An Evaluation of the Competency-Based Industrial Arts Workshops Sponsored by Old Dominion University Conducted under Vocational Education Amendments of 1976 Public Law 94-482 from the Virginia Department of Education

Cuthrell Brockington
Old Dominion University

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AN EVALUATION OF THE
COMPETENCY-BASED INDUSTRIAL ARTS WORKSHOPS
SPONSORED BY OLD DOMINION UNIVERSITY
CONDUCTED UNDER
VOCATIONAL EDUCATION AMENDMENTS OF 1976
PUBLIC LAW 94-482
FROM THE VIRGINIA DEPARTMENT OF EDUCATION

A STUDY
PRESENTED TO
THE FACULTY OF THE SCHOOL OF EDUCATION
OLD DOMINION UNIVERSITY

IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE
MASTER OF SCIENCE IN EDUCATION

BY
CUTRELL BROCKINGTON
August 1985
This research paper was prepared by Cuthrell Brockington under the direction of Dr. John M. Ritz in VTE 636, Problems in Education in 1979. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Education.

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CHAPTER I
INTRODUCTION

Competency-based education (CBE) is being explored as a viable alternative to the traditional time-based course oriented approach to teacher education. Several states and teacher education institutions are developing and implementing competency-based programs aimed at preparing and certifying professionally competent industrial education teachers at various levels.

Schmieder (1973, p. 20) has identified some of the motivational forces that appear to have given impetus to the competency-based education movement. They include:

1. Introspection of the educational community,
2. Emphasis on accountability,
3. Increased focus of political action on fiscal issues,
4. Management organization movement,
5. Press for personalization and individualization of education,
6. Desire of State Education Departments to develop more effective certification processes and standards.

At a time when public schools nationwide are operating on reduced budgets and when student enrollment is lower than desirable, it is imperative that schools be held accountable for the tax dollar and that teachers be accountable for achieving their
goals as educators (Reilly, 1978, pp. 21-22). Competency-based education has been seen as one means of accomplishing this two-fold objective. The concepts of competency-based education were first proposed as a developmental basis for the Comprehensive Elementary Teachers Evaluation Module in 1968 and have already been incorporated into programs for secondary teacher education, professional education, military training, and vocational education (EPDA Regional Workshop on CBVE, 1976 p. 3).

The need for states to teach students to master the fundamental skills in all areas of education is generally recognized, and the areas of industrial arts is no exception. Since 1978, Old Dominion University has sponsored a state-wide program for competency-based education (CBE) in industrial arts so that teachers would be prepared to implement this mode of instruction.

Almost every educational journal has carried the comments of both supporters and critics of CBE, but few have given any factual data. Assumptions have been made on the effectiveness of programs. Descriptions of various programs have also been presented. CBE is not a cure-all or final solution to professional education; rather it is a means to improve education.

One of the major criticism is that you cannot take a professional and sub-divide his skills into smaller parts. The demand was for change from models that emphasized quantity models to that emphasize quality. Factual data were needed to support the
demand for change. Assumptions have been made on the acceptance of CBE programs (Reilly, 1978, p. 28). Factual data were needed to support many of these assumptions.

STATEMENT OF THE PROBLEM

The problem of this study was to evaluate the effectiveness of the competency-based industrial arts workshops as viewed by the participants. A ten question survey based on the competencies of the course was used as the measuring instrument.

The competency-based industrial arts workshops organized at Old Dominion University were designed to expose the teacher participants to the various areas of CBE with which they needed to be familiar so that they might more effectively incorporate CBE into their teaching programs. Such areas as the characteristics of CBE, task catalogs, lesson plans, performance objectives, criterion-referenced tests, and self-instructional modules were stressed.

This study was used to determine the extent to which teachers participating in the workshop throughout the state of Virginia felt they were competent in applying the principles of CBE to their instructional programs.

RESEARCH GOALS

1. To evaluate the effectiveness of the competency-based industrial arts workshops as viewed by the participants.

2. To assess competency-based industrial arts workshop participants attitudes.

3. To restructure workshop course if necessary.
The questions listed below were used to evaluate their feelings:

1. Did this inservice program enable me to define the characteristics of competency-based education?

2. Did the program familiarize me with the contents of catalogs of tasks for competency-based industrial arts?

3. Did the program assist me in identifying industrial arts content important to learners?

4. Did the program assist me in preparing performance objectives?

5. Did the program assist me in providing instruction on how to develop alternative learning activities?

6. Did the program assist me in developing criterion-referenced test items?

7. Did the program assist me in determining the reasons for evaluating my industrial arts program?

8. Did the program assist me in understanding the use of self-instructional modules?

9. Did the program assist me in implementing a competency-based industrial arts program?

10. Did the program assist me in developing competency-based lesson plans for my industrial arts program?

BACKGROUND AND SIGNIFICANCE

Competency-based education programs require a great amount of time and effort on the part of teachers (Flammer, 1971, p. 512). Consequently, many teachers do not want to change their mode of instruction. However, if programs are to be successful, the teachers who manage them must be willing to accept and implement
change. The work of establishing criterion-referenced measurements, catalogs of competencies, and developing in-service training programs will be in vain without the support the classroom teacher. Establishing valid classroom instruction based on how teachers instruct courses will determine if competency-based education programs fit the needs of students in industrial arts in the State of Virginia. Evaluation of the program by teachers can help make its (program) implementation successful for those who have not yet enrolled in the workshops. If program evaluations are unfavorable, other action may be taken to improve the components of the Competency-Based Education Workshop for future use by industrial arts teachers.

This study also used CBE workshop evaluations from teacher participants at eight (8) locations during the Spring and Fall of 1979. Location, number of participants, and instructors' names are expressed in Table I. All classes were taught by master teachers trained at a four (4) day training conference at Wintergreen, Virginia. Master teachers were trained to conduct the CBE Industrial Arts Workshops for industrial arts teachers in planned locations. The master teachers were exposed to the contents and methodology of competency-based instruction.
<table>
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<th>INSTRUCTOR</th>
<th>LOCATIONS</th>
<th>TOTAL NUMBER OF PARTICIPANTS</th>
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<td>O.D.U., Norfolk, Virginia</td>
<td>17</td>
</tr>
<tr>
<td>Van Dyke</td>
<td>V.S.U., Richmond, Virginia</td>
<td>24</td>
</tr>
<tr>
<td>Tetterton</td>
<td>O.D.U., Newport News, Virginia</td>
<td>33</td>
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<tr>
<td>Cummings</td>
<td>O.D.U., Portsmouth, Virginia</td>
<td>35</td>
</tr>
<tr>
<td>Ritz</td>
<td>O.D.U., Virginia Beach, Virginia</td>
<td>30</td>
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<tr>
<td>Hardy</td>
<td>V.P.I., Charlottesville, Virginia</td>
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<td>Barrier</td>
<td>V.P.I., Roanoke, Virginia</td>
<td>25</td>
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<tr>
<td>Bonfadini</td>
<td>G.M.U., Fairfax, Virginia</td>
<td>35</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>211</strong></td>
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</table>
ASSUMPTIONS

It must be assumed that attitudes and feelings are measurable and that the following statements are indicative of each master teacher who taught a workshop in one of the eight workshop locations.

1. The original design of the class followed sound instructional principles.
2. All master teachers taught the course as instructed in the four-day training workshop at Wintergreen, Virginia.
3. Alternative instructional strategies were perceived to meet individual differences.
4. Evaluations were administered in a timely manner.
5. Responses from questionnaires reflect sincere feelings and attitudes of teacher participants.

LIMITATIONS

Several limitations must be considered in this study:

1. Master teachers provided for the workshop evaluations.
2. Total participation was hampered by absences or illnesses of teachers enrolled in workshop classes. One master teacher did not submit evaluations.
4. Course evaluation results were collected from eight different workshops offered during the spring and fall of 1979.
5. This study was limited to the course evaluation results gathered from the eight workshop locations.
PROCEDURES

Master teachers who taught the CBE Industrial Arts Workshop were issued a set of questionnaires to be distributed to their students on the last day of class. The questionnaire (Appendix A) contained ten questions relating to teacher's feelings on what they had learned in the workshop and whether it would lead them to implement Competency-based Instruction in their classes. On the last day of instruction, each master teacher collected questionnaires and returned them to the researcher at Old Dominion University. The researcher identified and interpreted responses in evaluating the content and effectiveness of the workshop.

DEFINITION OF TERMS

A few basic terms and concepts will be discussed to insure clarity.

Competency - The ability to perform a specific task or duty successfully.

Competency-Based Education - Educational program in which required performances are specified and agreed to in detail in advance of instruction.

Criterion-referenced measurement - An evaluative item based on a performance objective, requiring the learner to show ability to accomplish a task in a given situation according to a pre-set standard.

Evaluation - The act or process of evaluating competency-based instruction and the result of evaluating, appraising, or judging these programs.
Performance objective - A behavioral statement of learner outcomes typically at the end of a course. Two or more performance objectives support a program goal or competency.

Individualized instruction - Learner-centered instruction in which the materials and activities are tailored to meet the needs of the individual student.

Life skills - Skills in performing everyday activities such as keeping a checkbook balanced, shopping wisely, and keeping tax records.

Mastery - Meeting all requirements for completion of a task or duty.

Task - A unit of work which is a necessary part of distinct work activities in an occupational area.

SUMMARY AND OVERVIEW

The preceding discussion was an overview of an evaluation of Competency-Based Industrial Arts Workshop sponsored by Old Dominion University during the spring and fall of 1979 at eight locations. The introduction explained why the study was undertaken and familiarized the reader with issues. Also included in Chapter I were the statement of the problem, the evaluation questions, background and significance, limitations, assumptions, procedures and definition of terms.

The second chapter reviewed current writings based on problems and issues of Competency-Based Education and Competency-Based Education for Industrial Art Teachers. The researcher also reviewed some of the characteristics and challenges of Competency-Based Education.
The third chapter was devoted to the direction that was undertaken in the questionnaire for the purpose of gathering specific data from participants who evaluated the workshops. This Chapter included method of obtaining information and how the data were treated.

The fourth chapter analyzed the data gathered by the questionnaire and interpreted the information from the responses of the industrial arts teachers who participated in the CBE Workshops. Attitudes, feelings, and opinions toward CBE in Industrial Arts Workshops taught at eight locations were reviewed.

The fifth chapter summarized the data and presented conclusions from the findings and made recommendations for consideration of providing CBE to all Virginia industrial arts teachers.
CHAPTER II
REVIEW OF THE LITERATURE

INTRODUCTION

The purpose of industrial arts education is to prepare students to understand all aspects of industry and technology and to explore individual interests. The prime requisite for a successful program is a qualified teacher who is both technically competent and competent in teaching methods and supporting skills which are integral to the success of the instructional process. To become technically qualified the teacher must enroll in classes that teach the processes of industry and technology. The professional competency is gained through methods and professional classes, student teaching, and by actual employment as a teacher. Also additional competence can be gained through graduate education. Therefore, a carefully planned program of pre-service and in-service education which will enable the teacher to acquire necessary skills in teaching in the shortest possible time is essential.

Very few movements in education have received more widespread attention than the competency-based education (CBE) movement. Houston and Howsam (1972) reported that rarely, if ever, has any movement swept through teacher education so rapidly or captured
the attention of so many in so short a time as the competency-based
movement. Already well underway, the approach offers promise of
renovating and regenerating teacher education. Equally significant,
the authors added, it appears probable that it will do so in record
time (1972, p. 75).

For those who doubt whether competency-based teacher education
is with us to stay, the following sampling of national involvement
in CBTE may be somewhat surprising (Andreyka and Blank, 1976,
p. 36):

1. Over 30 states report either legislative/administrative
   support for CBTE or are studying the concept seriously;

2. Nearly a hundred teacher education institutions report
   either "total" CBTE programs or alternative programs;

3. There are at least 20 national consortia, institutes,
centers, or other groups whose primary or major function
is the promotion of the CBTE movement; and

4. Literally hundreds of articles, position papers,
   monographs, and other publications dealing specifically
   with CBTE appear monthly.

It seems, then, that much of the time we now spend philosophizing
and debating the relative merits and demerits of CBTE and whether
it will survive should be directed toward implementing the concept
and making it work.

CHARACTERISTICS OF COMPETENCY-BASED EDUCATION

Just how are basic characteristics of competency-based education
put into action varies greatly. Variety is one characteristic that
is most notable when examining different operational CBE programs.
Despite this variety, however, there are common characteristics among CBE programs that permit us to label a specific program as competency-based.

Competency-based education is education that focuses on students' acquisition of specific competencies. The educational program includes a set of learning objectives that are stated so that their accomplishment can be observed in the form of specified learner behaviors or knowledge. Minimum levels of achievement of these objectives are established as a criterion of success. Learning activities are geared to assist each student in acquiring at least the minimum levels for competence. Getting through the learning experience within a specified time period has no intrinsic value--acquiring minimum competence, regardless of time, is the valued end. This a direct application of the concepts of mastery learning and aptitude as described above.

Competencies are composite skills, behaviors, or knowledge that can be demonstrated by the learner and are derived from explicit conceptualizations of the desired outcomes of learning. Competencies are stated so as to make possible the assessment of student learning through direct observation of student behavior. Learning objectives are known to the student as he begins a learning experience. The student also knows in advance the levels of mastery to be used as criteria of successful achievement. Such criteria are always explicit and are based on the specified objectives that contribute to the competencies being learned.
Objectivity in assessment of achievement is sought by using the individual learner's performance as the primary source of evidence and by taking into account evidence of the learner's knowledge rather than relying solely on judgments.

Once we get past the basic notion of competencies as learning objectives, we discover that CBE can take almost any form necessary to get the job done in a particular environment or for a particular purpose. Some of the more common accessories of CBE, however, can be cited to provide an idea of how such a program might be structured. These features include self-pacing, modularized learning experiences; learning resource centers; faculty teams; field experiences; personalization strategies; and communication facilities. (Hall and Jones, 1976, pp. 10-12).

**Self-Pacing Learning Modules**

CBE programs frequently use "modules" as delivery systems for instruction. A module is a learning unit with stated objectives, a pre-test, learning activities to enable students to acquire competencies the pre-test has shown to be lacking, and a competency evaluation to measure learning success. A module usually focuses on a single competency or set of competencies. The ability to demonstrate these competencies satisfies the requirements of the module, whether the learner performs the module's enabling activities or not. The learner usually works through modules individually or in small groups and at his own speed. Modules are typically self-
contained so that the teacher is not always an essential element in
the learning of the competencies specified for a given module. The
instructor's role is that of an additional resource and guide to
the learner. Many learners may not require the instructor's input
at all to achieve module objectives.

Such self-pacing allows faculty the time for essential one-to-one
interaction with students to ensure that students understand the
Gestalt of the learning experience. Faculty may also aid students
in seeking unique ways of applying newly acquired skills, and they
may urge students beyond minimum learning requirements. By having
faculty spend considerably more time with students in one-to-one or
small group encounters, students come to know faculty better and
faculty know students better. This change is not always
comfortable--remoteness has traditionally provided some safety to
both camps--but it does open doors to increased attention to the
individual student's personal as well as cognitive needs.

**Learning Resource Centers**

Different use of instructional resources and classroom facilities
provides for a variety of organizational patterns for CBE. At some
institutions a learning resources center has become a central and
popular part of the program operation. The learning resource
center is essentially a library of written and media materials and
other instructional resources open for use by students as they
progress through modules and related experiences.
Faculty Teams

Interdisciplinary faculty teams allow for capitalization upon individual strengths and interests of faculty members while buffering the program and students from faculty weaknesses and dislikes. Teaming in professional training programs permits an integrated training approach with less redundancy and fewer gaps. At the same time faculty who plan and integrate their instruction for the same students tend to share information about students, which benefits students through the faculty's more varied and balanced view of their needs.

Field Experiences

Competency-based programs for professional training typically have a heavy emphasis on field-oriented experiences. This is particularly true in teacher education and the health sciences where the learners are from early in their training, heavily involved with clients of their future profession. Such field experiences entail close working relationships between in-service professional and pre-service students. Faculty members benefit through opportunities to become involved in the field experiences by staying abreast of the in-service realities for which they are preparing students and also in the increased knowledge such experience gives them about the entire scope and progress of the training program. Faculty also stay in closer touch with the developmental progress of each student. Field experiences can systematically
involve both professional and lay communities in program development and evaluation activities. This is important, since these communities are the consumers of the educational product and, in many cases, the source of funds for establishing and operating the program.

Personalization Strategies

By definition a CBE program cannot be successful without some form of personalization. By personalization we mean more than merely individualizing instruction to meet the cognitive and pedagogic need of the learner. Personalization means individualization of instruction that includes responses to the personal feelings and psycho-social growth needs of the learner as well. In attending to personalization some CBE programs include special features and procedures, such as active participation of a specially trained counseling psychologist. This attention to students' personal needs also requires utilization of techniques for assessment of such effective needs and their development.

Communication Facilities

Self-paced instruction combined with faculty teaming and field experiences often requires the establishment of special communication channels to keep scattered faculty and students in touch with each other. Such communication strategies as bulletin boards and newsletters help take up the slack.
NEED FOR COMPETENCY-BASED INDUSTRIAL ARTS TEACHER EDUCATION

For many years, vocational and technical teachers, administrators, supervisors and related personnel have received their professional preparation in traditional university-based programs. These programs usually consist of a series of courses focusing upon the acquisition of knowledge and culminating in a paper and pencil evaluation. This course-oriented approach for preparing teachers and individuals in leadership roles is coming under criticism for not meeting the real needs of practitioners (Finch and Hamilton, 1975; Norton, et al, 1975).

Among the shortcomings associated with the traditional approach are:

1. Objectives are vague and/or general
2. Program is content and textbook-oriented
3. Assessment is only cognitive in scope
4. Content and objectives are based upon tradition
5. Program focuses on general principles but seldom relates these to the problems faced by educators
6. Instruction is not tailored to the needs of individuals
7. The end product is not systematically evaluated
Finch and Hamilton (1975) reported that many of the professional courses completed by vocational and technical teachers are offered in random sequence and often focus on principles and techniques related only generally to the teacher's role in the classroom and laboratory. Schaefer (1971) reported that present vocational teacher education programs amount to nothing more than small encounters with a large and complex personnel development problem (1971, p. 14).

**PROBLEMS AND ISSUES OF COMPETENCY-BASED EDUCATION**

Advocates of Competency-Based Teacher Education (CBTE) point out the fact that the movement is not without its problems, criticisms and critics. Schmieder (1973, p. 24) states:

> Any movement as complex as that for competency-based education is sure to inspire a great many relevant and even some not so relevant—questions and issues regarding developmental problems and priorities.

The critical questions and issues regarding competency-based teacher education have been discussed by several authors (Brooks, 1974; Finch and Hamilton, 1974; Broudy, 1972).

Brooks (1974, p.7) listed six of the frequent criticisms of competency based education:

1. The "sum of the parts" does not always equal the whole, and thus, the mere fact that students are able to demonstrate competence in isolation does not guarantee success in the classroom.
2. Because the competency-based program has as one of its foundations a systematic approach, it is mechanistic and dehumanizing.

3. A competency-based program claims individualization, yet each student is expected to display the same competencies; this claim does not seem consistent.

4. Trivial behaviors are those most easily operationalized; the really important aspects of teacher education may be overlooked.

5. We really know so little about how children learn that it seems ridiculous to base a program on competencies that may not be the appropriate ones.

6. The really important areas of teaching are in the affective domain, and these are very difficult to categorize and measure.

These concerns have been discussed and excellent rebuttal statements have been presented in the literature supporting the competency-based education movement. Each teacher education program will have to resolve these questions concerning the value and effectiveness of competency-based teacher education for their own institution.
Rosner and Kay (1974) state that the long-range promise which CBTE challenges teacher education to accomplish is to improve the quality of instruction in the schools. This long-range promise is certainly a justification for CBTE. It is based upon two very important assumptions: (1) that effective public schools are largely dependent on the quality of teaching, and (2) that competent teachers can be prepared by teacher education programs (p. 290).

As implied in the assumptions, more knowledge concerning relationships between elements of teacher education curriculum and indicators of effective schooling needs to be acquired. Competency-Based Industrial Arts Education (CBIAE) offers the intermediate promise that teacher education institutions will have the demonstrable capability of preparing knowledgeable and skillful teachers in curricula whose component parts have been tested for validity against criteria of school effectiveness. This implies that teacher education programs will be willing to subject the elements of their curricula to empirical test.

Professional recognition and commitment in CBIAE is expected to result in more extensive support of teacher behavior research and the generation of inter-dependence between teacher behavior research and teacher education program development and implementation.
Another challenge that CBIAE offers is to stimulate wide-spread professional recognition of the hypothetical, tentative nature of various teacher education curriculum elements, and to generate professional consensus on the need to validate these elements. CBIAE should stimulate a commitment to tool up for the necessary development and research to strengthen teacher education programs in industrial arts (Finch and Hamilton, 1975, pp. 13-15).

A Challenge for the Faculty

The faculty who participate in competency-based industrial arts teacher education instruction must have a strong commitment to the initial preparatory program for teachers and believe that it is a critical component of the total teacher education program. In implementing any new program time is needed and changes must be made which require adjustments on the part of the faculty. According to Finch (1976), efforts to solicit faculty participation have pointed out the importance of modifying faculty loads to account for the additional time and effort as required in establishing the program. Recognition of the efforts and accomplishments of faculty members must be made and positive reinforcement given for faculty participating in an assignment demanding increased time for instruction and student contact (Finch, pp. 8-9).
A Challenge for the Students

Students are challenged to focus their attention upon their performance. A recognition must be made of the fact that their success will be judged on performance as opposed to strictly cognitive experiences. Grading will more than likely be on a "pass-fail" basis rather than by the conventional grading system. An adjustment must be made to the grading system. Students are challenged to participate in many more activities than are required in the traditional pattern. Since the assignments usually require continuous participation in a school setting, students are challenged to acquire and exhibit professional behaviors earlier than the student in the traditional teacher education program.

Students are challenged to develop the capacity for self-evaluation. This skill is developed early and requires the additional competency of evaluating objectivity. Students electing the competency-based field oriented patterns of teacher preparation must recognize that they will forego many of the campus activities that would be available in the traditional program. Students are challenged to fulfill time commitments in the field which often preclude their participation in many campus activities.

A Challenge for Accountability

CBIATE established a framework from which teacher education programs can demonstrate accountability. Knowledges, skills, and behaviors deemed necessary for beginning teachers, and the evidence acceptable for assuring that students possess these competencies
are explicit and made public in advance. CBIATE offers the immediate promise of increased prospects for accountability.

In competency-based industrial arts teacher education the student is held accountable for performance. Not only are the competencies derived from explicit conceptions of teacher roles, they are also made public in advance so that students can work toward developing these competencies. The competencies are stated so as to make possible assessment of the student's behavior in relation to each. The criteria to be employed in assessing the competencies are based upon the competencies to be developed. The expected levels of mastery under specified conditions are also made public in advance.

Competency-based programs are systematically designed with continuous feedback which makes the program more accountable for funds spent within the program. The students performance is used as the primary source of evidence that the student has developed competence as a teacher. Objectivity within the program is the goal of CBIATE. Not only is the performance of the student assessed but also evidence of knowledge relevant to planning for, analyzing, interpreting, and evaluating the classroom.

Accountability is evidenced in competency based industrial arts education by measuring the student's rate of progress in demonstrated competence rather than by time or course completion.
The program utilizing CBIATE will design the instructional program to facilitate the development and evaluation of the student's achievement of the competencies specified rather than unidentified fuzzy concepts (Finch, pp. 8-11).

EFFECTIVENESS OF CBTE

Competency-based education was first developed and used for teacher training (Reilly, 1978, p. 21). Robert Roth (1977, p. 760) did extensive research on the effectiveness of these programs and determined the following:

It must be stated that no conclusion can be drawn concerning the effectiveness of competency-based teacher education in general from the data available at this time.

Nevertheless, some studies have found that teachers completing training in competency-based programs have a favorable attitude toward them (Doyle, 1976, p. 2795-A). Using questionnaires, Doyle found that the program provided satisfactory experiences for performing in teaching situations. Favorable opinions were found in teachers in the competency-based programs toward personal development and job preparation.
Even though studies have not been made to determine whether or not teachers are in favor of competency-based education, studies have been made to determine student attitudes. The attitudes of industrial education students toward traditional and performance-based, competency-based instruction was researched by Stone (1978, p. 3992-A). The students were randomly selected and placed in two groups. Group one, the experimental group, consisted of twenty-six subjects, Group two, the control group, consisted of twenty-four subjects. The attitudes of the students were defined and measured on the Attitudes Toward Evaluation Scale. This instrument based on the semantic differential techniques, was specially designed to assess student attitudes toward the method of grading. The greatest attitudinal differences occurred among students in the traditional group at the 0.1 level. This study indicated that the traditional method was most disliked by the lower fiftieth percentile. An opinion poll given to 1,196 students, grades 9 through 12, in Georgia High Schools, determined that students were in favor of minimum competencies (Schab, 1978, pp. 61-62).
TEACHER ATTITUDES

Another area that can be looked at is teacher attitudes toward change.

The success of any broad educational innovation is not simply a result of whether the proper procedures have been technically carried out. It depends heavily upon the cooperation and involvement of the teacher (Keisler, 1977, p. 63).

It was concluded that the teacher who was involved in planning of an educational reform or has been given the opportunity to obtain competencies in implementing new programs will have a more favorable attitude toward them (Keisler, 1977, p. 7575). A similar study was conducted by Laugenbach (1972, p. 35).

The purpose of his study was to determine if teachers with preparational reform had a more favorable attitude than teachers without preparation. First, Laugenbach designed an instrument for evaluating this question. Principals selected at random from several schools were asked to nominate teachers with favorable and unfavorable attitudes toward reform. Of the 83 inventories of 307 statements, forty-five went to teachers nominated as having negative attitudes. Fifty discriminating statements were recognized and used to test another school district. The reliability and standard error of measurement were considered adequate enough to proceed
with the study. There were inventories sent to 274 teachers to
determine their attitudes. As a result it was determined that
teachers with some type of in-service preparation had more favorable
attitudes toward education reform.

To study the attitudes of teachers toward a topic in education
it was necessary to know the opinions of its supporters. The
step-by-step approach of competency-based education or instruction
had distinct advantages. Students knew exactly what was expected
of them. Teachers were able to identify slow learners more readily.
Parents could be better informed of what competencies their child
had mastered. Teachers could spend more time with slower students
with the use of individualized instruction (Reilly, 1978, p. 23).
Students could move at their own pace and would not be held behind
for a slower student to catch-up. Students can use any method or
experience to obtain a competency or complete a task (EPDA Regional
Workshop on CBVE, 1976 p.6). Competency-based programs will allow
students to enter and exit at any stage of a program (Nagel, 1972,
p. 12).

In reversing the situation, one discovers the opinions of the
critics of the competency-based education program. Who should
decide what competencies are necessary for a program and what
criterion-referenced measures should be used seem to be of utmost
importance. Programs and teachers will be evaluated on the achievement
of their students. Some critics fear that competency-based education
programs will lead to segregation in the schools (Reilly,
1978, p. 28). Since competency-based instruction is dependent
on individualized instruction, students with poor reading abilities may have difficulty with individualized learning materials. Individualization may lead to a decrease in student interaction. Programs will require more time and effort on the part of the teacher (EPDA Regional Workshop on CBVE, 1976 p. 10). "If students are told what to learn, that is all they will learn" (Flammer, 1971, p. 513).

SUMMARY

The CBTE approach has been advocated as one answer to this dilemma. The competency-based approach explicates the instructional process into its component parts by: (a) identifying specific instructional competencies, (b) defining the criteria used to judge success, and (c) making the teacher trainee accountable for meeting the criteria of success in a real teaching situation. This process should give some freedom from classroom instruction. A curriculum for industrial arts education teachers which includes CBTE options would allow for a wider selection of alternatives and more rapid progress.

We can conclude that the attitudes of teachers do affect the success of programs. There is support that attitudes can be measured. Questionnaires are most often used to research attitudes
and teachers who are prepared for teaching competency-based programs will implement and conduct them more favorably than teachers with no preparation.

It is believed that a study of the attitudes of teachers who participated in a competency-based industrial arts teacher education workshop will be valuable in planning programs to prepare teachers for administering and implementing competency-based programs.
CHAPTER III

METHOD OF RESEARCH

The research procedures and methods of analysis are presented within six headings. The design includes (1) The Problem, (2) The Sample, (3) The Instrument, (4) Data Collection, (5) Treatment of Data Collection, and (6) the Summary.

THE PROBLEM

Review of the literature supported the emphasis on the importance of CBE implementation in Industrial Arts Education programs. The problem of this study was to evaluate the effectiveness of the competency-based industrial arts workshops as viewed by the participants. A ten question survey based on the competencies of the course was used as the measuring instrument. This study was used to determine the extent to which teachers participating in the workshop throughout the state of Virginia felt they were competent in applying the principles of CBE to their instructional programs.

THE SAMPLE

CBE Workshop evaluations were collected from master teachers who taught the CBIA workshops at 8 different locations. Each master teacher was responsible for conducting the evaluation from
each industrial arts teacher who participated in his workshop. Two hundred eleven (211) industrial arts teachers participated in the workshop. The survey evaluations received from 7 master teachers were one hundred seventy-six (176).

THE INSTRUMENT

The questionnaire was devised by Dr. John M. Ritz, Project Director, Department of Vocational and Industrial Arts Education, Old Dominion University using the goals stated in the course outline.

A Likert five-point scale of responses was used to indicate the Industrial Arts teachers responses ranging from strongly disagree, disagree, uncertain, agree, to strongly agree. Also included in the survey was space provided for comment on ways each of them felt this inservice program might be improved. Identification of all participants was kept confidential.

DATA COLLECTION

The master teachers who taught the CBE Industrial Arts Workshop were issued a set of questionnaires to be distributed to their students on the last day of class. The questionnaire (Appendix A)
contained ten questions relating to teacher's feelings on what they had learned in the workshop and whether it would lead them to implement competency-based instruction in their classes. On the last day of instruction, each master teacher collected questionnaires and returned them to the researcher at Old Dominion University. The researcher identified and interpreted responses in evaluating the contents and effectiveness of the workshop.

TREATMENT OF DATA COLLECTION

Questionnaires were received from master teachers by mail as well as in person. The researcher tabulated the questionnaires as shown in Table I. An analysis of questions were compiled. After analyzing the data, it was noted that a definite pattern had emerged from each question presented as illustrated in Figures 1-10.

SUMMARY

Studying the questionnaire responses would determine if there is a relationship between attitudes of participants in the CBE Industrial Arts Workshop and their competency in implementing the principles of CBE in their instructional programs. Dr. Ritz designed the questionnaire used in this study and a Likert Scale was used to analyze the data.
CHAPTER IV

FINDINGS

This study was conducted to identify and analyze attitudes of participants enrolled in Competency-Based Industrial Arts Workshops sponsored by Old Dominion University, conducted under Vocational Education Amendments of 1976, Public Law 94-482 from the Virginia Department of Education. The research goals set forth in Chapter I were:

1. Evaluate the effectiveness of the competency-based industrial arts workshops as viewed by the participants.
2. Determine the extent to which teachers participating in the workshop throughout the State of Virginia felt they were competent in applying the principles of CBE to their instructional programs.
3. If program evaluations are unfavorable, other action may be taken to improve the components of the Competency-based Education Workshops for future use by industrial arts teachers.

The information generated by the study was based on CBE workshops evaluations from teacher participants at eight (8) locations during the Spring and Fall of 1979. Location, number of participants, and instructor’s names are expressed in Table I.
Figures 1 through 10 illustrate the results of the industrial arts teachers that were enrolled in the CBE workshops. The survey results were correlated in percentages. To minimize time and make the responses of the participants easier, a Likert Scale was employed. This Likert Scale simplified the evaluation process and added to the objectivity of the survey. The scale utilized for this survey was as follows:

SD – Strongly Disagree
D – Disagree
U – Uncertain
A – Agree
SA – Strongly Agree

The following collected data for this survey is presented in the remainder of this Chapter. The survey was distributed to 176 industrial arts teachers, who were uniquely qualified to answer the survey questions because they were the participants in the CBE workshops during Spring and Fall of 1979. One of the original instructors did not have students to complete the survey. This class was composed of 35 students which gives us a total of 211 participants in the program. Of these 176 teachers surveyed, 176 responded. This survey represented a total of 100 percent of the survey population and 83 percent of the total workshop participants. The results reported in this Chapter are a compilation of the data developed by the survey.

To determine an answer to the research questions, a preliminary question was asked. The participants were asked opinions toward the Competency Based Industrial Arts In-service Program. Figure 1
The survey results were summarized in terms of mathematical totals of Likert responses. Survey question 1 indicated that 61 percent of the Industrial Arts teachers agreed that the in-service program enabled them to describe the characteristics of competency-based education and 37 percent strongly agreed to this question. Out of 176 surveys, only 174 responded to this question and no one strongly disagreed or disagreed to this question.

Question 2 indicated that about one half of the teacher participants agreed (48%) as well as strongly agreed (51%) that this in-service program familiarized them to the contents of catalogs of tasks for competency-based Industrial Arts. One percent was uncertain, no participants strongly disagree and none disagree. Figure 2 as well illustrate a strong picture of the participant's responses to question 2.

As one looks at question 3, along with Figure 3, it shows that 174 responded out of 176 surveyed. Over half agreed (60%) along with 21% strongly agreed that this in-service program assisted them in identifying industrial arts content important to learners. However, it shows that 11 percent are uncertain, 5 percent disagree and 2 percent strongly disagree.

Question 4, that is illustrated in Figure 4, shows that all 176 participants responded to this question. Over half strongly agreed (59%) and 40 percent agreed that this in-service provided them an opportunity to develop competency-based lesson plans for their industrial arts program. Only 1 percent was uncertain. No one disagreed and none strongly disagreed.
QUESTION #1: This inservice program enabled me to describe the characteristics of competency based education.
QUESTION #2: This inservice program familiarized me to the contents of catalogs of tasks for competency based industrial arts.

N = 174
QUESTION #3: This inservice program assisted me in identifying industrial arts content important to learners.
Figure 4

QUESTION #4: This inservice provided me an opportunity to develop competency based lesson plans for my industrial arts program.

N = 176
Figure 5, as it relates to question 5, illustrates that there is a closeness of those that agreed (49%) and (47%) strongly agree that this inservice assisted them in preparing performance objectives. There is only a 2 percent difference in all 176 participants responding to this question who agree that the class will help. Two percent are uncertain, 2 percent disagree and none strongly disagree.

Question 6, in Figure 6, shows that all 176 participants responded to the question. Over half agreed (56%), with 26 percent strongly agreeing that this inservice program provided instruction on how they might develop alternative learning activities which is well illustrated in Figure 6. One can see that 11 percent are uncertain, 6 percent disagree and 1 percent strongly disagree.

Only 172 participants responded to question 7. One can see in Figure 7 that over half agreed (53%) and 36 percent strongly agreed that this inservice assisted them in developing criterion referenced test items. Nine percent of the industrial arts teachers are uncertain while two percent disagreed. Those teachers responding as illustrated in Figure 7, show that competency based instruction did give them new aspects of teaching and evaluating students.

Question number 8 shows that out of 176 participants, only 173 responded to this question. However, one can see in Figure 8's illustration that fifty-six percent and thirty-three percent agreed and strongly agreed respectively that this inservice program assisted them in determining reasons for evaluating their industrial arts program. Five percent disagree while only one percent strongly disagree.
QUESTION #5: This inservice assisted me in preparing performance objectives.
QUESTION #6: This inservice program provided instruction on how one might develop alternative learning activities.

N = 176
Figure 7

QUESTION #7: This inservice assisted me in developing criterion referenced test items.
Figure 8

QUESTION #8: This inservice program assisted me in determining reasons for evaluating my industrial arts program.

N = 173
Question 9, as illustrated in Figure 9, shows that a majority (63% and 18%) agree and strongly agree respectively that the inservice program assisted them in understanding the use of self-instructional modules. One can also see in Figure 9 that 13 percent are uncertain while six percent disagree and none strongly disagree. There are only 174 responses to this question.

Question number 10, illustrated in Figure 10, will show that slightly half agree (51%) and 32 percent strongly agree that the inservice assisted them in implementing a competency based industrial arts program. Eleven percent were uncertain while five percent disagreed and one percent strongly disagreed. Only 174 participants answered this question.

SUMMARY

The survey results were reported in Figures 1-10 (bar charts) which illustrated in percentages how the industrial arts teachers enrolled in the workshops during the Spring and Fall of 1979 felt they were competent in applying the principles of competency-based education to their instructional programs. The information generated by the study was based on CBE workshops evaluations from teacher participants at eight (8) locations. Location, number of participants, and instructor' names are expressed in Table I. Figures 1 through 10 illustrates the results of the industrial arts teachers that were enrolled in the CBE workshops. The survey
QUESTION #9: This inservice program assisted me in understanding the use of self-instructional modules.

N = 174
QUESTION #10: This inservice assisted me in implementing a competency based industrial arts program.
results were correlated in percentages. To minimize time and make
the responses of the participants easier, a Likert Scale was
employed. The Likert Scale simplified the evaluation process and
added to the objectivity of the survey.
CHAPTER V
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The problem of this study was to evaluate the effectiveness of the competency-based industrial arts workshops as viewed by the participants. This Chapter will summarize the procedures used in this study, draw conclusions about the findings and the study, and make recommendations for any inclusion or exclusion for changes in competency-based industrial arts workshops being taught in the state of Virginia.

SUMMARY

Chapter I was an overview of an evaluation of Competency-Based Industrial Arts Workshops sponsored by Old Dominion University during the spring and fall of 1979 at eight locations. The introduction explained why the study was undertaken and familiarized the reader with issues. Also included in Chapter I were the statement of the problem, the evaluation questions, background and significance, limitations, assumptions, procedures and definition of terms.

The second chapter reviewed current writings based on problems and issues of Competency-Based Education and Competency-Based
Education for Industrial Art Teachers. The CBTE approach has been advocated as one answer to this dilemma. The competency-based approach explicates the instructional process into its component parts by: (a) identifying specific instructional competencies, (b) defining the criteria used to judge success, and (c) making the teacher-trainee accountable for meeting the criteria of success in a real teaching situation. This process should give some freedom from classroom instruction.

The third chapter was devoted to the direction that was undertaken in the questionnaire for the purpose of gathering specific data from participants who evaluated the workshops. This Chapter included methods of obtaining information and how the data was treated.

The fourth chapter analyzed the data gathered by the questionnaire and interpreted the information from the responses of the industrial arts teachers who participated in the CBE Workshops.

The fifth chapter summarized the data and presented conclusions from the findings and made recommendations for consideration of providing CBE to all Virginia industrial arts teachers.

Industrial arts teachers participating in the workshop throughout the state of Virginia felt they were competent in applying the principles of CBE to their instructional programs.
Eighty-three percent (83%) of the participants attending the workshops responded to the questionnaire. The responses were compared, recorded and analyzed to identify those methods which appeared to be most effective that influenced changes. The analysis of the information supplied by means of the questionnaire from the responding participants served as the basis for the conclusions and recommendations of this study.

CONCLUSIONS

Favorable evaluation of program by teacher participants helped in the determination that implementation of the CBE program will probably be successful in the workshop setting and in the classroom. Eighty-three percent (51% agree and 32% strongly agree) of the respondents indicated that they were assisted in implementing a competency based industrial arts program. Further the responses indicate that the majority of participants were competent in applying the principles of competency-based education to their instructional programs. Although there is minimal disagreement, the percentage of disagreement does not significantly affect the finding that most of the participants felt that they were competent in applying CBE in their instructional programs. The disagreement items included identifying industrial arts content important to learners, preparing performance objectives, developing alternative learning activities, determining reasons for evaluating the industrial arts program and understanding the use of
self-instructional modules. Those items included in the unfavorable response (2-6%), tend to indicate those individuals who are not confident in specifics such as content, objectives, and modules. It would seem that perhaps the master teacher could allow for indepth teaching in these areas and offer the facility of a learning resource center; whereby, the teacher may capture the minimal disagreements and reduce it to less than 1%.

The results of this study showed that industrial arts teachers agreed that they are competent in applying the principles of CBE to their instructional programs. Some however, did not agree with competency base education methods of instruction.

In Table II, all responses considered unfavorable are listed. You will note that more than 10% of those responding to the uncertain category, are questions 3, 6, 9, and 10. Question 3 relates to participants identifying industrial arts content important to learners; question 6 relates to developing alternative learning activities; question 9 relates to understanding the use of self instructional modules, and question 10 relates to implementing the competency-based industrial arts program. It certainly appears that these participants are not ready to accept change or challenge in implementing CBE in their classrooms. Since they are uncertain in identifying content, developing alternatives and understanding the use of instructional modules, it seems that very little is left for the creating or exploring a new method of teaching all students.
Although there is minimal disagreement in all questions, the researcher does not wish to ignore that there is some disagreement. If you will note in Table II, that no response to any question is more than 6% disagreement and no more than 2% strongly disagree.

It is the opinion of the researcher that the percentage of all disagreements do not significantly affect the finding that most of the participants felt they were competent in applying CBE in their instructional programs.

### TABLE II

**LIST OF UNFAVORABLE RESPONSES**

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>STRONGLY DISAGREE</th>
<th>% DISAGREE</th>
<th>% UNCERTAIN</th>
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<td>10</td>
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<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>
The following conclusions were based on survey answers to the research questions:

1. The industrial arts teachers were able to describe the characteristics of competency based education.

2. The survey indicated that industrial arts teachers enrolled in the inservice program were familiar with the contents of catalogs and tasks needed for competency based industrial arts programs.

3. Most of the industrial arts teachers in the inservice program were able to identify content important to learners.

4. The industrial arts teachers were able to develop competency based lesson plans for their programs.

5. Industrial arts teachers were able to prepare performance objectives.

6. Most of the industrial arts teachers were able to develop alternative learning activities.

7. The industrial arts teachers were able to write criterion reference test items.

8. Industrial arts teachers were able to determine reasons for evaluating their industrial arts program.


10. The inservice did assist industrial arts teachers in implementing a competency base industrial arts program in their school districts.
RECOMMENDATIONS

Based upon the results of the survey as reported in Chapter IV and Figures 1-10, the following recommendations are submitted:

1. The researcher recommends that all industrial arts teachers enroll in the competency-based industrial arts program. Teachers will gain new skills and knowledge in developing and implementing their CBE programs.

2. The researcher recommends that each industrial arts teacher be held accountable for student competencies in a pre-set standard for local, district and state.

3. It is recommended that those industrial arts teachers who have not enrolled in a competency based program be required as a qualification for being an industrial arts teacher.

4. On an annual basis, the researcher recommends that teachers attend the industrial arts state conference where updated materials on competency based instructions can be acquired.

5. The researcher recommends that all school districts in the state of Virginia incorporate competency based education in their programs so that if students changed school districts, perhaps fewer problems with students adjusting will be encountered.

6. It is recommended that all institutions of higher learning in the state of Virginia develop a competency based industrial arts program.

The researcher highly recommend competency based industrial arts for all of the state of Virginia.
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APPENDIX A

COURSE EVALUATION

Competency Based Industrial Arts Education

Term ______
Location ______

DIRECTIONS: The purpose of this survey is to evaluate the content and effectiveness of the inservice course you just completed on competency based industrial arts. Your answers to this survey will be used to determine if and how this inservice program should be improved. Please circle one response to the items which most nearly describes your opinion of each statement. An example is provided:

Key:  SD - Strongly Disagree
      D - Disagree
      U - Uncertain
      A - Agree

Example: SD D U A SA
I feel that all students at the middle/junior high school level should be required to enroll in industrial arts classes.

This response indicates that the individual agrees with the item stated. You may now proceed to complete the evaluation.

1. This inservice program enabled me to describe the characteristics of competency based education.
   SD D U A SA

2. This inservice program familiarized me to the contents of catalogs of tasks for competency based industrial arts.
   SD D U A SA

3. This inservice program assisted me in identifying industrial arts content important to learners.
   SD D U A SA

4. This inservice provided me an opportunity to develop competency based lesson plans for my industrial arts program.
   SD D U A SA

5. This inservice assisted me in preparing performance objectives.
   SD D U A SA

6. This inservice program provided instruction on how one might develop alternative learning activities.
   SD D U A SA
7. This inservice assisted me in developing criterion referenced test items.

8. This inservice program assisted me in determining reasons for evaluating my industrial arts program.

9. This inservice program assisted me in understanding the use of self-instructional modules.

10. This inservice assisted me in implementing a competency based industrial arts program.

In the space below, please comment on ways you feel that this inservice program might be improved.

Thank you for your cooperation.