in Teacher Colleges." Unpublished Master's Thesis, Srinakinwirot University, March 3, 1977.

APPENDICES

APPENDIX A

**LETTERS SENT TO EVALUATIVE JURY AND NAMES OF MICHIGAN TEACHER
EDUCATORS, THAI TEACHER EDUCATORS, SUPERVISORS IN
INDUSTRIAL EDUCATION AND THAI STUDENTS**

March 20, 1978

Dr. Clois E. Kicklighter
Dept. of Industrial Education
Eastern Michigan University
Ypsilanti, Michigan 48197

Dear Dr. Kicklighter

I am presently conducting a research study which will attempt to ascertain the functional competencies needed by Thai beginning teachers at the secondary and college levels.

The enclosed list of functional competencies represents an analysis of: (1) the writer's teaching experience, (2) related studies in industrial education, (3) books and periodicals related to industrial arts education and (4) the objectives of preservice preparation programs at Pranakorn.

After analysis, the list will be developed by an evaluative jury. The evaluative jury selected from Michigan State University will be Dr. C. Blair MacLean and Dr. Rex E. Ray. However, I am looking for another teacher educator from Eastern Michigan University. According to a suggestion from Dr. MacLean and per your conversation with him, I pleasantly invite you for participating in a group meeting. I realize that you are a busy educator, however, it is only my hope that this research will perhaps result in sufficient merit to warrant your interest. If acceptable and possible, the group meeting will be held at your place by April, 1978. Later, I will contact you as the evaluative jury for arrangement of the group meeting.

Your assistance and participation will partly make my study meaningful and will be truly appreciated. I am looking forward to seeing you at this important meeting.

Sincerely yours,

Preang Kitratnee
1414 A Spartan Village
E. Lansing, Mi. 48823
Phone: (517) 355-0876

Enclosures: (2)

1. A list of functional competencies
2. A thesis proposal

May 23, 1978

Dear Thai Teacher educators and supervisors

I am studying for my doctoral degree in industrial education at Michigan State University, E. Lansing, Michigan. The final requirement in my program of study is to do a research project. The primary purpose in this research study is to determine the functional competencies needed by Thai beginning teachers for effective teaching as perceived by chairpersons and teachers at the secondary and college levels. It is expected that the research will result in meaningful implications for the preservice program at Pranakorn. When I have finished the study I expect to return to the teacher's college as a teacher educator.

You are asked to validate each competency statement by rating its appropriateness for Thai beginning teachers. This will be used to determine the questionnaire's validity. The final instrument then will be distributed to the identified population at the two program levels.

This proposed list of functional competencies, grouped into five areas, is included for you to validate according to the following scale:

Column I indicates you strongly agree.
 Column II indicates you agree.
 Column III indicates you disagree.
 Column IV indicates you strongly disagree.

When you have read each competency statement, please mark an X in the appropriate column. One final point to remember is that every statement is written as an instructional objective.

For Example: The competent beginning teacher of industrial arts should be able to: construct effective teaching aids.

It is hoped that the final results of the study will be of value to you as teacher educators and supervisors. Your cooperation will help to make my study useful and will be greatly appreciated.

Respectfully,

Preang Kitratnee

Enclosure:

1. A list of functional competencies

EVALUATIVE JURY
(The First Revision of the Instrument)

Dr. C. Blair MacLean, Professor and Coordinator of Industrial Education,
Michigan State University, East Lansing, Michigan 48823

Dr. Rex E. Ray, Professor of Industrial Education, Michigan State Uni-
versity, East Lansing, Michigan 48823

Dr. Cloise E. Kicklighter, Professor of Industrial Education, Eastern
Michigan University, Ypsilanti, Michigan 48197

THAI EDUCATORS AND SUPERVISORS
(The Second Revision of the Instrument)

Mr. Swath Brahmarnk, 21 Years of Service, Department of Practical Arts
Education, Chiangmai University.

Mr. Charlie Latthi, 21 Years of Service, Department of Pratical Arts
Education, Chiangmai University.

Dr. Vitoon Upthamp, 30 Years of Service, Supervisor of Industrial Arts
Education, Supervisory Unit, Department of General Education,
the Ministry of Education.

Mr. Raung Srikao, 20 Years of Service, Supervisor of Industrial Arts
Education, Supervisory Unit, Department of General Education,
the Ministry of Education.

Dr. Raung Chareonchai, 25 Years of Service, a Director of Educational
Planning, Department of General Education, the Ministry of
Education.

Mr. Sophon Kanjana, 9 Years of Service, Division of Industrial Arts
Education, Pranakorn Teacher's College, Department of Teacher
Training, the Ministry of Education.

Mr. Sam-ang Sungjern, 9 Years of Service, Division of Industrial
Arts Education, Pranakorn Teacher's College, Department of
Teacher Training, the Ministry of Education.

Mr. Jarin Teswanitch, 9 Years of Service, Department of Education,
Srinakharinwirot University, Bangkok.

Mr. Veera Kulab, 11 Years of Service, Division of Industrial Arts
Education, Pranakorn Teacher's College, Department of Teacher
Training, the Ministry of Education.

- Mr. Phaibool Phioypradith, 12 Years of Service, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.
- Mr. Pramote Teppullop, 9 Years of Service, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.
- Mr. Tawee Phromphruk, 25 Years of Service, Head of Ceramics, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.
- Mr. Nirutti Chandhanasup, 9 Years of Service, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.
- Mr. Preecha Chartmalakorn, 17 Years of Service, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.
- Prasert Worawong, 12 Years of Service, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.
- Mr. Chaloy Teeratinkorn, 12 Years of Service, Division of Industrial Arts Education, Pranakorn Teacher's College, Department of Teacher Training, the Ministry of Education.

THAI STUDENTS AT M.S.U.
(The Construction of Thai Instrument)

- Mrs. Rawiwan Rungsayapan, Instructor Nakorn Srithamaraj Teacher's College, Department of Teacher Training, the Ministry of Education.
- Mr. Pawat Wasiksiri, Division of Adult Education, Department of General Education, the Ministry of Education.
- Miss Yubol Chandruang, Instructor Department of Communication, Chulalongkorn University.
- Miss Malee Boonsiripunch, Instructor Division of Journalism and Communication, Dhamsart University.
- Mrs. Suwatana Suwanketnikom, a Research Consultant, College of Education, Michigan State University.

APPENDIX B

FUNCTIONAL COMPETENCIES LISTED UNDER THE FIVE ESTABLISHED AREAS

FUNCTIONAL COMPETENCIES LISTED UNDER THE FIVE ESTABLISHED AREAS

The functional competencies which every beginning teacher should be able to perform effectively in a particular program of industrial arts instruction. It is expected that five areas will be assembled as follows:

- I. Planning of Instruction and Materials
- II. Classroom and Laboratory Management
- III. Teaching Methods and Techniques
- IV. Interpersonal Relations
- V. Student Evaluation and Evaluation Techniques

The following criteria must be used to evaluate each competency statement which will become a questionnaire item:

- 1. Clearness of meaning
- 2. Any changes needed to improve the competency statements
- 3. Appropriateness of adjectives and
- 4. Additions to and deletions from the list necessary for completeness and conciseness.

The following additional criteria were used to enable jurors to better analyze each competency statement:

- A = it is accepted
- B = it is rejected
- C = it needs clarity
- D = it appears to duplicate others

Note: Based upon the given criteria of evaluation, the following eighty-two of one hundred and seventy-one competency statements were selected and categorized into five areas:

I. Planning of Instruction and Materials

- 2. Plan for appropriate use of physical facilities, equipment and supplies needed for specific programs.

5. Use evaluative results effectively to improve instructional planning and lesson organization.
8. Use knowledge of home situations in planning instructional activities.
18. Develop and plan instructional materials.
28. Organize teaching materials before, during and after their use.
30. Read, interpret and utilize current professional literature in planning and instruction.
36. Develop immediate and long-range plans for the total classes which take individual needs and plans into account.
38. Select appropriate textbooks and materials that contribute to the instructional objectives.
42. Use the students' background of experiences in planning appropriate educational activities.
43. Plan for and use appropriately the resources of the community in classroom and laboratory instruction.
45. Provide individualized projections and assignments, taking into consideration the needs of each student.
49. Participate in planning and implementing a systematic and exploratory program of occupational clusters.
52. Organize activities into a developmental sequence of experiences.
63. Develop instructional objectives and lesson plans.
66. Prepare bulletin boards and/or displays appropriately related to industry and technology.
72. Establish course objectives and instructional goals to effect desired changes in students behavior.
80. Prepare teaching plans to provide experiences that include both enjoyment and knowledge.

II. Classroom and Laboratory Management

4. Prepare appropriate student accident report forms.
6. Maintain an inventory of supplies, tools and equipment.
9. Create an organized classroom environment conducive to learning.

10. Prepare a budget for facilities, equipment and materials needed in each program unit.
12. Organize and conduct appropriate laboratory house-keeping practices.
21. Maintain tools and laboratory equipment in usable condition.
33. Maintain a safety and accident prevention program in compliance with safety rules and regulations.
35. Demonstrate consistency and objectivity in classroom and laboratory management.
39. Plan for physical plant facilities, supplies and equipment consistent with program objectives.
44. Maintain an effective balance of freedom and safety in the classroom and laboratory.
61. Determine and provide appropriate safety apparel and devices for hazardous activities.
64. Prepare purchase orders for instructional materials, supplies and equipment.
67. Make the classroom and laboratory attractive and interesting.
76. Devise effective system of collecting and recording laboratory fees.

III. Teaching Methods and Techniques

7. Use graphic materials and educational displays of real objects to aid instruction.
16. Provide situations which encourage students to think and work independently and creatively.
19. Conduct lessons that result in student mastery of specified objectives.
20. Skillfully use large and small group discussion teaching methods.
22. Provide experiences to help students understand and develop their own values.
23. Relate course content to every day personal, family living and occupational experiences.

27. Develop interest and understanding in the problems and processes of mass production.
32. Incorporate modern industrial processes and principles into the instructional program.
34. Demonstrate safe operation of machines and equipment.
47. Apply appropriate principles of learning to teaching methods.
57. Select opportunities for students to work together in groups of varying sizes and tasks.
59. Utilize a variety of teaching techniques and methods to reach instructional objectives.
60. Conduct group counseling sessions related to understanding of career opportunities in industry.
62. Engage students in identifying, seeking out and evaluating resources for learning activities.
68. Select and utilize instructional materials compatible with course objectives.
69. Select activities and teaching techniques on the basis of individual abilities and interests.
70. Make effective use of individualized instructional methods.
74. Organize group projects which depict industrial situations.
77. Design learning experiences which include opportunities for inquiry, discovery and experimentation.
79. Use laboratory demonstration effectively in teaching.

IV. Interpersonal Relations

11. Exhibit a fair, consistently firm, friendly tolerant and understanding attitude.
14. Help students perceive and deal with each other as human beings of intrinsic worth.
15. Demonstrate attitudes, opinions and emotions which encourage others to express themselves honestly and openly.
24. Stimulate and maintain interest throughout the instructional process.

29. Provide opportunities for students to develop qualities of leadership and self-direction.
40. Develop an atmosphere in which students are willing to cooperate in group activities.
50. Encourage students to develop more positive attitudes toward learning, self, teachers and peers.
51. Accept suggestions for self-improvement without reacting defensively, becoming hostile or withdrawing.
55. Demonstrate the ability to communicate with students, other teachers, administrators and laymen.
58. Assist the school in creating an atmosphere in which democratic leadership can grow and flourish.
71. Function as a facilitator, rather than a director, in the learning process.
78. Demonstrate an understanding of working interpersonal relationships within school organization.
81. Recognize patterns of human interrelationships as they exist in a classroom or laboratory.
82. Demonstrate appreciation of the dignity and worth of the individual.

V. Student Evaluation and Evaluation Techniques

1. Evaluate learning experiences in terms of planned goals and objectives.
3. Assess students' progress on the basis of formulated, long-range instructional goals.
13. Construct manipulative and written examinations which reliably measure student achievement.
17. Inform students of the basis and guidelines for evaluation.
25. Construct pre and post-evaluative diagnostic instruments.
26. Evaluate facilities, equipment and materials needed for specialized instructions.
31. Allow students an important role in the evaluation of their own growth and development.

- 37. Evaluate student performance according to objective criteria.
- 41. Provide systematic feedback to students about their performance.
- 46. Use a variety of evaluative techniques in assessing students learning.
- 48. Determine how to measure cognitive, affective and psychomotor skills.
- 53. Develop standards for scoring progress and reporting of student achievement.
- 54. Analyze test items for validity and reliability, utilizing accepted statistical procedures.
- 56. Use a variety of instruments and techniques to keep students informed of their progress.
- 65. Interpret the results of tests administered in each unit of instruction.
- 73. Analyze his own teaching style and behavior in its effect upon the teaching learning environment.
- 75. Use systematic observation techniques to analyze the effectiveness of instruction.

APPENDIX C

**COVER LETTER, SURVEY INSTRUMENT AND FOLLOW-UP
LETTER IN ENGLISH TRANSLATION**

Pranakorn Teacher's College
Division of Industrial Arts Education
Bangkhen, Bangkok.

October 12, 1978

Dear Colleague

I am a representative of Mr. Preang Kitratnee who is doing a research project required for his doctoral degree in industrial education at Michigan State University. His research deals directly with Pranakorn's preservice program of industrial arts teacher education. Pranakorn, where I work, is a central point for distributing and collecting questionnaires from each agent in the secondary and college programs.

You are one of the agents selected to distribute questionnaires to an enclosed list of respondents in your school and collect and mail them back to me as soon as possible. It is expected that all returns will be collected and mailed to Preang Kitratnee at M.S.U. by December, 1978.

Your assistance and cooperation will make Kitratnee's research project worthwhile and will be extremely appreciated.

Sincerely,

Sophon Kanjana

Enclosures:

1. Instruments
2. A list of respondents
3. A stamped self-addressed envelope

October 12, 1978

Dear Colleague

I completed the preservice preparation program of industrial arts teacher education at Pranakorn in 1969. Now I am studying for my doctoral degree in the same field at Michigan State University, E. Lansing, Michigan in the United States. The final requirement in my program of study is to carry out a research project. The primary purpose of this study is to ascertain the functional competencies needed by Thai beginning teachers* for effective teaching as perceived by chairpersons and teachers at both the secondary and college levels. It is expected that this research will result in a meaningful contribution to the improvement of the preservice program at Pranakorn.

You have been selected to respond to a questionnaire. The purpose of this instrument is not to evaluate your academic knowledge but to obtain your perceptions of the functional competencies needed by beginning teachers to perform adequately in your program of industrial arts instruction.

I would like you to answer every competency item in section I and fill in the personal data in the spaces provided in the section II. This instrument is designed so that the questions may be answered quickly and should take no more than 20 minutes to complete. When you have completed the instrument, please return it to the agent in your school. He will collect the questionnaires and mail them back to Mr. Sophon Kanjana at Pranakorn. Mr. Sophon will mail them all to me at M.S.U. You can see there is a long process involved collecting the data. Therefore, your help and cooperation in answering and sending the questionnaire promptly is needed and will be greatly appreciated.

Sincerely yours,

Preang Kitratnee
1414 A Spartan Village
E. Lansing, MI 48823

*Beginning teachers refers to teachers who have completed the preservice program at Pranakorn and they have less than two years of teaching experience in either rural and comprehensive programs (secondary level) or college programs.

SECTION I

Instructions

The following are items of functional competency which beginning teachers may need to possess to perform effectively in your local program of industrial arts instruction. When you have critically read each competency item, please mark an X in the appropriate column according to following criteria:

1. Column I if you perceive the item is "urgently needed" by beginning teachers.
2. Column II if you perceive the item is "much needed" by beginning teachers.
3. Column III if you perceive the item is "somewhat needed" by beginning teachers.
4. Column IV if you perceive the item is "little needed" by beginning teachers.
5. Column V if you perceive the item is "not needed" by beginning teachers.

The beginning teacher of industrial arts should be able to:	1	2	3	4	5
1. Evaluate learning experiences in terms of planned goals and objectives					
2. Plan for appropriate use of physical facilities, equipment and supplies needed for specific programs					
3. Assess students' progress on the basis of formulated, long-range instructional goals					
4. Prepare appropriate student accident report forms					
5. Use evaluative results effectively to improve instructional planning and lesson organization					
6. Maintain an inventory of supplies, tools and equipment					
7. Use graphic materials and educational displays of real objects to aid instruction					
8. Use knowledge of home situations in planning instructional activities					
9. Create an organized classroom environment conducive to learning					
10. Prepare a budget for facilities, equipment and materials needed in each program unit					
11. Exhibit a fair, consistently firm, friendly tolerant and understanding attitude					
12. Organize and conduct appropriate laboratory house-keeping practices					
13. Construct manipulative and written examinations which reliably measure student achievement					

The beginning teacher of industrial arts should be able to:	1	2	3	4	5
14. Help students perceive and deal with each other as human beings of intrinsic worth					
15. Demonstrate attitudes, opinions and emotions which encourage other to express themselves honestly and openly					
16. Provide situations which encourage students to think and work independently and creatively					
17. Inform students of the basis and guidelines for evaluation					
18. Develop and plan instructional materials					
19. Conduct lessons that result in student mastery of specified objectives					
20. Skillfully use large and small group discussion teaching methods					
21. Maintain tools and laboratory equipment in usable condition					
22. Provide experiences to help students understand and develop their own values					
23. Relate course content to every day personal, family living and occupational experiences					
24. Stimulate and maintain interest throughout the instructional process					
25. Construct pre and post-evaluative diagnostic instruments					
26. Evaluate facilities, equipment and materials needed for specialized instructions					
27. Develop interest and understanding in the problems and processes of mass production					
28. Organize teaching materials before, during and after their use					
29. Provide opportunities for students to develop qualities of leadership and self-direction					
30. Read, interpret and utilize current professional literature in planning and instruction					
31. Allow students an important role in the evaluation of their own growth and development					
32. Incorporate modern industrial processes and principles into the instructional program					
33. Maintain a safety and accident prevention program in compliance with safety rules and regulations					
34. Demonstrate safe operation of machines and equipment					
35. Demonstrate consistency and objectivity in classroom and laboratory management					

The beginning teacher of industrial arts should be able to:	1	2	3	4	5
36. Develop immediate and long-range plans for the total classes which take individual needs and plans into account					
37. Evaluate student performance according to objective criteria					
38. Select appropriate textbooks and materials that contribute to the instructional objectives					
39. Plan for physical plant facilities, supplies and equipment consistent with program objectives					
40. Develop an atmosphere in which students are willing to cooperate in group activities					
41. Provide systematic feedback to students about their performance					
42. Use the students' background of experiences in planning appropriate educational activities					
43. Plan for and use appropriately the resources of the community in classroom and lab instruction					
44. Maintain an effective balance of freedom and safety in the classroom and laboratory					
45. Provide individualized projects and assignments, taking into consideration the needs of each student					
46. Use a variety of evaluative techniques in assessing students learning					
47. Apply appropriate principles of learning to teaching methods					
48. Determine how to measure cognitive, affective and psychomotor skills					
49. Participate in planning and implementing a systematic and exploratory program of occupational clusters					
50. Encourage students to develop more positive attitudes toward learning, self, teachers and peers					
51. Accept suggestions for self-improvement without reacting defensively, becoming hostile or withdrawing					
52. Organize activities into a developmental sequence of experiences					
53. Develop standards for scoring progress and reporting of student achievement					
54. Analyze test items for validity and reliability, utilizing accepted statistical procedures					
55. Demonstrate the ability to communicate with students, other teachers, administrators and laymen					
56. Use a variety of instruments and techniques to keep students informed of their progress					

The beginning teacher of industrial arts should be able to:	1	2	3	4	5
57. Select opportunities for students to work together in groups of varying sizes and tasks					
58. Assist the school in creating an atmosphere in which democratic leadership can grow and flourish					
59. Utilize a variety of teaching techniques and methods to reach instructional objectives					
60. Conduct group counseling sessions related to understanding of career opportunities in industry					
61. Determine and provide appropriate safety apparel and devices for hazardous activities					
62. Engage students in identifying, seeking out and evaluating resources for learning activities					
63. Develop instructional objectives and lesson plans					
64. Prepare purchase orders for instructional materials, supplies and equipment					
65. Interpret the results of tests administered in each unit of instruction					
66. Prepare bulletin boards and/or displays appropriately related to industry and technology					
67. Make the classroom and laboratory attractive and interesting					
68. Select and utilize instructional materials compatible with course objectives					
69. Select activities and teaching techniques on the basis of individual abilities and interests					
70. Make effective use of individualized instructional methods					
71. Function as a facilitator, rather than a director, in the learning process					
72. Establish course objectives and instructional goals to effect desired changes in students behavior					
73. Analyze his own teaching style and behavior in its effect upon the teaching learning environment					
74. Organize group projects which depict industrial situations					
75. Use systematic observation techniques to analyze the effectiveness of instruction					
76. Devise effective system of collecting and recording laboratory fees					
77. Design learning experiences which include opportunities for inquiry, discovery and experimentation					
78. Demonstrate an understanding of working interpersonal relationships within school organization					

The beginning teacher of industrial arts should be able to:	1	2	3	4	5
79. Use laboratory demonstration effectively in teaching					
80. Prepare teaching plans to provide experiences that include both enjoyment and knowledge					
81. Recognize patterns of human interrelationships as they exist in a classroom or laboratory					
82. Demonstrate appreciation of the dignity and worth of the individual					

SECTION II

Instructions

Personal data will be used for this study only; please mark an X in the appropriate boxes and fill in the spaces provided.

1. Your age _____
2. Sex ☐ Male ☐ Female
3. Level or program instruction ☐ College
☐ Comprehensive secondary
☐ Rural secondary
4. Your status in the department ☐ Chairperson
☐ Teacher
5. Years of teaching _____
6. Subjects (in order of your teaching skills in them)
 - (1) _____
 - (2) _____
 - (3) _____
 - (4) _____
 - (5) _____
7. Numbers of student teaching each term _____ (approximately)
8. You have ☐ attended a work shop about _____
☐ had field experience in _____
☐ earned a higher degree of education in the area of _____

c/o Mr. Sophon Kanjana
Pranakorn Teacher's College
Division of Industrial Arts Education
Bangkhen, Bangkok.

November 15, 1978

Dear Colleague

Last month you may have received a questionnaire form from an agent in your school. Your response to this survey is needed to complete a study in identifying the functional competencies needed by Thai beginning teachers. Your returns of the questionnaire will be needed if valid results are to be expected from the study.

I realize that you have tight schedules of school teaching. It is my hope that you may be interested in my study. This research will not only result in meaningful implications for the preservice program at Pranakorn, but will help me complete a program of study.

The completed instrument is needed within the next two weeks because I will start tabulating the data soon. For your convenience, an additional copy of the questionnaire is included along with a stamped self-addressed envelope.

Please respond the questionnaire quickly and mail it back to Mr. Sophon Kanjana. Your help and cooperation will be truly appreciated.

Sincerely yours,

Preang Kitratnee

Enclosures:

1. An instrument
2. A stamped self-addressed envelope

ตอนที่ ๑

คำชี้แจง

คำถามเหล่านี้เกี่ยวกับความรู้ความสามารถในด้านต่าง ๆ ของครูใหม่ผู้เข้าสมัครสอบ เมื่ออ่านและได้พิจารณาแต่ละข้อแล้ว ขอให้ท่านแสดงทัศนคติความคิดเห็นต่าง ๆ โดยทำเครื่องหมาย X ลงในช่องต่าง ๆ ดังนี้

ข้อที่	ถ้าท่านคิดว่าครูใหม่นั้น	ต้องการมากที่สุด	ที่จะใช้สอนในสถานศึกษาเกี่ยวกับท่าน
๑	"	ต้องการมาก	"
๒	"	ต้องการพอสมควร	"
๓	"	ต้องการเล็กน้อย	"
๔	"	ไม่ต้องการเลย	"

ตัวอย่าง ถ้าท่านคิดว่า ครูใหม่ควรมีความรู้ "ต้องการพอสมควร" ในการแสดงความรู้ความสามารถ วางแผน และสร้างอุปกรณ์การสอนอย่างมีประสิทธิภาพ ขอให้ท่านตอบดังนี้

ครูใหม่ผู้เข้าสมัครสอบจะทำได้	๑. ต้องการมากที่สุด	๒. ต้องการพอสมควร	๓. ต้องการเล็กน้อย	๔. ไม่ต้องการเลย
๑. วางแผนและสร้างอุปกรณ์การสอนอย่างมีประสิทธิภาพ			X	

ครูใหม่ผู้เข้าสมัครสอบจะทำได้	๑	๒	๓	๔	๕
๑. ประเมินผลประสิทธิภาพการเรียนรู้ ตามจุดมุ่งหมายและวัตถุประสงค์ที่ตั้งไว้					
๒. วางแผนใช้วัสดุ อุปกรณ์ และสิ่งอำนวยความสะดวกที่จำเป็น ในรายการเฉพาะต่าง ๆ อย่างเหมาะสม					
๓. กำหนดความก้าวหน้าของนักเรียน ตามหลักเกณฑ์ของจุดมุ่งหมายการสอน ในระยะยาวที่ตั้งไว้					
๔. เตรียมแบบฟอร์มที่เหมาะสม เพื่อใช้รายงานอุบัติเหตุอันอาจเกิดขึ้นกับนักเรียน					
๕. ใ้เหตุผลที่ไ้จากการประเมิน เพื่อช่วยปรับปรุงการเตรียมการสอน และบทเรียนให้มีประสิทธิภาพ					
๖. จัดทำบัญชีรายการ วัสดุ เครื่องมือ และอุปกรณ์อยู่เสมอ ๆ					
๗. ใช้วัสดุอุปกรณ์และการแสดงของจริง เพื่อช่วยประกอบการสอน					
๘. ใช้ความรู้เกี่ยวกับสถานการณ์ทางบ้านของนักเรียนมาประกอบการเตรียมกิจกรรมการสอน					
๙. สร้างสิ่งแวดล้อมในชั้นเรียน มีความสามารถรักษาให้ก่อให้เกิดการเรียนรู้					
๑๐. เตรียมแบบงบประมาณสำหรับใช้จ่ายในสิ่งอำนวยความสะดวก วัสดุ เครื่องมือ และอุปกรณ์การสอนแต่ละหน่วยโปรแกรม					
๑๑. แสดงความยุติธรรม ความหนักแน่น รับฟังความคิดเห็น ตลอดจนมีทัศนคติที่เข้าใจผู้อื่น					

ครูในหลักสูตรสามารถ	๑	๒	๓	๔	๕
๑๒. จัดระบบและดำเนินการฝึกหัดครูรักษาความเป็นระเบียบ ในโรงฝึกงาน ให้เหมาะสม					
๑๓. สร้างมาตรฐานของข้อสอบ หังข้อเขียนและเชิงปฏิบัติ ที่วัดความ สมดุลย์ของนักเรียน อย่างเชื่อถือได้					
๑๔. แนะนำให้นักเรียนยอมรับ และปฏิบัติต่อกฎอื่น โดยคำนึงถึงคุณค่า ของความเป็นมนุษย์					
๑๕. แสดงทัศนคติ ความคิดเห็น และอารมณ์ ซึ่งเกื้อหนุนให้ผู้อื่นแสดงตัวเอง ออกมาอย่างจริงจังและเปิดเผย					
๑๖. จัดหาสถานที่ซึ่งสนับสนุนให้นักเรียนได้คิด และทำงานอย่าง เป็นอิสระและสร้างสรรค์					
๑๗. แจ้งให้นักเรียนทราบถึงหลักเกณฑ์ และแนวทางในการประเมินผล การเรียน					
๑๘. วางแผนและพิจารณาวัสดุ เนื้อหา และอุปกรณ์การสอนให้ดียิ่งขึ้น					
๑๘. ดำเนินการสอนบทเรียนที่เป็นผลให้นักเรียนได้บรรลุวัตถุประสงค์ที่ตั้งไว้					
๒๐. ใช้วิธีสอนแบบอภิปราย ทั้งกลุ่มเล็ก และกลุ่มใหญ่อย่างชำนาญ					
๒๑. จัดรักษาเครื่องมือเครื่องใช้ ในโรงฝึกงานให้อยู่ในสภาพที่ใช้งาน ได้อยู่เสมอ					
๒๒. ป้อนประสบการณ์ซึ่งช่วยให้นักเรียนเข้าใจ และพัฒนาค่านิยมของตัวเอง					
๒๓. เชื่อมโยงเนื้อหาวิชาที่สอน ให้เข้ากับความสนใจในชีวิตประจำวัน และประสบการณ์ทางบ้านอาชีพ					
๒๔. กระตุ้น และคงความสนใจ ตลอดระยะเวลาในการดำเนินการสอน					
๒๔. ทาวิธีการวินิจฉัย และประเมินผลทั้งก่อนและหลังการเรียนการสอน					
๒๖. ประเมินผลเครื่องมือ เครื่องใช้ และเครื่องอำนวยความสะดวกที่จำเป็น ในการสอนเป็นกรณีพิเศษ					
๒๗. เสริมสร้างความสนใจ และความเข้าใจในปัญหาและรายการของ การตัดสินใจของงานมาก ๆ					
๒๘. จัดลำดับเนื้อหา และอุปกรณ์การสอนในระยะต่าง ๆ ก่อนการสอน หน้าที่ทำการสอนและหลังการสอนแล้ว					
๒๘. เปิดโอกาสให้นักเรียนได้พัฒนาคุณสมบัติความเป็นผู้นำ และรู้จักแนวทาง ของตนเอง					
๓๐. อ่าน แปลความ และนำความรู้จากการสารที่ทันสมัย มาประกอบ การเตรียมบทเรียน และการสอน					
๓๑. เปิดโอกาสให้นักเรียนมีบทบาทที่สำคัญ ในการประเมินผลความก้าวหน้า และพัฒนาการของตนเอง					
๓๒. ประมวลหลักการและรายการทางด้านอุตสาหกรรมที่ทันสมัย เข้าใน โปรแกรมการสอน					

ครูใหม่ผู้ตาสาตรกรรมคือไม่ควรจะถามว่า	๑	๒	๓	๔	๕
๓๓. รักษาความปลอดภัย และการป้องกันอุบัติเหตุ ความกฎระเบียบของโรงฝึกงาน					
๓๔. สถิติการปฏิบัติงานเกี่ยวกับการใช้เครื่องมือจักรกล และเครื่องใช้ต่าง ๆ อย่างปลอดภัย					
๓๕. แสดงความสม่ำเสมอ และความเพียรตรงในการปกครองชั้นเรียน และโรงฝึกงาน					
๓๖. พัฒนาโครงการสอนระยะสั้น และระยะยาวทุกชั้นเรียน โดยพิจารณาถึงความต้องการและแผนการเรียนของนักเรียนเป็นรายบุคคล					
๓๗. ประเมินผลการปฏิบัติงานของนักเรียน ความพึงพอใจของวัตถุประสงค์ที่ตั้งไว้					
๓๘. เลือกแบบเรียนและอุปกรณ์ต่าง ๆ ที่เหมาะสม เพื่อช่วยเกื้อหนุนให้บรรลุวัตถุประสงค์ของการสอน					
๓๙. วางแผนอำนวยความสะดวกของอาคารสถานที่ วัสดุ อุปกรณ์การสอน เพื่อให้สอดคล้องกับวัตถุประสงค์ของโปรแกรม					
๔๐. สร้างบรรยากาศให้นักเรียนมีความตั้งใจกระทำกิจกรรมการเรียนร่วมกัน					
๔๑. จัดระบบที่ดีในการแจ้งผลการเรียน และการปฏิบัติงานของนักเรียน					
๔๒. ใช้กระบวนการเสริมของนักเรียนในการเตรียมกิจกรรมการสอนอย่างเหมาะสม					
๔๓. วางแผนและใช้ทรัพยากรในห้องเรียน ให้เหมาะสมกับการสอนในชั้นเรียน และโรงฝึกงาน					
๔๔. รักษาความสมดุล ระหว่างเสรีภาพและความปลอดภัยในชั้นเรียน และโรงฝึกงานอย่างมีประสิทธิภาพ					
๔๕. จัดหาโครงการ และมอบงานเฉพาะบุคคล โดยคำนึงถึงความต้องการของนักเรียนเป็นหลัก					
๔๖. ใช้เทคนิคหลาย ๆ แบบในการประเมินผลการเรียนรู้นักเรียน					
๔๗. ประยุกต์หลักการเรียนรู้อย่างเหมาะสม เพื่อมาใช้ในการวัดผลและแบบ					
๔๘. กำหนดวิธีการวัดความรู้ความเข้าใจ หัตถ์คิด และทักษะของนักเรียนในวิชาที่สอน					
๔๙. มีส่วนร่วมในการเตรียม ทรัพยากร และดำเนินการในโปรแกรมสำรวจกลุ่มอาชีพต่าง ๆ					
๕๐. สนับสนุนให้นักเรียนได้พัฒนาทัศนคติในทางที่ดีต่อการเรียน ตนเอง ครูผู้สอน และหมู่คณะ					
๕๑. ขอมรับคำแนะนำต่าง ๆ เพื่อปรับปรุงตัวเองโดยปราศจากปฏิกิริยาการก้าว เป็นปรมาภิบาล หรือทอดทิ้ง					
๕๒. จัดกิจกรรมต่าง ๆ ให้สอดคล้องกับลำดับขั้นพัฒนาการของกระบวนการเรียนรู					

ครูใหม่บุคลากรทางการศึกษาจะสามารถ	๑	๒	๓	๔	๕
๔๑. สร้างมาตรฐานการให้คะแนนความก้าวหน้า และรายงานความสัมฤทธิ์ผลของนักเรียน					
๔๔. วิเคราะห์ความเที่ยงตรง และความเชื่อถือได้ของข้อสอบโดยวิธีรวมการทางสถิติ					
๔๕. แสดงความสามารถสื่อสารกับนักเรียน ครูผู้สอน ผู้บริหารและคนงานได้อย่างดี					
๔๖. ใช้เครื่องมือและเทคนิคแบบต่าง ๆ เพื่อให้นักเรียนรายงานความก้าวหน้าของตนเองอยู่เสมอ					
๔๗. ให้นักเรียนมีโอกาสเข้าปฏิบัติงานร่วมกันเป็นกลุ่ม ฝึกขนาดและงานต่าง ๆ กัน					
๔๘. ช่วยสร้างบรรยากาศสนับสนุนความเป็นผู้นำทางประชาธิปไตยในโรงเรียน					
๔๙. ใช้เทคนิคและวิธีสอนแบบต่าง ๆ เพื่อให้บรรลุวัตถุประสงค์ของการสอนที่ตั้งไว้					
๕๐. ดำเนินการแนะนำนักเรียนเป็นหมู่ โดยเกื้อหนุนให้เข้าใจถึงโอกาสการประกอบอาชีพในอุตสาหกรรม					
๕๑. กำหนดและจัดหาอุปกรณ์ เครื่องมือเพื่อความปลอดภัยสำหรับกิจกรรมอันอาจจะเกิดอุบัติเหตุได้ง่าย					
๕๒. ส่งเสริมให้นักเรียนรู้จักวิเคราะห์ และประเมินค่าทรัพยากรเพื่อใช้ในการเรียน					
๕๓. ระบายวัตถุประสงค์การสอน และการเตรียมบทเรียน					
๕๔. เตรียมรายการสิ่งวัสดุ เครื่องมือ และอุปกรณ์เครื่องใช้ต่าง ๆ ที่ใช้ในการสอน					
๕๕. แจกแจงและสรุปผลของการสอน ในแต่ละหน่วยของการสอนที่สิ้นสุดลงแล้ว					
๕๖. เตรียมทรัพยากรนิเทศการ และ/หรือ การแสดงแบบที่เกี่ยวข้องกับอุตสาหกรรมและเทคโนโลยี					
๕๗. ทำชั้นเรียนและโรงฝึกงาน ให้มีความดึงดูดใจและความน่าสนใจ					
๕๘. เลือกและใช้รูปแบบการสอนและเนื้อหาการสอน ให้สอดคล้องกับวัตถุประสงค์ของวิชา					
๕๙. เลือกกิจกรรมและเทคนิคการสอน โดยคำนึงถึงพื้นฐานความสามารถและความสนใจของนักเรียนแต่ละคน					
๖๐. ใช้วิธีการสอนแบบให้นักเรียนเรียนรู้ด้วยตนเอง ตามความสามารถเฉพาะบุคคลอย่างมีประสิทธิภาพ					
๖๑. ทำหน้าที่เป็นผู้อำนวยการความระมัดระวัง ไม่ให้เป็นอุปสรรคหรือบังคับในรวมการเรียนรู้นักเรียน					
๖๒. ตั้งวัตถุประสงค์ของวิชา และจุดมุ่งหมายของการสอนให้เกิดการเปลี่ยนแปลงพฤติกรรมของนักเรียนตามต้องการ					
๖๓. วิเคราะห์เนื้อหา และพฤติกรรมการสอนของตนเองซึ่งมีต่อการเรียนรู้การสอน					
๖๔. จัดระบบการปฏิบัติงานเป็นกลุ่มเพื่อจำลองสถานการณ์ทางอุตสาหกรรมแก่นักเรียน					
๖๕. ใช้เทคนิคการสังเกตที่มีแบบแผนเพื่อวิเคราะห์ประสิทธิภาพการสอนของตัวเอง					

ครูใหม่ถูกสหกรณ์กรรมสิทธิ์จะถามารด	๑	๒	๓	๔	๕
๓๖. คัดค้านหาวิธีที่มีประสิทธิภาพในการเก็บ และการบันทึกค่าใช้จ่ายของโรงฝึกงาน					
๓๗. วางรูปแบบระบบการเรียนการสอน โดยเปิดโอกาสให้นักเรียนได้ทำการศึกษา ค้นคว้า และทดลองด้วยตนเอง					
๓๘. แสดงถึงความเข้าใจในการปฏิบัติงานร่วมกับบุคคลากรในโรงเรียน					
๓๙. ใช้โรงฝึกงานในการสาธิตการสอนอย่างมีประสิทธิภาพ					
๔๐. เตรียมโครงการสอนที่ให้ความสำคัญกับกระบวนการเรียนรู้					
๔๑. ใช้ห้องเรียนและโรงฝึกงานให้เป็นศูนย์แห่งการเรียนรู้					
๔๒. แสดงความนิยมในเกียรติยศ และคุณค่าของบุคคล					

ตอนที่ ๒

คำชี้แจง

ข้อมูลต่าง ๆ ในแบบสอบถามนี้จะใช้ในการศึกษาวิจัยเท่านั้น กรุณาเติมข้อความลงในช่องว่างต่าง ๆ และใส่เครื่องหมาย X ในช่องที่เหมาะสม

๑. อายุของท่าน _____ ปี

๒. เพศ ☐ ชาย ☐ หญิง

๓. ระดับหรือโครงการที่สอนปัจจุบัน ☐ วิทยาสัยครู

☐ โครงการมัธยมแบบประสม

☐ โครงการมัธยมส่วนภูมิภาค

๔. ฐานปฏิบัติงานของท่านภายในหมวด ☐ หัวหน้าหมวด (หัวหน้าสาย)

☐ ลูกหมวด

๕. จำนวนปีที่ทำการสอน _____ ปี _____ เดือน (ประมาณ)

๖. วิชาที่สอน (ตามลำดับความถนัด)

(๑) _____

(๒) _____

(๓) _____

(๔) _____

๗. จำนวนนักเรียนที่สอนแต่ละเทอม (ประมาณ) _____ คน

๘. ท่านได้เคย ☐ เข้ารับการอบรมทางบ้าน _____

☐ ฐานทางบ้าน _____

☐ ศึกษาต่อทางบ้าน _____

APPENDIX D

RESPONDENTS WHO HAVE HAD MOST TEACHING SKILLS,
A LIST OF 82 COMPETENCY MEAN SCORES, AND
ANALYSES OF VARIANCE

**Respondents (Chairpersons and Teachers) Who Have Most
Teaching Skills on Different Subjects**

Subjects on teaching skills	College		Secondary		Total
	Chairpersons	Teachers	Chairpersons	Teachers	
1. Mechanics	4	9	7	11	31
2. Electronics	-	27	7	10	44
3. Wood Working & Construction	10	10	5	10	35
4. Ceramics	2	7	1	3	13
5. Metal Working	3	16	2	2	23
6. Design and Drafting	9	22	7	3	41
7. Arts and Crafts	3	3	-	-	6
8. Teaching Methods	-	3	-	-	3
9. Other Related Fields	-	-	2	-	2
Total	31	97	31	39	198

A List of 82 Competency Mean Scores
Established by Chairpersons (C), Teachers (T) and Faculty (F)
at College and Secondary Levels

Competency item	College Level			Secondary Level		
	C Mean	T Mean	F Mean	C Mean	T Mean	F Mean
1	4.03	3.77	3.84	4.13	4.00	4.06
2	4.23	4.10	4.13	4.26	4.18	4.12
3	4.23	3.77	3.88	3.97	3.72	3.83
4	3.29	3.22	3.23	2.55	3.31	3.41
5	4.23	4.02	4.07	4.07	4.00	4.03
6	4.23	4.16	4.17	4.26	4.33	4.30
7	4.32	4.31	4.31	4.10	4.36	4.24
8	3.39	3.20	3.24	3.13	3.13	3.13
9	3.81	3.85	3.84	3.84	3.90	3.87
10	3.90	4.02	3.99	4.26	4.03	4.13
11	4.29	4.18	4.20	4.03	4.03	4.03
12	4.36	4.26	4.28	4.16	4.08	4.11
13	4.13	4.01	4.04	3.90	3.82	3.86
14	3.68	3.75	3.74	3.68	3.69	3.69
15	3.90	3.65	3.71	3.65	3.59	3.61
16	4.29	3.93	4.02	3.94	3.90	3.91
17	3.77	3.69	3.71	3.65	3.51	3.57
18	4.29	4.17	4.20	4.10	4.08	4.09
19	4.13	4.19	4.17	4.26	3.98	4.10
20	3.36	3.22	3.25	3.10	2.97	3.03
21	4.68	4.52	4.55	4.42	4.46	4.44
22	4.10	3.99	4.02	4.26	3.97	4.10
23	4.16	4.30	4.27	4.42	4.18	4.29
24	3.97	3.86	3.88	3.94	3.82	3.87
25	3.74	3.66	3.68	3.74	3.62	3.67
26	3.87	3.58	3.65	3.77	3.64	3.70
27	3.71	3.54	3.58	3.45	3.49	3.47
28	4.23	4.05	4.08	3.97	3.80	3.87
29	3.97	3.84	3.87	3.95	3.85	3.90
30	3.97	3.93	3.94	3.87	3.68	3.76
31	3.56	3.77	3.74	3.74	3.59	3.66
32	3.81	3.79	3.80	3.74	3.62	3.67
33	4.52	4.54	4.53	4.42	4.51	4.47
34	4.45	4.62	4.58	4.52	4.46	4.49
35	4.10	4.14	4.13	4.03	4.08	4.06
36	3.77	3.66	3.69	3.58	3.44	3.50
37	3.68	4.02	3.94	4.00	3.69	3.83
38	3.77	3.90	3.87	3.90	3.80	3.84
39	3.84	3.74	3.77	3.81	3.46	3.64
40	3.81	3.93	3.90	4.00	3.69	3.83

(continued)

Competency item	College Level			Secondary Level		
	C Mean	T Mean	F Mean	C Mean	T Mean	F Mean
41	3.74	3.78	3.77	3.55	3.44	3.49
42	3.71	3.63	3.65	3.61	3.56	3.59
43	4.58	4.40	4.45	4.07	4.05	4.06
44	3.68	3.84	3.80	3.90	3.80	3.84
45	3.81	3.77	3.78	3.90	3.82	3.86
46	3.90	4.00	3.98	3.90	3.62	3.74
47	4.03	3.80	3.86	3.77	3.62	3.69
48	3.74	3.69	3.70	3.55	3.56	3.56
49	3.94	3.65	3.72	4.03	3.28	3.61
50	3.94	4.01	3.99	3.94	3.72	3.81
51	4.42	4.19	4.24	3.94	4.18	4.07
52	4.03	3.80	3.86	3.77	3.74	3.76
53	3.77	3.71	3.73	3.58	3.59	3.59
54	3.71	3.55	3.59	3.48	3.56	3.53
55	4.16	3.98	4.02	3.74	3.92	3.84
56	3.81	3.91	3.88	3.74	3.74	3.74
57	3.94	3.91	3.91	4.00	3.85	3.91
58	3.77	3.87	3.84	3.77	3.69	3.73
59	4.07	4.12	4.11	4.10	3.95	4.02
60	3.77	3.80	3.80	3.87	3.80	3.83
61	4.03	4.16	4.13	4.07	4.15	4.12
62	3.94	3.74	3.79	3.48	3.46	3.47
63	3.58	3.58	3.58	3.61	3.39	3.49
64	4.16	4.07	4.09	4.00	3.95	3.97
65	3.84	3.59	3.65	3.55	3.54	3.54
66	3.74	3.88	3.84	3.71	3.82	3.77
67	4.29	4.13	4.17	4.10	4.28	4.20
68	4.26	4.18	4.20	4.10	4.00	4.04
69	4.03	3.97	3.98	3.97	3.74	3.84
70	4.03	3.83	3.88	3.58	3.59	3.59
71	4.07	4.01	4.02	3.90	3.95	3.93
72	4.00	3.91	3.93	3.81	3.49	3.63
73	3.87	3.78	3.81	3.81	3.80	3.80
74	3.81	3.70	3.73	3.94	3.59	3.74
75	3.81	3.78	3.79	3.42	3.80	3.63
76	3.81	3.72	3.74	3.84	3.69	3.76
77	3.87	3.89	3.88	3.81	3.56	3.67
78	3.87	3.89	3.88	3.81	3.56	3.67
79	4.26	4.41	4.38	4.36	4.21	4.27
80	4.19	4.08	4.11	4.10	3.85	3.96
81	4.03	3.91	3.95	3.90	3.59	3.73
82	4.03	4.02	4.02	3.68	4.05	3.89

Multivariate and Univariate Analyses of Variance
Five Areas of Functional Competency Needs

Sources	DF	Multivariate		MS	Univariate	
		F	P		F	P
STATUS	5 & 190	0.7657	.5756			
C1	1			.3337	2.0563	.1532
C2	1			.0353	0.2082	.6487
C3	1			.1208	0.7978	.3729
C4	1			.0284	0.1421	.7066
C5	1			.1090	0.6144	.4341
TLEVEL	5 & 190	2.3144	.0454			
C1	1			.8643	5.3265	.0221
C2	1			.0108	0.0634	.8015
C3	1			.6818	4.5046	.0351
C4	1			.7233	3.6225	.0585
C5	1			.4953	2.7925	.0964
T x S	5 & 190	0.1410	.9825			
C1	1			.0158	0.0976	.7551
C2	1			.0043	0.0256	.8732
C3	1			.0271	0.1792	.6725
C4	1			.0020	0.0098	.9213
C5	1			.0001	0.0008	.9773

Each degree of freedom for error term is 194

DF = Degrees of Freedom
F = F ratio

P = Probability
MS = Mean Squares

One Way Analysis of Variance Between College
Faculty and Secondary Faculty
For Each Variable

Variables	DF ₁	DF ₂	MS	F	P
43	1	196	6.8185	11.5819	.0008
72	1	196	4.1031	8.1471	.0048
62	1	196	4.5656	7.5358	.0066

Variables = Competency Items

DF₁ = Degrees of Freedom Between Groups

DF₂ = Degrees of Freedom Within Groups

MS = Mean Squares

F = F ratio

P = Probability

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