COMPETENCY-BASED INDUSTRIAL ARTS TEACHER EDUCATION

1977

American Council on Industrial Arts Teacher Education

26th yearbook

1977 Competency-Based Industrial Arts Teacher Education 26 ACIATE

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Foreword

The preparation of teachers for the industrial arts programs in the public schools is a major concern of ACIATE. Competency-based teacher education (CBTE) is one system of identifying and setting performance standards for the everyday tasks which are required of today's industrial arts classroom teachers. The subject of this yearbook is to look at the concept of teacher preparation from a predetermined competency base and to give guidance and understanding of how CBTE might be initiated into a workable system.

The dissatisfaction with the public schools, the financial constraints placed on school officials, an acceptance of the idea of industrial engineering into educational programming and a general trend toward greater accountability in all education has given impetus to competency-based teacher education. The use of performance objectives has more and more permeated the entire educational network, from grade schools through the universities. This yearbook is an attempt to look at the characteristics of a CBTE program and to explain as simply as possible its implication to the field of industrial arts.

The ACIATE is grateful to the co-editors, Stan Brooks and Jack Brueckman, for their dedication in pursuing this publication and to the authors who have given of their time. The quality of research and the willingness of these dedicated professionals will contribute much toward improving the teacher education programs in industrial arts.

The Council is also grateful for the contribution made by McKnight Publishing Company whose support over the last 26 years has made the ACIATE Yearbook program possible.

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Yearbook Proposals

Each year, at the AIAA national convention, the ACIATE Yearbook Committee reviews the progress of yearbooks in preparation and evaluates proposals for additional yearbooks. Any member is welcome to submit a yearbook proposal. It should be written in sufficient detail for the committee to be able to understand the proposed substance and format, and sent to the committee chairman by February 1 of the year in which the convention is held. Below are certain criteria employed by the committee in making yearbook selections.

ACIATE Yearbook Committee

Guidelines for ACIATE Yearbook Topic Selection

With reference to a specific yearbook topic:

1. It should make a direct contribution to the understanding and the improvement of industrial arts teacher education.
2. It should avoid duplication of the publications activities of other professional groups.
3. It should confine its content to professional education subject matter of a kind that does not infringe upon the area of textbook publication which treats a specific body of subject matter in a structural, formal way.
4. It should not be exploited as an opportunity to promote and publicize one man's or one institution's philosophy unless the volume includes other similar efforts that have enjoyed some degree of popularity and acceptance in the profession.
5. While it may encourage and extend what is generally accepted as good in existing theory and practice, it should also actively and constantly seek to upgrade and modernize professional action in the area of industrial arts teacher education.
6. It can raise controversial questions in an effort to get a national hearing and as a prelude to achieving something approaching a national consensus.

7. It may consider as available for discussion and criticism any ideas of individuals or organizations that have gained some degree of acceptance as a result of dissemination either through formal publication, through oral presentation, or both.
8. It can consider a variety of seemingly conflicting trends and statements emanating from a variety of sources and motives, analyze them, consolidate and thus seek out and delineate key problems to enable the profession to make a more concerted effort at finding a solution.

Approved, Yearbook Planning Committee
March 15, 1967, Philadelphia, Pa.

Previously Published Yearbooks

1. *Inventory-Analysis of Industrial Arts Teacher Education Facilities, Personnel and Programs,* 1952. Walter R. Williams, Jr, and Harvey Kessler Meyer, eds.
* 2. *Who's Who in Industrial Arts Teacher Education,* 1953. Walter R. Williams, Jr. and Roy F. Bergengren, Jr., eds.
* 3. *Some Components of Current Leadership.* Roy F. Bergengren, Jr. *Techniques of Selection and Guidance of Graduate Students.* George F. Henry. *An Analysis of Textbook Emphases.* Talmage B. Young. 1954, three studies.
* 4. *Superior Practices in Industrial Arts Teacher Education,* 1955. R. Lee Hornbake and Donald Maley, eds.
* 5. *Problems and Issues in Industrial Arts Teacher Education,* 1956. C. Robert Hutchcroft, ed.
* 6. *A Sourcebook of Readings in Education for Use in Industrial Arts and Industrial Arts Teacher Education,* 1957. Carl Gerbracht and Gordon O. Wilbur, eds.
* 7. *The Accreditation of Industrial Arts Teacher Education,* 1958. Verne C. Fryklund, ed., and H. L. Helton.
* 8. *Planning Industrial Arts Facilities,* 1959. Ralph K. Nair, ed.
* 9. *Research in Industrial Arts Education,* 1960. Raymond Van Tassel, ed.
10. *Graduate Study in Industrial Arts,* 1961. Ralph P. Norman and Ralph C. Bohn, eds.
*11. *Essentials of Preservice Preparation,* 1962. Donald G. Lux, ed.
*12. *Action and Thought in Industrial Arts Education,* 1963. E.A.T. Svendsen, ed.
*13. *Classroom Research in Industrial Arts,* 1964. Charles B. Porter, ed.
*14. *Approaches and Procedures in Industrial Arts,* 1965. G. S. Wall, ed.
15. *Status of Research in Industrial Arts,* 1966. John D. Rowlett, ed.
16. *Evaluation Guidelines for Contemporary Industrial Arts Programs,* 1967. Lloyd P. Nelson and William T. Sargent, eds.
17. *A Historical Perspective of Industry,* 1968. Joseph F. Leutkemeyer, Jr., ed.
18. *Industrial Technology Education,* 1969. C. Thomas Dean and N. A. Hauer, eds. *Who's Who in Industrial Arts Teacher Education,* 1969. John M. Pollock and Charles A. Bunten, eds.
19. *Industrial Arts for Disadvantaged Youth,* 1970. Ralph O. Gallington, ed.
20. *Components of Teacher Education,* 1971. W. E. Ray and Jerry Streichler, eds.
21. *Industrial Arts for the Early Adolescent,* 1972. Daniel L. Householder, ed.
*22. *Industrial Arts in Senior High Schools,* 1973. Rutherford E. Lockette, ed.

23. *Industrial Arts for the Elementary School,* 1974. Robert G. Thrower and Robert D. Weber, eds.
24. *A Guide to the Planning of Industrial Arts Facilities,* 1975. Donald E. Moon, ed.
25. *Future Alternatives for Industrial Arts,* 1976. Lee H. Smalley, ed.

* Out-of-print yearbooks can be obtained in microfilm and in Xerox copies. For information on price and delivery, write to Xerox University Microfilms, 300 North Zeeb Road, Ann Arbor, Michigan, 48106.

Contents

Preface

The 26th Yearbook is another milestone in the continuing effort on the part of the American Council on Industrial Arts Teacher Education to keep the profession abreast of contemporary issues in education. The initial background research for the yearbook began in 1967 when the editors became involved with the New York State Education Department Bureau of Certification's search for a new style of certification. In the Spring of 1971, the New York State Education Department funded several trial certification projects including the Industrial Arts Trial Certification Project. This provided the editors with the opportunity to direct the project and to establish a professional consortium, with parity, which included classroom teachers, public school administrators, college students and teacher educators. The purpose of the project was to determine the feasibility of establishing a competency/performance-based Industrial Arts teacher preparation program. Though the project has been terminated it has been a moving force in the formulation of the 26th Yearbook.

The 1977 Yearbook is structured and designed to serve a multiplicity of Industrial Arts C/PBTE interests. For some it will provide a prescriptive pattern for establishing C/PBTE programs whether they be undergraduate or graduate in scope. For others it will provide a succinct compilation of sources of information and resources for further study and/or involvement in C/PBTE. For those bent on obtaining a better understanding of IAC/PBTE from the standpoint of its rationale to its current status, the authors have supplied ample substantive content with supporting evidence based on their research.

The Yearbook has been written following the two essential characteristics of C/PBTE, namely, precise learning objectives and accountability. The writers have identified and specified explicit objectives of each chapter. Each author has been selected because of his previous research and unique experience in the C/PBTE field. The first four chapters present a rationale for IAC/PBTE, in the means of effectively dealing with the affective domain in C/PBTE and concerns of the State certifying agencies as well as the current status of IAC/PBTE. Chapters five through eight focus on operational programs by indicating the planning and implementation methodology. These chapters also provide the reader with the author's critiques of problems inherent in IAC/PBTE related to new institutions, institutions with traditional programs, and institutions which have modified their programs through the use of computer-assisted and inservice techniques.

The Yearbook concludes with two chapters: one enumerating the procedures for the evaluation and measurement of IAC/PBTE programs; and the other being a series of recommendations, references, and resources providing the means for continued involvement in IAC/PBTE.

It is the Editors' intent that this Yearbook provide the profession with insights into the topic of IAC/PBTE, and serve as a valuable resource for continued dialogue and research.

Jack C. Brueckman, Jr.

Stanley E. Brooks

Dr. Larry S. Wright

Dr. Wright is currently Assistant Dean, the Graduate College; Program Director, M.S. Degree Program, Industrial Education; Professor, University of Wisconsin - Stout, Menomonie, Wisconsin. He received his BS and MS degrees in Industrial Education in 1947 and 1948 from the Stout Institute, and his Ed.D. degree from the University of Missouri in 1954. He taught at the University of Northern Iowa for 18 years and came to UW - Stout in 1967.

He has authored a drafting textbook, numerous professional journal articles, and completed several research studies. He contributed to the 13th yearbook of ACIATE and is presently co-editor of the *Wisconsin Industrial Education Association Newsletter.* He served a 5-year term as a member of the ACIATE yearbook planning committee, has served three terms as treasurer of ACIATE and was chosen as ACIATE's Man of the Year.

In 1973 he published an eight-part report on the re-evaluation of the base for the professional component of the M.S. degree program in industrial education at UW - Stout which was a validated list of 327 professional tasks of industrial education teachers. In 1974 he contributed to a further refinement of those tasks resulting in *The Industrial Education Teacher's Professional Tasks.* He also chaired a UW - Stout task force to develop a definition of competency-based education.

chapter 1

Foundations of Competency-Based Education

Lawrence S. Wright

Upon completion of this chapter the reader should be able to:

- Describe the significant events that have led to the competency-based education movement.
- Define competency-based education.
- Differentiate between competency, competence, and performance.
- Characterize competency-based education from existing operational practices.
- List at least eight of the issues confronting competency-based education.
- List at least eight major problems inherent in the present state of the art of competency-based education for which resolution is needed.
- Participate with modest assurance in discussing issues and problems related to competency-based education.
- Synthesize one's professional view and evaluate the professional views of others with respect to competency-based education based upon modest knowledge of how the movement developed, what competency-based education is and the issues and problems that confront the concept.

SELECTED SIGNIFICANT EVENTS LEADING TO THE CONCEPT OF COMPETENCY-BASED EDUCATION

Introduction

If one accepts the rather simplistic definition of philosophy: that it is what is believed; and, then defines educational philosophy as: what one believes about education, it would seem, even from a cursory glance at the literature, that there are many beliefs about education and therefore many philosophies of education.

If one's beliefs about education (educational philosophy) guide what one does, given an educational problem, and if these beliefs vary either from person to person or from one group of persons to another, it would seem to be reasonable to expect given educational problems to be attacked differently by those holding differing educational philosphies.

Perhaps it could be argued that research evidence could obviate the above statements as applied to problems in need of solution and indeed this might be the case if all our problems in education had been neatly resolved by this method and systematically cataloged for retrieval. This, however, is not the case. We probably have more unresolved than resolved educational problems. Whether the concept of competency-based education is a good thing is one of the issues in education today. Educators fall into four categories on this issue: (1) those who do not believe, (2) those who are attempting to believe, (3) those who believe, (4) those who are unaware of the issue.

It is the hope (if not belief) of this writer, that to look at selected significant events that have led to the concept of competency-based education may be of interest to persons rgardless of their location within one of these four groups.

Speculating on the Origin and Purpose of Education

In speculating about the origins of education, one is led first to the basic need of individuals to survive: it would seem that all other needs unfold from this one; for, without survival, other prospective needs seem to vanish.

Basic survival needs of people include food, clothing, and shelter. More recently, we have observed the need for ecological balance as it affects survival.

Out of these basic survival needs are *derived* needs. To survive, to obtain food, clothing, shelter, and an ecological balance, individuals must solve the problems with which they are confronted. This then becomes a significant derived need for an individual to survive: to solve the problems with which he/she is confronted.

Long before recorded history we can imagine that individuals found it advantageous for purposes of mutual protection and assistance to band together into societal units. Probably the first of these were family units which later expanded into clans, tribes, villages, cities, counties, states, and nations. Today, even as in the beginning, survival and solving problems are the common threads among our individual needs. With the banding together into societal units, the need to communicate was born. Societal units cannot exist for long without some ability to communicate among the members of the group.

Whatever the form of the first communication, it may have been taught by chance through imitation. As individuals began to see that it was efficient to share what they had learned, probably from solving problems by trial and error, or from observations of their own; they began to pass on what they had learned to their sons and daughters. To teach families the arts of survival and communication was to strengthen the family unit.

Education, then is another significant derived need which, it can be speculated, grew out of the basic need to survive. Whatever the system used to provide it, education is used to pass on the cumulated knowledge from generation to generation so that each individual has the opportunity to profit from and build upon the knowledge and experience of others.

How knowledge is to be transmitted is still an issue. We do not agree on whether learning should be direct, indirect or a combination.

That some system of education be used is in general agreement. What the system shall be is at the center of the competency-based education controversy.

The Need for Analysis of Human Performance

Public education as an institution in the United States during the first half of this century tended to focus on the individual's problems and development. It was believed that to provide the learner with an array of contacts in content believed to be of "much value" by subject-matter specialists was the best education. How the learner might apply what was learned to solve day-to-day problems was left to him/her. The assumption was that the learner, having amassed an appropriate display of courses, credits and grades, would find a way. The emphasis was on achieving the highest possible grades within a normative grading system. This permitted only a few to receive "good grades".

Industry and the military during this same time were not so willing to leave to chance whether the learner could apply what he/she had learned. Industrial training programs could not afford the luxury of inefficiency for economic reasons. The military was painfully aware of the survival requirements its educational programs must meet and for this reason it could not afford education which was not direct and responsive to development of specific performance capabilities.

Growing out of needs for efficiency in industry and in the military, the study of human performance through analysis became one of the significant events in the evolution of the concept of competency-based education.

Analysis to Improve Production Efficiency

Industry, after the turn of the century, began to look at improved means of efficiency in production by studying the worker's performance. Principles of scientific management were being developed by Frederick W. Taylor (1911) sometimes called the father of scientific management. In his book on this subject, he described the situation that then existed as one of "initiative and incentive" (p. 34). By this he meant that workers were ordinarily left pretty much to their own initiatives as to how to proceed with their job and those that proceeded effectively were likely to be given special incentive for their efforts. Management did not know more about the jobs than the collective group of workers who performed them.

In making studies of work performed, Taylor (1911) suggested that:

> Perhaps the most prominent single element in modern scientific management is the task idea. The work of every workman is fully planned out by the management at least one day in advance, and each man receives in most cases, complete written instruction, describing in detail the task which he is to accomplish, as well as the means to be used in doing the work . . . This task specifies not only what is to be done but how it is to be done and the exact time allowed for doing it. (p. 39)

Here we have evidence (*circa,* 1910) of the need for analyzing tasks as they were being performed in industry for the purpose of more effective performance. It might be noted that the performance element was described, the conditions under which the performance was to take place were specified and the time standard for performance was spelled out. The purpose here was not for education. It was for increased production.

Analysis to Improve Instruction

While Taylor worked in the area of "scientific management" for more efficient production and identified the "task" as the most prominent single element, Charles R. Allen was concerned with analysis of tasks *for purposes of instruction* which would subsequently result in production efficiency.

Wilbur (1954) reports on some of the early analysis work by Charles R. Allen.

> During the first World War, as was the case also in the second World War, the United States found itself critically short of skilled workers needed in vital war industries. A method for training large numbers of men quickly and effectively was needed. In this crisis, Charles R. Allen, a leader in vocational education, was asked to study the situation and develop a method for the training of shipyard workers. The study culminated in an analysis of all the "jobs" performed by shipyard workers and the preparation of carefully planned "job sheets" explaining exactly how each should be performed. A "job" was defined as "anything for the doing of which a man was paid." A book by Mr. Allen, entitled *The Instructor, The Man and The Job,* described the method of analysis, the preparation of "job sheets" and how to use them. (p.p. 171-172)

Allen (1919) applied the techniques of analysis of production jobs to the work role of instructor in his book.

The point of this discussion is that industrialists seeing the need for efficiency in production were using the analysis technique to identify specifically what needed to be done and were then holding workers accountable. This effort was intensified by the needs of the military in World War I to produce the goods required for survival. This was followed by wide applications of job analysis in vocational education by Selvidge (1923), Smith (1927) and others.

Uhl (1927) suggested that objectives of education are derived by analysis and that there are different approaches that man has used to this end.

Uhl's work suggests something of the heritage analysis has as a technique for identifying objectives toward which education might be directed, going back as he does to the time of Plato (p. 293).

The interface between the threads of preparation for vocations and the case of analysis for curriculum development in public schools seems to have been suggested by Charters (1923). He indicates that:

> Analysis of activities is not an unfamiliar operation. It has been used as a method of instruction, but its application has not been wide and the present emphasis upon analysis is an effort not so much to use a new method as to make wide application of a method which has been used for a long time in a few situations. (p. 35)

He goes on to say that techniques of analysis are valuable in the public school curriculum:

> The public school curriculum. — In the reorganization of the course of study in the elementary schools we have now considered three points. We must, first of all, determine the size of the unit for which the curriculum is to be organized . . . after the unit has been selected, it is necessary, in the second place, for the faculties of the schools, the school boards, and public-spirited citizens generally, to decide upon the ideals which shall dominate the instruction of the youth in schools. Then, in the third place, an analysis must be made of the important activities of laymen, irrespective of the vocation which they may enter; this involves making an extra-vocational analysis; and, finally, determining after the analysis the essential elements of learning common to all vocations. (pp. 54-55)

Charters seems to be among the earliest writers to recommend the use of analysis techniques to curriculum development outside of the realm of vocational subjects.

In defense of the permissive posture of public education, it should be said that although it was responsive to the prevalent beliefs of educators of those times, there were notable exceptions. To name one, Dr. Ralph Tyler (1973) was working with teachers of undergraduate biology at the Ohio State University (circa, 1930) to help them to construct better examinations and to improve the effectiveness of their instruction. As he worked with them he found:

> that these biology teachers were seeking to help students learn to use the subject in their own contact with biological phenomena and did not consider memorization of details of content a major purpose of the course. From their experience with students, they had found that some who could answer questions on content details could not use biological concepts and principles in explaining the phenomena that they encountered in the laboratory or in the world outside.

> This led me to realize that it was important in constructing an achievement test to identify the one or more kinds of things that students were expected to learn so that test exercises would be designed to furnish an opportunity for students to *show* the extent to which they had learned these things. (p. 55)

Role of Training Psychology in Developing Complex Skills

Although World War II, as in World War I, focused attention on the need for efficiently preparing production workers in industry, another need provided an additional link in the evolution of the concept of competency-based education.

The military training needs were often for development of highly complex skills in relatively short periods of time. With the increase in technology, an increase in the complexity of job was evident. The area of training psychology proved to be effective in preparing persons to fill a wide variety of complex roles to a high standard such as aircraft pilots, electronics technicians, and crews who could work together successfully in teams.

As Joyce (1971) pointed out:

> Up to that point, universities and schools had been leisurely and general, for the most part. Most educators and psychologists who had been concerned directly with education focused on the problems of the individual learner and his affective responses to training. Thus they tended to focus on educational strategies which gave the student an opportunity to develop himself on his own terms and which paid maximum attention to his need structures and his emotional responses to the training that he was to undergo. (p. 20)
>
> . . . The urgency of war conditions took attention away from the needs of the learner and toward the need for precise and rapid training which considered the learner chiefly in terms of his capacity to respond to the training and his ability to hold himself together during a rather arduous training process. (p. 21)

Psychologists, to meet these highly specific needs, developed training systems which could deliver, in relatively short periods of time, persons who could function well in pre-specified work roles.

Joyce identifies four steps which result in this type of preparation:

1. The identification of the program goal in terms of sets of specific behavioral elements which fit together to define the competency of the trainee at the end of the training program . . . For example, the task of the pilot is defined in very specific, interrelated behavior streams even though very complex operations

are involved. *Specificity* and *relatedness* of behavioral elements are essential.

2. The organization of these behavioral elements into coherent units or groups which could form sequenced streams for training. Again in the case of the pilot, some of his activities involve communication to other members of his air crew. Yet others involve communication to the aircraft and the ground-control systems. Still others include navigation. All these are in addition to the complex skills related to the flying of the aircraft, the preparation for operations such as bombing and the like. Each of these complexes of activities can form behavior streams consisting of sequences of behaviors leading from those which are simple to more complex ones. The later, complex performance is thus dependent on the acquisition of prior skills and knowledges.
3. The development of training exercises which could be matched to each of the behaviors in each stream. Sometimes this involves the development of a general setting in which a sequence of skills can be taught — such as the pilot simulator which enabled the practice of skills ranging from communicating with ground control, starting the engines of the aircraft, through to flight conditions including combat problems. At other times the exercises are simple and discreet, including programmed tasks and simple exercises.
4. Creating the evaluation system. Related to each training exercise is an evaluation device, preferably administered immediately after or imbedded within the training task, to determine whether the behaviors were acquired and to provide immediate feedback to the trainee, or the instructor, on achievement of skills. This is one of the critical steps in developing a training system and one which differentiates it most dramatically from indirect training methods. (p. 22-23)

The prior steps lead quite naturally to the development of a managed program in which evaluation is monitored by a system which can determine progress of all trainees, strengthen weaknesses of particular aspects of programs, and so on.

The importance of evaluation systems explains why training psychologists adopted the practice of stating behavioral objectives in measurement terms, even using sample test items as exemplars of the specific behaviors which would be required to complete a training unit or module. It does not help the trainer to have a behavioral objective defined precisely if the measurement is not included and one can determine whether the behavior has been achieved. In other words, the particular positivistic convention that became established was to state objectives always in precise terms that specified the conditions under which they might be measured. Whether this is necessary for all education is not clear, but in the urgency of crash-

> training programs, it is quite understandable and seems so obvious that questioning it has not been done frequently or with any great thoroughness although the practice *has* been severely criticized. (p. 25-26)

Thus, here we have the development by teams of people responding to the training demands of World War II in developing a system which efficiently produced the desired results.

Cybernetic Psychology

Another of the bases for competency-based education lies in cybernetic psychology which provides a way of thinking about learners and training systems.

Joyce explains that:

> If we conceive of a person as an automatic, self-regulating, information processing system and liken it to an electronics communication system which is capable of receiving information from the environment and modifying its own behavior to become more effective in its environment, we get a picture of a computer connected to its environment by sensors. This machine processes information on its own behavior (as that behavior relates to the environment) and learns by experience.
>
> If we take this step further and suggest that an environment be built which facilitates the effectiveness with which these sensors can detect the performance of the individual in its environment (if, in other words, we build a machine designed to fit very closely the requirements of the human machine), we can conceive of developing training systems made up of tailored environments and training tasks which lead the student to practice new skills and improve his performance by responding to feedback to his behavior. (pp. 28-29)

The result is simulated systems designed for training purposes.

Joyce illustrates this through describing what it might be like to teach the behavior of employing advance organizers in teaching:

> Now, let us suppose we take a cybernetic stance toward the same problem. Let us build a teaching laboratory in which our teacher candidate can be presented with an instructional system or with a seminar or lecture or series of readings designed to teach him what an advance organizer is and how it can be used. Let us provide him in the teaching laboratory with a small group of learners with whom he can immediately try out what he has learned. Let us further provide him with observers who can consult with him about the nature of his organizer and help him compare his procedures with those that others have used

in similar circumstances. As he teaches, let us provide observers who can analyze his behavior and feed that back to him. In addition, let us help him construct measures to determine whether the organizer functioned for the children. In his environment, he receives a tremendous amount of feedback about his knowledge of organizers, his ability to construct them, his ability to present them to children, and the effects that they had on those children. He is then in a position to correct his own behavior, to modify what he is doing according to criteria related to the learning that he was supposed to be acquiring. (p. 31)

As a summary of this point Joyce suggests that:

If critical, complex warlike situations can be simulated effectively, in the development of cybernetic trainers, it seems reasonable to suppose that the relatively more tame environment of the classroom can be simulated with a realism to be effective for training purposes. (p. 33)

Gagné and Analysis of Human Behavior[1]

The report that seems to provide the best rationale for the use of analysis of human behavior required as a basis for the development of programs of learning leading to successful work-role performance is by Gagné (1965). Gagné identifies three broad goals of education upon which he believes there is high agreement:

1. Making it possible for the individual to participate in and to share with other people a variety of aesthetic experiences.
2. Development of responsible citizenship.
3. Development of individual talents to the end of achieving satisfaction in a life work or vocations. (p. 2)

He raises the crucial question of: How can we tell when an individual has achieved these goals? To answer this question, he suggests that we must "analyze, or break down into smaller components or stages, the progression towards these goals" (p. 4).

"The fundamental reason why human performance is related to education is that it must be used to define what happens, or what is supposed to happen, in the educational process" (p. 4).

[1]Excerpted from Robert M. Gagné, "Educational Objectives and Human Performance," in John D. Krumboltz (Ed.), LEARNING AND THE EDUCATIONAL PROCESS, © 1965 by Rand McNally & Company, Chicago, pp. 2-21. Reprinted by permission of Rand McNally College Publishing Company.

"Human performance is the fundamental class of data one must have in order to infer learning" (p. 5).

"One cannot tell whether learning has occurred until a difference in performance is observed" (p. 4).

"Since observable human performance forms the basis on which the inference of learning is made, it would seem to be a corollary that these same performances should constitute the objectives of education" (p. 5). However, Gagné (1965) points out that to define objectives by human performance is the subject of some debate. There are two primary issues: (1) accomplishment versus direction of change and (2) long-range unanticipated outcomes versus intermediate specified events.

First, there is the argument that objectives should state what is to be attempted, not what is to be accomplished. In line with this idea, one sometimes finds objectives stated in some such way as this:

The student should acquire a developing awareness of the magnitude of the solar system and the universe; or, The child should become increasingly confident in extemporaneous oral expression.

It is difficult to know what to say about such statements except that they are weasel-worded. Why is it not possible to say exactly what one wants the student to do in showing his awareness of solar system magnitudes. Why is it not possible to state what kind of extemporaneous oral expressions one expects the child to perform? The answer may be of course, that the latter kind of objectives can indeed be stated, but not all students will attain them. Unfortunately, this is probably true under present circumstances. It would be good, though, if we could amend the statement to read: "Not all students will attain them with the same speed". Then they would still remain objectives which any intelligent person could identify rather than descriptions which, if not deliberately hedging, are at least ambiguous. (p. 5-6)

A second kind of objection to clearly stated objectives is a much more serious one. It runs like this: "I can't be sure exactly what the student should be able to do at the end of some period of instruction. In fact, I am not interested in this. What I am interested in is how he will perform five or ten or even twenty years hence." (p. 6)

This is the only reason I can see that it is more serious, because actually it is intellectually insupportable. If one is actually interested in performances which will appear ten years hence, there is nothing wrong with that. Two courses are then available. The first is to perform some longitudinal studies to determine what differential factors are in the current educational backgrounds of people who behave desirably and people who behave undesirably at some future time. Alternatively one could experimentally introduce certain differences in the education of groups of present students, and follow them up after five or ten years to see what kinds of decisions they make. Both of these techniques are of course well known to behavioral scientists, and successful studies have been and are being done to find answers such as these. (p. 7)

If we must have hypotheses concerning the precursors or determinants of some ultimate performances in advanced stages of education, or in adult life, by all means let us do so. But there is no reason not to make these hypotheses explicit. In fact I should call it presumptuous not to do so. (p. 7-8)

But I return to an earlier point — unless it can be demonstrated that learning has occurred, the expectations of some *other* outcome seems slim indeed. And if one expects that learning is going to occur then this means there must be a demonstrable change in performance. There may be some other unexpected kind of change, but there *has* to be some particular kind of change that can be specified. And that brings us back to human performance, since that is where the observable change will appear. There would seem to be no valid reason why such performances cannot be described. (p. 8)

It seems clear enough that performances must be explicitly described whether they are long-range goals or not, and that even when we are interested in a direction for behavioral change that this can be identified by careful wording.

Gagné (1965) then reports three reasons for seeking to define educational objectives in terms of human performance.

These objectives are used to tell us whether the inference of learning can be made. They are used as specifications of the kinds of questions to ask the student in assessing his current capabilities. They become important guides for the teacher's behavior in selecting appropriate instruction. And they could probably be used to greater advantage than they are at present in informing the student of goals to be achieved. (p. 10)

Any description of human performance must contain a strong verb referring to observable human behavior. Such a verb is the action part of the tasks which are to be performed. Gagné (1965) states that:

The task is, then, an extremely useful unit of description, which can be rather readily identified for any job, old or new. (p. 12)

These tasks as descriptions of behaviors should serve in these ways: (1) they should express a purpose which makes sense within the larger context of the person's life goals; (2) this purpose should be distinguishable from others (p. 13).

Gagné sees three reasons for analyzing human performance:

1. In designing a curriculum, it becomes very evident that certain objectives depend on other ones. (p. 14)

2. Closely related to this reason for breaking down educational objectives into finer units is *the need for assessing student progress.* (p. 15)
3. One of the most important reasons for analyzing objectives is *to determine some important facts about the conditions* for learning them. (p. 16)

As a consequence of analyzing objectives Gagné (1965) sees two major outcomes:

> a marvelous possibility becomes evident: all of this tremendous variety of human performance begins to fit together into categories, which can then be dealt with and thought about as classes of events, rather than as separate and distinct ones. (p. 17)
>
> By utilizing a relatively small number of categories or classes of behavior which are important to education, the steps that a student may take toward each more generally stated objective can be specified.
>
> There are three implications suggested for the use of these behavior categories.
>
> First, the establishment of each of these categories of performance requires a different set of conditions for learning and thus makes a difference in the method of instruction used to bring it about...
>
> Second, each of these performance classes implies something different with respect to the sequencing of instruction within a topic to be learned...
>
> Third, the classes of performance which are analyzed out of educational objectives suggest the possibility of "diagnostic" assessments of student progress along the way to a more comprehensive goal. (p. 20-21)

Gagné's positions seem to clearly show the importance of specification of the work-role requirement to programs of effective preparation. Certainly, teachers would be better able to execute their tasks if these were explicitly stated and sound strategies were employed to lead the prospective and inservice teacher to competency in each task.

Events of the Last 20 Years

During the last 20 years several other factors have contributed to the development of competency-based education.

1. Programmed learning promoted the careful analysis of content to develop a systematic movement from step to step.
2. Bloom's, Krathwohl's and Simpson's taxonomies provided a base for analysis and a structure for the cognitive, affective and psychomotor domains.

3. Efforts to individualize instruction called for careful analysis and specification of behavioral objectives into carefully sequenced instructional groups.
4. "Packaged instruction" required an analysis of elements of instruction in order to permit orderly progression of the learner.
5. Systemization of instruction and management by objectives were based on analysis of elements and careful organization.
6. Assessment and accountability depended upon clear statements of prerequisite tasks, instructional tasks and criteria for performance.
7. Dissatisfaction and criticism of the schools resulted in clear needs to make schools and instruction more relevant.
8. Use of computers permitted handling of more data and again require analysis of content into component elements.
9. Federal funding permitted innovative approaches and usually encouraged systematic development of instruction based on analysis.
10. Military training programs were quite successful in developing instructional systems based on analysis of the needs of persons occupying various work-roles in the military.
11. Flexible and modular scheduling techniques are based on careful analysis of content and "mods" that are appropriate to instruction in varying time blocks.
12. Sputnik and the notion that our educational system was inefficient caused a re-examination of the system toward the end of improving it.

The Philosophical Base

As one searches for the philosophical base for competency-based education through the literature, one becomes impressed with the idea that it is a concept that has emerged in an evolutionary way rather than a new theory that has been suddenly spawned out of a new set of principles of an uncommonly rational philosophy handed down from a gifted individual or group.

Klingstedt (1972) states that

> "Competency-based education" (CBE) is founded on educational justifications derived from the philosophy of education known as Experimentalism. (p. 10)

He goes on to suggest that

> The birth of competency-based education did not come as a surprise — indications of its impending arrival were present for some time . . .
>
> Ideas do not just materialize "out of the blue". They have a source — they are rooted in a pattern of thinking. (p. 11)

He lists programmed instruction as one of the "indications of its impending arrival" and experimentalism as the thought pattern that gave us CBE with "its emphasis of studying man by scientifically studying his behavior".

Additional relationships between CBE and experimentalism are identified as

> The use of behavioral objectives
> Hierarchies of behavior based on step-by-step learning
> Planning of instructional sequence to give immediate feedback
> Use of pretests
> Emphasis on competency attainment rather than grades
> Criterion levels which are absolute, based on experience and always related to a specific time and situation
> Providing alternative learning routes based on psychological data which indicate that different people have different learning styles
> Use of technology to enhance the learning experience (p. 11-12)

Elvira Tarr (1973) states that there has been no thoroughly developed position to support CBTE. (p. 3)

She alludes to Stanley Elam's (1971) widely quoted five essential elements of Performance-based Teacher Education saying that

> Although Elam states that his elements are "theoretically-based" what we are presented with is a "strategy" that seems to have its genesis in psychological research but is concerned with teaching". (p. 5)

She distinguishes between teaching theories and learning theories to add clarity to Elam's claim. She refers to teaching theories as being primarily prescriptive, dealing with what *ought* to be done to facilitate learning and to learning theories as being primarily descriptive dealing with explanations of how learning occurs. She concludes that:

> An examination of CBTE in the light of the distinction above suggests that it is neither one, nor the other, though perhaps a little of both. (p. 5)

These remarks would tend to support the position that competency-based education has evolved from a combination of events and that perhaps, although not having the benefit of considerable time to evaluate its effect, it represents one position with respect to the state-of-the-art in dealing with educational matters at this particular point in time.

According to the AACTE committee (1975), although relationships can be identified between competency based education and experimentalism, it does not represent a particular philosophical approach. Rather, competency-based education is an approach or a process which can accommodate varying philosophical view. This process is based on a collection of ideas growing out of both accumulated research and practice. It is new, but dynamic, in that as new evidence and practice suggest, modification of the process and the definition continue.

David A. Trivett (1975) in one of the more recent references at this writing has identified from the practice of several competency-based programs, those ideas which can be generalized. These are listed under his extrapolations from (1) behavioral objectives, (2) mastery learning and (3) testing for competence:

1. *From behavorial 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. That outcomes of student learning should be verifiable by other competent persons than those proposing the objectives;
4. That to 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 material;
7. That incremental levels of accomplishment will be most conducive to long-term learning and perseverance 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 "criterion 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. (p. 8-9)

DEFINING COMPETENCY-BASED EDUCATION

Root Word Is "Competent"

What is *competency-based education*? The answer seems so obvious: competency-based education is education based on competencies. The root word is *competent* and requires more careful examination.

Dictionary definitions include:

1. well-qualified
2. answering all requirements
3. having requisite abilities or qualities
4. capable
5. adequate
6. sufficient without excess
7. legally qualified or fit

Implicit in the word *competent* is the assumption that competence in a given task can be held to differing levels of proficiency. Moreover, while the words, *adequate, sufficient without excess,* and the like, imply less than the highest possible proficiency level, competency really does mean *answering all requirements, well qualified,* and *having requisite abilities and qualities.*

Competency as a Descriptive Label

Kidd and Natalicio (1972) describe competency as only a descriptive label of a static condition (p. 16-20).

They point out that comparisons are made with pre-specified behavioral criteria. Competencies:

> are labels given to the comparison of the measurable output of this process of synthesis with some predetermined performance standard. (p. 19)

They use as an illustration a football team whose several sub-systems contribute in their performance to the total performance of the whole team. Competencies of individuals contribute to the competencies of the sub-groups such as the backfield. The performance standards for the backfield are ordinarily rather clearly defined. Having performed, the performance is subject to analysis and assessment. The performance is being analyzed at a particular point in time. A competency label can be ascribed to this observed performance. Appropriate feedback can improve the performance of the sub-system so that its competency-level can be modified in future performance.

Competency-based learning they say is:

> simply a summary label applied to the ongoing sequence of particular interactions which have been systematically designed to approach and finally to approximate the particular performance standards. (p. 18)

Competency Must Have an Object

There must be some object or relevant role toward which competency development is directed. One obviously should be competent in something. What then is the class of objects with respect to which one can be competent? The answer seems to lie in the domains of knowledge: cognitive, affective, and psychomotor. Competencies may be developed in any one or combination of the domains of knowledge. This provides a theoretical model for instructional decision making. This is not to say that we know with precision how to make decisions equally well in each domain nor that we can measure with equal ease whether competence has been developed within each domain. It is to say, however, that to the extent to which we can specify role-relevant outcomes, that we can identify the competencies needed for successful performance and that we can design instructional programs which will guide learners toward acquiring these competencies in a reasonably efficient manner.

It follows that if competency-based education is role-relevant, relevant roles must be carefully studied and analyzed in order to be assured of that in which the competency is to be developed.

Competency-Based Implies Criterion Standards

Klingstedt (1972) suggests that: "Competency-based education is based on the specification or definition of what constitutes competency in a given field" (p. 10).

In addition to the careful pre-specification of competencies, criterion standards are listed which permit judgment to be made about whether the pre-specified behavior was, in fact, accomplished.

Kauchak (1973) says it this way:

> Competency-based education also emphasizes the execution of predetermined activities, but *in addition* is concerned with the establishment of criterion standards for the execution; and with the level of proficiency at which the activities are executed. (p. 132-133)

Competency-Based Education as a System

Competency-based education appears to have emerged at least tentatively as a system. In a definition by Place (1973) a *competency-based curriculum* has been defined as: "A system designed to provide instructional data to interested parties (p. 2).

Bruce Joyce (1971) thinks of competency-based education as an attempt to manage education.

> The case of competency-based education is not unique in the history of educational trends except that it is more technical than any previous general movement in education, and it represents an attempt to manage education (bring it under the direct control of the policy maker) more than to influence its goals or methodology. (p. 1)

A Definition

In the light of the foregoing let us propose a working definition for competency-based education:

Competency-based education is a system of education designed to develop pre-specified, role-relevant competencies in those who are products of the system.

Input-Process-Output Model

At the elementary level, the accompanying input-output model suggests how a single competency is developed.

If pre-assessment reveals existence of the competency the process is skipped. If not, the learner experiences the activities designed to bring about the specified competency, then is assessed to determine whether he/she has the competency. If so, he/she exits the model. If not, based on the feedback from the assessment the learner returns to additional behavioral interactions which may be the same as before or not. In theory the learner can leave the process portion of the model when assessment shows that he/she does possess the competency.

In a competency-based system, collections of competencies are either developed or found to exist. Each one of these within the collection can be modeled as in Fig. 1-1.

Figure 1-2 suggests a similar model for the development of competencies appropriate to a particular role. Within it are the many sequences of behavioral interactions which are subsystems.

Fig. 1-1. Subsystems Model for Developing a Competency

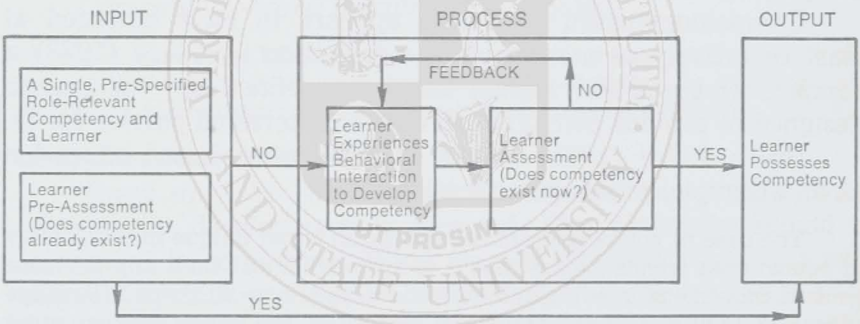
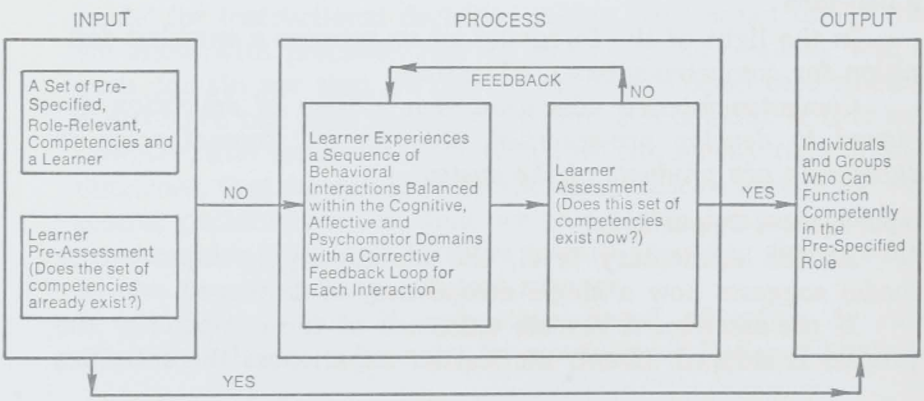


Fig. 1-2. Systems Model



The collection of these subsystems make up the integrated behavior of individuals who are to function in the role whether it be an occupational role, a professional role, or a general role such as citizen.

CONTRASTING COMPETENCY AND PERFORMANCE

The AACTE Position

Considerable debate has taken place at meetings and in the literature over whether *competency-based, performance-based* or either one of these terms may best be used to describe the concept. Although some of the contrasting examples which follow are from the field of teacher education, the points made in this comparison are equally applicable to any dimension of competency- or performance-based education without reference to field.

A committee of the American Association of Colleges for Teacher Education (1971) has taken the view that it doesn't matter which term is used if the operational principles are agreed upon:

> The AACTE Committee on Performance-Based Teacher Education has chosen to retain the term "performance-based" in the belief that the adjective itself is relatively unimportant if there is consensus on what elements are essential to distinguish performance- or competency-based programs from other programs. (p. 6)

Three years later in reviewing its position the committee (1974) stated that both terms are needed since the concepts implied in each are included in the programs no matter which term is used to describe them:

> The AACTE Committee decided to stay with its original title, largely for reasons of convenience and because it saw no compelling reason to change. It is perfectly happy if anyone else wishes to use the term CBTE and considers the terms interchangeable within the context of its work. (p. 11)

Arguments for More Precision

A caution is suggested. Competency and performance are obviously different words and presumably do have differing meanings. This being the case, it would seem wise to examine these terms more carefully. We may have an idea or concept of significant value and it would seem a shame to cloud possible acceptance by imprecise terminology.

> Competency-based emphasizes a minimum standard; it adds criterion levels, value orientations, and quality to the definition of the movement. (Houston, 1972, p. 26)

Dictionary definitions of *performance* focus upon the execution of an action, something to be accomplished. Fears are expressed that performance may connote physical activity only. To the extent that evidences of performance are the evidences of the existence of competency, performance may be the desirable term. However, performance carries with it the past-tense of having performed while competence suggests the capability to perform. Accordingly, *competency* defined as *having requisite abilities* or *qualities to specified minimum proficiency levels* seems to the writer to be the better choice for the name of the system.

CONTRASTING COMPETENCY AND COMPETENCE

Another pair of terms over which discussion centers in the literature is competency and competence. The dissatisfaction with the word competency may be inferred from the statement that "the whole is more than the sum of the parts". An excellent article taking this position is one by Bob Knott (1975).

One would not (and could not) effectively argue against the need for competence. Indeed in our earlier presentation we have used "competent" as the root word. It would seem, however, that one could argue with the statement that "the whole is *more* than the sum of the parts". If something more than the sum of certain parts exist, then this too, must be clearly stated and it simply becomes a competency at a different and probably higher level. Competencies should be identified that require integration and utilization of sub-sets of competencies. Thus, in competency-based education, the whole is not more than the sum of the parts. The word "competency" is the noun that describes each output element whether large or small. Competence, on the other hand is a noun or characteristic of one or more persons who are capable of performing collections of competencies.

In attempting to make such a distinction Houston (1972) suggests: "Both performance-based and competency-based express important elements of the movement — one focusing on objectives, the other on criteria" (p. 25).

> Objectives describing a behavior but without additional criteria lead to performance-based education; while behavioral objectives with performance criteria lead to competency-based education. (Burns, 1972, p. 39)
>
> The word "performance" itself connotes action or motion regarding some task or activity, implying not random movement but rather a disciplined and orderly flow in which there are present some constants providing structure to and continuity within the action. (Aubertine, 1973, p. 6-7)

Characterizing Competency-Based Education — An Operational Definition

The literature reveals many more statements of characteristics, of competency-based education than definitions of it. Apparently the choice of these writers has been to define it in operational rather than conceptual terms. This may be one of the reasons for the confusion that exists. By identifying the characteristics of competency-based education as they are proposed operationally, it is hoped that a more adequate view of competency-based education will be provided.

ACCTE Statement of 1974

As the base for this chapter the work of the AACTE Performance-Based Teacher Education committee is quoted at some length. This committee has published, to date, nineteen bulletins on performance-based teacher education over a period of five years. In February of 1974, the committee itself wrote and published the 16th bulletin in the series: *Achieving the Potential of Performance-Based Teacher Education: Recommendations.* It will be recognized that this is the committee referred to earlier which has taken the position that either competency- or performance-based education can be the term that is used. In this considered report, before they deal with teacher education, they have set forth characteristics of *any* performance-based instructional program,

1. The instructional program is designed to bring about learner achievement of specified competencies (or performance goals) which have been
   — derived from systematic analysis of the performance desired as end product (usually that of recognized practitioners) and
   — stated in advance of instruction in terms which make it possible to determine the extent to which competency has been attained.
2. Evidence of the learner's achievement
   — is obtained through assessment of learner performance, applying criteria stated in advance in terms of expected levels of accomplishment under specified conditions and
   — is used to guide the individual learner's efforts, to determine his rate of progress and completion of the program, and ideally, to evaluate the efficacy of the instructional system and add to the general body of knowledge undergirding the instructional process.

The foregoing implies, of course, that

1. Instruction is individualized to a considerable extent.
2. Learning experiences are guided by feedback.
3. The program as a whole has the characteristics of a system. (p. 7)

A statement of special concern on this point was prepared by committee member William H. Drummond (1974) as follows:

> A good human system does not have to have a completely clear view of the end product. A good system recognizes that man's knowledge is limited; that teaching is situation specific. The task, therefore, is to forecast goals as well as one can using the data which are available. Then, using science and current professional knowledge, institutions should forge ahead with programs which make each activity a learning enterprise for the institution, the staff and the students. This process used to be called action research. (p. 38)

4. Emphasis is on *exit* requirements
5. The learner is considered to have completed the program only when he has demonstrated the required level of performance.
6. The instructional program is not time-based in units of fixed duration. (p. 7)

In the AACTE report the committee goes on to discuss the word *competencies*. Additional significant discussion is presented and then closes with a claim for the power of performance-based instruction:

> The point should be made, also, that the term "competencies" in the statement of essential characteristics does not refer solely to discrete skills and descriptive knowledge but may include much more

complex attributes such as the ability to marshal evidence, to reason logically, to appreciate beauty, etc.

The formula for performance-based instruction is deceptively simple: careful definition of performance goals in assessable terms and guidance of instruction by evaluation of learner performance. It might well be argued that any sensible approach to instruction included formulation of goals and assessment of student progress. And so it does. The essential distinction lies in the degree of explicitness and realism with which goals are defined — their direct relationship to the learner performance ultimately desired — and the degree of rigor with which the evaluative process is carried out in direct consonance with the stated goals. The stress on performance is intended to lead those responsible for the instructional program constantly to check that program against the goal it is ultimately intended to achieve — the desired performance of the practitioner — not to be satisfied with attainment of proximate goals within the instructional process which tend over time to become ends in themselves. (p. 8)

Committee member Drummond expressed concern with respect to the possibility of closing the system:

There is a danger that a system may become closed — that is, it may become unable to change as conditions external to the system change. Both a system and a scientific experiment tend to focus attention and energies exclusively on events which lie within the parameters of the problem or the system. PBTE programs may be vulnerable to this problem. PBTE programs probably should be shut down periodically to see if the operating goals and objectives are worthy — whether the underlying assumptions are still appropriate in relation to the human condition and the problems of the world. (p. 38)

It is important to recognize that the characteristics listed above would apply to any performance-based instructional program regardless of the age of the learners, the type or complexity of the learning task, or the values of the society in which it was carried on. They would apply to marksmanship instruction in Hitler Germany, teaching of Red Cross life-saving to adults in Russia, or teaching prospective teachers in America how to diagnose reading difficulties. If the program met the above criteria, it would be performance-based instruction. It should be noted that nothing is said about instructional techniques, the usual focus of discussions of instructional programs. Under the foregoing definition, a wide variety of instructional techniques may be used — lecture, discussion, laboratory exercises, problem solving, field experience, microteaching, game playing, etc. The specific technique used is not unique to the concept of performance-based instruction and, therefore, does not enter into the definition. It is generally the case in actual practice that instruction is individualized, although these are not essential defining characteristics. Moreover, the concept implies no special relationship between the learner and the instructor and no particular role for the student other than the traditional one of "doing his lessons."

> Performance-based instruction, so defined, is a powerful model, minimizing waste in the learning process by clearly defining goals and by the continuous use of feedback. It is limited in that it can be applied with full rigor only where the objectives sought can be defined in advance in terms which allow the degree of attainment to be verified. This requirement makes it difficult (but not inherently impossible) to apply the process where the outcomes sought are complex and subtle and particularly where they are of an affective nature. (p. 8)

Other Characteristics

Another characteristic for the performance-based curriculum is that it focuses on the student in the teaching-learning process.

Johnson (1973) explains that competency-based education should make "realistic allowances for differences among learners" including "their accumulation of experience, extent of achievement, and rate and style of learning" (p. 2).

Hamilton (1973) speaks to the independence of performance evaluation to others: "Competency-based programs are criterion referenced and thus provide information as to the degree of competence attained by a particular student teacher, independent of reference to the performance of others. (p. 3)

Re-enforcement of criterion referenced measurement is suggested by Elam (1971) when he states that: "Greater congruity between objectives and evidence admitted for evaluation purpose" (p. 11) is characteristic of competency-based programs.

Johnson (1973) relates objectives directly to relevant roles suggesting that a characteristic is that competency-based education insures that one can do the job as opposed to just "learning about it" (p. 2).

In the AACTE statements presented earlier, it was suggested that affective outcomes were difficult but not inherently impossible within systems of competency-based education. In a paper delivered to the Association for Educational Data Systems, (1973) the position is taken that: "Competency-based education is morally neutral in that it is not inherently positive or negative in contributing to a humane educational environment" (p. 2).

Hamilton (1973) in her extensive review of competency-based education projects of the U.S. Office of Education has this to say:

> The directors claim, however, that the CBTE approach need not make teacher training inhumane and mechanical: specification of be-

> havioral objectives does not preclude the attainment of other, equally important, objectives in the affective domain. (p. 24-25)

A problem has been that some educators become so concerned that a high level of precision measurement must be available for each and every competency that they take the position that competencies which do not meet this measurement criterion must be excluded from the competency-based curriculum. This does not seem to be a sound position. There are affective areas that do not lend themselves to precision measurement at this time. It does not follow that these areas should be omitted from the curriculum. Perhaps a more realistic idea would be to include whatever is significant, measure it with whatever devices can be designed, and continue the search for better measurement techniques.

FUNCTIONS OF "COMPETENCY" AS A LANGUAGE

Six functions of competency are identified in a paper on "Competency: The Language of the Behavioral Objectives Movement." (Craig, 1973)

The *Binary Function* of competency is its ability to turn some people "on" and others "off". This would suggest its relationship to philosophical views. Some believe in a behavioral approach and some do not.

The second function is the *Communication Function.* This function reduces or eliminates communication failure. Craig states that: "This is the most frequently used function, but because of the language's novelty, fluency varies and risk of massive communication failure is inherent" (p. 11).

The *Suggestive Function* produces both major and minor instructional development. "Goals expressed in competency readily suggest innovative experiences in methodologies organically related to the goals" (p. 12).

In the *Investigative Function*:

> Educational researchers have long been using a variation of competency in the investigative function. Their research hypotheses (a competency dialect) provides for a series of observable independent and dependent variables such as I. Q., achievement, attitude and age. (p. 12)

The *Generative Function* is theoretical at the moment. Craig cites as an example of how it might become operational that: "educational philosophers of most orientations might enjoy productive and powerful philosophical speculation". (p. 12-13)

The final function in his list is the *Valuative Function* as he states:

> All persons involved in CBTE have used Competency at one time or another in the valuative function. Discussions on the characteristics of a model teacher, on how to distinguish among various levels of teaching ability, and on competency-based professional certification involve Competency in this function. As it happens, most of the negative orientations toward CBTE originate in this function. For example, when a person makes a tentative commitment to Competency in the binary function he very quickly finds himself embroiled in a debate over model teacher characteristics or assessment procedures using Competency far above his level of fluency in the valuative function. Discouragement sets in and the individual rejects Competency, reverting back to the generalities of descriptive English which usually characterize such discussions. (p. 13)

The foregoing discussions indicate that there is increasing agreement among those who are working with the concept of competency-based education as to what it is operationally. This is certainly not to say that all are in agreement, nor that criticism does not abound. It does say, however, that as more professionals work with the ideas that there is emerging a set of characteristics which can be ascribed to the concept and which will probably become more clear with further research and experiences.

SELECTED ISSUES AND PROBLEMS

In examining foundations of competency-based education, one becomes aware of a number of issues and problems. This is not so unusual. A good many issues and problems surround almost any educational position that one might take. Selected issues and problems are presented here without discussion to "round out" this chapter on foundations. Other chapters deal with issues and problems in more detail.

Issues

Following are set forth what appear to be the chief issues presently confronting the competency-based education movement. Since issues are debatable it will be for the reader to judge for himself where he stands on each.

1. Can all competencies for a given role be specified?
2. Can all competencies that can be specified be measured?
3. Can competencies accommodate affective education?
4. Should the time period for development of a given competency be specified?
5. Does CBE promote only the teaching of the insignificant through its reliance on analysis of elements and its requirements of measurable outcomes?
6. Does CBE have an adequate philosophical base?
7. Does the CBE movement promote a closed system unable to cope with change?
8. Because CBE already means so many things to so many professionals, does it really have any chance for success?
9. Will the profession accept an innovative concept which tends to provide the vehicle for holding them accountable?
10. Is the "competency" concept so difficult in practice that its potential may never be reached?
11. Can the extensive resources required be made available to implement the concept?

Problems

While issues are defined as debatable, problems are identified and await solution. Critics as well as proponents of CBE have identified an ample supply of problems. Even if we were all to turn our attention to these there remains the question of whether viable solutions can be found.

1. How can an adequate research base be established?
2. How do we determine who is competent?
3. What are adequate assessment and measurement devices for CBE?
4. What are desirable systems of management for CBE including credits, credentials and certification?
5. How may narrative evaluations be made more efficient?
6. How can financial requirements be met?
7. In an essentially individualized program how are group activities scheduled?
8. At what level(s) of specificity should the parts of CBE be defined?

9. When do we stop further specification and sub-division of competencies?
10. How can teacher acceptance of CBE be developed (promoted)?

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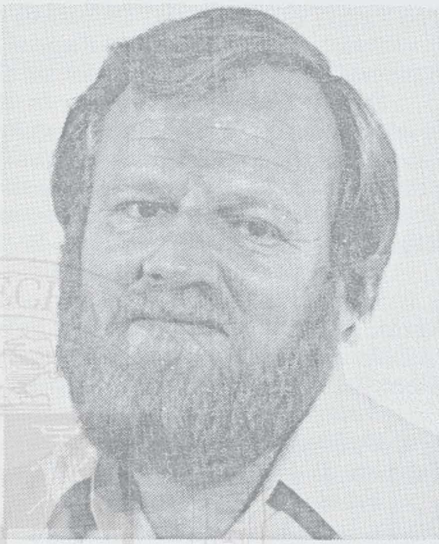

Dr. John Kampsnider

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While completing his Doctoral Program in Educational Psychology at the University of Utah, Dr. Kampsnider developed the *Interaction Laboratory for Teacher Development* for the competency-based teacher education program at Weber State College in Ogden, Utah. He subsequently joined the faculty of the School of Education at Florida International University where he presently is an associate professor in the Division of General Professional Education. Since his arrival at F.I.U. Dr. Kampsnider has developed the affective component of the competency-based teacher education program and continues to speak and write in the area of competency-based affective education.

chapter 2

Affective Teacher Education in a Competency/ Performance-Based Program

John J. Kampsnider

Upon the completion of this chapter, the reader will be able to:

- Utilize positive value statements to describe the role of affective learning as it relates to the training of teachers.
- Describe in positive attitudinal terms the use of affective learning techniques in a competency-based teacher training program.
- Describe and analyze the affective components of a competency-based teacher training program.
- Describe the relationship between affective and cognitive learning as it occurs in a competency-based teacher training program.
- Identify the major problems of implementing affective learning in a competency-based teacher training program.
- Identify at least four major affective training techniques that can be used in a competency-based teacher training program.

HUMANISM IN COMPETENCY-BASED EDUCATION

The difficulty in approaching the subject of affective teacher education becomes apparent when one considers the theoretical and philosophical controversy which surrounds it in the literature. The problem compounds itself when the ideas of competency-based teacher education are catalytically mixed into this fermenting educational brew. However, if this space were solely utilized to sort out, defend and debate the many issues surrounding the controversy, there would be too little room to discuss some practical approaches toward solving the dilemma. It is this writer's intent to provide an introductory summary of the historical background which led to the present controversy focusing on the issues related to competency-based affective teacher education, and to integrate these issues, when appropriate, within the context of a plausible approach toward the implementation of competency-based teacher training in the affective domain.

The concern toward the development of an affective dimension of teacher training is not new. It can be traced back to the original attempts to humanize American education through "progressive education" and the early contributions of John Dewey. However, the impact of industry and manpower training resulting from World War II, the educational challenge of Sputnik and the subsequent expansion of educational technology has resulted in the development of curricula that mainly focus on achievement in the cognitive domain. This cognitive emphasis has affected both public schools and teacher training institutions. Recent social developments, such as the civil rights and sexism movements, wide-spread drug abuse, and reduced influence of the family as the focal point of social learning have stimulated modern educational critics, such as Goodman (1962), Holt (1965), Silberman (1970), Kozol (1972), et. al. to attack the regimented aspects of public schooling and its heavy emphasis toward competition and cognitive achievement. Schools have been called upon to assume a greater role in the socialization of the child, and teacher educators are being strongly challenged to provide teachers with the affective skills necessary to provide a humanistic dimension to facilitate learning.

The response to the renewed demand for affective education from humanistic educators, such as Rogers (1969), Purkey (1970), Combs (1974), and Brown (1975), has supported the need for teachers with affective skills in human interaction. However, they offer little guidance as to how these teachers should be trained. The approach of these educators seems to be one of values clarification around humanistic educational goals. This is a critically important first step, but it offers few guidelines to take teacher education beyond additional courses in humanistic educational psychology. Response from those who would espouse a behavioral position with regard to affective competencies, such as Clarizio (1971), Homme (1970), Skinner (1971), and Glasser (1969), has focused on increased training in behavioral strategies such as contingency contracting, reward-oriented classroom management systems and other behavior modification techniques. Although this latter group offers models which are more conducive to training evaluation, they ignore major areas such as self concept formation (in both teacher and student) and values clarification. Also, much of this behavioral technology is unmanageable for everyday classroom use.

The emergence of competency-based education with its emphasis on accountability through behaviorally-stated, performance-centered criteria seemed to align itself with the behaviorist position. This drew a cautious and sometimes negative reaction from those who desire a humanistic dimension for CBTE. Heffernan-Cabrera (1974) notes in reference to the August, 1971 Invitation Conference on Performance-Based Teacher Education (sponsored by the American Association of Colleges for Teacher Education) that:

> "If one accepts literally the definition sponsored by AACTE as the design structure for a CBE program, one would indeed be in conflict with humanistic philosophy." (p. 51).

She goes on to point out that competency-based teacher education can become an "organizer for humanists" if competency-based professors of education do not put all their emphasis on cognitive competencies and the criteria for evaluation. Elvira Tarr (1974) also criticizes the CBTE movement for its "lack of attention to the affective domain" and notes that affective competencies cannot be dismissed simply because they are difficult to define and measure. Paul Nash's treatise, "A Humanistic Approach to Performance-Based Teacher Education" (1973) extends the above criticisms and cautions CBTE advocates not to be limited by an "exclusive focus on external behavior" lest we become too simplistic and ignore the more subtle aspects of perception and personal meanings assigned to observable events. Drummond (1974) and Place (1973) also advise CBTE proponents not to throw out affective competencies because they are difficult to incorporate into a performance-based model. They seem to feel that affective concerns can be met within a CBTE program. However, little guidance for implementation is offered.

The renewed emergence of humanistic thought in education has almost coincided with the development of competency-based teacher education. Much of the reaction by the educational community toward this coincidental phenomenon has been to view the two movements as being antithetical and representative of the polar extremes of the future path of education. The question of which will exert the most influence in the future seems to some extent dependent on how responsive each is to the other. Adoption of humanistic components within CBTE might offset the many criticisms that hold it to be antihumanistic, but by the same token, proponents of the humanistic movement might broaden their base through incorporation of performance-based elements into their approach. If affective competencies are viewed as being limited to the framework of behavioral technology as it presently exists, they will become bogged down in problems of definition and evaluation and will preclude attainment of the humanistic goals inherent within them. On the other hand, if affective competencies are stagnated at the awareness-of-value stage within an open-ended framework of humanistic education, their subsequent influence on the classroom teacher will be speculative at best. The CBTE approach has the capability to include both sides of this issue if it is viewed as a working model and not a set of fixed laws. Indeed, this flexibility of function may be critical to its survival in teacher education.

What Are Affective Competencies in Teacher Education?

Due to the many interpretations of affective learning and the competencies and activities associated with it, it will be of some benefit to clarify the concept prior to any further discussion. Affective competencies usually refer to all demonstrable emotional learning which is directly or indirectly observable in the form of attitudes, interests, values and other socially expressed feelings. Within the context of teacher training this concept can be narrowed to focus on those emotional behaviors of teachers and students which enhance or interfere with the learning environment. It should be stressed that this interpretation of affective learning is not necessarily dependent upon the curriculum at hand; i.e., the subject matter need not be specifically affective in nature, such as magic circle or values clarification. Also, it assumes that teachers play a central enabling role in the learning environment and that learning employs all three domains (psychomotor, cognitive and affective) regardless of the content of the learning experience. For example, when teachers learn social reinforcement, they use psychomotor coordination to provide eye contact and a non-threatening body posture, they must cognitively understand the concept of reinforcement at the application level and they must be aware of their affect or feelings toward the learner as being separate from their feelings toward the learner's response (I like you and I like your answering behavior, but I don't like your answer). In view of the language used in this definition, it would seem obvious that affective teaching objectives must be behaviorally defined. However, the reader is cautioned not to approach an affective competency as simply the sum of its behavioral parts; to do so will lead to mechanistic and unmanageable instructional techniques.

The important distinction made between affective skills and affective curricula noted in the above definition requires further attention. The recent impact of humanistic concerns has manifested itself through the dissemination of a variety of new packaged, structured and programmed curricula which is aimed at the affective education of children in the school setting. Most of these programs, such as values clarification, Magic Circle, Kindle, DUSO, Peer Counseling, etc. often require affective skills on the part of those teachers administering them, however, in some instances they do not. In any event, such materials are aimed at the affective learning of pupils and should not be confused with affective competencies in teacher education. The affective skills of teachers extend to all areas of the curriculum and not only those specifically designated as affective in terms of content.

Why Are Affective Competencies Important in Teacher Education

Many teacher educators feel that the problems of definition, delivery and evaluation associated with affective learning reduces its role to that of something we agree with but can do little to implement. Others feel we should not impose our values on the student or intervene in the area of personal attitudes and interests. Regardless of the nature of the argument against the teaching of affective competencies, the facts remain clear; *we do teach them.* We teach values through our choice of a model of learning, we influence interests through our required texts and reading assignments, and we create attitudes through our value-loaded discussions of the curriculum. It is ironic that a preservice teacher can complete almost two years of course work without being held accountable for his/her interpersonal style, sensitivity toward others and/or general attitude toward the teaching profession and then suddenly be deselected from a program during student teaching due to an inability to relate to children or manage behavior in the classroom. To require affective skills of the student teacher at the exit stage of the program, as we often do on student teaching evaluation forms, raises strong doubts as to the amount of concern and responsibility we profess for the student, who should be informed of required skills early in the program. More importantly, failure to attend the development of affective skills is to disregard a growing body of research evidence linking affective classroom behavior to teaching effectiveness.

A recent summary of research relating teacher behavior to student achievement by Potter (1974) notes several studies which correlate interpersonal teaching skills with gains in student achievement. In an overview of teacher influence on student self concept, Hamachek (1971) cites an impressive amount of research which reveals a direct influence of affective teacher skills on self concept and pupil learning. He also notes a correlation between positive teacher self concept and positive student self concept. Flanders (1960), found that flexibility of the interaction style of teachers (i.e., ability to change interpersonal roles as classroom situations change) was directly related to teaching effectiveness. Mager (1968) devotes an entire book to the importance of teacher influence on student attitude toward learning. In a recent study of the classroom behavior of industrial arts teachers, Roberts and Becker (1974) 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 pleasant social-emotional environment through the use of praise and banter." (p. 15).

These investigators go on to point out that "few communication guidelines exist for aspiring or practicing vocational educators." Their recommendations offer a clear mandate to industrial arts teacher educators, when they point out that the research will only be useful if teachers acquire new behavior patterns. They conclude that:

> . . . it seems imperative that knowledge gained from this study be incorporated somehow into teacher training programs . . . (p. 15).

These selected highlights from educational research clearly reflect the importance of affective skills in the teaching process. In turn, this supports the inclusion of an affective learning component in programs of teacher education. How to accomplish this within a competency-based teacher education program raises other issues and problems that must be given consideration.

The major problems surrounding affective teacher education in a competency-based model, parallel the poignant questions posed by Mager (1968), i.e., "Where Am I Going?", "How Shall I Get There?", and "How Will I Know I've Arrived?" What are the goals of an affective learning component and how are they translated into affective objectives? What affective training techniques can be utilized and how can they be implemented? How are affective skills evaluated? These questions immediately raise the larger issue of what approach to learning will allow inclusion of affective learning within a competency-based model of teacher development. Since competency-based teacher education relies heavily on a behavioral learning model and affective skills seem strongly dependent on a humanistic view of learning, how can this conflict be resolved? As suggested earlier, the answer lies somewhere between the two extremes of either position. A competency-based program must incorporate both dimensions in order to be viable. Clarification of this compromise and its implications for affective teacher education will require closer examination of the so-called "conflict".

C/PBTE Versus Humanistic Teacher Education: Conflict or Confusion?

The conflict between a humanistic approach to teacher education and the behavioral learning model adopted by most C/PBTE programs, essentially centers around the basic issue of control of the focus of behavior. More specifically stated, the behaviorists generally hold that behavior is scientifically observable and is basically controlled and/or motivated by the external environment (extrinsic), whereas humanists view the major focus of control and/or motivation to be within the individual learner (intrinsic). The primary advocates on either side of this conflict are B. F. Skinner and Carl Rogers, who concede that there is a good deal of overlap in their respective views, but they are in opposition with regard to the central issue (Avila, et. al. 1971). The similarities in the two conflicting positions is discussed by Avila and Purkey (1971) with respect to its relevance for teacher education. Pointing to the teacher's ability to manipulate the learner through the use of affective interpersonal skills, they note that extrinsic and intrinsic motivation factors are simultaneously present in the teacher-student interaction. Their position is supported by this writer who also feels that a teacher cannot force learning to occur, regardless of the attractiveness or averseness of the reinforcer. The teacher can, however, be aware of the behavioral principles of social reinforcement and by demonstrating interpersonal skills which are reinforcing to the learner can facilitate learning behavior. This position would be essentially behavioristic without mention of an additional element, i.e., the long range goal of the teacher. If the teacher's goal for learning is merely limited to the immediate consequence of social reinforcement of learning behavior, then his/her teaching strategy will be limited to behavioral technology. However, if the goal is expanded to include broader consequences for learning which will result in the eventual internalization of motivation to learn, reinforcement must eventually come from within the learner. Teaching strategy becomes less fixed to extrinsic reinforcers and becomes more adaptable to variation of the learner's needs. Also, with respect to this broader goal, the teacher must form the kind of relationship with the student which will enhance the student's sharing of needs with the teacher. This type of personal relationship allows for the importance of intrinsic motivation advocated by humanists who view personal warmth, trust and sharing as optimal conditions of learning. Judith Beatty (1973) gives an excellent example of this concept of humanistic behaviorism when she notes that most students will be reinforced by a candy bar but occasionally you find a child who is reinforced by an onion sandwich; therefore, to determine what is reinforcing for the student who likes onion sandwiches, you must have the kind of teacher-student relationship which promotes trust and sharing.

It is interesting to note that humanists and behaviorists are seldom in conflict about long range goals for learners, but when learning goals are stated as the immediate consequence of behavioral strategies, conflict emerges. Since both sides agree to the same learning goals, what appears to be conflict is actually confusion about long-range goal orientation.

The concept of humanistic behaviorism provides a viable compromise between competency-based and humanistic teacher educators with respect to the development of affective competencies. Rather than be trapped within a narrow framework of unmanageable behavioral definitions and their subsequent evaluation, it allows C/PBTE to define a set of humanistic learning values which can encompass a broad spectrum of behaviorally stated affective skills. Preservice teachers can be allowed to idiosyncratically demonstrate affective skills within two major affective categories (teacher-centered and student-centered affective skills) as long as they can clearly demonstrate the relationship betwen the affective skills and the broader value system. This approach toward implementing affective skills training will become clearer when a more detailed explanation of the three phases of affective learning are presented below.

Cognitive Versus Affective Learning Objectives

The perceived difference between cognitive and affective objectives has led to a conflict similar to that of humanism versus behaviorism. The dialogue between cognitively-oriented and affectively-oriented educators often reflects this conflict, (Menacker, 1974). Affective learning objectives centered around interests, feelings, and values are reproached by cognitive educators as an infringement on the personal and moral life of students. It is argued by Ebel (1974) that these educational goals should be met in the home or religious institutions. Dennison (1974), on the other hand, feels that cognitive goals can only be achieved through equal educational emphasis on affective learning, which he describes as "generalized loving". He goes on to note that overemphasis on cognitive curriculum falls short of the original goals of education in this country. Schools, he notes, should provide learning that reflects the values and beliefs of surrounding society in addition to the cognitive knowledge and technical skills necessary to survive within it.

In reviewing the conflict between the affective and cognitive advocates it seems clear that each side proposes to meet its educational objectives at the expense of the other. Although the affective educator would not eliminate cognitive learning from the schools, this position nevertheless demands new teaching methods and delivery systems. Cognitive proponents seem to hold a more narrow view in that they delegate the activity of schools exclusively to the cognitive domain. Regardless of the intensity of their respective positions within the controversy, both sides tend to focus their attention on the content rather than on the process of learning as it occurs within the school setting. Although questions of curriculum content are directly related to instructional techniques and the process of learning, they are not *ipso facto* evidence that learning only occurs in the cognitive or affective domain to which it is respectively assigned. To argue that cognitive content or affective content should be the focus of learning activity leads one to the false conclusion that these two domains function independently of each other in the learning process. The unwarranted conclusion that affective and cognitive learning occur independently of each other is surprising in view of the attention given to their overlap and interrelated function (Krathwohl, 1964).

Indeed, Krathwohl clearly points out the almost parallel relationship between the cognitive and affective taxonomy categories as they are viewed from top to bottom on the respective hierarchies. Application of a little common sense reveals that the learner cannot be disengaged from the affective learning domain just because he/she is involved in cognitive learning activities. In fact, the learner must be at least functional at the affective *receiving* level to be engaged in learning at all. The affective categories of *receiving* and *responding* are necessary conditions of any cognitive activity, regardless of the level of cognitive learning assigned. This conditional role of affective categorization has been extended by Krathwohl to reflect that higher levels of cognitive activity should be accompanied by corresponding higher levels of learning in the affective domain. If one can agree with Hauenstein (1972) who notes that "man behaves in terms of what he knows and how he feels about it", it seems reasonable to assume that higher order cognition requires a corresponding higher level of affect to facilitate the cognitive function. The very nature of *evaluation,* the highest level of the cognitive domain, reveals it to be a mental exercise in assigning value. More importantly, the cognitive skills necessary to accomplish *evaluation* must be highly valued, as demonstrated by higher motivation on the part of the student, in order to function at this high cognitive level. Unfortunately, most teachers are willing to settle for *recall* (memorization) of *evaluation* level test items rather than focus on the affective learning which will provide the student with the necessary values and motivation to engage in higher levels of cognitive process.

The interdependent relationship between cognitive and affective learning objectives presents a clear mandate to those educators who align themselves with a competency-based approach to teacher education. If we are to specify learning prior to instruction and hold the learner accountable for what is learned, we must incorporate an affective learning component into our objectives. The competency-based attack on traditional educators who failed to specify their objectives can now be turned inward with respect to the affective domain. If competency-based educators agree that teachers must have affective skills in the classroom, they must specify those affective learning objectives which accompany the cognitive components of their programs. To do this we must seek language and learning activities that will combine affective and cognitive learning objectives.

The recent work of Brown (1971) in *confluent education* has been aimed at integration of cognitive and affective learning through the design of curriculum and instructional strategies which can be used within the classroom setting. This approach appears to have merit for use within a competency-based framework, however, the underlying emphasis on Gestalt learning poses some difficulty for assimilation in a traditional school setting. A more feasible approach seems to be the structured experiential learning techniques utilized by this writer in the human relations component of the competency-based teacher education program at Florida International University. Experiential learning activities allow better control of the affective response level of the student and are conducive to the integrated and overlay of cognitive competencies within the same learning activity. The following example might clarify the combined use of affective and cognitive objectives through experiential learning:

Affective Competency: (Pupil-Centered) The student will demonstrate pupil-centered active listening skills in a simulated classroom setting (affective) and will be able to describe in writing the positive value of this skill in the teaching process as revealed through high probability verbal indicators of attitudinal behavior, (cognitive).

Learning Activity: Participation in a structured role play wherein the role-playing students experience communication breakdown when active listening is not demonstrated during the simulated lesson.

Evaluation: Instructor observation of the various behaviors required for active listening, (affective). Instructor evaluation of written value statements about active listening as a part of the teaching process (cognitive).

The value of experiential learning in meeting this objective is that it allows the group of learners to experience a common phenomenon which produces a similar level of feeling response (i.e. frustration versus non-frustration on the part of the role-playing students who are allowed or not allowed to ask questions during the simulated lesson) and then through structured discussion, offers the opportunity for the student to conceptualize the phenomenon of active listening with positive value-loaded language as applied to teaching. These concepts can then be submitted in written form to determine the student's ability to demonstrate his/her value position. This latter cognitive measure does not insure valuing *per se* but it can provide positive indicators which will set the stage for implementation of the value during the student teaching experience. It is of particular importance to note that this example combines affective and cognitive objectives to reach the affective goal. If the student can not cognate or conceptualize the feelings or affective dimension of the learning activity, he/she will be unable to communicate with the observer about the skill when it is requested in the student teaching experience. The combined use of affective and cognitive objectives makes this future behavior possible. It should also be noted that the affective level of achievement noted in the example above is *acceptance of a value;* higher levels of value will not be reached until the implementation phase of affective learning, i.e., student teaching.

Accountability Versus Professional Judgment in the Evaluation of Affective Learning

The most difficult problem facing the competency-based approach to affective teacher education is that of evaluation. The elusiveness and unobservable nature of many affective teaching competencies raises the question of accountability which is a central theme in the competency-based approach to learning. It is often the case that affective competencies are left to the professional judgment of the educator rather than being evaluated through the use of a clearly prescribed objective measure. The problem is further complicated by the fact that cognitive competencies are usually evaluated from the standpoint of *can do* measures, whereas affective skills must be measured within the framework of *does do* measures, (Krathwohl, 1964). This behavioral observation requirement of affective competencies also leads to expensive logistical problems in evaluation.

Although the trend in all educational disciplines has been toward objective, scientific methods of evaluation, those of us who engage in the education of professionals must be careful not to ignore skills which are resistant to scientific measure. How skillful is the doctor who does not value the life of his/her patients? Or, the teacher who can't tolerate the cultural differences of his/her students? In his "Ten Commandments for a PBTE Developer" Crocker (1974) offers two cautions to competency-based educators:

> Do not seek to measure a "value" or an "attitude" with a meter stick.
>
> Take care lest you rely too heavily upon measuring only what is easily measured.

Nash (1973) also warns those in competency-based teacher education to view the developing teacher as a whole being with integrated skills rather than a series of minute behavioral parts which are only the sum of that which is measurable. These views should not be taken to mean that affective competencies should be without evaluation, on the contrary, what is being stressed is the fact the evaluation must be kept realistic in terms of what is being measured.

The implicit negative connotation assigned to "professional judgment" when compared with "objective evaluation" appears to lack substance when submitted to closer inspection. Whatever the behavioral specificity and no matter how objective a measure is designed to be, it is seldom the case that such measures are free from the professional judgment of the teacher educator. It is the teacher educator who arbitrarily assigns the level of criteria which determines whether or not the student has met competency. He/she decides how many times a student may recycle a learning activity before it is clear that competency will never be met. In any measure of competency there is always a point at which some degree of professional judgment must be employed. Ironically, the evaluation argument used against the teaching of competency-based affective skills can be turned around and be applied to a large number of other teaching competencies which are trapped in measurement jargon that can usually be translated into subjective professional judgment.

The power of professional judgment should not be regarded as merely off-hand subjective speculation. Professional judgment, when used to make "objective" decisions, often reflects the agreement of a large group of professionals who have adopted scientific language through which they communicate their judgments. Although many affective competencies, particularly those which deal with the student self-concept, are resistant to scientific behavioral language, they can be stated in terms which have program related meaning for a specific group of professionals. This language can be funtional for use in the evaluation of preservice professional teachers. The key to formulating such language is, of course, communication within the faculty group, but this holds true for commonly accepted jargon for any set of competencies. The process used to establish faculty agreement on competency-based language can also be utilized to reach agreement on affective competency definition and evaluation criteria.

In reaching agreement on affective evaluation criteria for the competency-based human relations training program at Florida International, the faculty decided to use high-probability cognitive indicators as the criteria for evaluating the attitudinal posture in student written response. The rationale for decision was based on the fact that the large number of students precluded extensive individual observation in or out of the classroom setting. It was then determined that written responses could reflect the potential attitudinal behavior of students if coupled with affective learning experience which stressed the desired attitude that enhances the greatest amount of learning in the normal school setting. The faculty realized, of course, that there would be some degree of variance among their professional judgments, but that clear positive cognitive indicators would provide sufficient guidelines to reflect an *awareness* level of affective skill. This *awareness* level of positive attitude would be necessary to set the stage for *modeling* behaviors during the methods and observation courses. It was further reasoned that if faculty *modeling* (actual demonstrations of the desired affective behaviors provided during other program courses) was followed by reinforcement during *implementation* (student teaching), it was likely that the affective skill would be incorporated into the students' repertoire of teaching skills. An example of the process flow of evaluation of a specific affective competency will be provided later in the chapter.

Developing Affective Competencies in a Competency-Based Teacher Education Program

The most important step in the process of identifying affective competencies for a teacher education program is gaining faculty cooperation and input. As noted earlier, this process should be similar to that used in the overall development of a competency-based model for a teacher education program. This early stage of development will be the most difficult, but hard work and persistence at this point will make the remaining phases much easier to carry out.

One important issue regarding the nature of affective competencies must be clarified before embarking on the development of an affective component in a competency-based teacher education program. An affective competency, whether it be an interest, attitude or value must be translated into a set of observable behaviors which represent the value or feeling that is causing them. To simply say that a teacher will value pupil response in a learning situation leads to the question: How do we know that the teacher values the response? We can only determine values or interest through the behaviors which we agree are indicators of that value or interest. Values or interests must be stated as broad affective learning goals, under which several categories of affective behaviors can then be subsumed. An example at this point may be helpful.

If we establish a broad affective learning goal; such as, the student will value pupil response as an important component in learning, we must then translate this value into some behaviors which can be regarded as high probability indicators of the value in question. The next step is to list a broad range of behaviors that will be high probability indicators, then narrow them down to those behaviors which can most clearly be observed within the instructional conditions available. We then provide the value statement and begin to teach the behaviors, constantly reinforcing the value statement. When the student demonstrates the behaviors, we assume he/she has reached a point of valuing.

Although it is not the intent of the writer to dictate the process of development for any other faculty group, one other caution with respect to the initial phase of development should be noted. Do not impose restrictions of class size, delivery methods and/or other limitations which might subsequently be imposed by the larger educational system prior to developing the affective competencies. It will be difficult to avoid discussions of delivery . . . etc., however, if such restrictions become the focus of developmental deliberations some important areas of affective competency may be eliminated. It is quite proper to impose limitations and restrictions during the later steps of development of instructional procedures and evaluation, but unless a full range of competencies are initially agreed upon, the program may be limited unnecessarily. Considerations of new delivery and support systems will be greater if the initial competencies are developed with strong unified faculty support.

Affective competencies can be identified within two major categories: (1) Pupil-centered affective competencies; and (2) Teacher-centered affective competencies. Although each of these categories represents a distinct set of skills, they should not be regarded as mutually exclusive from one another. Each category overlaps with the other in many ways and they are interdependent upon each other. The most important advantage of using broad categories such as these is the fact that after students have completed the *awareness* phase in each category and have reached the level of *valuing* basic skills in each category, they may concentrate further skill development in any category which best meets their area of specialization, individual needs and personal style. This removes the difficult problem of trying to push students into advanced skill areas which conflict with their personal interaction style; i.e., a quiet student who is not prone to warm interaction with children (pupil-centered) may gain the same level of affect; i.e., interest in the subject matter, through dynamic use of curriculum materials (teacher-centered). Discussion of the identification of each category should further clarify this idea.

Identifying Pupil-Centered Affective Competencies

Although the bulk of teaching behaviors might be described as "pupil-centered", this category of affective skills specifically refers to those interpersonal behaviors of teachers which focus on sensitivity to pupil behavior. When the teacher is specifically focusing his/her attention and facilitating toward the response behaviors of the pupil, and/or the group of pupils he/she is demonstrating affective skills in this category. This attending and facilitating behavior goes well beyond the content of the pupil response; i.e., "the right or wrong answer"; it includes group role behavior, voice tone and a broad range of nonverbal pupil behaviors. This category of affective skills is most exclusively displayed when the teacher is using an inquiry method of teaching. In this method of learning, the teacher must stimulate a great deal of student talk and frequent reinforcement of verbal and nonverbal pupil behaviors is necessary to increase interaction. Also, the needs of special education pupils and pupils in inner-city schools often require more emphasis in this category of affective teacher skills.

Pupil-centered affective competencies can be subdivided into the subcategories described below:

Basic Communication Skills: These skills center around the ability to enhance the communication process during the delivery of a lesson. Upon completion of this learning module the student should be able to demonstrate the following:

— Identification of three major types of communication breakdown; i.e., one-way communication, passive

listening, and selective listening, and description of how each interferes with learning and how each can be avoided in the teaching process.
- Understanding and demonstration of the principles of two-way communication and be able to describe its value in teaching a lesson.
- Active listening skills; i.e., clarifying listening through paraphrasing, eye contact, responsiveness to feelings as expressed through voice tone and body posture.

Group Process Skills: These skills focus on the student's understanding of group dynamics as they occur in a normal classroom setting. Upon completion of this learning module, the student should be able to demonstrate the following:
- Ability to identify three major group role categories as they occur in a classroom setting.
- Ability to influence role balance in the classroom to maximize participation and learning.
- Ability to utilize sociometric measures to determine classroom group norms and peer interaction patterns. Understanding of the "ripple" effect and ability to influence it to increase positive group interaction.
- Ability to enhance the classroom group learning environment through development and facilitation of classroom rules.

Behavior Management of Individual Pupils: These competencies center on classroom management through the control of individual pupil problems. Although students should have basic skills throughout this area, elementary students would normally develop advanced skills in basic behavior modification techniques, whereas secondary students would focus on contingency contracting (interpersonal problem solving). Upon completion of this learning module the student should be able to demonstrate the following:
- Understanding of the relationship between pupil self-concept and scholastic achievement and ability to enhance pupil self-concept through positive written and verbal reinforcement.

- Understanding of basic behavior modification skills and ability to demonstrate interpersonal social reinforcers, extinction procedures, and delivery of constructive feedback.
- Ability to define and apply appropriate punishment procedures.
- Understand and apply interpersonal problem solving procedures (contingency contracting).

Identifying Teacher-Centered Affective Competencies

Teacher-centered affective competencies combine two major areas of teacher behavior: (1) Intrapersonal behaviors which focus on the teacher's ability to evaluate and/or receive feedback about his/her self-concept, values and ethical posture; and (2) Interpersonal behaviors as they relate to classroom delivery of the curriculum. This latter component has to do with the teacher's charisma or skills in front of the classroom group; i.e., the ability to share one's personal experiences and values toward the curriculum to support the lesson delivery. This latter skill can also be described as the teacher's ability to draw positive affective response from pupils through modeling his/her personal affective posture toward the curriculum; i.e., pupil's desire to have the same positive feelings toward craftsmanship as displayed by the teacher. Interpersonal and intrapersonal behaviors are seldom distinctly separate from each other, since sharing of personal affect through the curricula is dependent on the teacher being aware of appropriate personal values which can be shared to enhance the learning environment. Also, through introspection, the teacher must become aware of how much classroom expressions of personal affect are meeting his/her personal needs or those of the pupil.

Teacher-centered affective competencies can be subdivided into the following subcategories:

Self-Awareness and Behavioral Self-Definition: These skills are the most difficult to evaluate since they occur within the private subjective life of the student, however, several intrapersonal instruments, activities in values clarification and feedback/self-concept model (johari window) can be utilized with some degree of assurance that the student has been involved in self-evaluation. It is important to limit self-evaluation activities to that level which is relevant to the role of a teacher as defined in the local community. Self-evaluation activities such as encounter groups and personal counseling would usually extend beyond those areas which are pertinent to the teaching role. Upon completion of this learning module the student would be able to demonstrate the following:

— Ability to describe the relationship between indirect instrumented measures of interpersonal style and the teaching role.
— Ability to relate personal values about human interaction and the ethical commitments of the teaching profession to pupils, parents and colleagues.
— Ability to reveal self-understanding of his/her interpersonal orientation toward others and how it might relate to future teaching behavior.

Modeling Teacher/Self-Role Behaviors: These competencies are to some extent an extension of intrapersonal self-evaluation, but the focus is on ability to relate personal values and style to delivery of the curriculum. The emphasis is placed upon skill in sharing personal feelings as they might be translated through the teaching methods. Upon completion of this learning module the student will be able to demonstrate the following:

— Ability to clarify values related to prospective subject specialization and be able to assess personal experiences which might be shared or incorporated into delivery of lesson in a classroom setting.
— Ability to demonstrate personal learning style and compare it to various learning styles of others.
— Understanding of personal group leadership style and its effect on group dynamics in a simulated classroom setting. Also, ability to modify group leadership style in accordance with teaching methods and/or learning goals.

Giving and Receiving Feedback: Although the major focus of these competencies is on the ability to encourage and receive feedback from others, the giving of feedback also requires some teacher-centered skill in that the giver of feedback must be receptive to the readiness of the receiver for feedback. Also, the giver of feedback should be able to check the effect of the feedback to be sure it has been properly received. 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 effectiveness. Upon completion of this module the student should be able to demonstrate the following:

- Understanding of a conceptual model of feedback which will cause the student to value feedback as a source of data to improve teaching skill.
- Encourages and receives feedback from others which relates to teacher role behaviors.
- Gives feedback within the constructive guidelines of a feedback model which emphasizes concern, behavioral specificity and follow-up.

Developing Affective Objectives

Once affective competencies have been identified, each must be converted into one or more affective objectives. An affective objective must contain four basic components: (1) The behavior to be demonstrated; (2) The feeling, attitude, interest and/or value which we assume to be represented in the behavior; (3) The conditions under which the behavior is to occur and/or the consequences which will result from the behavior; and (4) The criteria or standard to be applied in the evaluation of the behavior. Each of these components will require further clarification.

The behavioral component of an affective objective may refer to the behavior of the actor (student teacher) or the recipient of the actor's behavior (pupil, parent, or colleague). Most commonly, the behavior referred to in the objective will be that of the student teacher. Behaviors can usually be observed as one of three modes: (1) approach behaviors; (2) neutral behaviors; and (3) avoidance behaviors. Most behavioral components in an affective objective would be stated as approach behaviors, though all three can be indicators of attitude or feeling (Lee & Merrill, 1972). By the same token, most affective goals or values are stated in positive terms since the word "value" is most commonly connotated as a positive posture toward something. There are instances when negative values are emphasized, but these are the exceptions rather than the rule. The approach behaviors in the objective should have a high probability of occurring and this should be highly structured during the early phase of learning; becoming more open-ended as the student nears his/her field experience. For example, verbal and nonverbal cues might be provided on cards during an initial role-play of active listening to insure a high probability of occurrence, but later courses in teaching methods would reflect reduced structure to the eventual provision of minimal cues for lesson delivery in student teaching.

The second component in an affective objective relates the feeling, attitude or value which we assume is the motivator behind the behavior. If the student is told that he/she will demonstrate a positive attitude in the objective, there is some question as to how much this statement in and of itself influences his/her behavior. On the other hand, if the student is asked to explain the effect of the behavior on pupil learning, we can better evaluate how much positive loading he/she has given the behavior. If a student provides a written statement that contains several positive adjectives about the behavior and its consequences, we can accept the statement as a high probability cognitive indicator of positive attitude. The combined attitude and behavior portions of the objective to be expressed cognitively might read as follows:

> "The student will demonstrate two-way communication skills and be able to explain in positive terms their effect on pupil learning."

The third component of an affective objective is a statement of the conditions under which the objective is to take place. For teacher education purposes, conditions will usually be simulated classroom conditions, small group settings, or the actual school setting during student teaching. In some instances, the affective objective should contain a statement of the consequences of the behavior to be demonstrated. For example, if the student is demonstrating the use of classroom rules and the focus of the behavior is on those pupils following rules, the objective might note that infractions of the rules will decrease if these pupils following the rules are positively reinforced. The reduction in rule infractions would be a necessary consequence of the reinforcement behavior. Now let's take a look at an objective with the first three components:

> The student will demonstrate extinction procedures in a simulated classroom setting ignoring inappropriate

pupil behavior and reinforcing appropriate pupil behavior and will explain how extinction procedures affect learning.

The last portion of an affective objective is the criteria or standard which is applied in evaluation or measurement. The criteria can be stated specifically as a number or percentage of behaviors desired during any learning activity. It can also reflect specific verbal or nonverbal behaviors which are desired to meet competency. It is desirable to state the criteria in more general terms to allow for differentiation in personal style. For example, it is easier to evaluate five interpersonal approach behaviors than to evaluate five smiles or five warm looks. Since you are often evaluating interaction behaviors, it is important to make allowance for the many variations of interactional cues. A student should not be held accountable for specific numbers of elicited behaviors unless it is highly probable that a number could occur. A good rule of thumb in specifying numbers of behaviors is to set the criteria at about half of the number that seems feasible. The following example combines all components of an affective objective:

> The student will demonstrate the five steps of the Interpersonal Problem Solving Model in a role-play situation wherein the role-playing pupil will be cued to be defensive and resistant to teacher assistance and will explain in writing how the resulting contract with the role-playing pupil will enhance other areas of learning.

Evaluation of Affective Competencies

Perhaps the most important guideline for measuring affective competencies is that offered by Mager who notes that we should avoid "hair-splitting" measurement of attitudes (Mager, 1968). Rather we should measure approach or avoidance tendencies. To say that a student with an IQ of 105 is more intelligent than a student with an IQ of 100 is absurd, but the translation of the intangible concept of intelligence into numbers often leads us into this trap. Affective competencies should be evaluated in terms of the general tendency of the observed behaviors to indicate a positive attitude or value. If written responses are evaluated through the use of high probability cognitive indicators, the criteria should also be flexible enough to allow for the variation of communication style. Setting specific words as the criteria will be too limiting and result in parroting behavior on the part of students. Here again, professional judgment, based upon faculty agreement on value indicators, becomes the most functional form of evaluation.

Measuring Process in Addition to Product: The greatest error in the evaluation of affective competencies is to focus all measurement on results or final exit behaviors. By the same token, evaluation of a competency should not stop at the completion of a course specifically designed for affective learning. The initial course should be an overview of all affective competencies; i.e., values, attitudes, etc. that are to be expected throughout the program. Evaluation at this point should be limited to lower levels of the affective domain and should focus on a general tendency to move toward the value or attitude. Subsequent professional course work should include appropriate affective objectives which will allow evaluation and reinforcement during the middle phase of the program. The point here is to look to the subsequent means of furthering competency development after an initial affective course has been completed. How is reinforcement of the affective competencies in other course work being carried out? How is the supervising teacher in the field to provide opportunity for performance and evaluation of affective competencies? In summary, the entire program must be examined for various possibilities to reinforce and hold students accountable for the affective skills which have been pre-specified.

In a narrower perspective, evaluation of the process of the affective training course must be carried out. When simulations and role plays are used, are we providing ample opportunity for the behavior to be displayed? Have the students been exposed to some common form of modeling (videotaped or film) prior to becoming involved in affective skill demonstrations? Constant evaluation from faculty must be conducted during an affective training program to determine how the process of carrying out learning activities is working. Faculty should be given the opportunity to periodically report their experiences at different phases of the program. This should be combined with student input to cross-check for common perceptions of the learning activities, as related to learning goals. Comparison of student and faculty data will offer some measure of the internal validity of the program, and more importantly offer clear indication for the need to revise particular aspects of the program.

Synthesis Measures of Affective Behavior: The final evaluation of affective competencies which is usually conducted during the student teaching phase of a teacher education program must be less specific than measures conducted in earlier learning activities. Final exit behaviors in the affective domain should demonstrate integration of the various specific behaviors learned earlier. With this in mind, the student teacher must be given more latitude while operating in the classroom setting. Since the actual classroom setting cannot be manipulated as easily as previous learning environments, there must be sufficient opportunity for the student to display the affective skills desired. Also, there must be allowance for the style and procedures of the supervising teacher who conducts the general classroom environment. Given these conditional restrictions the evaluation of exit competencies can then focus on the student's ability to synthesize the affective skills which have been demonstrated through previous learning experiences.

Synthesis of affective skills can best be measured through frequent periodic observation of the student teacher, as he/she performs various teaching activities. Cross comparison of the student's goals, those of the supervising teacher and the classroom conditions at the time of observation will allow the college supervisor to determine what affective skills are possible and probable; the check for integration or synthesis of the behaviors as the student responds to these variables can then be carried out. Broad categories of affective competencies; such as, classroom management skills, general communication style, and interpersonal interaction with individual and groups of pupils can be checked during each observation. Self-evaluation by the student teacher can also be requested after each observation to determine the degree of self-awareness during actual teaching. This latter evaluation should focus on the student's ability to identify the relationship between his/her feelings and the actual teaching activities. Conflicts in personal values and those held by the school setting should be discussed and functional compromises should be arrived at by the student teacher. Specific guidelines for these final evaluation activities must be worked out by faculty groups who represent a cross-section of all earlier instruction. This input, as in the case of all other competency-based planning, is the most critical factor for successful evaluation.

INSTRUCTIONAL TECHNIQUES FOR AFFECTIVE COMPETENCIES

Learning activities aimed at the achievement of affective competencies have traditionally been limited to classroom learning techniques; i.e., reading, exams and term papers. This overemphasis on cognitive learning has proven to be too limiting for the affective domain and though the student is capable of demonstrating knowledge about the desired attitudes and/or values, there has been little opportunity provided for actual experience and practice of the skills associated with these attitudes and values. Competency-based learning in the affective domain is most conducive to experiential learning activities; the student learns by doing. Although the inner changes in attitudes and values are not observable, we can specify behavioral indicators and require actual demonstration of affective skills which we assume are motivated by attitudes. Unless the student is provided the opportunity to experience the behaviors which we associate with the desired attitudes and/or values, he/she may have no clear perception of the link between the two. Thus, a student can enter the final phase of training with the desired value system, but have no idea of how to translate it into functional teaching behaviors.

Techniques of Humanistic Behaviorism: Three Phases of Learning

The concept of humanistic behaviorism offers a practical link between desired humanistic attitudes and values and the observable teaching behaviors which we expect them to elicit. If a program established an attitudinal goal which states that the student will value the process of feedback in the classroom, the student must become *aware* of the value of the feedback process, he/she should observe and experience the phenomenon of teacher feedback through *modeling* of feedback behaviors, and he/she should be given the opportunity to *implement* feedback behaviors in the actual classroom setting. This flow of affective learning activities falls into the three distinct phases noted; i.e., *aware-*

ness, modeling, and *implementation.* Utilizing this developmental approach to affective learning allows teacher educators to choose more appropriate instructional techniques as the student progresses through the program. Although a variety of techniques can be utilized during each phase, a sample of instructional activities for each phase will be provided for purposes of clarification.

Awareness Phase of Attitudes and Values: The initial phase of affective learning can be best carried out through the following techniques: (1) values clarification; (2) readings and/or films and (3) structured self-evaluation. Values clarification activities are best conducted in a group setting and can be structured through the use of critical incidents and/or case studies. The students are presented with controversial incidents or cases which demand teacher action. After private individual response, the cases or incidents are discussed by the larger group. The structured responses (multiple choice format) should offer three clear choices: (1) action supporting the desired value; (2) action which is antithetical to the desired value and (3) action which is neutral or avoids the desired value. Discussion of each incident should conclude with an indication of the desired response and a statement of the desired value.

Assigned readings and films can enhance the awareness phase of affective learning by offering expert testimony and research findings which support the desired value. Such readings should represent a balance of humanistic philosophy and behavioristic research findings. Group discussion should focus on the desired value judgments and students should be given opportunity to critique the readings and/or films in terms of how they support the values in question.

The process of self-evaluation, or intrapersonal affective learning should also begin during the awareness phase of the program. To some degree, this process will begin with the values clarification activities, but learning activities which focus on the personal values of each student should supplement the learning experience. Self-evaluation, in the areas of self-concept (social, personal and ideal) can be conducted through the use of cue sorts or adjective check lists. Also, instruments such as values inventories and interpersonal interaction scales can be utilized to provide the student with indirect measures of intrapersonal style which can be compared to the expected teacher profiles related to the desired value. These self-evaluation activities should not be discussed in groups due to the sensitive nature of the data. However, the student can provide personal reactions in writing, in terms of future teaching behaviors, without actually revealing scores or profiles. The goal in self-evaluation is not to psychologically evaluate the student, but to give him/her an opportunity to gain personal feedback through the use of standardized instruments which will later manifest itself in specific affective teaching behaviors.

Modeling Phase of Attitudes and Values: Modeling has two distinct areas of instructional technique; the modeling which the student observes and the modeling which the student demonstrates in a simulated situation. Observation modeling can be provided directly by the faculty member conducting this phase of affective learning or it can be provided by videotapes and/or films of actual teachers demonstrating the affective skills. Observation modeling can also be carried out in an actual field setting, however, the variation among teachers and school settings must be controlled in order to insure some degree of common experience. Modeling can also be carried out through simulated classroom situations and/or role plays. These techniques provide the student the initial opportunity to demonstrate actual affective behaviors in front of a simulated classroom setting. Role play techniques can be carried out in front of the entire class or may be conducted in trios (allowing one observer) or dyads. Group discussion of the simulated modeling phase should center around comparison of the simulated behavior to that observed or demonstrated by the faculty member.

It should be noted that all modeling activities should be accompanied by some reinforcement of the values and/or attitudes attained in the awareness phase of the program. A clear relationship between the modeled behaviors and the values assumed to be behind them should be established. Modeling should be continued throughout all methods courses with observation and/or simulation, reflecting the integration of the affective competency with other teacher competencies being covered in the respective methods courses.

Implementation Phase of Attitudes and Values: Instructional techniques during this phase of affective teacher education should be coincidental with the student teaching experience. Students should be required to specify the affective objectives and skills they anticipate in each of their student teaching observations. A seminar accompanying student teaching will help the students reinforce their affective skills through discussion and/or role play of actual classroom situations which they are having difficulty relating to their affective skills. Also, these seminars will offer an opportunity for ventilation of personal feelings and further self-evaluation at this terminal phase of their program. Support for fellow students is an additional attribute of the affective student teaching seminar.

Perhaps the most important aspect of the implementation phase of the affective teacher education is the use of affective skills as they relate to classroom management. Close supervision through coaching and modeling by the college supervisor will prevent the student from reverting to justification of authority and punishment as the only means of classroom management. Behavior modification techniques which center around the value "catch the child being good" will assist the student in expression of the broad range of affective skills which have been developed earlier in the program. Early focus on these classroom management skills will allow more attention to curriculum delivery skills during the remaining portion of student teaching.

The choice of instructional techniques throughout the three phases of affective teacher education must represent some degree of consensus of the faculty after attitudes, values and the related affective behaviors have been decided upon. This agreement will insure some control over the process of affective learning and provide consistency within the program. Working within the framework of the three phases of student development will facilitate the decision-making process with regard to instructional procedures and techniques.

SUMMARY

The behavioral orientation of C/PBTE as an instructional model has raised concern with regard to the fate of affective learning which heretofore has been largely limited to verbalization of humanistic educational philosophy. Although research evidence supports the need for affective teacher training, the performance-based approach raises several important problems for this type of learning, particularly with regard to the development of affective objectives which can be successfully implemented and evaluated. The issues arising from these problems are closely related to the so-called "conflict" between behaviorism and humanism. Closer examination of the situation reveals it to be more confusion than conflict. This misperception results from the misleading comparison of the extreme views of each theoretical view. The competency-based model seems capable of incorporating both positions under a new construct called "humanistic behaviorism." Within this format the issue of cognitive versus affective objectives becomes a moot point, since cognitive and affective (and psychomotor) learning occur simultaneously and must be dealt with accordingly.

The key to developing affective competencies lies in cooperative faculty input and agreement on affective goals within the respective C/PBTE program. Affective competencies can be separated into two major categories: 1) pupil-centered affective competencies; i.e., basic communication skills, classroom group process skills, and the behavioral management of pupil behaviors; and 2) teacher-centered affective competencies; i.e., self awareness, modeling teacher self-role behaviors, and giving and receiving of feedback. Once these general competencies have been established within the broader framework of overall program goals, behavioral objectives and instructional techniques can be specified.

Evaluation of affective skills must involve criteria which are relevant to the broader affective goals of the C/PBTE program in question. Evaluation efforts must avoid the trap of measuring only that which is easily measured. Here again, the cooperative agreement of criteria by program faculty is critical for successful evaluation. Evaluation of affective competencies can be greatly improved if emphasis is placed upon the measurement of process as well as product. Also, attention should be given to the evaluation of synthesized behavioral patterns rather than the sum of a set of isolated behaviors.

The development of an affective learning program will be most effective if it utilizes an experiential learning model built on the foundation of "humanistic behaviorism." Within this framework a program should follow three phases of development: 1) awareness, 2) modeling and 3) implementation. Since these three learning phases extend over the entire preservice program, there must be a clear commitment by the entire faculty toward the affective goals of the C/PBTE program. Competency-based programs which have been somewhat successful in this regard are those at Weber State College in Ogden, Utah and Florida International University in Miami, Florida. This writer's participation and observations during the development of these programs revealed them to each have a high degree of staff participation. This participation extended across all departmental lines and much of the success can be attributed to this factor. Also, the fact that both of these programs are in a constant state of revision indicates that process evaluation has been a focal point of the ongoing development. A program description and learning modules can be obtained from the schools of education in each institution by sending a request to this writer at Florida International University, or Dr. Harley Adamson at Weber State College.

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chapter 3

A State Looks at Competency/Performance-Based Teacher Education

Vincent C. Gazzetta

Upon the completion of this chapter the reader will better understand the legal responsibilities exercised by most states in:

- Accrediting preparatory programs which are designed to train professional personnel for the public schools.
- The issuance of certificates attesting to the holders' eligibility to serve in the public schools.

Increased understanding will be demonstrated through the reader's ability to:

- State the purpose of requiring professional personnel in the public schools to be certified.
- Identify the constituency to which the State is primarily responsible.
- Describe problems related to the various approaches to competency/performance-based teacher education.
- Identify at least three benefits of CBTE as seen from the legal accrediting and certifying agency's point of view.

BACKGROUND

The purpose served by the establishment of a system which requires personnel in the public schools to be certified can be stated in two ways. A certification requirement can be viewed as a means of protecting the public from the incompetent, or, in a more positive sense, it can be viewed as a means of ensuring that competent personnel will be serving in the schools. It can be argued that both views are essentially the same and the difference is one of semantics. The difference, however, increases in magnitude when a State views its certifying responsibility as one which is used to keep the incompetent out, versus the view that certification is a way to encourage the competent to seek certification. The way in which requirements for certification are stated suggests the approach used by the particular state. States whose requirements are tightly specified in terms of courses and/or semester hours within some legal code are likely to see their responsibility as one which uses certification as a means of keeping incompetents out of the schools. States which couch their certification requirements in a more general fashion are much more likely to see certification as a means of providing a pool of certified persons from which employers can select those whose potential for serving in that district are highest. However, one or the other "policy attitudes" is better than not ascribing to either. For if a "non-attitude" is taken, there can be no adequate policy on which to base and administer a system which is equitable and has the greatest possible degree of objectivity.

Generally speaking, present certification systems in most states have followed a similar pattern of development. From local certification based in many instances on locally developed examinations to State certification based first on examinations and then sequentially on training programs of ever-increasing lengths: six weeks; one, two and three years, baccalaureate programs, and in many states a fifth year mandate.

The present thrust seen in many states toward a competence- or performance-based system is a natural outgrowth of the evolutionary development of certification. As certification requirements were increased through the requiring of a greater length of preparation it became evident that years of preparation could not be continually added. Thus, when a baccalaureate or higher degree was required and changes were necessary, the responses by the states were couched in terms of a rearranging of the semester hours required for a baccalaureate degree, e.g., from 20 hours of a subject to 36 hours or from 52 hours to 24 hours.

The shifting and rearrangement of semester hour requirements was seen by many state agencies as a "magic-numbers" game which ends up on a no-win situation. In this writer's opinion, the end of the line is the certification system made up of highly specified semester hours and course titles. As dissatisfaction with the semester hour requirement grew it was paralleled by a growth in the belief that certification should be based on public statements of expected capabilities in terms which are as explicit as possible.

Certification became associated with patterns of specialized preparation and most states found it was necessary to identify those preparatory programs which were appropriate for purposes of certification. The need for some means of state sanction became necessary as programs culminating in a baccalaureate were required. Consequently, states entered the accreditation business: some for purposes of certification only and others because of wider jurisdiction granted by state legislatures.

Program accreditation brought the "approved-program approach" into existence. This approach permits personnel staffing accredited programs to recommend graduates for certification. In some states the certificate is virtually granted automatically upon recommendation by program officials.

Over the years dissatisfaction with the traditional accreditation procedures of judging the quality of a program on descriptions of elements such as the training and experience of faculty, the curriculum structures, the adequacy of facilities and student profiles was voiced by those responsible for program accreditation. It was acknowledged that a lot of data was collected, but that the analysis of that data provided little information on what a graduate could be expected to know and do.

Without belaboring the historical setting, a number of events and developments converged to produce a setting for the birth of the competence- or performance-based movement; a movement yet to be adequately defined, but which promises a more clear and careful explication of expected outcomes of a preparatory program.

THE STATE'S RESPONSIBILITY

The State as a certifying agent has many interests to which it must be responsive. Colleges and universities are important constituents, for the programs of preparation are theirs to provide. School districts are important for they are the users of those trained and are usually the entities most closely governed by the State. In each instance, however, certification and the activities stemming from the existence of certification, must be responsive to the public interest and responsible to the public in the final analysis.

The State's responsibilities can be hierarchically defined with the first as the most important and the third the least important. It is important to keep in mind that the final responsibility for the adequacy of the system of teacher education and certification rests on the State. Delegation of authority may be proper in many instances, but the state's responsibility cannot be delegated.

The highest level is the legal responsibility which requires that the State either protect the public from the incompetent in the schools or, better still, assure the public of the existence of competent personnel prepared for service in the schools. On a parallel with that is the responsibility that the State ensure that educational enterprises at the elementary, secondary and higher education levels meet a minimum level of quality.

The second level of responsibility is for the State to protect the individual candidate's access to certification. While it cannot be expected that all who are interested are capable of attaining whatever is required for certification, the State has a responsibility to ensure that fair and equal treatment is given to those who seek certification. It is at this level the "policy attitudes" mentioned above are most visible. Fair and equitable treatment can be given if the State has a "policy attitude" and operates in accordance with it. If a "non-attitude" exists, fair and equitable treatment is difficult, if not impossible, to achieve.

The third level or responsibility deals with the state's advisory and consultative role which is usually provided to a variety of interested agencies, e.g., the higher education institution, the school district, professional associations as well as individual citizens.

In most instances the lines between the three levels are very fine and often indistinguishable. But the state must always be careful that lower order responsibilities do not compromise those at a higher level.

THE COMPETENCY-BASED MOVEMENT

C/PBTE is a national movement. While not every state is fostering a statewide thrust, some evidence of C/PBTE is occurring in every state. As one looks at the various state approaches to C/PBTE it is evident that there is no single definition of the concept and the lack of definition, at present, is aiding the growth of confusion. An early publication of the AACTE Committee on Performance-Based Teacher Education suggested that there were three levels of characteristics; essential, implied and related or desirable. While the five elements of the essential characteristics are usually present, even they are not universally present and the level of importance of each of the elements varies from place to place. The essential characteristics, described by Elam (1971) are:

1. Teaching competencies to be demonstrated are role-derived, specified in behavioral terms, and made public.
2. Assessment criteria are competency-based, specify mastery levels, and made public.
3. Assessment requires performance as prime evidence, takes student knowledge into account.
4. Student's progress rate depends on demonstrated competency.
5. Instructional program facilitates development and evaluation of specific competencies. (p. 7)

Looking at even the most general definition and some of the confusion over structure and terminology that has existed over the past few years raises the question as to why the movement has taken on national significance.

Again there seems to be no single reason for the spread of the C/PBTE concept. Reasons and perceptions of reasons are complex and so intermeshed that a clear exposition of why C/PBTE developed in one place would have little value if used as a measure somewhere else.

Schmieder (1973) has listed some nine general reasons for movement towards a form of PBTE. They are:

1. Continual and Conscientious Introspection of the Education Community.
2. Press for Accountability.
3. Increased Focusing of Political Action on Fiscal Issues.
4. Management Organization Movement.
5. Press for Personalization/Individualization of Education.
6. Desire of State Education Departments to Develop More Effective Certification Processes and Standards.
7. Investment of Federal Funds in CBE Development Efforts.
8. "Readiness" of Education R and D.
9. Increase in Alternative Educational Systems and Resulting Need for Dependable Measures of Comparison. (p. 3-4).

In an attempt to summarize the variety of positions the several states are taking on CBTE, Roth suggests that a continuum ranging from "Decentralized" to "Centralized" be drawn. The following "locators" are noted on the continuum beginning with "Decentralized".

1. Informational
2. Process
3. Alternative Program
4. Facilitation
5. Mandate
6. Generic Competencies
7. Specific Competencies
8. Competencies - Criteria
9. State Assessment (Roth, 1974)

The first four "locators" represent means used by the State to positively encourage the local development of CBTE programs. In these instances, few, if any, specific content requirements are imposed by the State. The fifth "locator" can be viewed as a bridge between the least decentralized and the least centralized. The State that "mandates" CBTE can either "mandate" a decentralized system or a more centralized one which would include some state-approved content. The final four are clearly related to an increasing degree-of-centralization, from specifying some generic competencies to be included in preparatory programs to requiring a specific State assessment procedure.

The status of the various states varies from month to month and a specific listing of states and where they are on the Roth continuum would not be appropriate. The most recent survey of the states shows no state at either "locator 1 or locator 9." The majority of states, that have taken state action, are found in either the "alternative program" locator or the "mandate" locator. But almost as many states can be categorized as having CBTE under study. In each of these states activities are being carried on under the heading CBTE but the State itself has taken no specific action.

With the reader's understanding that a definitive statement of any particular State's position on CBTE is outdated almost as soon as it is made, some illustrations of various patterns may be helpful.

Florida

Florida continues to support the movement toward competency-based certification and teacher education through encouragement of innovative programs in districts and institutions, and through support of projects for research, development and dissemination of products and practices useful in competency-based programs.

Indiana

Indiana is revising the state requirements for school personnel. It is not the intent of the State Board of Education to mandate CBTE. Provisions have been made, however, within the new certification regulations for preparatory institutions to develop competency-based programs.

New York

Policy established by the Board of Regents in 1972 calls for all accredited programs of preparation to be revised by 1979. While the CBTE label has been attached to the implementation of the Regents' policy, New York notes that a competency-based program is one which the collaborative efforts of representatives from higher education institutions, school districts and the professional staff of school districts provides a readily available and explicit statement for preparatory programs that identifies;

1. the knowledge, skills and attitudes expected of graduates based upon a stated conceptualization of the role for which people are being prepared.
2. the means, standards and conditions by which the attainment of the desired skills, knowledge and attitudes will be assessed.
3. the evaluative mechanism by which the program will be monitored, evaluated and modified in light of experience.

Pennsylvania

New standards requiring that education programs become competency based have been developed. Extensive work has been done on preparing, through a "grassroots" process, an inventory of generic teaching competencies. Developing a plan to evaluate and certify certification applicants who are not graduates of Pennsylvania approved programs.

Vermont

Mandate from the State Board of Education to develop alternative inservice certification programs that are competency based. Competencies are to be based at the local level by involvement of all interested parties. Programs for inservice certification may be submitted by local school districts for state approval.

These four short descriptions of State action are illustrative of the variety of approaches being taken. This author believes that the diversity represented is a most healthy sign which, over time, will bring the education profession much closer to the definition of a professional body of knowledge. The deep involvement of school district personnel in developing and implementing CBTE preparatory programs is another sign of a definite movement toward the continued improvement of programs of preparation.

PROMISE AND PROBLEMS

Regardless of the tack a state takes in the initiation of a statewide C/PBTE program of teacher education there is the promise of significant benefit to the State's responsibility for the legal accreditation process. A more public and explicit declaration of expected outcomes as a result of a teacher education program provides better information about the program than does a curriculum guide and set of course descriptions. A more public and explicit declaration of the standards and criteria for assessing the attainment of the expected outcomes is better than the statement of policy that a 3.0 grade point average must be maintained when there is no evidence of what a 3.0 GPA means. A required plan to establish a system by which the program is monitored and evaluated gives better data on the determination of the appropriateness of the expected outcomes, their reliability and their validity. The more intimate involvement of school personnel working in conjunction with collegiate staff in the planning, development, implementation and evaluation of a preparatory program promises a more adequate meld of theory and practice as well as a sense of relevancy heretofore assumed but not always factually found to be in existence.

These promises are not only of benefit to the State but also to the institution offering the program by providing more concrete information about the appropriateness of the program. In addition, employing officers have available to them additional data in terms of more explicit information for purposes of recruitment and selection about what capabilities an applicant had demonstrated during his/her program of preparation.

While, at least from one person's viewpoint, the promise of C/PBTE is significant and exciting, the fulfillment of the promise will take time and effort to overcome the problems surrounding C/PBTE.

Probably the major problem faced by those involved in C/PBTE at State or local level is assessment. The capability to establish valid and reliable criteria for the assessment of the wide variety of expected capabilities included in a preparatory program just does not exist at the present time. The problem is made more complex by the fact that the development of adequate assessments cannot be done on a research basis prior to use. Development must occur within the scope of an operational setting and over a period of time which may be lengthy.

The issue of the cooperative involvement of representatives of schools and colleges is a problem needing solutions. The plural "solutions" is used deliberately, for the determination of the roles and responsibilities of those involved cannot fit into a standard pattern. They must be worked out within the constructs of the local situation.

The problem of financing needs to be solved. This is not to say that new money needs to be found, for new dollars in an over-burdened economy at a time when the demand far exceeds the supply are probably not readily available. The basic problem to be solved is not how much more is needed, but how much is needed and how does what is needed compare with what is presently being spent? The question of whether more, the same, or less money is needed for C/PBTE programs has yet to be answered. The problem goes beyond the identification of cost projections. Once cost figures have been identified, ways of meeting the costs by the creative use of existing resources will be a difficult task.

In a large number of the C/PBTE programs, the primary thrust is on the professional education portion of the teacher education program. Problems are envisioned, be they real or imagined, in involving subject matter personnel in C/PBTE. Subject matter personnel have an enormous contribution to make and must be involved regardless of whether competence in the subject area is assessed at the time of instruction, or if some assessment of subject competence is to be made during the period when the major portion of the professional sequence is being taken.

SUMMARY

Looking at the general concept of C/PBTE from the viewpoint of a regulatory agency one finds many positive features. The aspects of many public and explicit statements of expected outcomes and means of measuring outcomes are highly beneficial.

The State accreditation of programs to prepare persons for public school service must use those procedures which give the greatest promise of providing the public with assurance that persons to be certified have demonstrated competence, C/PBTE provisions promise better information than data which describe the training and experience of faculty, the course outlines, the library holdings, other facilities, etc.

It is important to remember that C/PBTE data is still in its early infancy. While the literature abounds with information about C/PBTE, the actual body of knowledge regarding; 1) those capabilities which make a difference and 2) the means by which capabilities can adequately be measured is, at best, insufficient and inconclusive. Thus, the gathering of data should be viewed as the establishment of base line information; a point from which direction for continued improvement can be seen more easily.

While the status of infancy must be recognized, the state can use the C/PBTE concept in exercising its legal responsibility. The importance of using every available means to assure that persons seeking certification have demonstrated those capabilities deemed necessary or desirable cannot be overemphasized. Even though the capability of describing and assessing those capabilities is in a primitive state, that kind of information is still more appropriate than traditional measures of adequacy and quality which have been traditionally used.

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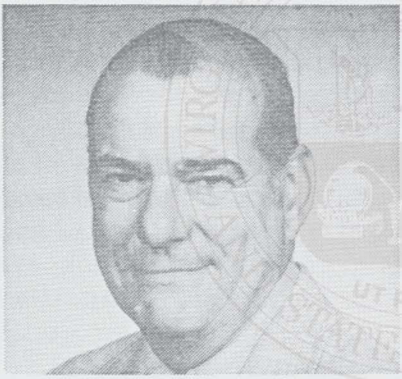
Schmieder, Allen. *Competency-Based Education: The State of the Scene.* Washington, D. C.: American Association of Colleges for Teacher Education, 1973.

Dr. Brooks has been on the Industrial Arts Education staff at the State University College at Buffalo since 1961. His primary assignments have been in the undergraduate and graduate professional education components of the program. He was primarily responsible for the introduction and development of the Professional Semester Center approach to student teaching, including a Competency-Based Guide for the Professional Requirements.

He received his Bachelor and Master degrees from George Peabody College for Teachers in Nashville, Tennessee and the Doctor of Education degree from the University of North Dakota.

In 1964 Dr. Brooks joined a ten-man educational team, sponsored by Teachers College, Columbia University and the Agency for International Development, to serve as advisors to the Minister of Education in Peru, South America.

New York State's early thrust in the competency-based teacher certification movement provided Dr. Brooks the opportunity to serve as Project Director for the State's CBTE pilot project in industrial arts, and since that time he has been actively involved in CBTE activities.



Dr. Stanley E. Brooks

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From 1971 to 1975, he served as a member of the New York State Industrial Arts Trial Certification Project. The mission of this Project was to design a competency-based certification program, whereby, prospective industrial arts teachers would receive initial certification. As a Life Member of AIAA, he has served as a member and chairman of various committees, and has been a frequent convention presenter and delegate at most of the annual conferences.

Dr. Brueckman has recently served as the Project Manager for the design and implementation of a competency-based curriculum, facility and industrial teacher education program for the Achmad Yani Technical Institute in Jakarta, Indonesia.

chapter 4

The Status of Competency/ Performance- Based Industrial Arts Teacher Education

Stanley E. Brooks

and

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Upon completion of this chapter, the reader should be able to identify:

- Those institutions presently studying and/or implementing C/P BIATE.
- The extent and type of involvement of IA teacher education institutions in the C/P based teacher education movement.
- Industrial Arts Teacher Educators who have displayed expertise in developing and implementing programs focused on the C/P BIATE mode.
- Sources and varied types of protocol materials essential to the implementation of C/P BIATE programs.
- National trends and emphasis of C/P BIATE.

THE BACKGROUND FOR THE STUDY

In 1974 the New York Industrial Arts Trial Certification Project published a report entitled, *Competency-Based Industrial Arts Teacher Education,* (Brooks and Brueckman, 1974). This report contained data collected through a nationwide survey of nearly 200 colleges and universities that have industrial arts teacher preparation programs. The editors of this yearbook have continued to monitor the status of C/P-BIATE by surveying the field in 1974 and 1975. The results, conclusions and comparisons of all three of these surveys provides the data base for this chapter and the statistical record of the current status of C/P-BIATE. The Industrial Teacher Education Directory, sponsored by ACIATE and NAITTE and compiled by Dr. Ervin Dennis was used to identify the institutions surveyed. A copy of the 1975 survey follows and is identified as Table 1.

An annual average of over 200 colleges and universities were contacted as part of this three-year survey. Despite the 60-9 percent annual average of return (see Table 2), the data does not include information from some institutions which are known to have made some progress in the development of a C/P BIATE program.

Table 1

A Status Study of Competency-Based Industrial Arts Teacher Education and Certification

1. Is your staff studying CBTE? Yes ☐ No ☐
2. Is your staff engaged in an operational CBTE Program? Yes ☐ No ☐ (If your answers to 1 and 2 are no, you have just completed the survey.)
3. Is your CBTE implementation primarily concerned with: Professional Sequence ☐ Technical Sequence ☐ General Education ☐ Individual Courses ☐ Total I.A. Teacher Education Program ☐
4. Is your CBTE commitment . . . A Total Staff Project ☐ A few staff ☐ One Member's effort ☐ Administrative effort ☐
5. Your CBTE Program is focused on: Undergraduate Level ☐ Graduate Level ☐
6. As of this date, your stage of CBTE Development can be categorized as . . . Studying the Concept ☐ Beginning to Implement ☐ An Operational Program ☐ Evaluating and Revising ☐
7. Approximately how many of your staff attended or will be attending the following professional meetings this academic year: AACTE ☐ ATE ☐ ASCD ☐ AACCTE Clinics ☐

8. Please check the degree of Agency involvement which was (is being) used to develop your CBTE Program:

Degree of Involvement

Agency	Planning			Operating		
	None	Some	Total	None	Some	Total
Public School IA Teachers						
Professional IA Associations						
IA College Students						
Public School Administrators						
Public School Guidance Personnel						
Inter-Disciplinary Departments — College						
Lay Advisory Groups						
State Education Department						
Others — List:						

9. Is there a contact person other than yourself, to whom interested CBTE parties should write for additional information?
   Yes ☐ No ☐
   Name ______________________________

10. Are printed materials for your CBTE Program available?
    Yes ☐ No ☐
    Please list titles and cost below.

____
ID Number

Table 2

Survey Contact Results

Year	Number Sent	Number Returned	Percent of Return
1973	198	139	70
1974	213	149	70
1975	195	131	67
Average/Year	202	140	69

The first two questions on the questionnaire were designed to indicate the amount of staff involvement in the CBTE process. The results of the first two questions also serves as an indicator of change in involvement over the three-year period. (Table 3).

Question 1: *Is your staff studying CBTE?*

Question 2: *Is your staff engaged in an operational CBTE Program?*

Table 3

Responses To Questions 1 & 2 (Number of Institutions)

Year	Question 1 Yes	Question 1 No	Question 2 Yes	Question 2 No
1973	72	64	34	99
1974	100	32	36	108
1975	79	38	36	88

Table 3 indicates that 30% (36/124) of the institutions participating in the survey in 1975 have an operational CBTE program. The 30% figure is slightly higher than that of the surveys from the two previous years.

The apparent consistency in the number of institutions, 34 in 1973, 36 in 1974 and 1975 with operational programs, could indicate very little growth in the development of CBTE programs.

The data for the three-year study indicates that 66 different institutions have reported operational programs, however, only 12 institutions have consistently reported operational programs during the same time span (see Table 8). It is also interesting to note the number of institutions studying CBTE in 1974 (100), as compared to 72 in 1973 and 79 in 1975, and then to compare those figures with the number of operational programs (see Table 3). It might be concluded that the results of the departmental studies conducted during 1974 deterred any further development of additional CBTE programs. This conclusion would be contrary to the findings of the Westbrook and Sandlefus (1975) survey which was reported in the December issue of the Kappan Magazine. Their report indicated an increase of 37 AACTE institutions reporting full scale CBTE programs in 1975 when compared to an earlier study in 1973 of similar institutions. Another explanation for the decrease in the number of industrial arts departments studying CBTE is what might be referred to as the wait and see attitude toward CBTE. For example, some industrial arts departments are waiting for reports from college of education committees and for pilot studies before determining the direction and scope of their CBTE program.

In an attempt to clarify the format and direction of their implementation of CBTE, the respondents were requested to indicate the focus of primary concern in the development of CBTE at their institution. (See Table 4)

The results of the 1975 survey points out that the professional sequence, student teaching and teacher education courses, have had more implementation than any of the other areas that are generally considered to be part of industrial arts teacher preparation. This emphasis is consistent with the national research in CBTE. Most of the available CBTE protocol material focuses on the development of pedagogical performance objectives and generic teaching competencies such as the Cotrell (1971) study.

Question four reveals the type of staff commitment to the CBTE movement by requesting institutions to indicate whether the involvement was by the total staff, a few staff, one staff member, or the administration. (See Table 5).

Table 4

Primary Focus of CBTE Implementation
(Number of Institutions)

Question 3: *Is Your CBTE Implementation Primarily Concerned With:*

	Professional Sequence?	Technical Sequence?	General Education?	Individual Courses?	Total IA Program?
1973	25	18	3	24	36
1974	34	27	7	30	31
1975	39	20	7	24	17

Table 5

Staff Commitment
(Number of Institutions)

Question 4: *Is Your CBTE Commitment:*

	A Total Staff Project	A Few Staff	One Member's Effort	Administrative Effort
1973	28	30	10	
1974	28	38	10	16
1975	15	31	8	14*

* Multiple Responses

The 1975 responses for staff commitment attests that most of the institutions responding have a few staff members involved with CBTE. The concept of a group effort when studying or developing a CBTE program is advocated by most CBTE authorities. In fact, Stanley Elam (1971) and the American Association for Teacher Education's Committee on Performance - Based Teacher Education agree that one of the desirable characteristics of CBTE program, "is a broad base for decision making — for logical reasons as well as the requirements of democracy and professionalism" (PBTE Series No. 16, 1974).

Each of the 14 institutions indicating administrative effort as their CBTE commitment did so as part of at least a double response to question four. Specifically, four institutions indicated a combination commitment of the total staff and the administration involved with CBTE.

The 1975 responses to question five indicates that the focus of the CBTE effort at fifty-six institutions (see Table 6) is at the undergraduate level. Of the 21 institutions indicating effort at the graduate level, 18 also indicated effort at the undergraduate level. The three institutions in 1975 indicating only a graduate level focus are:

Southwest Missouri State University
Keene State College — New Hampshire
Southern Utah State College

Table 6

CBTE Program Focus
(Number of Institutions)

Question 5: *Your CBTE Program is Focused on:*

	Undergraduate Level Only	Graduate Level Only	Undergraduate & Graduate
1973	50	2	16
1974	89	2	20
1975	56	3	18

The apparent decline in the number of institutions, 89 to 56, (See Table 6) involved with CBTE on the undergraduate level from 1974 to 1975, coincides with the pattern of responses to question six (See Table 7).

Table 7

Stage of CBTE Development (Number of Institutions)

Question 6: *As of this date your stage of CBTE Development can be categorized as:*

	Watching	Beginning	Well Along	Done and Waiting
1973	12	48	8	3
	Studying*	Beginning	Operational*	Evaluating*
1974	50	44	6	11
1975	36	25	9	12

* Title of Categories Changed from 1973

It is difficult to generalize as to the reasons why fewer institutions are studying the CBTE concept and/or beginning to implement in 1975 as compared to 1974, (see Table 7). The fact still remains that there has been a decline. Upon further study into the factors causing what appears to be a decreased interest in the CBTE process, the explanations most frequently offered could be best categorized as economic. These explanations include a lack of support defined as time, money and personnel, for:

1. program research
2. program development
3. staff development
4. program governance
5. development of competencies
6. assessment and feedback

This listing is not exhaustive as far as economic considerations are concerned and, of course, it does not begin to deal with any of the other outside factors which have a very definite influence on the industrial arts teacher education department attempting to be involved with the CBTE process. Outside factors include other collegiate departments — typically in the liberal arts, co-operating schools — administration and staff and, probably the most influential, the professional teacher organizations.

In spite of the decreased involvement by many of the responding institutions, there are 36 institutions participating in the survey that indicate that they have an operational program. Table 8 is a listing of those institutions indicating operational programs and the person who was either initially contacted or who was identified as the departmental CBTE contact or leadership person.

Table 8

Institutions Reporting Operational CBTE Programs

Institution	Program Status	Contact Person
Tuskegee Institute	(2)	R. Ellis
San Jose State University		A. J. MacDonald
Adams State College	(a)	C. R. Svendsen
Southern Colorado State College		J. B. Morgan
Florida International University	(3)	A. Dean Hauenstein
Illinois State University	(3)	F. L. Loepp
Iowa State University	(3)	W. D. Wolansky
University of Northern Iowa	(2)	A. J. Freitag
Kansas State College of Pittsburg	(2)	F. V. Sullivan
		F. L. Penny
Western Kentucky University		F. Conley
Grambling State University	(2)	F. M. Lloyd
Central Michigan University	(3)	L. G. Ecker
Lake Superior State College		D. L. Lickteig
Northern Michigan University		E. D. Cory
Wayne State University	(2)	J. D. Bies
Western Michigan University		R. E. Dannenberg
St. Cloud State College	(b)	W. H. Kemp
University of Minnesota	(3)	D. C. Bjorkquist

(Continued on next page)

Table 8 (cont.)

Institution	Program Status	Contact Person
University of Minnesota, Duluth	(2)	H. O. Wickler
Southeast Missouri State University		B. D. March
Glassboro State College		J. W. Gallinelli
Trenton State College	(c)	R. Edelback
Appalachian State University	(3)	A. F. Rapp
North Carolina A & T State University		G. C. Gail
Wilmington College		J. M. Benson
California State College	(3)	J. R. Linton
Millersville State College	(3)	P. D. Wynn
Tennessee State University	(3)	Mrs. Elizabeth Reed School of Education
Abilene Christian College	(3)	J. D. Drennan
Texas A & I University		J. W. Hendrick
Southern Utah State College	(d)	R. C. Hilton
Utah State University	(3)	N. C. Slack
Western Washington State College		J. L. Burwell
Fairmont State College	(3)	J. A. Hales
University of Wisconsin - Stout		M. J. Benson

Program Status

a — not on a formalized basis
b — somewhat
c — very limited, only in a few areas
d — partly at this time

Program Status

3 — Reporting for three years
2 — Reporting for two years

* One institution declined to give permission to be cited.

Some of the total figures of the three-year data indicating attendance at CBTE professional meetings elicits comment. With an annual average number of over 83 institutions (see Table 9) indicating that they had staff studying CBTE from 1973 to 1975, the total number of individuals attending CBTE professional meetings has greater significance.

Table 9

Attendance at CBTE Professional Meetings
(Number of Individuals)

Question 7: *Approximately how many of your staff attended or will be attending the following professional meetings this academic year:*

	AACTE	ATE	ASCD	AACTE Clinics	Total
1973	14	4	9	14	41
1974	15	9	4	10	38
1975	29	4	1	2	36

An annual average of only 38 individuals attended clinics, workshops and conferences specifically and totally directed toward the dissemination and exchange of CBTE materials and procedures. It should also be noted that many of the approximately 80 industrial arts departments studying CBTE sent more than one individual to the various professional meetings each year during the survey period. This fact simply points out that many less than the annual mathematical average of 38 industrial arts staffs were represented at any of the professional meetings focusing on CBTE. As an example, the 36 individuals attending CBTE professional meetings in 1975 (See Table 9) represented only 19 different institutions.

Question eight requests information concerning the agencies and groups of people who could be involved in the development of a CBTE program. The concept of a consortium effort is supported by the AACTE's Committee on PBTE recommendation # 12.

> "PBTE programs should generally be undertaken on a collaborative basis involving significant roles in governance and planning by representatives and colleges and universities, school districts, the organized teaching profession, students in teacher education programs, and the general public." (PBTE Series # 16, 1974, p. 20)

In the survey (See Table 10) the agency with the highest degree of involvement was the Industrial Arts College students followed closely by two public school agencies, namely: the industrial arts teachers and the administrators. The involvement of these three "agencies" may support the portal school concept of CBTE (Shearron & Johnson, 1973) but the involvement with these agencies is probably due more to the traditional student teaching arrangement which many college industrial arts departments have with the public schools.

Table 10

Agency Involvement in CBTE Program Development in 1973 (Number of Institutions)

Question 8: *Check the degree of agency involvement which was (is being) used to develop your CBTE program:*

	None	Some	Consider-able	Total
Public School IA Teachers	10	31	9	1
Professional IA Association	14	22	6	1
IA College Students	5	33	14	
Public School Administrators	15	29	6	
Public School Guidance Personnel	22	14	3	
Inter-Disciplinary Departments College	12	16	16	3
Lay Advisory Groups	18	17	5	
Others (ie, State Education Department)	1	5	4	

The 1974 and 1975 surveys differentiated between the planning and operating functions of the various agencies as well as the degree of involvement in CBTE program development. There was a 15% decrease in the number of institutions responding to any part of question eight from the 1974 survey to the one in 1975. Of the 48 different response categories in question eight (see Table 11), only four responses showed an increase in the degree of involvement from 1974 to 1975.

Table 11

Agency Involvement in CBTE Program Development in 1974 and 1975 (Number of Institutions)

Question 8: *Check the degree of agency involvement which was (is being) used to develop your CBTE program:*

Agency		Planning 1974	Planning 1975	Operating 1974	Operating 1975
Public School I. A. Teachers	None	18	12	9	5
	Some	47	25	17	13
	Total	1	3	1	0
Professional I. A. Associations	None	26	15	12	9
	Some	36	20	11	4
	Total	2	0	0	1
I. A. College Students	None	11	7	4	4
	Some	57	29	21	12
	Total	24	1	5	3
Public School Administrators	None	27	14	9	5
	Some	37	21	15	10
	Total	0	0	0	0
Public School Guidance Personnel	None	39	21	18	10
	Some	18	5	4	4
	Total	0	0	0	1
Inter-Disciplinary Departments College	None	17	12	6	5
	Some	40	25	19	13
	Total	3	2	1	1
Lay Advisory Groups	None	34	15	10	7
	Some	18	13	10	9
	Total	0	0	0	0
State Education Department	None	8	12	6	4
	Some	56	23	20	14
	Total	6	3	6	3

There was a total of 11 responses for 1974 and three for 1975 in the "other" category. Most of the 14 responses appeared to be the types that would be the result of a misinterpretation of the question. Responses such as publications, teacher educators and college I. A. teachers were common.

The operating section of responses has greater significance when the responses to question two are reconsidered (see Table 2). There were 36 institutions that indicated an operational program in 1974 and in 1975. Logically, only the institutions indicating an operational program would respond to the operating category in question eight.

Of the 36 institutions reporting operational programs in 1975, 15 were doing so for the first time (See Table 12). Twelve institutions reported an operational program from 1973 through 1975 and six different institutions reported operational programs both in 1974 and 1975. The rationale for three institutions reporting an operational program in 1973 and 1975 and not in 1974 is unidentified at this time.

Table 12

Operational CBTE Programs in 1975 (Number of Institutions)

New in 1975	15	
Operational 1973, through 1975	12	Identified by "3" in table 8
Operational 1974 and 1975	6	Identified by "2" in table 8
Operational 1973 and 1975	3	
Total	36	

In addition to the 36 institutions reporting in 1975, four more institutions which had indicated an operational program in 1974 and 1973 did not respond to the 1975 survey. Another example of what purports to be an abandonment of operational programs is the fact that of the 18 institutions reporting an operational program in 1974, nine did not respond to the 1975 survey and the remaining nine institutions indicated that they did not have an operational program in 1975. A similiar 50-50% distribution for responses was reported for the 12 institutions indicating an operational program in 1973 and not in 1974 and 1975.

The question still remains as to why the discontinuance and what, if anything, was learned during the operational phase of the development of the CBTE programs. What, if any, printed materials were generated for or during the operational phase of the program? The 11 positive responses to question 10 were not made by any of the institutions indicating a cessation of an operational program. In fact, 10 of the 11 institutions indicating the availability of printed CBTE materials have indicated they have operational programs in 1975. Table 13 lists these institutions and the individuals to be contacted for further information.

Table 13

Sources of Printed C/PBIATE Program Materials

California State University, Chico	E. J. Mannion
Grambling State University	F. M. Lloyd
Wayne State University	J. D. Bies
Southeast Missouri State University	B. D. March
Keene State College	R. E. Wenig
Trenton State College	R. Edelbach
Department of Education, Harrisburg, Penn.	Ms. K. Kies
Millersville State College	P. D. Wynn
Southwest Texas State University	M. J. Pierson
University of Wisconsin - Stout	E. R. Rudiger

It should be noted that K. Kies was identified by the respondent from California State College and M. J. Pierson was identified by the respondent from Abilene Christian College. Both institutions have had an operational program for at least the three-year period of the survey and have indicated the CBTE resource person as being outside their department. However, a very limited amount of information has been developed specifically for the industrial arts discipline.

SUMMARY

The following observations, recommendations and conclusions have been reached as a result of a careful examination of the data from the three-year national survey, personal contacts with some of the individuals identified by the surveys, and visitations at institutions reporting progress in the development of CBTE programs.

1. It should be noted that at the date of this publication, the most current data and information from the surveys and visitations reported in this chapter will be at least two years old.
2. A great divergence in the definition of an operational program has been identified by the surveys. Programs are reported operational when any or all of the typical program elements are in a CBTE mode. Of course, the biggest mistake that can be made in translating to a CBTE format is to shortcut the actual program development as W. Robert Houston, noted CBTE authority, points out,

   > "CBTE offers the opportunity to reconceptualize professional education to make it more relevant in a rapidly changing culture. Simply translating current courses into modules and course objectives into behavioral terminology shortcircuits the process and undermines a potentially powerful movement."[6] (Houston 1974)

3. There is a need for better communication among industrial arts departments interested in C/PBTE regardless of the level of program development. Hopefully, the identification of institutions and individuals presently involved with CBTE will help to initiate the needed communication.
4. There are logical reasons to establish, at least on an ad hoc basis, a committee within the national organizational structure that would supply the platform for the exchange of CBTE program formats, procedures and materials as part of the annual national convention.

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Dr. A. Dean Hauenstein

Dr. Hauenstein is well known to the industrial arts profession for his work with the Ohio State Curriculum Project and for his *World of Communications* and *Communications Careers* texts. He has also been a frequent speaker at state and national industrial education meetings.

He received his Bachelors and Masters degrees from Miami University, Oxford, Ohio and the Doctor of Philosophy degree from Ohio State University. While at Ohio State, Dr. Hauenstein served as a teaching and research associate on the IACP development. From 1967 to 1971 he assumed the role of Assistant Director Curriculum Development - IACP.

Moving to Florida International University in 1971, a CBTE oriented institution by design, Dr. Hauenstein has developed numerous competency-based instructional resources. And, he has served as Interim Director for FIU's competency based Industrial Education Program.

chapter 5

Florida International University: A Case Study

A. Dean Hauenstein

Upon completion of this chapter the reader should be able to:

- Identify the university setting, student characteristics, organization of the university, similarities and differences between traditional and CBTE programs and comprehend CBTE terminology.
- Identify the inputs, processes, outputs of a CBTE system and the several factors that influence the system.
- Describe at least five program standards, describe the organizational structure within which the industrial arts program operates, and describe the program plan and control.
- State the primary competencies for the Bachelor's and Master's degrees and describe the programs; how they were developed; the delivery system utilized; and, the course development model.
- Describe the instructional process of the CBTE system.
- Explain how the students and the program are assessed and/or evaluated.
- Identify four major problems associated with CBTE and explain why they are problems.

BACKGROUND

The Setting

In a growing Florida community the university has an important part to play in the education of the populace. In fulfilling this vital role the School of Education, under the leadership of Dean Wesley G. Sowards, is committed to the development of quality teachers in all aspects of education. To achieve this goal, competency-based teacher education is thought to hold the most promise. Thus, this chapter deals with the systems approach used for the development and implementation of CBTE in industrial arts at Florida International University.

For proper perspective, the reader should be aware of the setting in which the university exists and the clientele it serves. Florida International University is an accredited upper division State university in metropolitan Dade County, Florida. FIU was legislatively authorized in 1965 and opened its doors to over 5,000 juniors, seniors and graduate students in 1972. In 1973, 1974, and 1975 the student populations were over 10,000. Student projections for 1980 show a continued growth pattern.

Student Characteristics

Most students enter FIU with an A.A. or A.S. degree from the local Miami-Dade Community College and Broward Community College. About fifty percent of the students work and commute to the university.

No dormitories are planned for the university. The student body is a mixture of black, white, and Latin cultures. South Florida is increasingly becoming a melting pot of people from all parts of the United States, the South and Central Americas, and the Caribbean Islands, as well as European and African cultures.

University Organization

The following outline depicts the organization of the university and the place of industrial arts within the organization.

College of Arts and Science (service to all schools) (Traditional programs)

School of Hotel, Food and Travel Services (Traditional programs)

School of Technology (Traditional programs)

School of Business (Traditional programs)

School of Health and Social Service (CBE)

School of Education (CBTE)

Division:
- Childhood Education
- Psycho-Educational Services
- Health, Physical Education and Recreation
- Secondary Education
- General Professional Education and Educational Administration
- Vocational and Adult Education

Programs:
- Industrial Arts Education
- Vocational Industrial Education
- Home Economics Education
- Technical Education
- Health Occupations Education (1977 program approved by the University)
- Vocational Handicapped Education (near future)
- Adult Education
- Business and Office Education (1977 program approved by the University)

CBTE Characteristics and Terminology

Before proceeding to a discussion of the systems approach, it is essential to understand the differences between traditional and CBTE programs, and the terminology and format of CBTE at FIU.

1. Comparison of Traditional and CBTE Program Characteristics and Features

Program Characteristics

Traditional	CBTE
Content-based	Competency-based
Time-based	Performance-based
Group-paced	Individually-paced
Delayed Feedback	Immediate Feedback
Textbook/Workbook	Multi-media Materials
Course Oriented	Module Oriented
Classroom-based	Field-based
Instructors	Facilitators
General Objectives	Specific Objectives
Subjective Criteria	Objective Criteria
Norm-referenced Standards	Criterion-referenced Standards

Program Features

	Traditional	CBTE
Objectives	— General	Specific and Behavioral
Content	— Textbook(s), Lectures	Modules, Visuals
Nature	— Group Oriented Lectures, Recitations Outside Readings	Individual Oriented Self-Paced Study, Tutoring
Evaluation	— Tests, Quizzes, and Written exams: Norm-referenced	Performance in School Situations: Criterion-referenced
Feedback	— Seldom	Frequent
Emphasis	— Achieving Grades Knowing	Achieving Competence Doing

2. Terminology of CBTE in Industrial Arts at FIU

a. Behavioral Body of Knowledge. Concepts derived from a taxonomy of teacher functions, which include professional and technical habits, skills, attitudes and concepts.

b. Criterion-referenced Evaluation. Objectives expressed with performance task, conditions, and standard of acceptability or proficiency. Emphasis is on mastery and proficiency rather than on grades.

c. CBTE Reporting System.

A = Excellent (demonstrates superior performance)
B = Good (above minimum standard of acceptable performance)
C = Average (minimum standard of acceptable performance)
D = Poor (unacceptable level of performance) not acceptable for undergraduate credit in required program of studies)
NC = No Credit (student must retake course)

d. Course. A collection of related modules with experiences designed to develop competencies.

e. Individualized Instruction. Student is self-paced, works at his/her own speed, resource materials and facilities are available as needed.

f. Flexible Scheduling. Courses offered are based on student feedback of course and program needs of students, day or evening, weekday or weekend, on-campus, off-campus.

g. Delivery System. Course handbooks with modules, tasks, enablers, and resources are distributed at first class meeting. Student knows goals, tasks, and performance standards at outset.

h. Field-based Experience. Methods courses culminate in field-based applications, student-teaching is fully field-based.

i. Record-reporting System. Record system for student assessment and counseling is computerized as resources permit.

j. Counseling. Individual program guidance, program registration and personal counseling.

3. Format of Handbooks *

At the beginning of each course handbooks are distributed which contain the following:

- Title page
- Course description as per catalog description
- Table of contents
- Introduction to the course
- Grading standards and procedures
- Entry level requirements
- Modules possess the following format:
    - Introduction — provides context and background
    - Goals of Module
    - Tasks
        - Performance objective — behavior, conditions, and acceptable standard of proficiency
    - Enablers
        - Cognitive and affective input. What you need to know or feel to perform the task at an acceptable standard
    - Instructional Resources
        - Books, articles, presentations, demonstrations, films, etc., to gain enabling knowledge prior to task performance

*See Appendix "A" Material titled *EIA 405 Instruction in Industrial Arts,* as a sample handbook (Modules) containing competencies in the industrial arts teaching methods course.

INTRODUCTION TO THE SYSTEM

A system is characterized as an entity that has three major parts; inputs, processes, and outputs. A CBTE program also has these three parts.

Inputs

Inputs to a CBTE program include: (a) knowledge; (b) people; (c) finance; and, (d) industrial and service resources. Knowledge of CBTE purposes and concepts are essential to developing and implementing CBTE programs. At FIU, faculty and administration committed to the CBTE concept were employed from the outset. As faculty and administration come and go, replacements are selected on the basis of their experience and predisposition to CBTE. Finances (funds and capital) are as essential to establishing and operating CBTE programs as they are to any educational endeavor. Financial resources, whether legislated or solicited are a major detriment in achieving the goals of CBTE. Industrial resources such as buildings and equipment and services of water, light, and telephone are essential to provide the educational environment in which CBTE programs can be developed and nurtured.

Processes

The processes of the system include: (a) managing, (b) researching and developing, (c) preparing for instructions, (d) teaching, and (e) evaluating.

Managing the system entails the planning, organizing and controlling of the inputs, processes, and outputs. Researching and developing activities gather and apply new knowledge to program design and implementation. Preparing for instruction includes the preparation of instructional materials, scheduling facilities and personnel and setting up field centers. Teaching is facilitating the development of competencies. Evaluating includes assessing the program and the proficiency of the learner, and provide feedback for program modification and improvement.

Outputs

Outputs of the system include (a) competent teachers, counselors, administrators and other educational personnel; and (b) effective and efficient learning systems. Together, these outputs have a discernable impact upon the preservice teacher, the quality of industrial arts programs in the school, the facilitation of pupil learning, and supportive services in public and private educational settings.

Factors Influencing the System

There are many factors that influence the system. Some of the more important factors have been: legislation, certification, university goals, School of Education and Division goals, and students and faculty.

For the system to be implemented, State legislation must be such to allow CBTE to be developed, experimented with and supported. Without legislative and financial support, little can be accomplished. Certification of teachers must be consistent, or at least flexible enough to accommodate the products of CBTE programs. The Florida Department of Teacher Certification recognizes and certifies products produced by CBTE programs in industrial arts. Division and School of Education goals must be compatible within the framework of university goals. It would be difficult to carry out Division programs and policies which were at odds with the goals of the University or School of Education. CBTE programs would also be difficult to implement if the faculty were not committed to the approach and the program not accepted by the students.

According to FIU School of Education student evaluations of courses, about ninety-five percent of the students favor CBTE as compared to the more traditional approach. Students like the self-paced aspects of courses along with knowing what is required before they begin a course.

There were and are faculty differences of opinion on the grading system. The School of Education was committed to three years of experimentation with the credit grading system. In 1975, the credit grading system was changed to an A, B, C, D, NC system, but maintained the criterion-referenced levels of performance and all other CBTE evaluation concepts. The workings of this grading system are exemplified later in this chapter.

MANAGING THE SYSTEM

Management of the system involves making decisions and coordinating all of the inputs and processes in the system to achieve the desired output. The year prior to the opening of the university was a planning year. This time was devoted to formulating policies on the selection of personnel, identification of competencies, teaching loads, grading systems, field experiences, program articulations with community colleges, schedules, instructional resources, delivery systems, school and division organization, and budgets.

Generally, two or three faculty were employed in addition to the chairman of each division to assist in making these decisions. The author was fortunate to be one of the faculty employed during the planning year.

Inasmuch as the State Department of Education did not have program standards for CBTE in 1970-71, the School of Education at FIU was asked to develop CBTE program standards for teacher education. These standards provided direction for the management policies and work on the School of Education.

The following are the program standards of the School of Education, FIU as reported to the State Department of Education Committee in the document *Preparation of Educational Personnel at Florida International University* (1975, pp. 181-182).

PROGRAM STANDARDS FOR COMPETENCY-BASED TEACHER EDUCATION PERFORMANCE CRITERIA

The institution has a composite of the exit competencies, as well as a set of prerequisite competencies, which must be mastered by each person who successfully completes the program.

RESOURCES AND ACTIVITIES

Personnel

The institution has a roster of the personnel working in each program. It includes a summary of the educational and professional experiences which qualify them to be working in the program.

Facilities

The institution has information on the amount, type and utilization of facilities provided for conducting and evaluating program activities and learning experiences. This includes both on- and off-campus facilities.

Materials

The institution has information on the amount, type and utilization of materials provided for conducting and evaluating program activities and learning experiences.

Budget

The institution has a budget report on the overall cost of conducting and evaluating the programs.

Program Activities

The institution has information on the type of activities provided by the program. This includes information on the extent to which the program has the following characteristics: (a) prespecified competencies, (b) a criterion-referenced evaluation system, (c) extensive field-based learning experiences, (d) individualization in regard to pacing and optional learning experiences.

MANAGEMENT OF PROGRAMS

Decision Making

The institution has written documentation on the office and/or position responsible for making each type of decision which is required in operating the competency-based programs.

Admissions

The institution has clearly defined written criteria and procedures for admitting persons to the program.

Student Performance

The institution has procedures (1) for determining when specified prerequisite and exit competencies have been met and (2) for providing persons in the program with continuous feedback on their performance in relationship to those prerequisite competencies and exit competencies.

Screening

The institution has written policy and procedures for assisting students whose performance does not meet specified criteria.

Graduation

The institution has established policies and procedures for designating persons who have completed the competency-based program.

Follow-up

The institution has an established procedure for collecting, analyzing and reporting information on the types of employment or assignments accepted by all graduates.

Program Organization

During the first year of operation the industrial arts laboratory experiences were conducted in local Dade County School facilities due to a lack of on-campus facilities. When campus facilities were completed the program was initiated on campus. When the School of Technology came into existence in 1972-73, the technical laboratory aspects of the program were shifted from the School of Education to the School of Technology.

The Division of Industrial Technology in the School of Technology operates a quasi CBTE program for industrial arts students. It has modified its traditional approach to meet the needs of industrial arts education, yet operates within the policies and procedures of the School of Technology.

Thus the professional aspects of industrial arts education are housed within the School of Education and the technical aspects of the program are housed in the School of Technology. There is a close working relationship between the two schools. The technical industrial arts courses were outlined by the faculty in the School of Education and are implemented by industrial arts faculty employed by the School of Technology. Guidance and counseling of industrial arts students is provided by faculty in industrial arts education.

Program Plan and Control

Articulation agreements were negotiated with Miami-Dade Community College for a pre-teaching program in industrial arts. Students typically meet their general education requirements for a Baccalaureate degree and pre-professional requirements for certification at the community college.

Baccalaureate and certification requirements are completed at FIU. Typically, this means forty-five quarter hours of credit in professional education. To graduate a student must have 180 quarter hours of credit. Of the forty-five quarter hour professional component, fifteen quarter hours are earned in the "Professional Core" offered in the School of Education and thirty quarter hours of professional credit are earned in the Division of Vocational and Adult Education. Methods courses for industrial arts students are taught by industrial arts faculty. The supervision and coordination of industrial arts student teachers and other field experiences is also done by the industrial arts faculty. Follow-up data of student employment is obtained by the university Office of Institutional Research.

RESEARCHING AND DEVELOPING THE CURRICULUM BACHELOR'S DEGREE INDUSTRIAL ARTS TEACHER COMPETENCIES

During the initial planning year the author's responsibility was to plan the undergraduate and graduate industrial arts teacher education programs and other divisions programs. Many interdivision and intra-division meetings produced agreed-upon common professional undergraduate competencies. All trainees in the School of Education would develop basic knowledge and skill proficiency in teaching in three core courses: Schooling in America, (basic knowledge and exposure to the teaching role, and schools); General Teaching Laboratory I (generic professional technical teaching skills); and, General Teaching Laboratory II (human relations skills). Specific knowledges, attitudes and skills would be developed by each division. For example, all vocational division students would develop specific competencies in course planning and teaching techniques in this area of specialization. In addition, industrial arts students would develop competencies in the special methods of teaching industrial arts. The minimum professional education component for industrial arts is forty-five quarter hours.

Technical subject matter areas in industrial arts were derived in part, from the research done by the Industrial Arts Curriculum Project, at the Ohio State University, and legislation and State certification requirements (forty-five quarter hours in four of six technical areas).

In 1971, according to Florida State Board of Education Regulations, Chapter 6A-4, Section 21, the Florida certification areas were: woods, metals, graphic communications, electricity/electronics, power and transportation and arts and crafts. Under the leadership of Dr. Ralph Steeb, State Consultant for Industrial Arts, Florida was moving to update the certification requirements in industrial arts while at the same time there was movement toward performance-based education. The author submitted the subject matter areas of construction, manufacturing, industrial research and development, materials processing, graphic communications and power systems (electrical and mechanical) to the State subcommittee for certification in industrial arts. A dual track for industrial arts teacher certification was approved to accommodate FIU and other State universities and school districts moving in the CBTE direction. It should be noted that in Florida, industrial arts programs at the 6th, 7th, 8th, and 9th grade levels are specified as *pre-vocational* whereas, programs at the 10th, 11th and 12th grade levels are specified as *pre-technical.* Certification in industrial arts encompasses K-12.

The following is a listing of FIU's Industrial Arts Teacher Competencies as submitted for the document *Preparation of Educational Personnel at Florida International University,* (pp. 119-121, 1975). Figure 5-1 describes the undergraduate program of studies.

Bachelor's Degree: Industrial Arts Teacher Competencies

1. The pre-service teacher can plan a pre-vocational or technically oriented course of study to increase learning effectiveness, teaching efficiency, and technological relevancy. The teacher can plan the course with respect to the following:

Write goal statements.
Conceptualize behavioral functions, habits, skills, attitudes, concepts.
Write objectives.
Organize behaviors, content, and sequence to accomplish objectives.
Specify appropriate learning strategies.
Specify appropriate teaching strategies.
Develop lesson plans that reflect concepts, attitudes, skills, and habits.
Identify assessment criteria and develop assessment instruments.

Identify equipment and supplies.
Identify appropriate instructional resources.

2. The pre-service teacher can demonstrate proficiency in teaching pre-vocational or technically oriented industrial arts in a laboratory setting with regard to four of the following six areas: construction, manufacturing, graphic communications, power systems, materials processing, and industrial research and development. The teacher can demonstrate the following non-interactive and interactive skills in industrial arts.

IA Non-Interactive	IA Interactive
Prepare lesson plans	Organize class for individual and group work
Prepare instructional aids	Motivate students
Maintain clean and safe laboratory conditions	State concept referents and give oral presentation using appropriate language
Maintain inventory records	Lead discussions
Order equipment and supplies	Provide positive feedback and reinforcement
Complete school reports and papers	Give clear directions
	Present organized demonstrations
	Use visual aids and other instructional devices
	Manage classroom and laboratory activities
	Correct unsafe practices
	Identify student learning problems (reading, hearing, etc.)
	Evaluate student progress
	Interact with students, teachers and school personnel according to ethics of the profession

3. The pre-service teacher can demonstrate technical performance and use appropriate technical language in four or six of the industrial arts areas of: construction, manufacturing, graphic communications, power systems, materials processing, and industrial research and development with knowledge of, prin-

ciples and practices of industrial economics, management, personnel, and production related to the following technologies:

Researching and assessing consumer needs
Establishing enterprise goals, inputs, and policies
Product design and engineering
Planning for production
Procuring material resources and preparing for production
Converting raw materials into industrial materials
Converting industrial materials into components
Assessing production inputs, processes, outputs and impact
Installing, maintaining, repairing and altering industrial goods

4. The pre-service teacher can perform with positive attitudes of, and knowledge about, the following:

The role of the industrial arts teacher
The goals of education
The psychology of teaching and learning
The philosophy of industrial arts in the schools
Ethical practices and professional organizations
Teacher interaction with students
Assessment of student progress
Course of self assessment
Management of accident prevention programs
Administration and supervision of programs
The State educational system

Master's Degree Industrial Arts Teacher Competencies

As graduate programs primarily service certified teachers, several assumptions were made for program design:

Certified teachers possess the technical area skills under which they were certified
Teachers desire to increase or update their teaching and technical skills
Some teachers desire to gain administrative and supervisory skills
Teachers want higher education for higher salaries
Teachers not fully certified desire full certification
There are instructional and curriculum competencies common to all teachers.

Fig. 5-1. FIU Program of Studies for Bachelor of Science in Education. Specialty: Industrial Arts Education

1. Foundations of Education
   Psychological and Sociological foundations taken in the lower division.

	Quarter Hours
2. Professional Education	45
EDU 305 Schooling in America	5
EDU 311 General Teaching Laboratory I	5
EDU 312 General Teaching Laboratory II	5
EDS 401 Special Teaching Laboratory: Reading	5
EVO 306 Course Planning in Vocational Education	5
**EIA 405 Instruction in Industrial Arts	5
EVO 425 Student Teaching: Industrial Arts	15

	Quarter Hours
3. Technical Preparation	45
A. Required: A minimum of 45 quarter hours are required for certification with a minimum of 10 quarter hours in each of the following areas:	
Construction	
IAT 305 Construction Technology	5
IAT 405 Construction Process	5
IAT 420 *Architectural Drafting	5
Manufacturing	
IAT 306 Manufacturing Technology	5
IAT 419 Materials Processing	5
IAT 415 Drafting I	5
or	
IAT 416 Drafting II	5
IAT 409 *Materials of Industry	5
IAT 406 *Industrial Research and Development	5
Graphic Communications	
IAT 307 Reprographics	5
IAT 407 Planographics	5
IAT 408 *Photographics	5

(Continued on next page)

Power	
IAT 417 Mechanical Power Systems I	5
IAT 418 Electrical/Electronics Systems	5
EET 300 *Survey of Electronics	5
IAT 422 *Mechanical Power Systems II	5

*Elective Courses

B. Technical Electives: See asterisked courses above and other courses offered by the School of Technology. 5

90

4. Advised Electives
Enough electives should be taken to equal a minimum of 90 quarter hours.

**See appended Chapter 5 material titled EIA 405 Instruction in Industrial Arts as an example of one FIU, CBTE course.

With these assumptions in mind, research was conducted in the South Florida area to determine the needs of industrial arts teachers. As a result of the research, two 45 quarter hour graduate programs were designed; curriculum and instruction, and, administration and supervision.

The curriculum and instruction program is designed to develop competencies which increase effectiveness and efficiency in relation to functions of planning, facilitating learning, evaluating, and professional role.

The following are common competencies required of all graduate students in curriculum and instruction in the Division of Vocational and Adult Education.

Planning

1. Conducts and/or uses research as inputs for goals, program development and instruction.

2. Assesses social, economic, political, cultural and educational forces as they affect learners and the learning environment.

3. Formulates appropriate, flexible, short-range and long-range plans for programs and facilities.

4. Develops a systematic approach to selection and organization of knowledge and skills for a variety of learners.

5. Selects, develops, and evaluates appropriate educational resources and instructional strategies.

Facilitating

1. Establishes and maintains a safe and facilitative learning environment.
2. Prepares effective lesson plans and instructional materials.
3. Orients and motivates students.
4. Presents concept referents through multisensory media.
5. Demonstrates principles and practices of learning.
6. Uses interactive and non-interactive skills.
7. Manages learning activities.
8. Maintains a record keeping system.

Evaluation

1. Identifies assessable program components.
2. Designs, administers, and interprets assessment instruments and procedures.
3. Collects, utilizes, interprets, and reports data.
4. Monitors an educational program and modifies the educational process based on feedback.

Professional Role

1. States, defines, and defends philosophies of education, vocational education, and area of specialization.
2. Participates in professional activities, youth and/or adult organizations at the local, state, regional, national, and international level.
3. Interacts ethically with students, community, and colleagues.
4. Evaluates and maintains own professional growth and standards.
5. Counsels and advises students and colleagues.
6. Promotes professional growth of prospective teachers and colleagues.

Field experiences allow students to demonstrate their knowledge and skills in school situations.

Master's Degree: Industrial Arts Teacher Competencies

The Master's Degree Industrial Arts Teacher Competencies are listed below and Fig. 5-2 denotes the Master's Degree Program of Studies in Industrial Arts Education.

1. Planning

The master teacher can plan a prevocational or technically oriented industrial arts curriculum to increase learning effectiveness, teaching efficiency and technological relevancy. The teacher can plan a program with respect to the following:

Identify and assess program needs
Conceptualize a body of operational and informational knowledge
Write program goal statements
Conceptualize a program of courses
Write course objectives
Design and develop an instructional plan
Organize courses and their sequence to accomplish program goals
Outline and write a curriculum guide

2. Facilitating and Evaluating

The master teacher can demonstrate proficiency in facilitating and evaluating prevocational or technically oriented industrial arts in a laboratory setting in relation with one or more of the following: construction, manufacturing, graphic communications, power systems, materials processing, industrial research and development, woods, metals, electricity and electronics, plastics, graphic communications, power and transportation.

The teacher can demonstrate the following non-interactive and interactive skills.

Non-Interactive	Interactive
Develop record keeping systems	Experiment with and display command of teaching techniques
Plan and assess a laboratory facility for safety and efficient management	Display command of laboratory management techniques
Develop instructional media to communicate a concept, principle or practice	Display command of evaluation techniques
Evaluate programs according to criteria	

3. Professional Role

The master industrial arts teacher will perform with more sensitive attitudes and knowledge perspective about the following:

The philosophy, goals and programs of industrial arts at the national, state and local levels.

Research procedures and disciplined writing as a means of solving curriculum and instructional problems.

Trends and issues in vocational education and industrial arts.

Fig. 5-2. FIU Program of Studies for Master of Science in Education. Specialty: Curriculum and Instruction in Industrial Arts Education

		Quarter Hours
1. Required Core:		24
EVO 506 Trends and Issues in Vocational Education	4	
EVO 507 Curriculum Development in Vocational Education	4	
EVO 527 Evaluation in Vocational and Technical Education	4	
EVO 616 Research in Vocational and Adult Education	4	
EVO 695 Supervised Field Experience	4	
EVO 696 Seminar in Vocational Education	4	
2. Area of Professional Emphasis:		12-16
EIA 605 Analysis of Industrial Arts Education	4	
EIA 528 Equipment and Facilities Planning	4	
The student, under the direction of his or her advisor may develop professional competencies in an area of emphasis via school-based field experience, seminars, methods courses, workshops, or independent study.		
3. Technical Electives:		5-10
The student is encouraged to select courses that will increase his or her subject area technical competence.		
		45

The administration and supervision program is designed to develop initial operational competencies in relation to: knowledge of the field, decision making, curriculum and program planning, supervising teachers, coordinating work, utilizing community resources, and administering programs. Field experiences allow students to participate and practice administrative and supervisory skills in school environments. See Fig. 5-3 for the program of studies in administration and supervision.

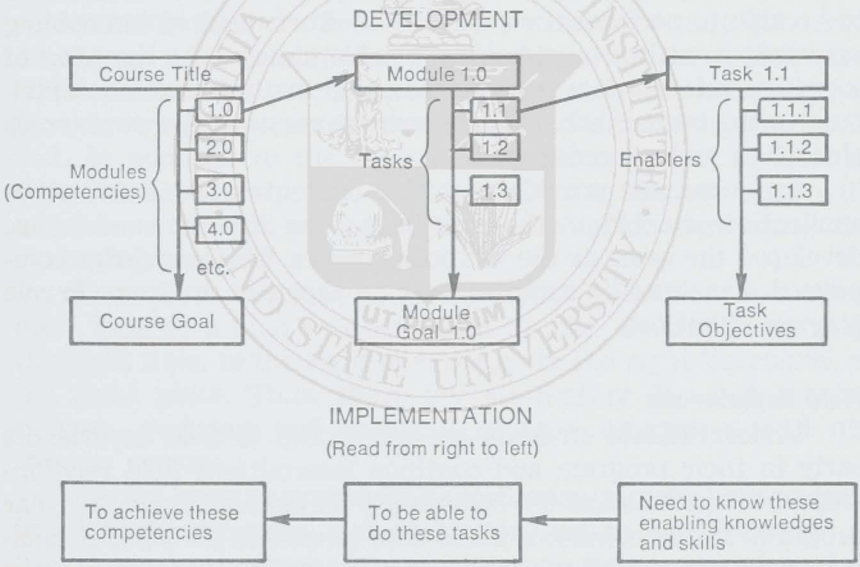
Fig. 5-3. FIU Program of Studies for Master of Science in Education. Specialty: Administration and Supervision of Vocational Education

		Quarter Hours
Required Core:		
EVO 507	Curriculum Development in Vocational Education	4
EVO 517	Supervision and Coordination of Vocational Education Programs	4
EVO 526	Community Relations and Resources for Vocational Education	4
EVO 606	Administration of Local Vocational Education Programs	4
EVO 696	Seminar in Vocational Education	4
EDA 605	The Organization and Operation of Public School Systems	4
EDA 607	The Administration of Secondary Schools	4
EDA 608	Supervision in Education	4
EDA 609	Curriculum Development	4
Area of Professional Emphasis:		
EVO 695	Supervised Field Experience	4
Electives:		
		5
	The candidate will be encouraged to select courses that will increase his or her administrative and supervisory competencies.	45

Model for Competency Development/Implementation

A model needed to be developed to systematically delineate the competencies. The author originated the Competency Development and Implementation Model shown in Fig. 5-4. It shows the delineation of a course in terms of processes, tasks, and enablers. The reverse order is how the competency is developed by the student. Each course was analyzed in terms of the process required to achieve a broad understanding and skill in the competency. The process steps become the modules in the delivery system package and identify the competencies to be achieved.

Fig. 5-4. Competency Development and Implementation Model



In effect, a behavioral body of knowledge for each competency was delineated. As you recall a course is composed of a series of modules which provide experiences to gain the desired competency. The criteria used for identifying modules was as follows:

1. The terminology must be expressed in gerund nouns (ing endings indicating *doing*).

2. The modules must be totally inclusive of the competency.

3. The modules must be mutually exclusive of each other (little or no overlap between modules).

4. Modules must be organized in a logical instructional order.

5. The modules must be functionally adequate (be able to be implemented).

After the modules were identified the course goal statement was written. Each module was then analyzed for the tasks required to achieve proficiency. The same criteria was used, that is, ING endings, total inclusiveness, mutual exclusiveness, logical order, and functional adequacy. Once the tasks were delineated they would be expressed in behavioral performance terms with criterion standards.

Each task was then analyzed for "what one needs to know to be able to perform the task". This effort resulted in enabling knowledges, attitudes and skills. Enablers may take the form of cognitive information, motor skills, and attitudes which contribute to the larger task. Enabler statements were then written as objectives and procedures.

Some courses provide cognitive content essential for other application-oriented methods courses. The content courses are developed the same as the methods courses. The knowledge competencies are usually demonstrated on paper, or orally, or in role playing situations.

Field Experiences

Undergraduate students are introduced to field experiences early in their program and continue intermittent field relationships with schools and the community throughout their two year program. Initial contact is made with schools in EVO 305 Schooling in America, and contact is continued throughout the three core teaching courses. The specialized technical teaching laboratory (EIA 405, Instruction in Industrial Arts) operated by the Division in local schools ready the trainee for the student teaching experience. The field experience culminates with one quarter of full time student teaching.

The graduate program field experiences are continuous because the teachers are in the schools. However, the culminating field experiences require the curriculum and instruction graduate student to work in his own school with other teachers or in other schools on curriculum and instructional problems. Students in administration and supervision are required to serve as an administrative assistant or supervisor in their school and take part in all administration and supervision meetings and duties. Students who are already supervisors or administrators usually carry on research studies pertinent to educational problems in their field.

Delivery System

As you recall the delivery system for communicating the course information was the *Course Handbook* which contains the modules, goals, tasks, enablers and instructional resources. A major task of the new university was to acquire the essential library materials to support the multitude of programs. At the outset many of the standard library resources were procured. As courses were developed and instructional resources identified, additional materials were procured. Of course this is an ongoing process as new courses are instituted and old courses are modified. In addition to the library, a media center, a curriculum materials laboratory, and demonstration rooms equipped with television and VTR equipment were set up for monitoring and evaluating teaching skills.

Plans were developed for a two year cycle of course offerings. That is, a plan was developed to offer the right course at the right time, to the right clientele, with the right instructor, at the right place. Thus, there are alternating day and evening courses, weekday and weekend courses, on-campus and off-campus courses.

Record keeping systems for admittance, registration, counseling, student progress, and evaluation had to be developed. As resources permit, these systems are connected to computer print-out systems. It is desirable, for example, to have the capability to obtain a weekly and bi-weekly print out of each student for counseling and guidance.

TEACHING

Courses

Handbooks are distributed at the beginning of each course. Thus the student is aware of the competencies to be developed and the standards of performance. Class attendance may not be mandatory depending upon the design of the course and the availability of resources.

Courses that are more cognitive in nature and are non-interactive (do not require personal interaction) lend themselves to individualized instruction and self-pacing. Instructors in these situations may not always meet the class formally but are available for individual help. They may also require small groups to attend a seminar type session for special instruction. Other courses may meet formally when the tasks can be accomplished more efficiently in a classroom situation. Large class lecture type presentations are held to a minimum. The emphasis is on individual or small group instruction.

Laboratory courses meet when the class is scheduled. Obviously students need to work with the equipment when it is available. Open laboratory time will be scheduled when on campus facilities become fully operational.

Instructional Process

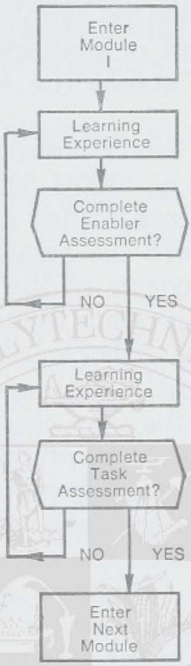
The development of a competency for the learner follows this cycle.

1. Read module.
2. Do enablers — test on enablers, pass to task or recycle enabler.
3. Do task — test on task, pass to next task, or recycle.

Field Experiences

Undergraduate students obtain field experiences in some of the core courses, methods courses and student teaching. These are valuable experiences because they allow the student to become familiar with the classroom and demonstrate and modify his/her instructional skills and develop appropriate attitudes and role behavior. Students are periodically visited and supervised by university industrial arts personnel and are supervised daily by their assigned directing teacher in the field school. See appended Chapter 5 material titled *EIA 405 Instruction in Industrial Arts* as an example of Handbook (modules) containing competencies in the teaching methods course and the accompanying evaluation instruments.

Fig. 5-5. Instructional Process



Field experiences at the graduate level relate closely to curriculum development, teaching, and research. Curriculum development includes conceptualization of new courses, improvement of courses currently taught, writing of course guides and facility planning. Teaching experiences relate to the improvement of instruction and facilitating techniques. Video tapes are made and critiqued. Research emphasizes action research to solve curricular, instructional, and administrative problems in the field. Experiments are set up to determine effective instructional strategies for specific clientele. Surveys are conducted to decide program directions, uncover problems, and provide decision making inputs. Students in administration and supervision go to administrative meetings, assume responsibilities and supervise other professionals in the field. Administrative and curriculum and instruction students are supervised by field and university personnel.

EVALUATION

Assessment

Learners are assessed on enablers and tasks. In the core courses, students test out of enablers at an assessment center. The assessment center houses the enabler tests for the core courses.

Students using the center request tests in terms of course, module, task, enabler, e.g., "EDU 305, Module III, Task 2, Enabler 3". Graduate students serving as assessors administer and score the tests and record the results on the data forms. The assessor informs the students of the adequacy of their performance and provides appropriate feedback. When necessary, students are given additional opportunities to successfully complete a test on alternate forms. Tests can be taken immediately or when the students feel they are ready to recycle. Test reports are sent to the instructor of the students. These reports indicate which task or enabler was attempted, when, by whom, and whether it was successfully completed. The report form must be signed by whoever has done the assessing.

In the Division of Vocational and Adult Education most instructors prefer to assess enablers and tasks themselves. This is also true of the industrial arts technical laboratory courses where the students must demonstrate proficiency to the instructor.

From 1972-1975 the following grading system was in effect:

CR = Credit — met standard of acceptability or proficiency

NC = No credit — did not meet acceptable standard

HCR = High Credit — surpassed acceptable standard, demonstrated superior performance

If students did not develop the level of proficiency within the quarter they received an NC2. An in-house designation system was as follows:

NC1 — dropped from course

NC2 — completed over 50 percent of the tasks

NC3 — did not complete 50 percent of the tasks, student must reregister.

Students receiving an NC2 were allowed one additional quarter without reregistering to develop the competency. When the competency was achieved, NC2 was changed to CR.

In the Fall of 1975, the Florida Board of Regents and FIU agreed to use one common grading system across the university. The reporting system agreed upon was:

A = Excellent (demonstrates superior performance)
B = Good (above minimum standard of acceptable performance)
C = Average (minimum standard of acceptable performance)
D = Poor (unacceptable level of performance) not acceptable for undergraduate credit in required program of studies
NC = No Credit (student must retake course)

The following is an example of how the grading system works in the Division of Vocational and Adult Education. Let's say a course has five modules with two or three tasks per module and the attendant enablers. For an A, B, C, or D the student must complete all modules, tasks, and enablers. Each task has an assigned number of quality points (e.g., 5, 10, 15, 20) depending on the complexity or difficulty. Quality points are awarded by the instructor for the degree to which the student demonstrates his/her knowledge of the task, use of language, (written or oral), skill of task performance, and other related specifications. Quality points are tabulated and the student receives a performance score. The performance score equates with the score range set by the instructor for an A, B, C, D, or NC. In most cases the student can repeat a task to raise his/her performance score. Undergraduate students must maintain at least a C performance level. A student can repeat a task and raise the performance level if he/she so desires.

Undergraduate industrial arts students must maintain a 2.0 G.P.A. in their program of studies courses for graduation. Undergraduate students receiving a D in an education course must repeat the course. Graduate students receiving a C in an education course must repeat the course.

Course materials and instruction are assessed by an evaluation form completed by the students. A student, selected by the students, distributes and collects the evaluation instruments and delivers them to the Division secretary. The results are compiled and a summary is provided the instructor for improving the course design, materials, and instruction.

Periodically the School of Education and the Division hold "retreats" to meet to review program goals and directions, assess their progress and make decisions for program change. Various committees of the School of Education also monitor curriculum, instruction, faculty and student concerns. Periodic Division meetings provide interim dissemination and exchange of information.

Follow-up

The follow-up of graduates is in its infancy. Data collected from administrators, teachers and supervisors indicate that CBTE does appear to produce more effective and efficient teachers. However, no conclusions should be drawn from these limited data.

PROBLEMS

Funding

With any new programs there are problems that impede full goal achievement. In Florida, program funding is based on SCH (student credit hours) of FTE (full-time equivalent students). CBTE programs tend to require more field-based activity, personalized attention, and module development. There is a problem under current funding to meet the SCH requirements. Thus large classes must be maintained. The funding pattern opposes the quality and effectiveness of the program.

Training of Supervising Teachers

Training of supervising teachers in the field is a related problem. Teachers working with our interns need some orientation to the goals and philosophy of CBTE. There is no way to pay or reimburse teachers to enter an orientation seminar and few have the incentive to do this on their own. "Why should I pay to take a course to help train your teachers in the classroom for nothing in return? I don't need the extra work", is a common question and complaint. In addition, there is the problem of orienting new faculty to the philosophy and format of CBTE.

Faculty Workload

Another problem is faculty workload. Faculty appear to be working beyond desirable limits. In addition to normal advisement, counseling, teaching and field loads, faculty (under the funding formula) cannot easily be released to develop modules. This requires an enormous amount of time. Faculty must somehow find time to develop modules for the next quarter, evaluate and modify recently taught courses, and keep abreast of current literature in the field. Many faculty are overextended. Many choose to teach an overload course for extra pay, to provide service to the community. There are too few faculty to provide the work force necessary for full achievement of CBTE goals.

Field Coordination

The coordination of field experiences is another problem, especially for industrial arts. While elementary school interns can be placed in a few centers due to the number of elementary teachers in the school, industrial arts interns must be placed in many schools. This increases the travel and supervision time required to monitor students and compounds placement coordination tasks.

Performance Base vs. Time Base

One of the underlying precepts of CBTE is that time is variable to allow students to achieve the expected level of performance. This precept recognizes that all students do not learn at the same speed or in the same way. Thus courses are self paced and alternative instructional media are provided.

A problem arises when CBTE is forced to operate within conventional time restraints, i.e. semester, quarter, trimester systems. In the *conventional* programs *time* is held *constant* and student achievement levels vary. In *CBTE* programs *performance standards* are held *constant* and time is allowed to vary. Thus in conventional programs student achievement assumes a bell curve profile and a norm referenced grading system. In a CBTE program minimum criteria are established such as "C" level as well as B, A, D, and NC.

In the first three years of operation, FIU had a CBTE criterion-referenced system. Time was a variable. Problems arose when students did not achieve CR (credit) within the enrollment quarter. They were allowed to build up their proficiency even though it might require three or more quarters and recycling. Course reregistration was not required. When criterion levels were achieved, students were awarded credit. As the reader might foresee, an instructor could be teaching a full load each quarter and yet carry those who had not met CR levels. This carry-over overburden could amount to 25 percent or more from each class each quarter. These carryover students generated no SCHs.

As faculty struggled to keep on top of the situation, policy was adopted to limit carryovers to one quarter beyond the enrollment quarter after which, if the student had not received credit, he/she would have to reregister for the course. These carry-over students still generated no SCHs to support them, but faculty were satisfied. Economically and administratively, the situation was corrected by a common grading system and the policy that students must reregister for each quarter. Thus the program is again time-based to the extent that work must be completed by the end of the quarter. The instructor has the option to extend time to the student with no financial penalty to the student, or require the student to re-enroll.

CBTE concepts can be implemented if financial resources and administrative policy permit.

CONCLUDING REMARKS

In the four years since our opening in 1972 we have become a School in rather unmistakable terms. The School of Education is the third largest of the six academic units on the campus, based on student enrollment. In this 1975-76 academic year we are serving approximately 1,800 students and another 300 through off campus offerings. We have a regular full-time equivalent faculty of 49 persons augumented in any given quarter by 15 to 25 adjunct professors who teach a single course for us.

In industrial arts education we have maintained about 45 industrial arts majors at the undergraduate level and about 30 industrial arts majors at the graduate level.

Our original reach exceeded our grasp admittedly. We have had to temper our idealized desires and aspirations to the "state of the art" in CBTE and to the realities of the situation in which we work. But, we continue to feel strongly that our commitment to CBTE was appropriate in 1970-71 and is now in 1977. We are still developing the CBTE program. We feel we have accomplished a great deal in our short existence; we know we have a great deal more to do.

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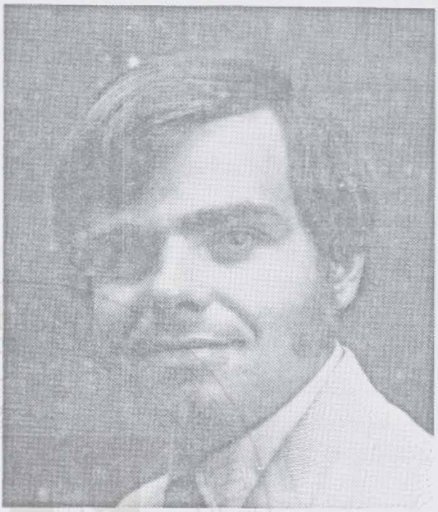


Dr. John D. Bies

Dr. Bies received his Bachelor of Science and Master of Science degrees from Buffalo State University College and the Doctor of Philosophy degree from the University of Missouri.

He has had teaching experience in the junior and senior high school, junior college and is currently an assistant professor of Vocational and Applied Arts Education at Wayne State University, Detroit, Michigan.

In recent years he has served as Vocational Education Consultant for the Missouri State Department of Education; Evaluation Consultant for the Bureau of School Services at the University of Michigan; and CBTE Consultant at the University of Nebraska, Lincoln, Nebraska.

Dr. Bies is a member of the NAITTE task force to study the updating of technical competencies for industrial education teachers. He has published and presented a number of papers dealing with the design and implementation of competency based education programs.

His experience with Wayne State's transition from a traditional to a competency-based teacher education mode, makes him especially capable to address the topic of "Systems Engineering in CBTE".

chapter 6

Engineering Systems Analysis: Applications to Competency-Based Teacher Education

John D. Bies

Upon completion of this chapter, the reader will be able to:

- Describe the components of a General Systems-Environmental Model and a Dynamic Systems Model.
- Identify and describe the four factors that must be considered if a systems model is to be functionally successful.
- Identify the problems and solutions in creating a change process within an existing teacher education program.
- Define parity and its relationship to the concept of CBTE.

INTRODUCTION

Systems analysis – what is it? Every time one turns to a professional journal one reads about the systems approach, systems analysis, instructional systems, and management information systems. When someone diagrams a sequence of courses or instructional content, it is identified as a systems model. In most cases, however, the term "systems" is incorrectly used.

Churchman (1968) notes that the concept of a systems approach to a problem can be traced back to the writings of Plato, in which Plato attempted to design a systems model of a city-state. Furthermore, the application of logic in the solution of problems can be exhibited in the works of Nietzsche, Descartes, and Spinoza, none of whom would have the slightest notion of what systems analysis is as it is applied today, even though they used its principles in their works.

The terms "system" and "system approach" were originally applied to methods for increasing the efficiency of planning, organizing, and coordinating the development of our weapon system during World War II. The "systems approach" considered the various individuals and teams that were involved in the development of a particular weapon. The approach required 1) defining in advance the task of each individual involved in weapon development, 2) detailing each task through analysis, 3) specifying performance criteria, and 4) delineating lines of communication and interaction between each group as required in the achievement of the pre-determined goals. The word "systems," therefore, denotes an organized plan carried out in detail, in fulfillment of pre-stated objectives or goals.

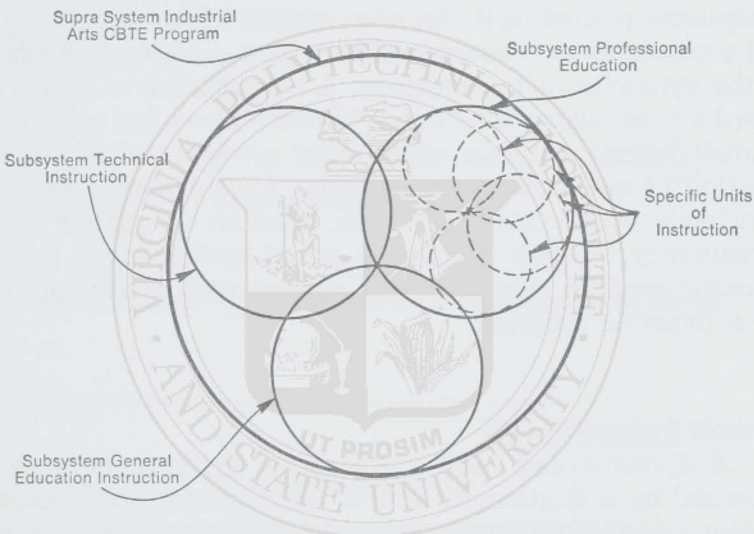
PRINCIPLES OF A SYSTEMS MODEL

The term "model" is used as an abstraction of a real world situation. It is a simplified and stylized depiction of the environment that abstracts the cause and effect relationships dependent upon a given problem. In systems analysis, therefore, the role of the model is to specify each component of the process, and to identify all possible alternatives that may be used to eliminate any barriers along the way.

General Systems-Environmental Model

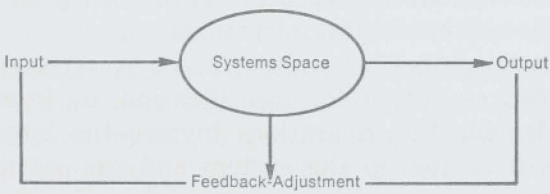
All systems models are composed of a supra system made up of subsystems. The supra system attempts to achieve a primary goal (e.g., to produce a competent industrial arts teacher), while the subsystems attempt to relate to it (e.g., instructional subsystems, management information subsystems, resource allocation subsystems, etc.). Banathy (1968) notes that based upon these parameters, it is possible to infer that any subsystem may become a supra system and any supra system may become a subsystem. For example, in Fig. 6-1 the industrial arts CBTE program is a supra system made up of many subsystems — 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 it. The specifications of supra and subsystems are relative to the model being designed.

Fig. 6-1. Systems-Environmental Model



The general systems-environmental model shown in Fig. 6-2, operates within four processing components: 1) input, 2) systems space, 3) output, and 4) feedback. Input are measures and data that are needed for the systems space to operate. The systems space is the processing aspect of the model, while the out-

Fig. 6-2. Processing Components of a Systems Model



put is the product itself. By means of evaluation data gained from the product, feedback information is provided for the systems space for analysis. After the 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 in order to produce the expected product; second, the desired expectations for the product should be changed to accommodate the system; or third, the system is terminated.

A systems model may be closed, open, or a combination of the two. A closed system has no input from other systems or subsystems related to it. An open system allows various systems and subsystems to interact within it, thus growing and adjusting to the dynamics of the program. A combination of an open and closed system allows interaction between some, but not all, of the related systems and subsystems. Most systems models are a combination of open and closed systems, for the simple fact that a completely open system could not function adequately within a bureaucracy, while a completely closed system would produce a dinosaur product that would be cumbersome and inappropriate for a dynamic program.

Dynamic Systems Models

A dynamic and functionally sound systems model is characterized by a continuous flow of information, and is composed of four interrelated subsystem models: 1) input operation model, 2) transformation model, 3) output operations model, and 4) feedback and adjustment model.

Input Operations Model deals with the receiving, decoding, verifying, and registering of data from individuals directly and indirectly involved with the system. As illustrated in Fig. 6-3, the first process of the input operations model is to receive an input message from a signal source and decode and register it; feedback and adjustment verifies the accuracy of the message and sends its content on for identification.

Once the incoming information has been received, registered, and forwarded as output for identification, its interpretation is required. Identification operations involve the interpretation of the data as it relates to the system and the selection of those elements of the data which are essential to the goals and oper-

Fig. 6-3. Interaction Operations in an Input Operations Model

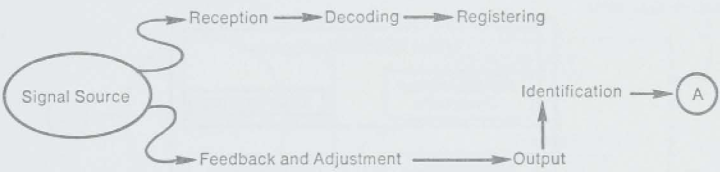


Fig. 6-4. Identification Operations in an Input Operations Model

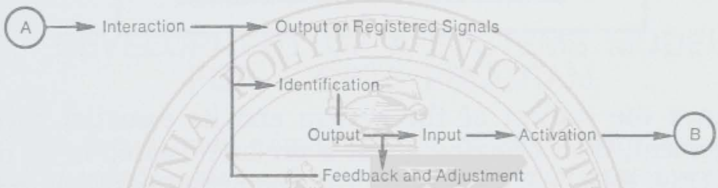
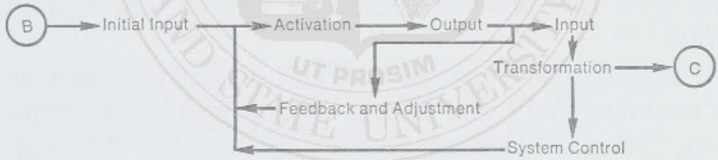


Fig. 6-5. Activation Operations in an Input Operations Model

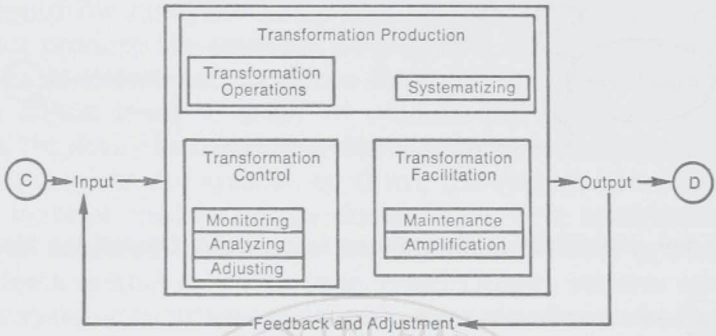


ation of the system. In turn, this data is quantified and qualified as input for activation (Fig. 6-4).

The activation operations within the input operations model are based upon the data supplied by identification operations. The feedback and adjustment component will determine if the initial input is needed with the required specifications; if it is, then the input will be supplied for transformation (Fig. 6-5).

Transformation Model — If the data is successfully processed through the input operations model, it is then incorporated in the transformation model, a process commonly referred to as "program implementation". The first aspect of this model is transformation production. The transformation production first

Fig. 6-6. Transformation Model and Its Components



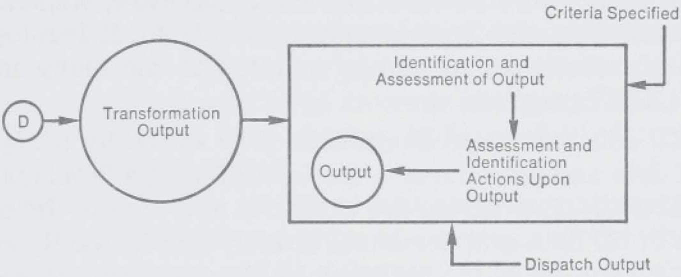
processes the subject of the system and its essential parts for engagement, thus bringing about a product desired in an output form (Fig. 6-6). All data is then systematized in order to facilitate the operations of the total systems model.

Transformation facilitation is the second component of the transformation model. All input and functions related to the maintenance of the system and geared toward the achievement of the goal are processed through appropriate systems components.

Transformation control and adjustment monitors and analyzes incoming data and makes appropriate adjustments in the system. The collection of data is an on-going function of the transformation process and is totally integrated with transformation production and facilitation. Analysis ascertains any discrepancies between criteria defined in the model and criteria actually being used and fed into the system. If discrepancies are found, adjustments are made in terms of component replacement, addition of new components, adaption of existing components, amplification of unused or underused components, and/or consideration of changes in performance, costs, and effectiveness.

Output Operations Model is primarily concerned with evaluation of data. Does the output meet the stated criteria? Based upon the standards established by the system's designers, the output data is tested and measured. These measurements are then dispatched (dispatch output) to all personnel involved in the program for review, analysis, and decision (Fig. 6-7).

Fig. 6-7. Output Operations Model and Its Components



DEVELOPMENT OF A SYSTEMS MODEL FOR A CBTE PROGRAM

The faculty and administration of any institution must become knowledgeable in the basic principles of systems engineering before they can address themselves to the implementation of a CBTE program. Schmeider (1973) surmised that a CBTE program is one having competencies (knowledge, skills, and behaviors), criteria for assessment, assessment of student's competencies, student's rate of progress, and an instructional program that facilitates student growth and evaluation. In order to assure that a CBTE program has these characteristics, a logical method of problem solving is needed for their implementation. An appropriately designed systems model provides this method.

Theoretical and applied research, conducted in industry and education, have identified four factors that must be considered if a system model is to be functionally successful. These factors are: 1) total commitment by all personnel involved in the CBTE program, 2) identification and exploitation of resources, 3) an instructional subsystem (i.e. goals, objectives, delivery systems, evaluation, criteria, etc.), and 4) a management information system. It is necessary, for any individual concerned with implementing a CBTE program, to understand the potential of the four factors identified.

Personnel Commitment

Any and all personnel affected by the implementation of a systems model should ask the following question: "Why implement a systems model into an industrial arts CBTE program?"

There are several answers to this question: first, a systems approach allows an organized, sequential, creative, empirical, theoretical, and pragmatic approach to a problem. It is a logical and flexible procedure that can be adapted to the many intricacies of a CBTE program.

All educational problems cannot be solved by using a single set of data and procedures — the issues facing a developing industrial arts CBTE program are extensive and require the organized usage of all data and personnel directly and indirectly related to the program. Thus, the philosophical base and procedural system used by all personnel must be taken into consideration when designing a CBTE systems model.

Industrial arts programs are made up of faculty and administrators who come from varying backgrounds and have their own commitments to a certain style of work. These styles are often in conflict with one another, but somehow, the differences must be overcome to achieve a common goal: the implementation of a CBTE systems model. The components of a systems model must offer a procedure for the operation of a unified approach for solving problems in the program. This can only be done with the total involvement and commitment of all staff members.

Selecting appropriate procedures (subsystems) to deal with varying problems in any educational program requires the collective and creative talents of all staff members. A systems model is *not* a long series of steps to be performed by everyone, but an established procedure that takes into consideration existing conditions, as well as possible future demands, in the solution of a problem. The purpose of some subsystems is to create alternatives that can be used in solving unique problems, since one method of solving a problem will not take care of all situations. Furthermore, it is quite possible that the subsystems may not follow, and could conflict with the familiar or traditional lines of professional organization, instruction, and management.

The reliability and validity of available data will influence the success of a systems model. Because of the large quantity of data required by an informational and instructional system, a serious problem of "over-collection of data" arises. Analysis must be conducted to determine what type of information is essential to the operation of the system. Furthermore, a procedure should be developed to specify these data empirically. It should be obvious that one major problem of an informational and instructional system is the vast amount of information that could be specified for a functional system, but this should not stop a faculty from accepting a particular model, for there are various means to deal with large amounts of empirical and quantifiable data. Later in this chapter, a discussion of computer applications will be provided.

Lapatra (1973) has identified two essential components required for the successful operation of a systems model, they are 1) a suitable data base, and 2) a theoretical backing for the subject area being examined. All facts related to the programmatic policies, procedures, and personnel of the program must be collected and will reflect the unique design of the systems model. The theoretical data base for the system, therefore, can be professional and/or technical in nature, requiring maximum input from the instructional staff, administration, student body, and field personnel.

A model has been defined as an abstraction of a real world situation; therefore, the systems model that is to be used must have significant impact on the everyday operations of the program. It must be pragmatic. Instruction and management must be designed with the needs of the field and program personnel in mind. Input into the design of the model must come from the field as well as the staff, for only then can real world competencies and management processes be developed.

A second reason for implementing a systems model into an industrial arts CBTE program is that it enables staff members to take existing instruction and sequence it in an orderly fashion, to insure each student's completing the program at a specified level of competency. This is not to say that instruction provided in a non-system modality is unorganized and irrelevant, but it does insure every student the same educational exposure and minimal performance for "passing" out of a program. The validity and reliability of any CBTE program are in its ability to inform all personnel (students, professors, administrators, community members, and public school personnel) of the common requirements that all students must meet to exit from the program. The antithesis to this statement is commonly found when one enters a college bookstore and reviews the materials used in various sections of the same course. Often one discovers that a variety of text materials, as well as course requirements, are specified for each section of the same course. This circumstance reflects the individual preferences of the instructor and does not insure that all students enrolled in that course will receive any common or consistent information. A systematized program would define what student performances are required for the course, and the criteria to be used in the evaluation of these performances. Thus, all students would receive the same materials and information in each section of the same course. This is not to say that the instructor could not go beyond the stated objectives, for the objectives are the minimum requirements used to determine competence. Additional information and objectives can be specified by the instructor for additional credit, this being the prerogative of each instructor.

The third reason for implementing a systems model is that it allows alternatives to be used by way of delivery systems. A delivery system is any systematic arrangement for disseminating instructional information to the student. Any technique or material that can be used as a method for the communication of ideas, concepts, principles, or theories is said to be a delivery system.

A number of CBTE specialists identify individual instruction modalities as a co-requisite in any CBTE program. This may or may not be a valid criterion. What is essential is the availability of various delivery systems to the student (e.g. lectures, small group work, demonstrations, film loops, individualized instruction modules, student organizations, etc.). A well designed systems model will not limit the instructional subsystem to one delivery system, but will identify a variety of alternatives available to the instructor and the student.

The concept of *cognitive style mapping,* developed by Hill (1974), lends itself to alternative modalities of instruction. In cognitive style mapping, two factors can be identified: 1) the student's preferred cognitive style, and 2) the student's actual cognitive style. The student's preferred style identifies under what conditions he/she likes to receive instruction, and actual style identifies those conditions under which he/she best performs. With these two "mappings", it is possible to program a student in various instructional alternatives that best suit his/her learning style.

Another advantage of the systems approach is its intrinsic capacity for effective feedback. Any educational program will be static and worthless if it is unable to collect, analyze, and act upon feedback data. This information can come from various sources: the profession, industry, the public school setting, staff members, or students. Thus, the formulation of evaluation and data collection systems contributes significantly to the entire feedback process.

Finally, a dynamic systems model provides a method for restructuring instruction. Through the identification of various instructional alternatives, the instructor will be able to devise the best delivery system for his particular teaching style. Conversely, the student will be able to select, or be guided into, the best delivery system for his/her cognitive style. Because it recognizes the differences in teaching and cognitive styles, the system should not force the instructor or student into one instructional modality. Thus, the alternatives specified in the system will provide personnel an opportunity to select the educational environment which best suits a particular goal.

If the systems approach is elected as a means for operationalizing a CBTE program, it must receive the total commitment of the faculty, administration, and student body. All data regarding the systems model and its ramifications must be presented to all personnel affected by the change, and provide them the opportunity of accepting or rejecting the model. If the systems model is to be successful, it must have the total support and continual commitment of faculty and students alike.

The acceptance of a systems model does not end commitment of personnel. Commitment is an on-going and developing process. Every effort must be used to insure the continual function and growth of the system. If the systems model that is adopted fails to meet the needs of the program, it is the responsibility of all personnel to bring about change in that model. Many individuals believe that because they commit themselves to a particular model, they must stick with it regardless of the outcomes, but this is an inaccurate assumption. If the model does not function as anticipated, one of the afore-mentioned alternatives must be selected: 1) adjustments must be made within the system to produce the expected output, 2) the staff must change its expectations to accommodate the system, or 3) the system must be terminated.

Resources

In order that a realistic and operational systems model can be designed for a given CBTE program, one must identify all available resources. In a few instances, grant or research monies are available for program design and implementation, but most institutions are forced to use the resources at hand without any additional budgetary considerations. Through careful planning, a systems model can assist programs with limited resources to meet the needs of students with varying abilities. The model design can reflect the staff's desire to find innovative and effective solutions to learning and instructional problems by using their resources more effectively and efficiently.

A unique feature of a systems model is its ability to require personnel to identify and utilize available instructional resources. It is not unusual for most staff members to be unaware of the varying instructional services and resource personnel that are available within institutional boundaries. Most of the resources can be categorized under 1) audio-visual supplies and services, 2) computer usage and storage capabilities, 3) clerical services, 4) instructional design personnel, 5) systems engineers, and 6) research personnel. Once these resources are identified, it is up to the expertise and problem-solving abilities of various staff members to adapt them to the designed systems model and CBTE program.

Since it is difficult to secure additional financial aid, it is essential that administrative and instructional personnel function within the limits of the system and its resources. Thus, the systems model will reflect the unique resources applied at that institution. The term "institution", in this sense, does not limit the resources to those found within institutional boundaries, but includes those additional resources found beyond institutional boundaries that are often contributing to or serving the institution.

Once the institutional resources are defined, it will be necessary to determine student needs, for the two are inextricably combined in a well designed system. The identification of student needs will involve an examination of the make-up and character of the institution as a whole. An urban commuter-type university will be different in character from a rural residential university. The social, cultural, and economic features of the student body will dictate, or at least play a major part in determining, the needs of the students. A major component of these needs will be the instructional content and modalities available. Some schools may require more tutorial services than others, while some will develop additional field-oriented experiences.

Allocation of manpower is of considerable importance in designing a systematized program. Because the development of a systems model demands a large amount of administrative and faculty input, consideration must be given to the allocation of released time to key personnel. If released time is not given, delay and complications will develop during the design and implementation phase of the model. However, if the staff is too small to warrant released time, it may be necessary to bring in outside resources or develop alternative techniques of system design.

An outside resource person acts as an expert or consultant to a particular phase of development. This person may be a public school teacher or administrator, a computer specialist, an instructional technologist, or a management information specialist. This is not to say that only one expert at a time must be used, for there are various techniques that can be applied to employ a variety of specialists: delphi, task forces, teams, etc. These techniques lend themselves particularly well to the industrial arts teacher educator involved in instructional module development who wishes to draw from the expertise found in the public schools or industry. Thus the research findings and techniques used in education, engineering, psychology, economics, and the sciences are interwoven with the type of data gathered from the field.

One aspect of resource specification that is often neglected is that of space allocation. Existing and planned facilities will dictate what can be done or must be done to implement the system. One such facility is the field itself, which may be viewed as a place for gathering information as well as for providing instruction. Public schools have been used as laboratories for the pre-student teacher as well as real-life situations for the student teacher. Industry and business, on the other hand, have been a place where students can serve "internships" in order that they might gain technical competence in their area of specialization — or in the case of the in-service teacher, an up-grading of technical skills. The field experience, therefore, should become an important ingredient in the design of a CBTE program.

Parity . . . . A Vital Concept in CBTE

Parity is one concept that is often neglected in the development of a CBTE program. It must be inherently incorporated into any performance-oriented program. Issues such as accountability, equal education, etc. all address themselves to the question of parity — for parity is an equality or similarity that exists in the instructional program of a CBTE model for all students.

The concept of parity is being studied in many states across the country. Legislative committees are in the process of assuring each student in a teacher education program, as well as elementary and secondary education programs, that they will be able to achieve a minimum level of competence upon leaving a given institution. This is ostensibly exhibited in the fact that a number of states are requiring all teacher education programs to redirect themselves in a CBTE framework. Thus, each student will become aware of the performances expected in a particular program, and those competencies gained through the achievement of these performances.

Parity can prove to be a blessing or a bane to the various teacher education programs across the country, for the faculty members will be held responsible to the students, administrators, institutional personnel, state departments of education, and the public. Teacher education programs capable of developing a realistic and ongoing CBTE program, which can be easily evaluated, should be able to handle any demands placed upon them by the public.

The condition and use of existing facilities should be closely examined and adapted to meet the design of the system. Concepts such as open laboratories, study centers, micro-teaching, instructional materials laboratories, and resource laboratories must be examined and exploited. The systems design with as many alternatives as possible is the design that will function best. There is a point, however, when too many facilities and alternatives will tend to slow down or clog the system, this being a function of student population, number of instructional and supportive personnel, existing facilities, and possibilities for expansion.

An underlying factor of all resource problems is the budget. Budgetary needs always seem to be in sharp conflict with actual budgetary allocations — creating a common excuse for not changing the status quo, for "our budget simply cannot handle the expense of implementing a systems model." This may be true, but what is often neglected is the relationship between initial cost and operating costs. Budgetary needs will be higher during the development and implementation stages of the model, but the operating costs, *ex post facto,* should be within the constraints of programmatic budgets. When calculating the budget, the following factors should be considered:

1. *Faculty time for curriculum development* – money should be allocated to release faculty from day-to-day responsibilities in order that instructional and administrative materials can be designed and placed into the designing process of the model. If no released time is given, the entire developmental process will be lengthened and quality work will become more difficult to achieve. Anything from one-quarter time to full time should be considered.

2. *Field input* – when one thinks of the field providing input data, it is normally in the context of going out and gathering data for evaluation, but seldom is the field viewed as a place for gathering consulting specialists. Educators and industrialists are normally quite willing to contribute their time and expertise in the development of a teacher education program, and ask for very little in return. Small budgetary items, such as hiring substitute teachers for releasing the classroom teacher from duties, travel costs to a working meeting, all day meeting or retreats with paid meals and/or lodging, consulting fees or honorariums are all excellent vehicles to encourage field personnel to contribute to the design of the systems model.

3. *Computer time* – of absolute importance is the budgeting of computer time. Most systems will require a vast amount of data and frequent use by faculty and students that cannot be handled by traditional management information procedures. Thus, the designing of a management information system (MIS) by computer would provide services otherwise prohibited by cost. The amount of administrative, faculty, and student use, as well as the type and amount of data required, will determine the amount of computer time needed.

It is easy to understand why initial costs would be high, but it is also easy to reason why operating expenses would be less than implementing costs. Maintaining the MIS would require the input of evaluative and monitoring data, all programs and necessary procedures having been established through the designing stage of the system. Most of the data from the field will have been collected, and the data needed (program evaluation) could be collected without additional expense. If properly designed, the model should save money in the long run, rather than placing an additional budgetary burden on the program, for there will be a minimal need of clerical help in the compilation, analysis, reporting, and updating of programmatic data.

Instructional Subsystem

Of all components in a CBTE systems model, none are more obviously exhibited than the instructional subsystem. It is possible to camouflage some personnel and resource problems within the model, but the instructional component is exposed to the public for review and evaluation. Thus, the instructional subsystem must reflect input from all program personnel, as well as the utilization of instructional and supportive resources. Designing an instructional subsystem requires consideration of six factors: 1) program goals, 2) competencies, 3) performance objectives, 4) criterion-referenced assessment, 5) delivery systems, and 6) statistical designs.

Specification of program goals is inextricably related to the competencies identified in the instructional subsystem. In no way, however, should goal statements be confused with competencies: they are related, yet different. Program goals are broad general statements that describe what the staff and students desire or expect to be able to accomplish upon completion of the program. An excellent example of these are the goals of students, which might be to receive a degree, needed training, or to become employable. Competencies, on the other hand, are vehicles for achieving these goals.

"Competencies are labels given to results of a comparison of a particular performance *state* of a process with a static performance standard or behavioral criterion." (Supplement to PBTE Newsletter, 1974). Competencies should be derived from sound research findings from the profession, as well as the related disciplines of philosophy, psychology, sociology, engineering, etc. Such specifications may come from the research findings of Cotrell (1971), or subsequent studies. The first step in the process should be the development of a "laundry list" of competencies, based upon research findings, that can be later validated during student teaching or in-service teaching.

Once the laundry list of competencies is drawn up, review and editing procedures should be followed to eliminate any redundancy and assure grammatical consistency. Upon initial processing of the competencies, an instrument should be designed to validate the competencies and to identify any new competencies that might have been overlooked. This is an appropriate time to turn to several resource persons who specialize in instrument design and evaluation, to insure the valid collection of data. The collection of competency data from the field and profession can be the most strenuous aspect of designing the subsystem, for the amount of data required can be formidable. Nevertheless, this procedure is required if validity is to be ascertained.

The collection and analyzing of data will provide information as to which competencies should be used in the program and which should be set aside. If some competencies are eliminated in the ratings, but the personnel staff still considers them to be significant enough to include in the program, then it is up to all personnel involved in the program to determine if they should be included or excluded. It should be noted that the original list of competencies identified after analysis is not fixed; it may be modified in any shape or form, based upon significant input data. Thus, the program is ever changing and dynamic.

After the program competencies have been identified, it will be necessary to categorize them according to commonality of instructional content. This procedure should follow the logical process used in factor analysis. The technique used in factor analysis statistically loads or categorizes various items (competencies) under specific factors or categories; these categories, in turn, are labeled according to the characteristics of the items listed under it. Thus, it will be possible to develop categories such as instruction, planning, evaluation, or professional role in the instructional subsystem. Since most institutions are bound to the traditional identification of "courses" for various units of instruction, these categories provide a useful outline for course identification.

Instruction cannot be provided with the sole use of program goals or competencies; further specification of performance is required. Outcomes of instruction, or indicators of competency, can be identified by performance objectives. Davis, Alexander, and Yelon (1974) have noted that performance objectives are descriptions of expected behavior of individuals after instruction has been provided. If competency is to be determined, performance objectives must be identified for each competency found in the program. Thus, competency may have one or more performance objectives as a means of specification. If performance objectives are difficult to write for a given competency, the staff should then determine whether or not the competency should be eliminated or what procedures will be used for its evaluation.

When writing performance objectives, one must remember that a working hierarchy lends itself to the process of designing valid and reliable instructional outcomes. Performance objectives can be categorized as either enabling or terminal.

Enabling Objectives are written for subunits of instruction and describe what performances have to be demonstrated in order to achieve the terminal objectives. An example of an enabling objective is as follows: "Given a series of specifications, the student will draw a complete set of floor plans according to AIA standards."

Terminal Objectives are written for instructional units and describe the performances to be demonstrated as a result of the entire unit. An example of a terminal objective is as follows: "Given a series of specifications, the student will design and draw a complete set of drawings for a residential structure according to AIA standards."

It is most impractical to sit around a meeting table and write terminal and enabling objectives for every competency in the program, for the criteria specified might appear appropriate on paper, but in actuality prove totally inoperative. The procedure that should be followed is to 1) write performance statements for each competency, excluding all criteria statements; 2) field test the performance statements in a class or laboratory situation; 3) estimate appropriate criteria based upon field testing and student products; 4) write terminal and enabling objectives for each competency based upon field input; 5) try out objectives for field testing; and 6) make modifications where necessary, based upon results from the field.

The final determinant of a successful CBTE program is based upon its evaluation. Criterion-referenced testing, therefore, plays an important role in the evaluation of students as well as of the program. When the term "criterion-referenced testing" is used, it normally connotes the use of a pass/no-pass situation. This, however, may or may not be the case. Criterion referenced testing, as noted by Weber (1973), is a procedure for evaluating an individual against a given level of performance specified in an objective. Thus, if one was to evaluate a student against the enabling objective stated above, the criteria for evaluation would be the standards set by the American Institute of Architects, rather than comparing the student's drawings to those of classmates.

Criterion-referenced evaluation lends itself to the product/process mode of evaluation. The product, or student, can be measured against the standards set in the instructional subsystem. Performance objectives designed with specified criteria should be the sole determinant of product success. If the product is evaluated against other standards, or fails to meet the standards set, then the performance objectives and/or related competencies should be reviewed, modified, and/or eliminated.

Process evaluation, on the other hand, evaluates the subsystem used to transmit the information, skills, and judgements to the student within the program. Student and instructional staff input, as evaluation instruments, provide input related to the quality and appropriateness of the delivery systems being used, and the relevance of instructional content. This process provides insight into the existence of any shortcomings of staff commitment, resources, and the instructional subsystem.

It should be noted at this point that the use of *normative* evaluation techniques has its place in criterion-referenced evaluation. All criteria established is set against some norm. For example, it would be ridiculous to specify a performance objective that required all students to run the 100 yard dash in five seconds or less, since the world record in that event is presently nine seconds flat. If it is essential that all students were able to run the 100 yard dash within a specified period of time (the criterion), what would be the time measure to be used? A more realistic running time might be to run that distance in eleven seconds or better, this criterion being established against normative information. Unless the performance objective specifies it, the student should not be evaluated against the norms of the class — or, as it is usually called, grading on the curve. If the student knows what the criterion is before evaluation, such as grading on the curve, then this would be valid, but if the criterion is not specified prior to evaluation, then this would not be appropriate for criterion-referenced evaluation.

So far, little has been mentioned about the delivery system. A delivery system as "a means, vehicle, or system which facilitates the rapid and effective introduction of validated products into the mainstream of the American educational system. [furthermore] Any systematic arrangement for disseminating educational products to the client." (Supplement to PBTE Newsletter, 1974). In other words, a delivery system is any method used for the dissemination of information in order that the student may exhibit the product of competence. The specification of delivery technique is not always warranted in a systems model, for there are numerous times when the instructional technique would be left to the prerogative of the instructor. If a delivery system were to be specified, such as a field trip, it should be specified after all other techniques were reviewed and found inferior, for otherwise they might not meet the needs of every student in a particular situation — cognitive styles. Furthermore, if the delivery systems were to be left to the prerogative of the instructor, it would provide him the opportunity to select the most appropriate techniques for a given class in a given situation, based upon the information output advising him what was the best delivery system for the students' cognitive style. For this reason, it *is not* the belief of this writer that individualized instruction modules as the *sole* delivery system are co-requisites of a CBTE program.

The specification of delivery systems does not limit itself to instructional techniques, but can be applied to various output data (evaluations, enrollment data, student progression, systems modification, field studies, etc.). In the case of non-instructional materials, it is recommended that a standard delivery system be used. This can be simply understood by the following example: if a student were participating in ten instructional modules and received ten different types of output regarding evaluation and his progress in the program, there is a definite chance that he/she would not know where he/she stood; on the other hand, if a single delivery system were standardized, there would be little question regarding the data received.

The last aspect dealing with the instructional subsystem is the problem of statistical design. With many of the techniques described in this chapter, it should be apparent that they do not lend themselves to traditional statistical testing. If a traditional normative evaluation procedure were used, rather than the criterion-referenced technique, it would be simple to run an analysis on the data to determine statistical differences and relationships within the program, but with a system which uses the accomplishment of specified performance, analysis would be quite difficult. For example, a student is "passed out" of a course according to ability to perform certain performance objectives, and the test to determine this is actual performance. The question is, how do we check for reliability? It is possible to test for rater (instructor) reliability, based upon ratings over a period of time, but to say you have test reliability according to statistical definitions would be incorrect.

What is the answer to this problem? It is whether traditional statistical procedures are appropriate in a CBTE program or not. It can be stated that if appropriately used, statistical design procedures can be adapted for use in a CBTE program. Multivariate techniques (factor analysis, discriminant analysis, canonical and multiple correlations, least squares analysis, etc.) which are presently being implemented into educational research, have their place in a CBTE program. What must be understood, however, is that CBTE is not a new name for the same old thing, but a more realistic approach to the problem of accountability and teacher preparation.

Management Information System

The last component of a systems model is the management information system (MIS). "Even though the instructional phase of a competency-based teacher education system may well be considered the heart of the program it will cease to function if the management information system is not developed to support vital decisions." (Neuhauser, 1974, p. 1). The purpose of an MIS is to select, store, process, retrieve, and transmit data to personnel at an optimal time for more effective decision-making. The designing of an MIS should, therefore, be based upon users' needs.

Gale (1968) identified five factors that contribute to the designing of an MIS; these are 1) user orientation, 2) well-defined priorities, 3) responsibility for the system, 4) educational phase, and 5) increased complexity. User orientation addresses itself to the problem of what the MIS will be used for; what type of information is needed by program personnel, and how it will be used. Often, the use of a computerized MIS offers the opportunity to increase efficiency and demand services that would be impractical to duplicate in a non-computerized system. However, the specification of irrelevant data could increase costs while decreasing services. To eliminate the problem of irrelevant data, an analysis must be made as to the needs of the staff. What type of information is, and will be needed to make decisions pertinent to the operation of a program?

MIS analysis can be divided into two categories: administrative and instructional. Administrative analysis will yield the type of information needed to administer a CBTE program. For this reason, the following conditions should be reviewed and evaluated as to their importance in program administration: present and projected enrollments in the program and for each class; faculty assignments and committee structure; allocation of facilities, supplies and equipment; clerical services; admission, graduation, and certification data; and existing and projected budget needs and allocations.

Instructional analysis will be used to determine the type of information needed for the successful operation of the instructional subsystem. For this reason, it is quite essential that data be gathered from the field as well as internally from the administration, faculty, and students. Effective feedback is needed in the following areas to insure successful operation of the instructional subsystem; progress of each student as he/she completes each objective specified in the program; attainment of competencies; the utilization of the delivery systems and the hardware; development of instructional materials; student, faculty, and content evaluation; field experiences such as pre-student teaching and student teaching activities; instructional sequencing; and instructional/content change methodologies.

The second factor identified by Gale (1968) was of well-defined priorities. In other words, what data are essential for the operation of the CBTE program? Based upon MIS analysis, it will be possible to determine which set of administrative and instructional data should be fed into the MIS first. Since it will be impossible to completely switch over at one time, a decision must be made as to the order of priority that will be followed for data input. As the MIS develops, additional information can be fed into the system.

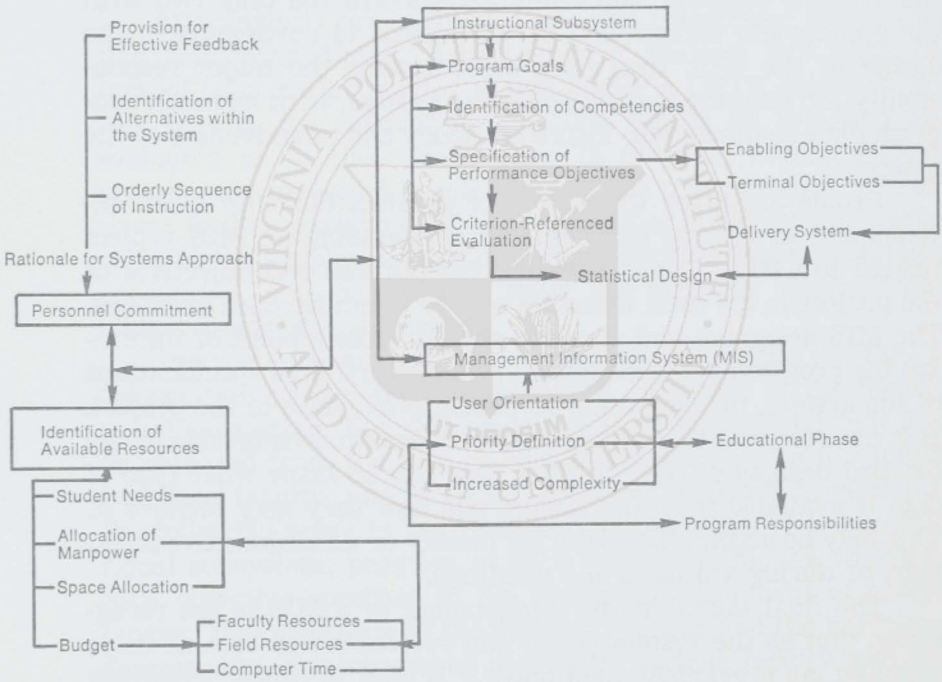
Responsibility for designing the MIS is a critical factor in the total development process. The most serious error in MIS development is giving the systems analyst and administrator complete control over systems specification. Without faculty, student, and field input, the entire MIS will be geared to the needs of the administrator and the perceptions of the systems analyst — leaving the MIS beyond faculty and student use. But if the systems engineer and administrator are the only two with the appropriate background or willingness to participate in the design of the MIS, then they must assume the major responsibility for defining and planning the system, with as much program data as possible to insure efficiency and effectiveness of the system.

People are often the source of greatest difficulty in an environment of change such as that surrounding an MIS project related to CBTE. Communicating the purpose and objectives of the project is the most effective way to minimize such problems. The MIS designers and planners should make a point of informing the program personnel of the progress and final specifications of the system, implementing an educational phase to the project. It is not essential that all personnel become knowledgeable of the detailed designs of the MIS, but they should know what type of data is available from the system and how they may retrieve it. This may be accomplished during faculty or administrative meetings, or during seminars and meetings.

The final factor in the development of a MIS is the recognition that as the system grows and evolves it will become more complex. As previously mentioned, it is easy to collect irrelevant information that can make the system too bulky to operate effectively, but it is also possible to collect needed information that can also make the system too bulky. For this reason, it is essential that the entire staff be continually apprised of the services offered by the MIS and the timetable for implementing priority items into the system. Furthermore, it is the responsibility of the staff to keep updated to the complexity and meaning of the MIS.

The description of the four factors that must be considered in the development of a CBTE systems model should give one an idea of the complexity of the process involved in model development. Figure 6-8 shows the components and interrelationships between these factors and how they influence the approach used by various teacher education staffs in the designing and implementation of their own models. An example of how one staff implemented their own systems model will follow later.

Fig. 6-8. Development of a Systems Model for a CBTE Program



CHANGE DIFFUSION OF INNOVATION[1]

For the past few years, a greater emphasis has been placed upon the process of change within an instructional setting. Previously, most research has focused on the operation, curriculum,

[1]Edited with permission from an unpublished paper written by David Frankel, entitled "Change Diffusion of Innovation", Wayne County Intermediate School District, 1975.

and program changes within the elementary and secondary schools. Rogers (1968) and Havelock (1973) have written on the change process, change agents, and innovations in education. However, most of their work has not dealt with change in a university or college setting.

During the late '60s and early '70s, students and faculty dissent brought about structural and programmatic changes within various institutions. Within the last five years, another significant movement has produced changes within the university and college setting — this being the introduction of the CBTE movement.

Recent conditions have brought about attempts to change the systems design of teacher education programs. CBTE has developed a unique approach to the teacher education process. Concurrently, this movement has brought with it much controversy. Articles, books, and monographs have declaimed the virtues and deficiencies of implementing CBTE models. A few teacher education institutions have begun CBTE programs, but it seems that they are few and far between. One begins to ask, why?

In the development of any CBTE program model, faculty input is desirable and often necessary, since the performance objectives specified within the system are a description in behavioral terms of the instructional content. In order to ascertain the necessary or minimum requirements for any programmatic system, the instructors need to describe what the students are expected to accomplish for a particular instructional unit. It is with this notion that the change process begins to take place.

A major problem in creating a change process is the establishment of an environment conducive to openness and frankness in faculty discussions. This is one of the most difficult situations to bring about in the development of any CBTE model. There are a number of alternatives, however, which can be utilized to bring about changes in faculty attitudes. One alternative is to describe the developmental process for the CBTE model to the total faculty and allow for questions and answers; also, seminars explaining the CBTE program can be held periodically. One of the most important points in any program development process is the visibility of goals and the process for attaining them. On-going information and reports should be made available to the faculty so that each member is constantly aware of all proposals made and their ramifications in program design. A cadre of experts, preferably selected by model designers as well as faculty, would be placed in charge of operating and defining program goals. It is with these components that a CBTE model can be initiated.

If a teacher education institution does not receive more than 50 per cent of total faculty commitment, more groundwork needs to be completed. It is necessary that at least 50 per cent of the faculty be in favor of the program change, since a majority will help in any faculty meeting of programmatic decisions. The initial work will involve a period of time to accomplish, so it is unwise to "force" something upon the faculty; *patience,* in this situation, is truly a virtue.

Once the groundwork has been completed, and the faculty has committed itself to a CBTE program, the next series of steps will not be as difficult to carry out in comparison to a mandated program. All current materials being utilized should be handed over to the selected cadre who will review and ascertain the commonalities of information being presented. It is extremely difficult for most faculty members to supply all materials they have pertaining to the program, including information files and course examinations. Based upon the information collected, a list of objectives are written, all faculty members must review them and collect data for feedback information. If there are changes, these must be brought to the selected cadre for evaluation and process decisions.

If, at this point, there appears to be a rift in the faculty or a majority of the faculty appears to be non-committal to the program, a questionnaire should be distributed to ascertain what the concerns of the faculty are. A faculty meeting should be held thereafter to bring out these concerns and to clarify the process being used or to generate some alternative solutions that can be agreed upon by the majority of the staff.

Once the objectives of the program are identified, the next area of development should be module specification and design. For this component, one to two hours of released time per term should be granted in faculty load for the development of instructional modules. Another alternative is for outside resource personnel to monitor classes and then develop the modules themselves. Furthermore, monetary rewards can be used as an incentive for module development. Other techniques also can be used, but they should reflect the creative and motivational characteristics of the faculty.

Part of module development is the sequencing of the modules. In this case, full faculty approval is necessary, since one component is contingent upon the others. The faculty must approve the sequence and content of the modules. Pilot testing the modules will result in feedback information and ultimate module revisions (content and/or sequencing revisions). The revision process, however, is not limited to the single pilot test. It is an on-going process and can take place as often as the modules are used. If this on-going process is terminated, then the program will become static and non-functional in relation to student needs. These are but a few of the total changes, on the part of the faculty, which are necessary for the development and implementation of a CBTE systems model.

There is another matter which is extremely important, yet little attention has been given to it, and that is the dissemination of materials developed by a CBTE program. A number of teacher education institutions have developed excellent teacher training modules, yet few individuals are aware of the quality or even the existence of these modules. There is need for a national dissemination effort to eliminate the consistent duplication of materials by the various teacher education institutions. An openness and commitment on the part of professional faculty allows a sharing of ideas and materials. If the faculty is open, the teacher education institution will perpetuate this notion.

THE VAE-CBTE SYSTEMS MODEL

The Vocational and Applied Arts Education (VAE) panel at Wayne State University was established in the College of Education in 1971. VAE is made up of the three former departments of Business and Distributive Education, Family Life Education, and Industrial Education; these departments now are designated as curriculum areas. Under the new organization, each curriculum area has responsibility for matters concerning its areas of specialization.

The VAE-CBTE Project was sponsored as an experimental program by the Vocational Education and Career Development Services of the State of Michigan Department of Education and was the vehicle used for developing the CBTE Systems Model. The model is divided into two major components: the instructional system and the management information system. The resultant systems are a product of the total effort and commitment of the VAE staff.

Instructional System

Within the VAE model, the terms "competency" and "goal" are both defined as demonstrated knowledge, skills, and/or judgements. Thus, the delineation of competencies and goals were accomplished through the same process. The VAE staff did not attempt to develop an entirely new set of competencies for the program, but started with the list of competencies in the Cotrell (1971) study at the Center for Vocational and Technical Education at The Ohio State University.

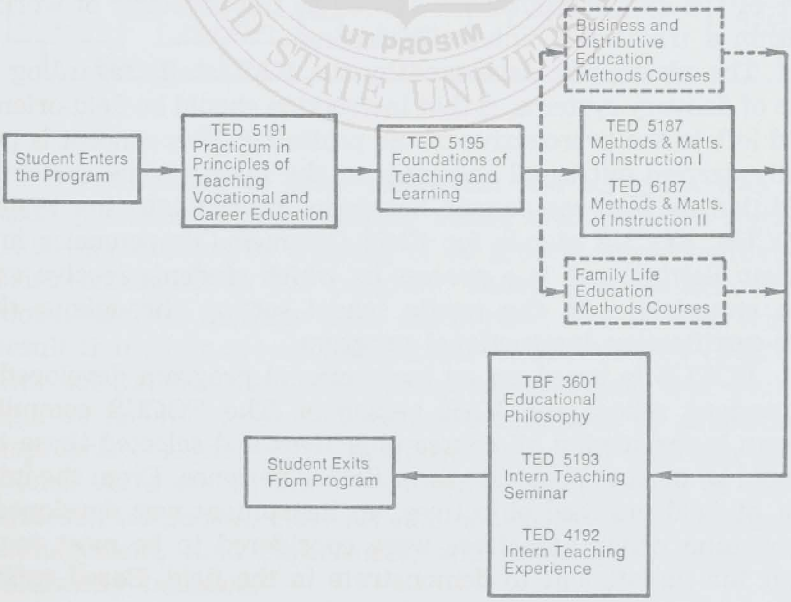
To specify competencies that were to be used in the pre-certification program, a systematic process had to be developed. The first step was to review, edit, and consolidate the initial list of competencies by means of faculty review teams. Second, with the assistance of evaluation experts, instruments were designed to validate and identify any new competencies for the pre-certification program. Ratings of competencies were gathered from the field. Teachers, administrators, counselors, secondary school students, undergraduate and graduate students were all sampled in the data collection process.

The data collected were tabulated and analyzed. Based upon the findings, 78 competencies were specified for the pre-certification program, and the remaining competencies were set aside for review and possible implementation in the graduate program. From the list of 78 competencies (this list has since been refined to 45 competencies) it was possible to categorize each competency into seven major clusters according to commonalities: planning, instruction, evaluation, guidance, management, public and human relations, and professional role.

Once the competencies were identified and clustered, it was necessary to design the instructional model in operational terms; thus indicators of competency achievement had to be specified in terms of performance statements. To assure editorial and evaluative consistency, a model format was selected for the writing of objectives. The format selected was developed by Kibler, Barker, and Miles (1972) in *Behavioral Objectives and Instruction*. Initially, performance objectives were written for existing courses in the program and then matched to specific competencies. This technique naturally proved to create a problem in competency evaluation, since the staff was attempting to fit an existing structure into a new one. It was not until the development of the graduate program that performance objectives were written for each competency.

The instructional system (Fig. 6-9) followed by all VAE students was established according to field data and not the whims of various staff members. As a result, two new courses were designed: Practicum in Principles of Teaching Vocational and Career Education and Foundations of Teaching and Learning. The practicum introduces the philosophy and structure of the instructional system, presenting each student with a list of competencies identified in the program and objectives for all courses in the instructional system. Thus, each student is made cognizant of program requirements and the criteria used in his/her evaluation.

Fig. 6-9. VAE Instructional System Program Followed By Industrial Education Students



It should be mentioned that the developmental process was not accomplished in an hourly meeting once a week, but was the result of extensive meetings, faculty workshops, and retreats. Several of the faculty retreats lasted for three to five days, while individual staff members were frequently involved in as much as 15 hours of CBTE committee work per week.

One of the key factors in the instructional model was the inclusion of program and student evaluation. On the basis of performance statements, *exit* examinations have been developed for each segment of the instructional process. Specialists in the field of educational evaluation and research were consulted in the design of instruments used in the evaluation process. A major accomplishment was the development of the intern teaching (student teaching) instrument which has been field tested and developed with the joint cooperation of the VAE faculty and cooperating teachers in the public schools. It was the thought of the faculty that an instructional system could be developed so that a student could enter the program and exit out as soon as he successfully passed the exit examinations; seat time in the classroom was not deemed a function of passing a segment of the instructional system. This, however, proved to be a difficult process to implement due to the time it took to complete a number of the exit examinations as well as the problems of working within a traditional university setting.

The philosophy developed by the VAE staff, regarding the use of delivery systems, is that instruction should be field-oriented and left to the prerogative of the professor. This concept is presently carried out in all segments of the instructional system. In addition, a new component has been infused into the system: FOCUS. FOCUS stands for Field Oriented Competencies in an Urban Setting, and is a process by which students receive varying experiences in the public school setting throughout their pre-certification instructional program.

FOCUS is based on an instructional program developed by secondary school and VAE personnel. The FOCUS committee began by reviewing all course objectives and selected those that would be most appropriate for a field experience. From the initial list of field oriented objectives, an instrument was developed to determine which objectives were considered to be most important for the student to demonstrate in the field. Based entirely upon public school teachers' input, several objectives from each course were identified and developed for field experiences. At present, all students are participating in field *activities* in each segment of the instructional system.

Management Information System

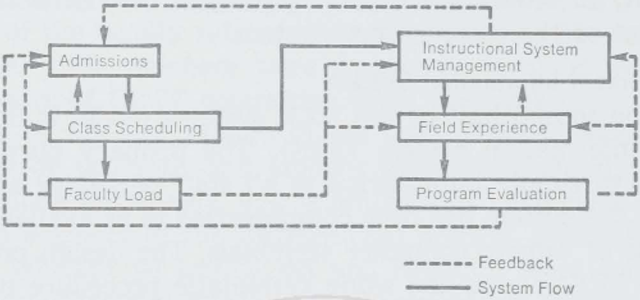
The second half of the VAE systems model is the management information system (MIS). The primary purpose of the MIS is to supply information to all staff personnel and for this reason the system has been computerized to be available through the use of remote computer terminals. The design process used in the MIS follows the same systematic procedure used in the instructional system: identification of program goals, determination of solutions and alternatives, selection of a solution, implementation, and evaluation-feedback.

Similar to the instructional system, the MIS has had to be divided into smaller components to facilitate implementation. The development process can be traced in Fig. 6-10.

Fig. 6-10. The MIS Development Process

Identification of each subsystem and its goals was based upon personnel characteristics, needs, and available resources. This was initiated by a listing of all general functions that were being conducted in the program. Based upon functional commonalities, the listings were categorized and labeled, with the result that there are six subsystems within the MIS (Fig. 6-11). The subsystems were then reviewed, analyzed, and evaluated against faculty needs and available resources to determine an appropriate sequence for transforming the old MIS into the new model. As a result, only the essential components of the subsystems; admission, class scheduling, faculty load, instructional management, field experiences, and program evaluation, were ultimately included.

Fig. 6-11. MIS Subsystems and Their Relationships



The characteristics of each subsystem are given below. The actual operating sequence, however, is not specified for each, since the total *VAE Documentation Manuals* for the MIS is over five hundred pages. What will be given is an overview of how the instructional system is managed because this is one aspect of CBTE programs that would have similar operating procedures.

1. *Admissions Subsystem.* This subsystem was designed to admit students into the program, develop their plans of work, and enter their records into the MIS within a week's time. Upon admission, the student receives a letter requesting a conference with a faculty adviser. Prior to the conference, the student reviews a multi-media orientation which explains program requirements (administrative and programmatic). Next, the student meets with a faculty adviser and develops a plan of work, which is designed to facilitate entry into the MIS. As a check, all plans of work are reviewed by a coordinating committee to be sure that no error has been made in the student's plan. Once reviewed, the student's records are microfilmed, placed on the master student records file, and the classes are indicated on a projected class list.

2. *Class Scheduling Subsystem.* The data gathered in the master student records file provides information regarding which classes should be offered during each quarter (it also provides information needed to predict the number of faculty needed each quarter). Based upon the data, administrative decisions regarding best tentative class schedule, alternative schedules, and final schedule selection are made.

3. *Faculty Load.* Due to the nature of a CBTE program, the VAE faculty has recognized the need for a more equitable means of determining faculty load. It was therefore necessary to collect data regarding all faculty activities regarding program and professional functions. Thus, program, research and development, and academic activities are gathered and merged with the data collected from field activities and fed into the master faculty file. From this data, it is possible to determine overload, underload, and any inequity in activities among the faculty.

4. *Instructional Management Subsystem.* This subsystem refers to all instructional activities that take place in a traditional university setting, and does not include the field experience subsystem. Because of the special nature of this subsystem, further discussion will follow.

5. *Field Experiences Subsystem.* The purpose of the field experience subsystem is to provide a means by which intern teachers may receive feedback from their college supervisor and field operating teacher regarding their progress in the field. The students are given Optical Mark Recognition (OMR) cards for each objective in the intern teaching experience. As they complete each objective, the card is filled out (it contains data regarding the number of attempts in passing the objective, time spent on completing the objective, whether or not the student has passed, and student identification data) and signed by the intern, cooperating teacher, and college supervisor. Furthermore, a weekly status report on the progress of the intern is sent into the college. All data received becomes part of the student's record file — all of which can be recalled by the instructor.

6. *Program Evaluation Subsystem.* Feedback from all subsystems are used for final evaluation of the student. Students are requested to complete the Content Evaluation Questionnaire during the quarter they are participating in a particular phase of the instructional program. The data are used for objective and evaluation revisions.

The most complex aspect of the MIS is the instructional management subsystem. This subsystem includes all instructional activities not performed in the field setting. A primary goal of this subsystem is to keep all manual recordkeeping at a minimum. As a result, faculty members are freed from the typical paper work involved in the traditional instructional program.

The professor of a particular course receives three bits of information: official class enrollment from the University tapes, a listing of course objectives, and program evaluation data. The latter two provide him/her with each student's history report, identifying how the student has progressed through the program up to this particular time.

Once the initial data is received, students are given "prerequisite skills" tests by the professor which determine whether or not the student possesses all prerequisite competencies for that particular course. If the student fails to pass the test, he/she can then be recycled through the program at particular points until he/she gains the requisite competence. Once the prerequisite skills test is passed, the student is cycled through the instructional content of the course. Figure 6-12 shows the progression of data as related to each student through the instructional management subsystem.

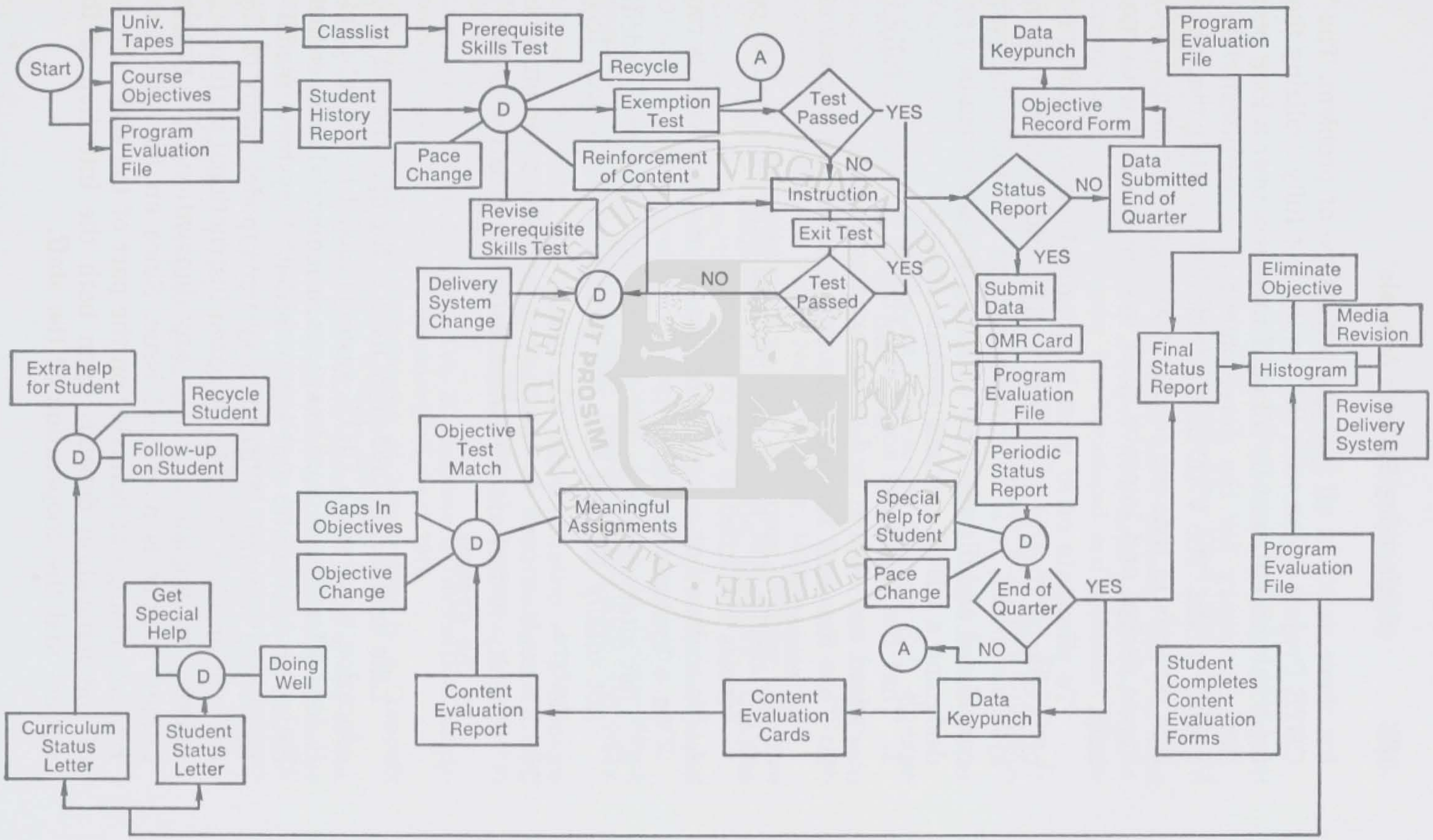
Each faculty member has a choice of how to submit objective completion data. The choice may be to use the OMR cards or the Objective Record Form, which is a computerized grade book. If the OMR is used, the student will periodically receive a computer print-out showing how he/she is progressing through the particular phase of the instructional system. Whichever reporting system is used, every student receives a Status Letter at the end of the quarter reporting those objectives completed or not completed. If there are any objectives not completed, the student is then instructed on alternatives available to complete these objectives.

Histograms are provided for every instructor indicating the number of students completing each objective, the number of times a student has had to be recycled through a particular objective, and the amount of time spent on completing each objective. The Curriculum Status Report of Students is given to each curriculum area to show the status of each student in the program. Students who have not completed objectives over an extended period of time are called in for consultation with a faculty adviser. This data is then used for evaluation and feedback.

Conclusions

To conclude that the VAE systems model was a complete success and operating without problems would be misleading,

Fig. 6-12. Progression of Data Through the Instructional Management System



for there exists in all systems some type of problem. The VAE-CBTE Project began with the faculty not fully realizing the need for total commitment by all staff members over a long period of time necessary for the development of a significant and high quality model. The VAE model is similar to other teacher education projects in that the faculty and support personnel were trying to design and improve their system too fast with too little help.

To eliminate or at least help individuals confront a number of problems that arise in the design and implementation of a systems model, it is recommended that the following points be considered and discussed by participating staff members *prior* to designing a CBTE systems model:

1. That the enormous scope and size of the task is fully recognized and approached as an existing reality.
2. That the need for resources and time are truly great as well as essential.
3. To assure that stated performance objectives lead to competencies identified in the program.
4. To realize that a significant amount of paper work is required in a systems model.
5. That alternative systems must be developed and students are not totally tracked into one path in order to exit from the system.
6. There is a need to increase opportunities for students and faculty to feel and be enthusiastic and creative as they work in the system.

Like another methodology used in the operation of a teacher education program, a CBTE systems model is not infallible, but it does offer a technique to approach industrial arts teacher education in systematic and logical order. A systems model has a legitimate rationale. Without a systems model, many of the concepts of an ideal competency-based instructional system are very difficult to implement. Like any innovation, the problem of human factors is a critical issue. Since an innovation usually requires change of behavior on the part of the staff, the success of the innovation depends upon both the intention of the designers and the cooperation of the staff.

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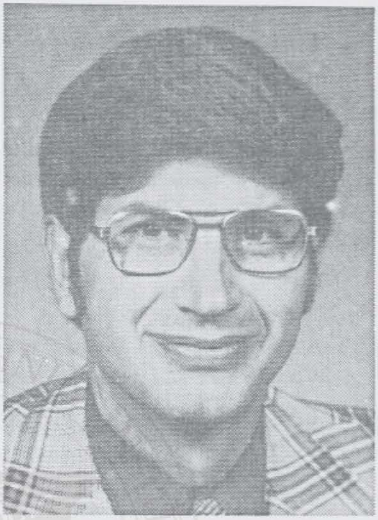


Dr. Loepp has taught industrial arts at the junior high, high school, community college, and university levels. For the past six years, his responsibilities have included the teaching of courses in the area of materials and processes and a variety of graduate courses. Presently, he is also serving as coordinator of the student teaching program at Illinois State University.

In 1973, Dr. Loepp was named the director of a two year, internally funded, departmental Competency-Based Instruction (CBI) Project. The main purpose of this project was to move the professional teacher education program from a traditional to a competency-based format. This involvement lead to a number of related activities. He served as staff associate on the Administration by Competency (ABC) Project — a state funded project in the Department of Educational Administration. Subsequently, he directed the Pre-service Occupational Program (POP) during 1974-76. The POP Project, funded by the state for three years, identified sixty-three competencies for prospective teachers, and developed complete learning activity packages for thirty-eight of the competencies. Due to his experience with CBTE, Dr. Loepp has served as consultant to several universities and frequently as presenter at educational conferences.

chapter 7

Implementing a Pre-Service C/PBTE Program in Industrial Arts Teacher Education

Franzie L. Loepp

Upon completion of this chapter, the reader should be able to:

- Describe at least four advantages and two disadvantages of using the competency-based model of instruction for a teacher education program.
- Develop strategies for orienting educational personnel to Competency/Performance-Based Teacher Education (CBTE).
- Analyze and describe the inputs, processes, and products of an industrial arts teacher program.
- Adapt for implementation, a suggested change model to guide the long-term transition from a traditional to a competency-based teacher education program.

INTRODUCTION

The process of implementing programmatic change is so complex that it does not lend itself to a recipe style presentation. Rather, educational personnel must rely on broad principles for change to provide a general direction in which to proceed. Then they need to assess their own situation and determine the amount and nature of each of these ingredients for change. This is not an easy task because the implementation of change should be accomplished in ways that maintain the integrity of all people who are affected. Further, any change must be made to facilitate the attainment of the aims and goals of education, the institution, and the specific administrative unit within the institution.

The primary axiom for making these changes is that of using a planned, goal-oriented systems approach (see Chapter Six). Although most university programs have evolved with little or no overall coordination or direction, most of what exists does contribute to a general mission or goal. Even though a department may not have a written "mission statement," in the broadest sense, this mission is usually understood by the professional staff.

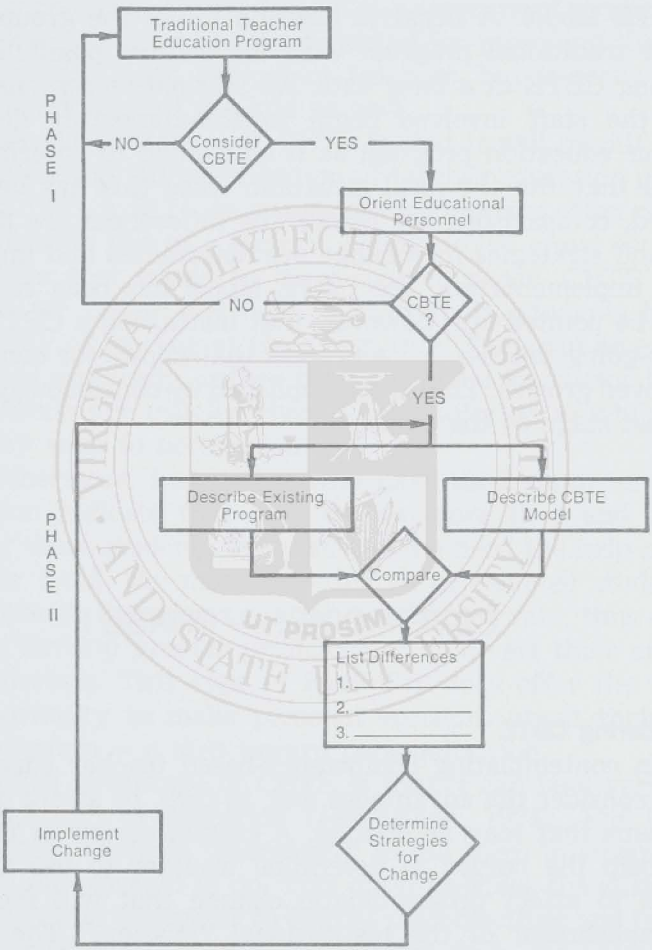
First, the axiom for curriculum innovation indicates that change must be *planned*. It . . . "requires a systematic sequence of work which deals with all aspects of the curriculum ranging from goals to means" (Taba, 1962, p. 455). Secondly, curricular change should be *goal-oriented*. For example, one of the goals of a department might be to "develop, maintain, and constantly update programs for the preparation of educational personnel in industrial education" (Mission Statement, 1974, p. 1). While this statement is purposely broad, it does give some direction, and therefore, becomes helpful in suggesting a direction for change. In addition, it clearly indicates that the departmental programs are designed for constant revision. One way to accomplish this mission is to install a competency/performance-based teacher education (CBTE) program. A shift to CBTE will necessitate a number of changes. It will invariably affect the curriculum, personnel (administration, faculty, and students) and facilities.

Most situations call for a model for moving from a traditional educational program to a competency-based model. The model with which this writer has worked during the past three years is shown in Fig. 7-1. A brief overview of this model is followed by a detailed explanation of each of its components.

The Overview

Initially, educational personnel must be willing to consider CBTE as an alternative to the traditional program. If the group's reaction is negative, then the changes required in shifting to a CBTE program cannot take place. In this case, a continuance of

Fig. 7-1. A Model for Implementing a CBTE Program



the traditional program is predestined. However, a willingness to consider CBTE leads to the process of orientating the educational personnel.

Following a period of orientation (usually one year) a decision again needs to be made as to whether or not to inaugurate a CBTE Model. A negative decision forces the group to return to the traditional program with the distinct possibility of considering CBTE at a later date. An affirmative response suggests that the staff involved begin to simultaneously describe the teacher education program as it exists and to describe a CBTE Model that fits the local situation. Once this has been accomplished, comparisons are made. The differences are then identified and strategies for change are determined and implemented. With implementation, the CBTE Model has been completed. It must be pointed out, however, that instituting a CBTE Model is an on-going process . . . a process that allows for continued and improved growth. This is accomplished by continuously repeating the last stage of the model.

CBTE MODEL — PHASE I

Considering CBTE

In contemplating competency-based teacher education, one must consider the advantages and, in turn, be aware of potential problems that may be created. A careful review of these issues will help the reader to determine whether to use CBTE as a means to affect programmatic change that will facilitate the accomplishment of the institutional "mission." The advantage of CBTE that is mentioned most often is accountability (Houston, 1974, p. 5). By designating in advance the competencies a pre-service industrial arts teacher must be able to demonstrate, it becomes possible to clarify the responsibilities for both the instructor and the student. This, in turn, increases the potential for the student to be able to perform as indicated in the instructional objectives (Levine, 1972).

This concept is quite palatable to those who are asked to attach a dollar value to the preparation of teachers. Societal pressures created by increased budgets for higher education and the decreasing availability of public funds, has brought attention to the issues of cost accounting and efficiency in education. And since it appears the CBTE does offer a measure of accountability, it therefore, not only has the potential for providing the field of education with more competent teachers, but it seeks to meet a paramount societal demand as well.

A second advantage of CBTE is that it will permit the personalization and individualization of teacher education programs (Bowles, 1973, p. 511). In an age when education often resembles the production line of a factory, young people crave educational experiences that relate to their specific needs. CBTE has the potential for filling this need. For example, students have the opportunity of moving at their own rate. They can be evaluated when *they* are ready, rather than when the instructor is ready. And students are usually given some choice as to which objectives they wish to accomplish.

Furthermore, instructors who have used competency-based instruction indicate that they devote more time and effort in assisting those students individually who need the help most. On the other hand, the more experienced or talented students can move through the program at an accelerated rate, thus enabling them to develop greater proficiencies or divert their energy to other interests. This type of flexibility does offer the students the opportunity to make personal decisions about their educational program — a step toward personalization.

A third advantage of CBTE is that it can be a very humanized approach to education (Hefferman, 1974). For instance, it is treating students "humanely" to tell them in advance what they will be expected to do. This often provides the stimulus for the student and instructor to discuss the objectives and to modify them as necessary. Even if the student finds the objectives inexpedient and unnegotiable, he/she then has the option to select an alternate program before investing a great deal of time in an unknown program that gradually becomes distasteful. Another area in CBTE that usually offers additional freedom to the student is the deliberate attempt to provide alternate learning activities for the same objectives. This is a clear attempt to provide for individual differences. And, finally, the method of grading in CBTE programs is more humanistic. Criterion, rather than norm-referenced evaluation issued. The students strive to develop and improve behaviors which are likely to increase pupil learning.

A fourth advantage of CBTE is increased motivation on both the part of the instructor and learner. Instructors have committed themselves to facilitate the attainment of predetermined competencies. This commitment often leads to action to improve instruction. And students tend to attain at the level of expectation. Again, the prespecification of objectives capitalizes on this principle of motivation.

A shift to CBTE may also cause some problems. One problem is referred to as "power sharing" (Drummond, 1974, p. 293). The systems approach to education required of CBTE programs necessitates a broadening of the base of power. No longer can professors determine the objectives of a course or program on their own. Rather, they are required to carefully and professionally determine the objectives after receiving feedback from several groups. Faculty, students, and teachers need to be involved in this process. Further, these objectives which are designed to powerfully communicate are made public. This type of openness can precipitate spirited discussions as to the validity of the objectives. Since most educational personnel are not accustomed to this sort of scrutiny and the cooperation demanded in operationalizing CBTE programs, they may tend to prefer a more autonomous role. It is apparent, however, that the delineation of varied and shared responsibilities is necessary in CBTE programs (Getz, 1973, p. 301).

Some students also have problems with CBTE programs. Most of them are accustomed to playing passive roles in education while the instructor is the one who "performs." The shift from taking notes on "how to teach" to demonstrating a set of teaching skills is not viewed positively by all students. Some students also find it difficult to adjust to a self-imposed schedule. These students sometimes allow extracurricular activities to successfully compete with a CBTE program. This lack of self discipline could lengthen the time required to complete the program (Edwards, 1973, p. 190).

Once the advantages and problems of CBTE have been considered, program planners must answer the following: (1) Is the issue of accountability important to your situation? (2) Would you like to offer students a personalized and individualized mode of teacher education? (3) Do you believe that teacher education should be humanized? (4) Should the motivation level of both instructors and students be increased? Affirmative responses to these questions suggest the next step in Phase I of the CBTE Implementation Model.

Orienting Educational Personnel

Initially, administrators, faculty, and students, along with public school administrators and teachers need to become acquainted with the essential elements of the CBTE program. This awareness can be gained through the reading of articles in professional journals and through attendance at professional meetings. However, more in-depth orientation is highly desirable. Activities such as workshops and seminars conducted by teacher educators who have had experience with CBTE are highly recommended. Another means of exploration is to visit campuses where CBTE programs are in operation. Of course, it is assumed that ordinary communication channels such as departmental meetings, conferences between public school and university personnel and/or newsletters describing the departments curricular efforts can also be used to orient these groups. It is further suggested that additional orientation be gained by actually involving instructors and students in short term experiments with CBTE materials and methods. For example, many individualized materials exist for the purpose of helping students learn to write student performance objectives. It is suggested then, that the instructor select and adapt some of these materials to be used in an existing course. In this way, both instructors and students will experience both the advantages and disadvantages and some of the problems that might be encountered in moving toward a CBTE program.

For most situations, at least one year should be devoted to this trial orientation phase. The following timetable includes some of the activities that are recommended for completion during the orientation phase.

Table 1
Sample Timetable for an Orientation to CBTE

SUMMER	— Obtain financial commitment for books and periodicals, travel, consultants, pilot test materials, etc.
SEPTEMBER	— Faculty meeting — summarize the year's plan in relation to CBTE Provide faculty with articles about CBTE Discuss CBTE with administrators at all levels
OCTOBER	— Faculty meeting — discuss CBTE Send at least two members to visit established CBTE programs Report of visits
NOVEMBER	— Invite "experts" to campus to inform students, faculty, administrators, and public school personnel about CBTE
DECEMBER	— Decide which units of instruction to pilot. Also decide which instructors and students are to be involved.
JANUARY - MARCH	— Pilot CBTE in selected units of program
APRIL	— Report results of pilot efforts Obtain opinions concerning CBTE from: Students Faculty Administration Secondary school personnel
MAY	— Decide whether or not to move toward CBTE

Near the end of the orientation phase, it is helpful to determine the opinions of students, faculty, administration, and secondary school personnel before entering the decision making process. The opinionnaire that follows was adapted from an instrument used at Illinois State University (Loepp & Miller, 1974, pp. 88-93). This instrument not only attempts to assess opinion, but also the respondent's understanding of CBTE. In this way, the effectiveness of the orientation phase can be determined and the collective feelings of the various groups can be ascertained. These data will be especially useful in the decision-making process.

Table 2
An Opinionnaire Concerning CBTE

DIRECTIONS: Circle the abbreviation of the statement that best describes your opinion.

SA — Strongly agree with the statement
A — Agree with the statement
U — Undecided about the statement
D — Disagree with the statement
SD — Strongly disagree with the statement

1. CBTE programs tend to be highly individualized in that students are expected to work individually and at their own pace.	SA	A	U	D	SD
2. A CBTE program provides more opportunities for feedback to the individual learner.	SA	A	U	D	SD
3. CBTE programs require that objectives and evaluation strategies be clearly identified and made public in advance of instruction.	SA	A	U	D	SD
4. In a CBTE program, formal lectures and class discussions are eliminated.	SA	A	U	D	SD
5. CBTE programs are highly modularized.	SA	A	U	D	SD
6. CBTE emphasizes demonstrated competencies as a means to evaluate the student's readiness to become a teacher.	SA	A	U	D	SD
7. Norm-referenced grading is eliminated in CBTE programs.	SA	A	U	D	SD
8. Performance objectives are an integral part of the CBTE program.	SA	A	U	D	SD
9. CBTE promotes the idea of accountability on the part of the student, teacher, and the training situation.	SA	A	U	D	SD
10. All students must achieve a pre-specified level of competency in order to "exit" from a CBTE program.	SA	A	U	D	SD
11. In CBTE programs, students are expected to master each identified competency in a fixed period of time.	SA	A	U	D	SD
12. CBTE represents little more than an educational fad, and the sooner it fades out, the better.	SA	A	U	D	SD

(Continued on next page)

13. Performance objectives should provide the criterion against which readiness to assume a professional role is assessed.	SA A U D SD
14. Each student should be expected to achieve the level of performance specified in the objective.	SA A U D SD
15. The use of performance objectives makes it difficult to plan instruction for higher-level (eg. synthesis, evaluation, organizing, characterizing, performing, and perfecting) learning activities.	SA A U D SD
16. Performance objectives tend to impart a rigid and inflexible cast to a lesson or learning activity.	SA A U D SD
17. CBTE programs tend to become mechanical and dehumanizing in application.	SA A U D SD
18. The CBTE approach to education will produce more competent teachers.	SA A U D SD
19. The CBTE approach to education conflicts with my conception of the role of the instructor.	SA A U D SD
20. I would like to work in a CBTE system.	SA A U D SD
21. CBTE requires the restructuring of conventional faculty roles.	SA A U D SD
22. Implementation of a CBTE program usually results in a reduction of the instructional staff.	SA A U D SD
23. A CBTE program usually requires that an instructor utilize a specified delivery system, or method of instruction.	SA A U D SD
24. A CBTE program results in diminished autonomy for the instructors.	SA A U D SD
25. In a CBTE program, interaction between the student and instructor is reduced.	SA A U D SD
26. CBTE programs are designed and validated by faculty, public school teachers, and students.	SA A U D SD
27. I favor a shift to a CBTE program.	SA A U D SD

The procedure for making the decision as to whether or not to commit to the CBTE Model depends on the local situation. In most cases, this decision is made by an administrator after he has obtained data from faculty, students, and public school personnel concerning their opinions and has received a reaction from upper level administration.

If the answer is maybe or negative, then simply continue the existing teacher education program and keep considering whether or not CBTE would facilitate the attainment of the goal of preparing educational personnel. A positive answer, on the other hand, suggests a systematic sequence of activities which deal with all the aspects of curriculum ranging from goals to means. Phase II of the implementation Model is designed to facilitate this process.

CBTE MODEL — PHASE II

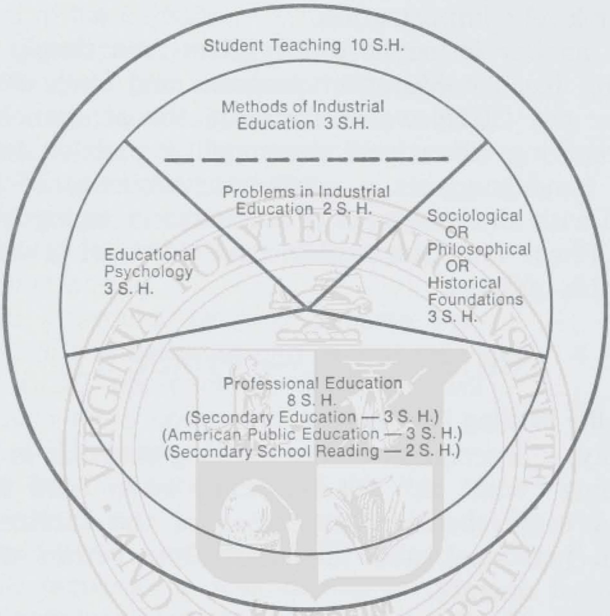
Describing the Existing Program

Initially, a description of the existing program is in order. In describing "what is," the following areas need to be addressed: A comprehensive description of the curriculum, the educational personnel, and the constraints within which the program must operate.

Describing the Curriculum is an important activity that can be accomplished in several ways. One way is to make a graphic presentation. This presentation should show all of the subsystems within the university that are involved in the preparation of industrial arts teachers. To adequately describe the existing professional education program, each of the subsystems needs to be described in detail.

An attempt must be made to determine as accurately as possible the content of each of the courses in the program. Generally, catalog descriptions and course syllabi are readily available. Discussions with faculty and students can be of help in describing the content of each course. To facilitate this process, a three-level conceptual analysis for each course is suggested. The first level should consist of an all-inclusive statement describing the content of the course in performance terms. This content should then be divided into three to six level concepts (sometimes considered course units), and, finally, each of these units should be

Fig. 7-2. Preservice Professional Program for Industrial Education Teachers



broken into three to six specific competencies. Performance terms are used to describe each of the concepts. There should be little or no overlap between concepts. Third level concepts should clearly describe the second level concept and the second level concepts should collectively describe the first level. Additionally, each of the concepts should have approximately the same value or size. If they are units of instruction, they should take about the same amount of time in a course. To illustrate the conceptualization of a course, the following example of a course in industrial education is provided in Table 3.

Table 3
Sample Course Conceptualization

I. Devise alternative solutions to problems that confront the Industrial Education teacher in the organization and management of the school laboratory.
  1.1. Examine the types of school shop organization
    1.1.1. Compare and correlate general and specialized education.
    1.1.2. Identify characteristics of vocational and industrial arts education.
    1.1.3. Categorize conventional school shop organization.
    1.1.4. Examine contemporary trends in industrial education organization.
  1.2. Identify and assess criteria pertinent to effective school laboratory planning.
    1.2.1. Determine demographic data.
    1.2.2. Assess role of school characteristics.
    1.2.3. Identify desirable physical characteristics of the school shop.
  1.3. Select, purchase and care for equipment and supplies
    1.3.1. Determine acceptable definitions for purchasing nomenclature.
    1.3.2. Demonstrate ability to adhere to acceptable purchasing procedures.
    1.3.3. Become acquainted with vendors of various materials.
    1.3.4. Analyze function of tool and equipment storage and maintenance.
  1.4. Identify criteria pertinent to effective classroom management.
    1.4.1. Determine activities germane to the industrial education teacher when starting and closing the school year.
    1.4.2. Analyze values of student-personnel organization.
    1.4.3. Identify role of teacher in school laboratory safety practices and liability.
    1.4.4. Identify types and uses of classroom records.
  1.5. Determine laboratory activities and methods of student evaluation.
    1.5.1. Categorize types of laboratory activities.
    1.5.2. Determine values of manipulative activities.

(Continued on next page)

1.5.3. Determine alternative methods of evaluation in various domains as they apply to industrial education activities.

1.6. Determine professional role of the industrial educator.

1.6.1. Identify opportunities for industrial education teacher in state and national organization.

1.6.2. Identify opportunities for industrial education teachers in subject area organizations.

It is recommended that faculty teaching the courses be involved in developing these conceptualizations. Once the courses within the program have been conceptualized, meaningful discussions concerning duplication and voids in a curriculum can take place.

Another important activity is to describe the delivery systems used in a given program. Obtain answers to questions such as: Which courses are prerequisite to other courses? Is there individualization within a course? Is content packaged in some unit other than courses? Is opportunity provided for students to repeat or engage in learning activities when their performance has been determined to be deficient? The answers to these questions will provide some indication as to the extent of change that is required in moving toward a CBTE program.

Describing the Faculty will aid in identifying the various talents available and the areas which will require in-service education. The following questions imply some of the qualifications that are desirable for faculty who are involved with CBTE programs. Does the staff include members who carefully plan and execute classroom instruction? Do some members prepare materials that are suitable for individualized instruction? Do some excel in diagnosing an individual student's deficiency and then recommend activities to correct the deficiency? Are there members who have the potential for managing a wide variety of learning experiences? Answers to these questions will give some indication as to whether a shift to CBTE would necessitate changes in personnel or in-service education for some faculty members.

Describing the Constraints is the last area to consider in describing the existing program. The most apparent limitation is that of finance. Therefore, funds for the purpose of programmatic changes are often limited. Rapid change can only be affected by a larger amount of financial commitment to the process. This may mean releasing some faculty from some of their instructional duties to work on curriculum development activities. Many institutions have employed graduate students and/or temporary staff to lighten regular faculty loads. Some have given faculty summer grants to make preparations for the change. Most institutions have sought and obtained special funding and/or devoted much of their travel, material and equipment budgets to this effort.

Several programs that have implemented a CBTE Model such as the agriculture educational department at the University of Nebraska and the curriculum and instruction department at Illinois State University have accomplished this without outside funding or substantial internal considerations. It must be noted, however, that a limited commitment of funds will slow down the rate of progress in shifting to a CBTE Model.

Another constraint related to finance is in the area of facilities. Most programs have instructional material centers where there is an ample supply of audio-visual equipment to maintain individualized programs. These centers usually contain cassette tape recorders, filmstrip projectors, movie projectors, slide projectors, and/or cassette video tape players. Occasionally some type of computer-assisted instruction is also available.

A third constraint has to do with university policy in relation to curriculum matters. Changes in curriculum are often subject to the approval of a hierarchy of administrators and committees, all of which have various policies under which they function. Further, some of these decision makers have biases which function outside of policy. Sometimes these policies were not written with the intent of considering program innovation. Finally, State credentialing procedures sometimes dictate requirements that must be met by teacher education programs. Fortunately, most states offer sufficient flexibility in their requirements to enable the implementation of CBTE programs.

Describing a CBTE Model

An activity that should occur simultaneously with describing the existing program in terms of curriculum, educational personnel, and constraints, is that of developing a model CBTE program. The first step is to describe graphically an "ideal" — a total system of teacher education. This may mean that the responsibility for various competencies should shift from one department to another.

A supporting activity in describing the "ideal" model is to develop a hierarchy of program competencies; in this instance, the competencies that are essential for successful industrial education teaching. Several projects have been undertaken to delineate the competencies for teachers (Bensen, et al., 1974, Cottrell, et al., 1970). These projects have gone through a number of activities to validate various sets of teacher competencies. From these lists, industrial education staff can begin to build a hierarchy of competencies for their particular situation. This activity invariably causes the staff to begin to project an ideal program. This hierarchy should take the form similar to the conceptualizations completed in the description of existing programs. An example of this kind of hierarchy was provided in an unpublished annual report completed at Illinois State University (Loepp and Miller, 1974, pp. 19-22).

Table 4
Teaching Competencies

I. Organizing (for teaching)
   A. Assessing learner needs and goals
      1. Study relationship between societal concerns and industrial education goals (in order to make program level curriculum decision).
      2. Study group cultures and principles of learning (in order to relate instruction to individuals).
      3. Diagnose learner readiness.
   B. Managing the physical environment
      1. Establish physical conditions conducive to learning.
      2. Plan for and organize the facilities needed for the program.
      3. Requisition and receive supplies and materials.
      4. Provide for maintenance.
      5. Maintain record and filing systems (provide clerical management).
      6. Develop and implement safety procedures.

C. Setting goals and objectives
    1. Develop program and course rationale.
    2. Determine program goals.
    3. Determine competencies to be mastered.
    4. Translate competencies into performance objectives.
D. Planning (for teacher-student interaction)
    1. Select and sequence content.
    2. Structure content into lessons.
    3. Select learning activities.
    4. Design instructional evaluation strategies.

II. Interacting (teachers and students)
A. Communicating in the classroom
    1. Promote constructive interrelationships and interaction with students.
    2. Conduct meaningful discussions and dialogues with students.
    3. Give clear, explicit directions to students.
    4. Respond appropriately to success achieved by students.
    5. Clarify misconceptions or confusion tactfully with students.
B. Nurturing humaneness in the classroom
    1. Build self-awareness and self-concepts in students.
    2. Develop understanding of students' attitudes and philosophies.
    3. Demonstrate sensitivity to students.
C. Instructing
    1. Motivate
    2. Employ instructional strategies.
    3. Interact with students.
    4. Adjust plans and strategies based on observed feedback from students.
    5. Teach the substantive content of the field.
D. Managing learning
    1. Plan and organize facilities.
    2. Requisition, receive, and store supplies and materials.
    3. Plan, organize, and requisition instructional media.
    4. Provide for maintenance.
    5. Develop and maintain records.
    6. Maintain physical conditions conducive to learning.
    7. Direct student activities in the laboratory.
    8. Identify and reduce deviant behavior.

(Continued on next page)

E. Evaluating
   1. Establish the evaluative criteria for competencies, programs, facilities, and educational process.
   2. Select measures appropriate to the evaluative criteria.
   3. Administer evaluative measures and collect data.
   4. Analyze and interpret evaluative measures for interested publics.

III. Being a Professional
   A. Gaining self-improvement
      1. Develop, maintain, and improve expertise in one's specialty.
      2. Demonstrate awareness of current professional developments, societal needs, and technological advances.
      3. Develop, maintain, and improve technical and teaching skills and strategies.
      4. Know self and develop a personal plan to capitalize on strengths and to modify weaknesses.
   B. Working with Colleagues
      1. Employ tact, judgment, social amenities, and good human relationships with the faculty members, administrators, and school staff.
      2. Develop and improve skills of interacting with others which will bring forth the expertise of all individuals.
      3. Help generate, communicate, and delegate responsibilities inherent in educational policies.
   C. Developing professional actions
      1. Demonstrate a respect, admiration, empathy for learners as growing, developing, and feeling human beings.
      2. Identify the characteristics, obligations, responsibilities, ethical choices, and organizations of the teaching profession.
      3. Become involved in program innovation and long range professional planning.

This hierarchy then needs to be submitted to the various groups for validation. Students need to be involved in discussing their perception of the competencies of successful teachers. Public school teachers must also have a part in the development and validation of this hierarchy. Public school administrators can also provide useful information concerning teacher competencies. Input from all of these groups can be obtained through various means. The two most common techniques are through the use of a survey instrument based on the competency hierarchy, or through personal interviews.

Comparing the Existing Program with the CBTE Model

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

This three-element approach will facilitate the development of a well-planned, sequential industrial arts teacher education program. It will not only assist in eliminating unwanted duplication, but it will also help to clearly specify which department in the institution has the responsibility for teaching each of the validated competencies.

It is recognized that there are certain competencies that are often judged to deserve repetition. For example, the writing of an objective may be repeated within a given program. The department of education may have the responsibility of teaching the techniques for writing objectives, while the industrial education department not only assesses the components of an objective, but also provides guidance as to the validity of the same.

Using the validated competency listing, it might be helpful to again refer to the Pre-service Professional Program for Industrial Education Teachers that was developed for the local situation (see Fig. 7-2). Then determine whether or not additions, deletions, or adjustments need to be made in the total program.

Listing the Difference Between the CBTE Model and the Existing Program

The next step is to compare the existing program with the ideal locally developed CBTE Model. To facilitate this process, the existing program is described in the form of a graphic representation, course conceptualizations, personnel qualifications, and the institutional constraints. The ideal CBTE Model is presented in graphic form, with a listing of validated competencies and a description of the essential elements of CBTE. Close scrutiny of these documents will reveal a number of differences. For example, the existing program might exhibit such characteristics as:

1. several areas of unnecessary duplication
2. limited or incomplete performance objectives
3. classroom, group instruction only
4. norm-referenced grading

In relation to these characteristics, the localized CBTE Model program may clearly suggest that:

1. the program should be sequential with only planned duplication
2. all courses should have performance objectives
3. various types of instruction should be available
4. criterion referenced grading should be instituted

Once the differences have been determined, then strategies for change need to be developed. These strategies should include the persons responsible to implement change and a timetable for achieving such change. Using the examples above, some strategies such as these might evolve:

1. By the end of the fall term, the curriculum committee, with Dr. Will Innovate, as Chairman, shall submit a plan that will clearly indicate which competencies are to be taught by each department providing professional teacher education. Furthermore, this plan should indicate which course in each department will have the responsibility for developing a given competency.
2. By the end of the academic year, each faculty member shall submit performance objectives for each course he teaches. These objectives must contain a student outcome, conditions, and criteria.
3. By the end of the term, each faculty member shall have at least one unit of instruction organized in such a way that it can be taught on an individualized basis.
4. By the end of the academic year, all courses should be evaluated on a criterion-referenced format.

A note of caution — be conservative in estimating the extent of change that can be made in a given amount of time. The process of moving toward the ideal model of teacher education is, in reality, an on-going process that is always susceptible to change and improvement. For this reason, Phase II of the implementation model should be repeated periodically. The existing program needs to be redefined as new theories of education evolve and the competencies of teachers change. Thus, the continuously changing CBTE Model needs to be updated. Again, comparisons need to be made and strategies for change developed. In this way, the CBTE program can constantly make the necessary adjustments to facilitate the preparation of competent industrial arts teachers.

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Dr. David Jelden

Dr. Jelden is Professor of Industrial Arts at the University of Northern Colorado, Greeley, Colorado. His Bachelor's degree was granted in 1952 from Kearney State College, Kearney, Nebraska; his Master's in 1957 from the University of Northern Colorado, Greeley; and his Ed. D. in 1960 from the University of Missouri, Columbia, Missouri. Dr. Jelden has taught at the junior high, senior high and university levels.

The major role of the University of Northern Colorado is the preparation of teachers. This thrust made research and exploration in the field of educational methods readily accessible. As such, Dr. Jelden implemented a competency-based educational program in electronics in 1968 at the University of Northern Colorado and has studied some of the ramifications of individualized instruction through a system called "Learner Controlled Education". Dr. Jelden spent a sabbatical leave studying the problems and characteristics of educational accountability. The result was an individualized learning activity package and resource book on "Orientation to Educational Accountability". At present, research is being conducted by him on a computer-assisted interactive instruction adjunct program.

chapter 8

Accountability within Competency/Performance-Based Teacher Education Programs for In-Service Teachers

David L. Jelden

Upon completion of this chapter, the reader should be able to:

- Discuss the pros and cons of accountability in education, relating these statements to the need for a competency/performance-based teacher education program.
- Formulate a list of six general requirements or conditions which will be necessary in order to initiate an accountability program in existing education environments using competency/performance-based teacher education.
- Write a sequential plan which will produce a logical system for determining and improving the actual educational output of the school program.

INTRODUCTION

The move toward implementing a competency-based teacher education program is a natural outgrowth of the thrust for educational accountability. One of the greatest contributions of the accountability movement is its impact on trying to identify rather specifically what the schools are doing. Accountability should be thought of as a dual process. One phase is concerned with the analyzing and evaluating of the instructional system; that is, what functions are performed by the teacher in interacting with students, fellow teachers, and the public. The second aspect of the accountability process is determining whether the schools are doing what they should be doing. In this chapter, emphasis will be placed on the functions of the practicing teacher and ways to implement a competency-based education program for in-service teachers.

Educational Accountability

Accountability, in its broadest sense, is defined as, *being responsible for*. In the educational setting, the parents, the public, the school board, the superintendent, the teachers, and the students all have a share of responsibility in the process of education. Delineation of responsibility of each of these groups is an essential part of the beginnings of an accountability program.

In establishing responsibility, an industry, by law, is responsible for the product it produces; a car which is defective and marketed becomes a liability to the manufacturer. In education, however, the existing philosophy of a public school system traditionally reverses this idea. Education was/is the only industry of a free enterprise system that holds the *consumer* responsible for the quality product. In reality, educators have taken the attitude that if the student succeeds, it's because of an excellent teacher; if the student fails, it's because of his/her own weakness and the failure becomes his/her problem. This kind of attitude is incompatible with the highly developed technological democratic society operating on the principles of free enterprise.

The reasons for the tremendous growth of the accountability movement are many. Some mentioned in educational literature are: the influence of the federal government, a dissatisfied public, and a tendency to look at education in terms of cost effectiveness. Wright identifies others in Chapter 1. Accountability, in fact, makes use of many of the principles of business and industry in developing a program called *educational engineering*. The breakdown of assignment of responsibility and accountable procedures used in industry are being adapted more and more in public education. Part of this adaptation process, then, involves the development of teachers who are competent in their professional and technical specialties.

Delineation of Responsibility

If teachers, and in particular, teacher educators, are to be accountable to no one but themselves, school systems, colleges and universities might still continue to produce some products (teachers) who are a liability to the public they serve. A decline of public confidence in our schools is becoming more evident. This is exemplified by a recent legal action taken by a high school graduate toward a school district. The student, although a graduate, could not read or write and, as such, was unable to get a job.

The critics of education, the number of students who can't or won't complete the program, the dissatisfaction of some of those who do, all reflect the failures of both public and private schools.

Human nature, being what it is, forces individuals involved in education to begin finger pointing to try to place the blame. The result has been an apprehension on the part of educators to accept the concept of accountability. Some educators see it as a threat to their existence and a process of blame assignment. In contrast, a good program of accountability should place a positive influence on the educational process and be embraced as a means of improving what the schools are now doing. To improve the educational system, more people need to become involved with the education of their children. Teachers have been, and are now, responsible for the direction of education. If, in fact, dissatisfaction does exist between the public, the administrators of education and the teachers, then a cooperative effort of all groups involved should be made to change these conditions.

A program of accountability should be for all levels and all school situations. Those involved must ask and find answers to such questions as: "What *are* we accountable for?", "What *can* we be accountable for?", and "What *should* we be accountable for?"

Competency-based teacher education is one means of determining the teacher's responsibility for the motivation and instructional process, particularly as it identifies the relationship of that teacher to the functions performed in the classroom. It is a means of delineating the particular items of competency for which the teacher can be held accountable. This delineation removes the guesswork and the assumption involved in identifying the educational process. It simplifies the business of instruction and provides guidelines for systematic instruction in teacher education. In addition, it will provide means whereby teachers who are now in the field can update their skills to obtain or enhance the competencies necessary and essential for a program of education in today's modern school system.

Industrial Principles Applied to Education

One should remember that the educational process is not exactly like the industrial process. Education deals with human beings who are continually interacting with other growing, changing human beings. This interaction is not predictable or directly measurable. Education does not deal with raw materials as does industry but with minds which are under continual change and are instinctively concerned with preserving their own integrity. In this sense, teachers and students are continually reaching for meaningful accommodations with the world around them.

In the schools, the output of the education process is not a product that can be explicitly measured like some product of industry. The school should develop individuals who are aware of their own strengths and weaknesses. It should develop a desire within each person to continue growing and learning. It should allow each person to try to continually solve the riddle of his/her own existence in a world that no one can fully understand and predict. It is for this reason that many of the problems encountered in writing objective criteria for professional accountability cannot be easily solved.

The experimental programs in accountability and attempts to facilitate some accounting-oriented system in the public schools, have promoted the belief that much of the value of the accountability movement should be based on instructional systems rather than on business and financial systems. In fact, much already exists on financial accountability within the existing business structure of the school. An educational accountability system must develop the thought that teachers, administrators, and school board members have to start something in the way of improving the image of education in the eyes of the public. If this can happen, then some of the problems of education might begin to solve themselves. The greatest benefit derived from an educational accountability system is the value of the individual teachers approaching instruction in an objective manner. The process of finding out where one is, where one wants to go, and how one wants to get there will narrow the credibility gap between education and the public. In this same vein, accountability will allow educators to stop anywhere along the line to determine whether they are still on the right road. Providing teachers in the field with experiences necessary to function as professionals, with learned and measurable competencies, becomes part of the overall accountability system.

Rethinking Our Responsibility to Children

It is very important that educators rethink, at this time, the purpose of the educational program in the public school. Unless they examine the purpose for schools, the skills and knowledge of the teacher and evaluation of their methods, systems and efficiency are useless.

Few would argue with the fact that schools exist to promote the democratic society. In order to do this, values must be taught to students. The teaching of these values is well defined by Wirth and O'Donnell (1970). They suggest that a society creates ideal images of behavior and thought actions of its members. These images give form to its values when known and approved by the members of that society. A value is an ideal or model setting forth a desired possible social reality. Values, then, are beliefs that the idealized way of living, acting and working are the best ways for society.

It is the responsibility of the public school to establish environments where learning can take place and the development of a value system, in line with the beliefs and ideals of a democratic society, can be pursued. We can say, in a sense, that learning is taking place if the students are being confronted with experiences which allow them to learn basic skills of reading, writing, and numbers; which allows them to individually discover elements of their world, both past, present and future; which allow them to grow in the ability to think, to question, to relate concepts, to create new fresh ideas, to enlarge personal and cultural vision; and which allows them to become more aware and confident in this world (Campbell, 1972, p. 17).

With the philosophical idea in mind of what the purposes of the public schools are, and with the existing programs which now operate in the public schools, educators need to look at some of the reasons why accountability and the move toward competency-based teacher education is being opposed. Basically, three kinds of opposition can be identified related to the need for and utilization of an accountability system in education. Basically, these are (1) philosophical or ideological; (2) the political or legal; and (3) the technological or economic (Hencley, 1971, p. 2).

In general, it should be pointed out that any effort to produce a better method of instruction will produce tension within the system. To this end a positive approach to accountability is essential. The emphasis of such a system is not on promises but on results. The process should be orderly, flexible, and modest to begin with. Its sole purpose is to improve the capabilities and the work of the school.

Deterrents to Accountability

The following statements have been collected to provide the reader with the kinds of reasons one might hear regarding why the schools and teachers *should not* be held accountable for what a child learns in school. They are completely out of line with parent and public expectations, aspirations, and perceptions. These *dodges* have been itemized by Gaines (1971) and others as reasons for opposing accountability.

'The schools can't be accountable for everything.'

'There is something wrong with your child.'

'There is something wrong with the environment.'

'The most important outcomes of education are human and therefore do not lend themselves to the accountability scheme.'

'Standardized tests cannot determine the effectiveness of individualized teachers or schools.'

'Certain children shouldn't be given standardized tests.'

'We do not have adequate measuring tools for accountability, worse yet, we can't even agree on what to measure.'

'We are doing the best we can now. Why confuse the issue.'

'Parents and the public can't be trusted with data on school performance. As teachers they might use it as a weapon against us.'

These are but a few of the many arguments employed to discourage the use of accountability in education. A move toward implementing a competency-based in-service teacher education program will probably run into many similar barriers.

In implementing an accountability and competency-based program, one very large fact is oversimplification of the process. Accountability and proof of competence is not solely the use of achievement tests versus time to determine pupil achievement. Accurate accountability is impossible without giving consideration to student aptitudes, previous achievement of students, the knowledge of local community resources, control of pupil's classroom behavior, general school facilities, the knowledge of past pupil behavior, in and out of school or classroom activities, adequate test data of students on previous school achievement tests in several disciplines and the competencies of the teacher. An accountability system which is oversimplified and established on a narrow base does not provide adequate data for decision making. Therefore, one principle essential to a sound educational accountability program is a well-planned, comprehensive base. It is not a simple, short-term, easily implemented process.

Philosophical/Ideological Deterrents

The philosophical arguments against accountability find their beginning in the value conflict surrounding the purposes that guide the operation of the schools (Hencley, 1971, p. 2). This conflict is not new in the field of education. The conflict between the humanist or behaviorist is primarily psychologically based — a push on one hand to make the schools more humane; a push on the other to make the schools more accountable. Chapter 2 in this book deals in detail with this conflict. There is, however, support for both sides. One says that the school should be made less grim, less joyless, less mutilative of spontaneity, less destructive of creativity which is ruinous to the development of a healthy self-concept. On the other hand, there is an equal insistence for a movement towards accountability with stress upon clear objectives, validated procedures and complete public reporting. An analysis by Campbell (1971) of the conflict stemming from this confrontation of ideology is worth thinking about. He infers that the accountability movement stresses specific procedures with precise objectives, tied to measurement outcomes and planned allocation of resources. The informal or "humane" school encourages its students to have creative experiences in the arts and in the academic subjects. In addition, its emphasis is on spontaneity, flexibility, and individual differences. There is much concern with measurement. The "humane" school is impressionistic — more like an art; whereas, the accountability type of school is highly rational and precise — more like a science.

In either case, it is evident that the teachers feel the responsibility for education belongs to the professionally prepared educator.

The choice of full acceptance of one alternative over the other is out of the question. Each will act as a deterrent to the acceptance of the other. Moreover, the ideological conflicts between humanistic accountability and central authority cannot be satisfactorily resolved without attention to other issues which pose substantial hurdles. Questions such as: "Will accountability become the big brother of educational decision-making?", "Will the push for accountability encourage teaching of the readily quantifiable and discourage areas where quantification is difficult?", and "Are we ready to live in an education by rigid structure that may accompany the quantification needed for accountability?" These and other questions must be answered.

Care must be taken in using existing accountability mechanisms in the process of education. The easily developed behavioral goals may place an emphasis on educational programs and the objectives in the lower level of achievement. As stated earlier in Chapter 2, those values dealing with individual worth, attitudes, and ideals are difficult to behavioralize and place in terms of good educational practice.

The last philosophical deterrent associated with accountability is the fact that performance contracting or accountability has a tendency to emphasize what *is* rather than what *should be.* It produces a curriculum of reflection rather than of development. In establishing an accountability program based on rank order or individual teacher competencies, care should be taken to consider the philosophical impacts on curriculum, teacher organization, and the assignment of responsibility.

Political/Legal Deterrents

The accountability system through its emphasis on testing and evaluation has raised the fear that the results of testing will be used for comparative purposes rather than for diagnostic purposes.

Teachers also are disturbed with the trends to centralize decision making regarding the teaching-learning process. To reduce the autonomy and freedom of professionals by viewing teachers as hired hands and to base pay on industrial piecework concepts with incremental gains based on standardized test results, is a backdoor form of merit pay. To subvert collective bargaining processes by replacing negotiated contracts with agreements between contractors and their own private staffs and to use accountability as a vehicle to punish, to scapegoat, or to fix blame in performance inadequacies are distinct deterrents to its acceptance. Of these oppositions, possibly the most serious political deterrent is the continued development of freedom and autonomy of teachers. Hencley (1970) implies that educators generally feel teachers must have a major role in deciding the matters that relate directly to teaching. Such things as selection and preparation of teachers, the standards of the profession, policies or regulations regarding evaluation, retraining, certification, dismissal and tenure should have teacher input. The education of in-service teachers, how the school curriculum is developed, and how media and materials are selected all require teacher participation. Only when the teachers are directly involved and participate in these professional competencies, can they be held more accountable.

The legal deterrents to accountability come largely from uncertainty. The fact is that some major issues stemming from accountability experiments have not been tested in the courts. It's possible that performance contracting as it is currently practiced in certain school districts is illegal. This legality hinges on the court's answer to the question, "Is it permissible for school boards to contract for services with an outside group when the board already has employees hired to provide these same services?" As of this writing, no rulings from the courts have been made on this issue.

School districts, as creatures of the state, possess very limited powers to contract. Where the school district has a duty to perform a task specified by constitutional declaration, it must carry out that duty. As of now there are no judicial decisions relating directly to educational performance contracting and its legal base.

Technological/Economic Deterrents to Accountability

Hencley (1970) identifies four formidable deterrents in the technological and economic areas. These are:

1. The need for resources to support research in the area and to disseminate the results of that research.

2. The need for precise identification of student learning outcomes or objectives.
3. The need for precise measuring devices to give valid and reliable evidence of student and teacher performance of pre-determined objectives or competencies.
4. The need to generate teacher learning strategies that produce the defined student outcomes. (p. 13).

Until teachers are taught to develop precise definitions of student outcomes, the measurement of educational output will remain largely ineffective. As of now the development of high level social, intellectual, and personal aims of education have not been placed in behavioral terms capable of accountability assessment.

Although much work and research has gone into the development of the teacher-learning relationship and the effectiveness of this relationship in the educational process, very little is known about it. The pure dissemination of knowledge retrieved from research in the field might become a serious deterrent to full implementation of the accountability program. The interrelationship of knowledge and the learning process is directly related to the process of accountability.

The move to make teachers accountable for their performance is questionable under present conditions. In medicine a doctor is not judged incompetent if he/she is unable to cure cancer, arrest heart disease, or reverse the effects of stroke. Yet the emphasis on product, occasioned by the push towards accountability, appears to overlook many things including a weak knowledge on the part of the student, the absence of accepted teacher models, and the lack of agreement in the profession of what constitutes good teaching. There is a lack of information on the remediation techniques that many teachers will have to employ and on a host of social, economic and family background variables that may, in effect, interfere with learning. There is much question surrounding the stress being placed on student outcomes as a measure of teacher effectiveness. Individual children learn different things at different rates, and even the same child learns at different rates at different times; it is therefore, almost impossible to improve classroom practice by assessing teacher-school effectiveness merely on the results of the children who perform in the classroom.

The final major opposition to accountability is money. Developing accountability systems is expensive in terms of research, information dissemination, and installation costs. Further costs arise from the necessary major revamping of teacher education. Significant investments appear necessary for new school plants and technology. All of this must be done in the physical facilities where taxpayers, legislatures, and school board members all have reasons for wanting to resist the increased cost implied. The amount of money allocated for research in terms of education is considerably less than what industry needs in its research and development program. Trying to create a change in educational methodology without supplying sufficient funds for research and development is at best a poor approach in solving educational problems.

Many of the arguments mentioned run counter to those promoting the movement of accountability. These issues are raised to make the reader aware of those who are arguing against accountability. Educational personnel in the field need to debate these issues. Decisions need to be made surrounding the humane versus the accountable school; individuality versus the centralized control school; the ultimate education ends versus the level of implementation; and the reflective versus the reconstructive role of the school. There is a need to look at the governance and control implications of accountability. The legal deterrents may be associated with the movement, the response of the boards, the administrators and teachers; the impact on children and the larger society will be great. If educators, in their own minds, can answer the questions raised and debate the arguments presented as deterrents to accountability, they are then in a position to move ahead and accept the major philosophical/ideological, poltical/legal and technological/economic nature of the accountability program (Hencley, 1970, pp. 16-19).

The benefits derived from an accountability program will far outweigh the disadvantages given. Only when the schools plan where they are going, determine how they are going to get there, and critically are willing to see if they have arrived, will the process of education improve and the responsibility for sound operation be on solid ground. Competency-based teacher education supports most all of the concepts of an operational accountability system.

Considerations for Implementing Competency-Based Education for In-Service Teachers

The problems of implementing some form of educational accountability, specifically a competency-based in-service teacher education program, are many. Those problems created by *not* trying to implement such a program are even greater. This discussion will center around the basic procedures that have been tried and have proven successful to some degree, if only in a general way.

Token Contribution or Total Commitment

The greatest hurdle that is to be overcome by any school district is to establish the commitment that accountability and competency-based in-service teacher education have much to offer. Then they must proceed with the idea of a more positive outcome which results from its adoption. In a sense, it is like a person's religion, philosophy of life, and family responsibility. The more one puts into it, the more one gets out of it. To be effective, the process needs more of a total commitment than a token contribution — a sense of commitment and obligation that is assumed rather than legislated. The impact of the schools on our society and their immense cost and complexity of operation require some form of teacher accountability. A program of public information on what competency/performance-based teacher education really is and seeks to do, should be the first priority.

Teachers of in-service programs need to promote a sound program of information on the concepts, purpose, and function of educational accountability. They need to transmit to the in-service teachers the advantages of competency-based teacher education and its relationship to the improvement of the whole school program. When professional teachers in the field can better understand their unique function and how their effectiveness will be determined, an acceptance of competency-based teacher preparation is more likely.

The Big Questions

In implementing an acceptable program, questions invariably come up that have to be answered. Such questions are:

Why is there a need to add to and update the skills now possessed by practicing teachers?

How can the move be made from a traditional mass approach to teaching and learning to a highly individualized approach?

What skills and knowledges must teachers possess to go about the *simple* task of treating each child as an individual?

How can the capacity for continuing self-renewal and for meeting increasing demand of fitting into new roles be built in ourselves?

The answers to these questions and others will be found if educators can see the part that can be controlled or changed to make individual actions a little more accountable. The first task for any person dealing with implementing teacher accountability is to choose an objective that is within one's power to achieve.

The story is told about George Washington Carver going out into the woods as a young man to meditate about what his life was all about. Being a very religious man he prayed to God a prayer for wisdom. He said, "Lord, why did you make the world?" The answer that came was "Little man, that's too big for you. Ask something smaller." Then he said, "Lord, why did you make man?" And the answer came back, "Little man, that's still too big for you. Ask for something smaller." So he thought for a little while and then he said, "Lord, why did you make the peanut?" And the answer came, "That's just your size." And he went into his laboratory and discovered 153 uses for the peanut and transformed the agriculture of the South (Christenson, 1970, p. 175).

The implementation of competency-based teacher education can be much the same. Most teachers see the whole problem as so complex and so overwhelming that they get discouarged even before they get started. To initiate a competency-based program for in-service teachers, one must look for specific items which are small and which are within reach of immediate accomplishment: an example being setting a goal on improving personal relationships with fellow teachers. This may involve an openness where one teacher offers to share some expertise or proficiency with another, the net result being the improvement of instruction.

Accountability is both a science and an art. It is something that good teachers must learn to do. They grow and become more capable as they enter into and practice accountability. Teachers who have disciplined themselves to make educational decisions on the elements they control are getting better and better results. Educators, starting on a new journey, must begin where they are and choose an objective that is within reach and which is more or less within the scope of things which can be directly controlled.

What Will Adopting Competency/Performance-Based Teacher Education Require?

It is a little difficult to see all that will be required to implement a competency/performance-based teacher education program in the public schools. The knowledge, skills, personnel, money, change in attitude and technology will all have a part. However, a number of general requirements are already evident.

First, it will require changing some of the attitudes of people in the institutions that control education. Clear identification of the specific competencies in terms of performance objectives are clearly measurable. An agreement in general of the functions performed by the classroom teacher and identification of the specific tasks which the teacher can clearly say are his responsibility should be made. In teacher education, in-service programs should initiate a performance contract as a predetermined goal prior to instruction and then let those teachers in the field demonstrate their ability as compared to a standard. It should be stressed that teachers who fall below the standard will be encouraged and helped to reach it through instruction and not culled out as sub-par teachers. The "threat" should be removed as far as humanly possible and yet maintain the integrity of the profession.

Second, competency/performance-based teacher education will most certainly require some self-determination by the teaching profession. Self-governance will have to become a reality before true teacher accountability is possible. Different levels of teachers in different kinds of programs might involve some of the principles of differentiated staffing. Special situations might have unique competencies established. The basic assumption is, however, that a professional teacher will meet a minimum level of competency prior to the determination of uniqueness.

Third, there must be involvement of the teachers in determining performance criteria and incentive criteria for upgrading the technical and professional skills/knowledges.

Fourth, in-service programs should adopt, as much as possible, learning experiences for the teachers who have contact with the "real world." Experiences should be able to show, as much as possible, classroom application and improved program/method for positive reinforcement.

Fifth, there must be far more extensive and sophisticated use of educational technology than teacher education programs and public schools have been willing and/or able to use.

Sixth, education must become individualized, not only in theory, but in fact. Teachers are required to write programs for each child. Likewise, the teachers themselves should be on an individualized continual upgrading experience program.

Seventh, instruments which are more reliable, individualized, and valid for measuring ability and performance in the cognitive and affective domains must be developed. A process needs to be designed to ensure that any teacher can determine for oneself whether the instruction or learning experiences are producing the results promised — in practice, a form of independent accomplishment audit for certification or level of competence determination.

Eighth, provisions will have to be built into the system for additional or changing roles and responsibilities to be identified and implemented. The process is never ending, and life itself is a series of new experiences and adjustments. Continual alteration, additional functions, and changing emphasis of both the professional and technical competencies will, of necessity, have to be incorporated into the educational program.

Whatever the make-up of the system, the criteria listed and the characteristics given will be an important part of it. This model will require a closer, more intense, relationship between teacher, supervisor, and teacher educator whose cooperative efforts will be needed to reach the goal of meaningful education for each individual teacher.

The model established will have to contain the following:

(1) Goals for each learner established on an individual basis between the teacher and the supervisor; a give and take exchange where the teacher has a chance for input into the things to be learned. The teacher educator would be the major contributor, but an opportunity for negotiation must be provided to establish a desired level of motivation on the teacher's part.

A greater responsibility for self-determination on the part of the teacher is essential to develop within himself/herself the concept of and need for 'continual learning' once he/she is in the classroom. In setting goals, it is also important that the learner understands how the goal is to be evaluated and why. This will lessen the confusion within tomorrow's educational program.

(2) General program goals developed from sessions involving teachers, supervisors, teacher educators and school administration officials. These goals might involve the establishment of criteria for measuring success, the selection of some test instrument or technique, or the establishment of some pre-set class mean or criterion-referenced base. The emotional and social progress of the participants might be a part of this goal setting process.

All in all, it is evident that the participants, school administrators, teachers, interested public, and teacher educators must make some commitment and accept responsibility for improving the educational program. It will be demanding in terms of money, time, and energy.

Implementation

Procedurally, a rough sketch of how to implement an inservice competency-based teacher education program will be given here. The following is a look at a step-by-step procedure of one proposed system.

Step 1. Inform the students, public, and educational structure of the need for and principles of educational accountability. Stress the positive outcomes from a workable system. Develop a strong public relations program. Develop within the teacher core a positive attitude toward professional/technical competencies.

Step 2. Do some long-range planning, involving teachers and supervisors concerning what is expected from them as the process is implemented. This phase can be supplemented by using consultants or establishing a strong relationship with the state educational agencies or teacher education programs using their experience to help the local effort.

Step 3. Start small. Focus in on a small part of the total program. Find an area of concern and zero in on a target that is controllable and one which will not take tremendous resources to complete. It's better to set goals too low and meet them easily rather than too high and fail. Success of future programs in the system or later phases will be directly related to past successes.

Step 4. Provide the staff (teachers, educational administration and supportive personnel) with the opportunity to have control and freedom to try new ideas. Encourage change and provide limited funds or additional personnel to implement change. Those who are being held accountable must be given freedom to choose their basic thrust and to help set up their own program. Expect some failure, as all things which are new are not always better, and be willing to learn from mistakes.

Step 5. Establish some intensive staff development or in-service programs for those faculty involved with target programs. Make competency of a nucleus of the staff a goal to be reached. These trained specialists will be the leadership as the program is expanded into other areas of the school and eventually the district. To initiate the in-service program (a) select established quality materials, (b) utilize effective professionals or consultants, and (c) provide adequate time for training to occur.

Step 6. Organize the in-service program in such a way that several alternatives exist for the participants. Allow them to select their preferred procedures so they feel some responsibility towards success.

Step 7. Write specific performance or behavioral objectives for the program involved. Again this is to be done by the teachers and may involve only a part of one function performed by a teacher. Don't try to expand too much too fast. The higher levels in the educational structure will be influenced by what happens at the lower level.

Step 8. Decide on some particular format of class organization, material structure, etc. This decision should be influenced, but not totally controlled, by its future anticipated application to the other functions and specific competency areas.

Step 9. Establish a specified time limit as to when the achievement level given in the objectives can be anticipated.

This kind of judgment is used *not* to determine the success or failure of the program but to validate judgments on the director's part. With practice, these decisions on performance will become more valid and reliable.

Step 10. Establish a process, means, or specific way to evaluate the level of achievement specified in the objectives. An outside teacher educator, consultant, etc., should be involved here as in future evaluations. Outside evaluations will be commonplace. For now, develop a cooperative effort with both teacher and outside input present. A teacher does not want to be held accountable for something with which he/she has had no experience or knowledge.

Step 11. Provide an opportunity for those involved in the sample program — teachers, administrators and outside consultants — to meet and interchange ideas on the program. Take into advisement those facts that may change or influence future programs. Complaints, disadvantages, etc., are valuable inputs to alteration of the program as it is expanded to the next level.

Sept. 12. Expand the sphere of influence to the next level of application. Develop some guidelines relating to process and product objectives. Publicity and much discussion over positive points of sample at this time will influence future programs and their acceptance. Build a need for greater accountability at the higher levels of operation to improve all teachers' competencies.

Step 13. Repeat steps 4 through 12 at a higher level of operation, utilizing the teachers and supervisors of the experimental programs as instructors for the in-service instruction. Keep consultant help available as the first time around may be trouble for the inexperienced experimental teacher.

Step 14. Develop some established monitoring or auditing procedures for public distribution and reporting. This is another phase where publicity and public information, which is frequent, reliable, valid and easily understood, can influence and expand the program.

Step 15. Develop some internal system for continual revision, experimentation, and development. This is where creativity and innovation flourish, when it's expected and welcomed as an integral part of the whole program supported by adequate funds for research and development.

Step 16. Establish a cooperative effort to evaluate the outcomes of education and a means of future determination of needs input by all parties involved. This is an on-going program of school needs assessment.

Step 17. Develop some system of budgeting, accounting, and allocation that is compatible with the higher level program. Planned Program Budgeting System, etc., with funds for research and development on a percentage basis, etc., is essential.

Step 18. Re-evaluate and develop a system of long-range planning, regarding facilities and personnel for the in-service program.

SUMMARY

Basically, the design and implementation for any teacher competency education system is going to involve the following factors:

Salesmanship and promotion
Technical and professional assistance
Needs assessment and resource materials
Change strategies and procedures for alteration
Management systems to administer program
Performance objectives on specific functions and tasks
Proper budgeting and financial commitment
Pre-testing and existing competence level determination
In-house staff development
Comprehensive long-range planning
Cost effectiveness
Program auditing

In addition, stress should be put on thinking big but starting small on implementing a system. Select an area, goal, class, objective or instructional sequence that's "just your size" and begin. Use common sense and set realistic and achievable goals in the first effort. Above all, it is a unified effort that must be started in a small way and must rely heavily on a good public relations program and competent leadership.

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chapter 9

Evaluation of Competence

Richard J. McCowan

and

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Upon completion of this chapter, the reader should obtain a minimum criterion level of 70 percent on the 10-item multiple-choice test which is included at the end of the chapter and is based on the following objectives:

- When presented with four definitions of evaluation, correctly identify the sources of each definition.
- Given four statements, identify the major purpose of evaluation.
- Given six classifications of evaluators or sources of data, match the major strength of each source with the proper classification.
- Distinguish between formative and summative evaluation by properly identifying the definition for each.
- When presented with four or more types of assessment techniques, differentiate a major strength and weakness for each.
- Distinguish between norm-referenced and criterion-referenced tests by properly identifying the definition for each.
- When presented with four types of objective tests, determine the type of test item which has the highest probability rate (guessing factor) in obtaining a correct answer/response.
- Given four types of test questions or items, classify them as either objective or subjective.
- When presented with four titles of management systems, match the acronym with the correct system.

DEFINITION OF EVALUATION

Numerous definitions of evaluation appear in the literature. Gronlund (1976) defined evaluation as the "systematic process of determining the extent to which instructional objectives are achieved by pupils" (p. 6). Cronback (1972) refered to evaluation as, "the collection and use of information to make decisions about an educational program" (p. 23). Scriven provided the following definition:

> Evaluation consists simply in gathering and combining performance data with a weighted set of goal scales to yield either comparative or numerical ratings, and in the justification of a) the data gathering instruments, b) the weightings, and c) the selection of goals (1974, p. 40).

This implies that the evaluator must evaluate both the performance and the objectives themselves, a somewhat different concept than presented in the preceding definitions.

For the purpose of this chapter, the authors feel that the following definition combines key concepts and is appropriate for the purposes of this chapter:

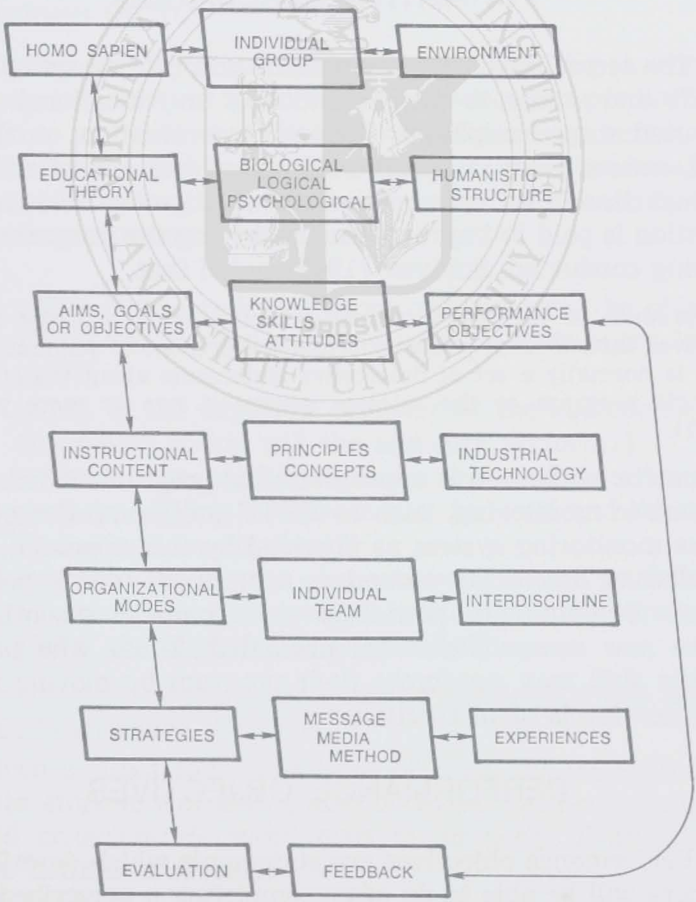
> Evaluation is the process by which a variety of techniques and/or instruments can be used to assess the goals and objectives associated with the systematic management of learning experiences.

MAJOR PURPOSE OF EVALUATION

Many teachers, administrators and board of education members may not desire to be evaluated in a systematic way. However, they are evaluated by numerous groups and individuals who use widely varied data sources, including colleagues, students, supervisors, administrators and parents. For example, students at all levels constantly evaluate their teachers, administrators and educational program. According to Bolton (1973) "the question is not whether teachers should be evaluated, since this cannot be avoided, but rather how systematic the evaluation should be in order to be most effective" (p. 22).

The major purpose of a formal evaluation system should be the improvement of the effectiveness of the educational program for individual learners. However, evaluation is also used for grading students and retaining staff. Refer to Fig. 9-1 titled, "The Process of Curriculum Planning" in which knowledge, skills or attitudes are expressed as: a) general statements, including aims, goals, and objectives, or b) as specific behavioral statements, including performance objectives and competencies. These general and specific behavioral statements provide the evaluator with the basic guidelines to assess the teaching-learning process.

Fig. 9-1. The Process of Curriculum Planning



Evaluation information or data can be gathered on a number of curricular components identified in Fig. 9-1. Instructional content can be assessed in terms of the effectiveness with which they provide students with challenging learning experiences. Methods and media should be regularly assessed by educators. Various organizational modes or structures, such as team teaching, modular scheduling and variable size grouping, must also be evaluated. If objective evaluation feedback is obtained on numerous curricular components identified in Fig. 9-1 from several sources, such as students, teachers and administrators, the educator will be better able to judge the merits of innovative curricular approaches.

FORMATIVE EVALUATION

The term "formative evaluation" was introduced by Scriven (1967) and relates to the evaluation of an educational program at varied stages or phases. Summative evaluation, on the other hand, occurs when the program is completed and often involves a comparison of a treatment and a control group. Relatively little attention is paid to improving or modifying the program while it is being conducted. Sullivan (1969) noted that

> The product of formative evaluation activities is expected to be an improved instructional program, while the product of summative evaluation is normally a set of descriptive statements about the efficacy of a single program or the relative merits of two or more programs (p. 81).

Formative evaluation is appropriate for programs which require systematic monitoring, such as CBTE programs. Use of a continous monitoring system as provided by this approach, enables an educator to modify and adapt a program as it is being conducted. Students are permitted to accomplish essential skills before new competencies are presented. Those who possess a specific skill may accelerate their program by moving to more advanced levels of instruction.

PERFORMANCE OBJECTIVES

Performance objectives are statements which describe what learners will be able to do after completing a perscribed unit of instruction. In a CBTE program, competencies must be stated as performance objectives, so it is essential that educators involved in preservice training acquire skill in writing them. A performance objective should have the following qualities:

1. A clear understanding concerning what must be done by the learner.
2. A definite criterion by which a learner's level of competency may be assessed when a phase of instruction is completed.

Two levels of performance objectives are used in developing an instructional system. These include the following:

1. Terminal Objectives (TO): the final performance a learner must exhibit.
2. Enabling Objectives (EO): Objectives which assist the learner to achieve the TO.

Writing an objective is similar to composing a complete sentence with a *subject* (who will do something), a *predicate verb* (what is to be done) an *object* (the receiver of the action of the predicate verb), and a *modifier* (how it is to be done). The writers of this chapter refer to this model as the A, B, C, D's of specific performance objectives.

A refers to the *audience* which will perform the objective. (Who are the learners and what is their entry level of skill?)

B refers to the expected *behavior* of the audience. (What observable action will the audience perform?)

C refers to the *conditions* under which the audience will perform. (What resources will be used and what time limitations are involved?)

D refers to the *degree* of measurement used to determine an acceptable performance level. (Has the learner completed the objective satisfactorily?)

An example of a specific enabling objective which uses the A, B, C, D approach would be:

> Given at least four definitions of tests, the undergraduate student will distinguish between norm-referenced and criterion-referenced tests by properly identifying the definition of each.

Sequencing Performance Objectives

A major focus of a formative evaluation of a CBTE program involves the development of a series of sequenced performance objectives which relate to the general objectives of the instructional program. Instructional objectives should be sequenced chronologically under major program objectives as immediate, intermediate and ultimate. This will alleviate the problem which often occurs in educational programs of dealing primarily with terminal goals which are difficult to evaluate. If objectives are properly designed and organized, a perceptive evaluator would be able to discover and modify specific performance deficits when they occur, rather than being forced to use cumulative data from the entire program. After this phase is completed, a feedback system designed to provide data will be used to control and modify plans and procedures through a monitoring system. The advantages of using this approach in a CBTE program is that it enables a student to acquire all the skills essential for effective teaching performance and provides adequate time for those who have difficulty with certain components of the program to repeat the training until the skill is mastered.

This approach suggested above is similar to a Discrepancy Evaluation Model (Provus, 1971), in which different objectives are used at different stages of the program. For example, during the first stage of a CBTE program initial emphasis would be placed on the appropriate use of resources, definitions of staff roles, and the establishment of effective operating conditions. Stage two would be directed toward recruitment of staff, the development and sequencing of performance objectives for the CBTE program, and the identification of appropriate instructional techniques and materials. Stage three would involve activities such as product development, the distribution of curricular packages to other institutions, and the completion of cost benefit studies of program components. Another important aspect of this evaluation model involves the assignment of definite responsibilities for achievement of given objectives to specific staff members. The evaluator can then more readily determine whether poor outcomes result more from poorly written objectives, inadequate procedures, or human performance and provide for unexpected outcomes.

EVALUATION PROCEDURES

The following procedures are adapted from Guba and Stufflebeam (1968) and provide an effective method of organizing a formative evaluation.

1. *Delimiting the evaluation:* Define the program to be evaluated and describe the purpose of the evaluation.
2. *Collecting information:* Specify each item of information to be collected, the populations, sources and sampling procedures, including all instruments and methods used for data collection. Include all necessary arrangements, procedures and a time schedule.
3. *Organizing information:* Specify a format for organizing the information and describe the means by which information will be coded, organized, stored and retrieved.
4. *Analyzing information:* Specify the procedures to be used for analyzing data.
5. *Reporting information:* Specify the types of reports, the audience receiving each report and a time schedule for report preparation.
6. *Administering the evaluation:* Summarize the evaluation schedule, assign staff to specific responsibilities, and determine budget requirements. Develop alternate procedures and plans as a contingency measure, in case original plans become unfeasible.

MAJOR COMPETENCIES OF EDUCATIONAL EVALUATION

Industrial arts programs, as well as preservice/inservice industrial arts teacher education programs, are seldom evaluated in terms of the components of educational evaluation identified in Fig. 9-2. Evaluators should collect data from administrators/supervisors, consultants, specialists, peer groups/colleagues, self-appraisal, students and community residents. Varied assessment techniques, including checklists/rating scales, criterion - referenced tests, norm-referenced tests and observational instruments, can be used in the process. These assessment techniques draw upon the domains of learning identified as attitudes (affective), skills (psychomotor) and knowledge (cognitive).

Although each of the major components of educational evaluation identified in Fig. 9-2 will be presented in detail in subsequent sections of the chapter, an example of one of the cells is presented in Fig. 9-3. The interrelationship of the use of obser-

Fig. 9-2. Major Components of Educational Evaluation

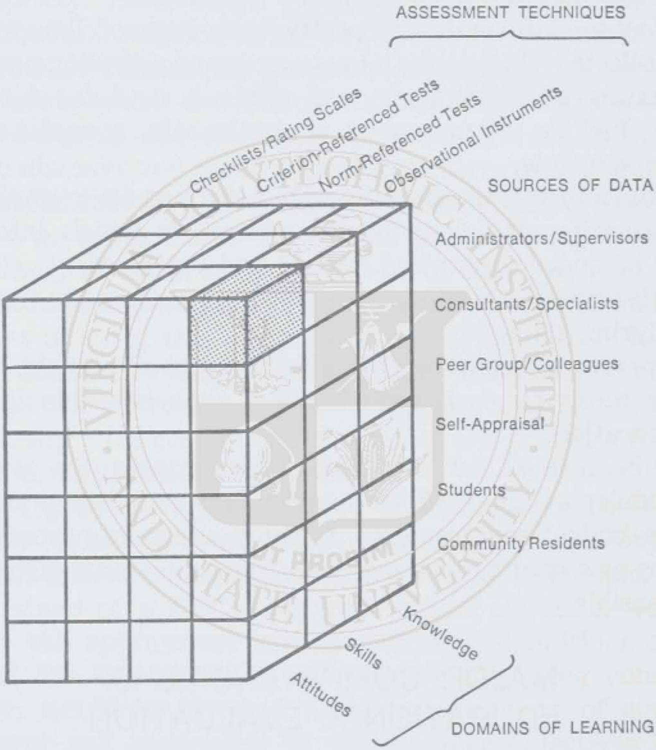
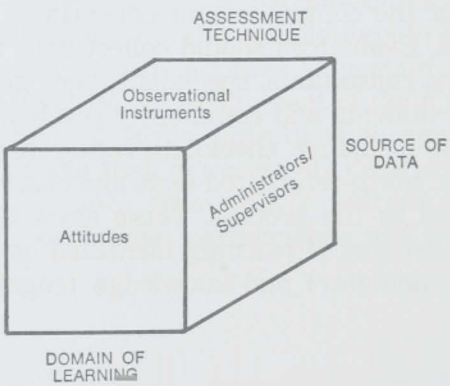


Fig. 9-3. Example of the Educational Model



vational instruments by administrators/supervisors to evaluate the attitude of the preservice industrial arts teachers is presented. Assuming that one of the competencies in the preservice teacher education is the following:

> In the classroom or laboratory setting, the preservice teacher will use positive verbal reinforcement at least 50 percent of the time while interacting with students.

How would the public or college superivsor evaluate this competency? A logical solution would be to count the total number of verbal responses in a given time period and divide by the positive verbal reinforcement of the preservice teacher. Refer to the major components of the model in the chapter for a more detailed discussion of educational evaluation.

Administrators/Supervisors

Administrators and supervisors are responsible for evaluating teacher effectiveness. They often use unvalidated, subjective checklists and rating scales to assess teacher performance. The rating scales may include vague descriptors as dress, classroom control, student motivation, lesson plans, questioning ability, staff loyalty and ethics. Judgments about inservice or preservice teacher attributes are necessary but most frequently the interpretation is subjective because of the lack of specific criteria. The "halo effect" sometimes plays a major role in the rating of an instructor and allows an irrelevant feature of a program or individual act to bias an evaluator's rating, either positively or negatively, since an observer may rate a teacher in terms of personal bias. If the administrator is impressed with the teacher as a person, more than likely the teacher will receive a positive rating on the basis of personal bias rather than the actual teaching. These problems have been discussed in greater detail by Remmers (1963), who also commented on other aspects of rating teacher behavior.

Consultants

The use of consultants is important because they can provide objective external assessment, as well as a level of expertise, which would be difficult to find among the staff of many school districts, particularly among smaller districts. Consultants can be obtained from institutions of higher education, as well as from private firms and agencies. Competent evaluators are in moderately short supply, since few universities provide extensive, specialized training in evaluation at the graduate level. Consequently, evaluators tend to obtain training in other disciplines (i.e., educational psychology, guidance and counseling) and then develop the necessary related skills. Often the best way to obtain such skills is during actual performance in the field, but unlike the 1960's when abundant opportunities and funds existed at national, state and local levels, the present economic situation makes it difficult for institutions and agencies to provide ample funds for evaluation. Caution should be observed in checking the credentials of individuals, and no evaluators should be employed without preparing a detailed list of specifications concerning their responsibilities in the form of a contract.

Peer Groups

In the last decade the use of peer groups to evaluate teaching performance has become more popular at post-secondary school levels. In theory these individuals can best judge the appropriateness of the instructional content or message that was presented in the teaching situation. In practice personal value judgments can influence the peer evaluation. Peer group observations are complicated by the fact that it is difficult to adjust schedules to permit teaching staff to observe their peers. Recent expansion of teacher union activities has caused faculty members to question the desirability of peer evaluations. If peer evaluation is used, effort must be made to develop objective, valid criteria on which to base the evaluations.

Self-Appraisal

Self-appraisal provides the opportunity for a preservice or inservice teacher to analyze personal strengths and weaknesses without external threat. Only a small percentage of teachers use formal self-appraisal techniques, primarily because of a lack of availability of valid instruments and limited training of teachers in the skills required to use the instruments which are available. Microteaching, which enables a student to observe himself and receive feedback from a supervisor, has been found effective (Johnston, 1969), but Salomon and McDonald (1969) reported that if no model of good teaching was presented and no evaluation of the student's performance made, change was unlikely to occur. External feedback, therefore, seems essential.

Student Feedback

In the past decade new emphasis has been placed on student ratings of teachers, particularly at the college and university levels. Formal student ratings may consist of open-ended questions or structured rating scales. Although student ratings are important, the evaluator should be somewhat skeptical of the validity and usefulness of these measures. Doyle and Whitely (1974) noted that student ratings varied depending on whether the evaluation was used for diagnostic purposes to improve instruction or for retention of personnel. Researchers (Bausell and Magoon, 1972; Holmes, 1972) stated that a strong correlation existed between course grades and positive student ratings with students who received high marks tending to view the instructor more positively than students who receive low grades.

Scores which students obtain on criterion or norm-referenced tests are objective and can be used to evaluate the success of staff and instructional programs, although many teachers resist this type of outcome evaluation. Other student achievements could be used as data for the evaluation process, including such things as experiments, assignments, art work, creative accomplishments, musical skill, and athletic performance. Some of these measures are difficult to measure in a reliable and valid way, but are potentially a rich scource of significant information.

Community Members

Community members are used infrequently in evaluating school programs. School districts on occasion will survey parents to assess their attitudes towards certain issues, such as a proposed building program or a budgetary issue. Typically these surveys suffer from methodological deficiencies, particularly from biased sampling and poor instrument development, which substantially limit the results.

Although taxpayers may not directly influence the classroom situation on many occasions, the mid-1970's have proven that taxpayers have influenced numerous school budgets and bond votes. Unstable economic conditions, coupled with declining school enrollments, have resulted in the curtailment, or even elimination of, some educational programs. Vocal citizens, even though in the minority, have exerted pressure upon the educational establishment. Parents unhappy with busing policies or choice of textbooks can change educational policy by pressuring boards of education, administrators and teachers to change their positions. The analysis of community attitudes can yield highly relevant information and greater effort should be devoted to utilizing this resource more effectively.

TYPES OF ASSESSMENT TECHNIQUES

A comprehensive educational evaluation system should utilize a number of different assessment techniques and instruments, since each of these provides different types of data. This procedure enables the evaluator to obtain a broad base of information on which to base his recommendations. The following section includes a brief description of several assessment techniques appropriate for use in a CBTE program mode.

Check Lists/Rating Scales

A rating scale is "a measuring instrument that requires the rater to assign the rated object to categories or continua that have numerals assigned to them" (Kerlinger, 1973, p. 547). Rating scales and checklists are frequently used to evaluate the effectiveness of teachers both on a preservice and inservice level. Checklists differ from rating scales in terms of the degree to which characteristics are evaluated. Usually a checklist requires that the observer determine whether or not some quality is present, whereas rating scales require the observer to determine the degree to which some quality exists.

Comprehensive references are available which persent exhibits of rating scales and observational instruments. Shaw and Wright (1967) include over 200 examples of observational instruments, while Lake, Miles, and Earle, Jr. (1973) provide 84 illustrations and compenda material. *Mirrors for Behavior: An Anthology of Classroom Observation Instruments* edited by Simon and Boyer (1970) is a 14 volume collection of 79 instruments and also contains comprehensive data on major features of the instruments, including, for example, types of communication recorded, data collection methods, personnel required for observations and observer reliability procedures. Each of these references present scales which could be used to evaluate teaching performance in a CBTE program.

A convenient way to classify scales was presented by Isaac and Michael (1974). They distinguished among three major types of instruments, including the following:

Likert-type or Summated Rating Scales

Instruments of this type are composed of a set of items designed to measure the attitude of individuals toward certain phenomena or variables. Each item is approximately equal in value or attitude loading, enabling the respondent to indicate varying degrees of intensity on scale which range between extremes such as like - dislike or strongly agree - strongly disagree. The number of possible responses ranges from three to seven, with five positions being most typical. Scores for individual items are summed, or summed and averaged, to yield a subject's attitude score. Consider the following example.

Table 1

Sample Likert Scale

Strongly Agree — Agree — Undecided
1 2 3
Disagree — Strongly Disagree
4 5

1. Industrial arts has a significant place in the curriculum.	1	2	3	4	5
2. More money should be spent on vocational education programs.	1	2	3	4	5
3. Other faculty members have high regard for industrial arts courses.	1	2	3	4	5

Summated rating scales are useful and, compared to other types of rating scales, easier to develop. However, the reader is cautioned to observe that valid scales are difficult to construct and that observer bias, particularly the tendency to consistently over-rate or under-rate, frequently causes problems.

Thurstone-type or Equal-appearing Interval Scales

Thurstone scales place the individual respondent on an agreement - disagreement continuum. They scale items by assigning a value which indicates the strength of the agreement response for each item. The respondent is asked to check only the items with which he agrees. The total points for each item are divided by the number of answered items providing an average scaled value. In the example below the numerical value which appears in parentheses is the average scaled value. The lower the scale value, the higher the level of agreement with the statement.

Table 2

Sample Thurstone Scale

1. Industrial arts has a significant place in the curiculum.	(10.2)
2. More money should be spent on vocational education programs.	(2.3)
3. Other faculty members have high regard for industrial arts courses.	(6.5)

The process by which these scales are developed is more tedious and time-consuming than for Likert scales. Since the added difficulty in scale construction does not add appreciably to the amount of potency of the data, Thurstone scales are not used as frequently as Likert scales.

Guttman-type or Cumulative Scales

Guttman scales consist of a relatively small set of homogeneous items which should measure only one attribute. They can yield reliable and interesting data when a single, clear-cut attribute is identified. This unidimensional scale derives its name from the cumulative relationship between the items and the total scores of respondents. In other words, an individual who agrees or disagrees on one item within a homogeneous set of items could be expected to give a similar response on the remaining items. The example given below should clarify this concept.

Table 3

Sample Guttman Scale

I would like to ask you some questions about your attitudes towards teachers from a minority group. Would you object to any of the following situations?

1. Employing a minority group teacher in a public school.
2. Employing a minority group teacher in your school district.
3. Employing a minority group teacher in your school building.
4. Employing a minority group teacher in your department.

Criterion-Referenced vs. Norm-Referenced Tests

It is difficult to distinguish between criterion-referenced and norm-referenced tests simply from observation. Popham and Husek (1969) noted that the distinction can be made by examining the following:

1. Purpose for which the test was constructed.
2. Manner in which the test was constructed.
3. Specificity of information concerning instructional tasks.
4. Generalizability of test data to the area of interest.
5. Use to be made of test data.

Glaser and Nitko (1971) distinguished betwen criterion- and norm-referenced tests. Criterion-referenced tests are constructed specifically, "to support generalizations about an individual's performance relative to a specific domain of tasks." (p. 653). Norm-referenced tests are designed to provide data concerning the relative standing of an individual within a group.

A criterion-referenced test provides measurements which can be interpreted in terms of specific performance objectives, rather than group norms. In other words, a criterion-referenced test is developed to measure individual cognitive performance in terms of specific instructional goals. This chapter is developed using this approach, since at the beginning of the chapter specific performance objectives were presented which the reader should accomplish. A brief multiple-choice test will assess the mastery of the learning tasks.

Norm-referenced tests are group oriented and discriminate among learners by ranking them in some way, such as by using percentiles or grade level scores. The content of norm-referenced tests may not match the specific aims of the course, while criterion-referenced tests will match student tasks. Most proponents of competency-based education believe that the learners should be made aware of the explicit criterion associated with a module or unit of instruction. However, an educator could utilize criterion-referenced testing without disseminating a list of performance objectives to the learners.

Norm-referenced tests are often standardized and commercially produced. They are useful in analyzing group achievement, but less useful for instructional diagnosis. This weakness was emphasized by Popham who was quoted in *Phi Delta Kappan* (1973) as saying, "You can't find out how well . . . individual pupils are learning by using standardized achievement tests – it's like trying to measure mileage with a tablespoon" (p. 715).

Observational Instruments

Observational instruments have been used by evaluators to assess verbal and non-verbal behavior of teachers in the classroom or in simulated classroom situations. Several references describing observational techniques were listed earlier. One of the most popular observational instruments was developed by Flanders (1960) and has been modified by many educators. Basically most of the systems have developed a multi-dimensional procedure for observing teacher and student behaviors. A more detailed description of Flanders' Interaction Analysis will illustrate the approach.

Flanders charted the interaction of teacher and learners with ten categories or descriptors including the following:

1. Accepts feeling
2. Praises or encourages
3. Accepts or uses ideas of student
4. Asks questions
5. Lecturing
6. Giving directions
7. Criticizing or justifying authority (teacher talk)

Student talk consists of the following three categories:

1. Student talk (response)
2. Student talk (initiation)
3. Silence or confusion

In using the instrument, the evaluator observes the instructional lesson and records the number of the category every three seconds. For example, in a 20 minute lesson the evaluator would make approximately 400 recordings. These data provide the observer with a comprehensive chart of student and teacher verbal behavior. Obviously the observer would need training to acquire the skill to categorize the responses and to analyze the data collected. Because of the large number of observations, computer analysis should be used to provide the observer and teacher with an interaction profile or graph.

TYPES OF TEST ITEMS

Among the assessment techniques used to evaluate preservice industrial arts teachers, test items developed by the individual teacher educator can be a powerful measuring tool. Very often teacher educators develop test items to measure how well a student has mastered a certain body of knowledge. Even though many industrial arts teacher educators are effective test item writers, a brief review of the major advantages and disadvantages is included in the chapter.

Test items are commonly classified as objective or subjective. Completion, matching, multiple choice and true-false questions are usually designed as objective, while the essay question is generally classified as subjective. Each type possesses certain strengths and weaknesses and should be utilized to assess appropriate learning experiences. Figure 9-4 summarizes major advantages and disadvantages of specific test items.

Essay Questions

Essay questions are typically used in test situations in which the learner discusses, analyzes, or evaluates a specific subject or problem. This type of question can assess higher cognitive levels of the learner, although major portions of essay questions could depend upon rote memory or specific recall. Essay questions can

Fig. 9-4. Summary of Test Questions/Items

Test Question or Item	Major Advantages	Major Disadvantages
Essay	1. Brief preparation time. 2. Can assess higher cognitive levels.	1. Unreliable if specific criteria are not identified. 2. Limited sampling of instructional content.
Alternate Choice	1. Can be scored rapidly. 2. Can include a wide range of instructional content. 3. Test items are easy to construct.	1. High probability of guessing correct answer. 2. Not easy to develop items that are entirely true or entirely false.
Multiple Choice	1. Can measure rote memorization or higher levels of learning. 2. Guessing factor is low. 3. Can be scored rapidly.	1. Can be very time consuming in preparing test items. 2. Difficulty to prepare effective item choices or distractors.
Completion	1. Can be scored more quickly than essay but is more time consuming than other objective test items. 2. Guessing factor is very low. 3. Somewhat easier to construct than other objective test items.	1. Usually requires rote memorization. 2. High probability of more than one correct response to an item.
Matching	1. Can be scored rapidly. 2. Guessing factor is low. 3. Can be administered in a relatively short period of time.	1. Often limited to factual information requiring rote memorization. 2. Frequently too many test items are included (ideal size is 5 to 8 items). 3. Difficult to find appropriate subject matter.

be unreliable if specific grading criteria are not identified. Grading could vary from day to day and from teacher to teacher. Essays can not be machine scored and require expert judgment by skilled teachers. Problems also exist in regard to content validity, since the scorer must consider elements such as handwriting, grammar, punctuation and spelling which although important, may not be relevant to the major purpose of the examination.

Subjectivity adversely affects the reliability of scoring in essay tests. Educators have been aware of this problem for many years. Ashburn (1938) commented that "the passing or failing of 40 percent depends not on what they know or do not know, but on who reads the papers", and that "the passing or flunking of almost 10 percent depends on when the papers are read." (p. 2). With only a few questions on an essay test, the sampling of instructional content may also be limited.

The strength of essay questions is also evident, since it does provide an opportunity to measure higher order cognitive processes and require that the student organize and synthesize his thoughts in a coherent manner. Techniques that can be used to improve the reliability and validity of essay questions have been discussed by several individuals and, since space does not permit further elaboration here, the reader is directed to such sources as Ahmann and Glock, (1968) Anastasi, (1961) Cronbach, (1969) Stanley, (1964).

Alternate Choice Questions

Alternate choice items are two choice items in which one item is explicit. True-false questions are widely used but other question forms such as "yes-no" or "right-wrong" are also used. These items are easily constructed and scored. A wide range of instructional content can be assessed in a relatively short period of time. It is difficult, however, to develop alternate choice items that are entirely true or entirely false. Some instructional aims such as inferences, generalizations and evaluations are difficult to test with an alternate choice item and tend to deal with relatively insignificant, ambiguous details. According to the New York State Education Department (1968), learners can often answer many test questions correctly by analyzing the structure of the item or by guessing. The fact that students are encouraged to guess is à further limitation. Increasing the length of the test, however, corrects this deficiency to a major extent.

> Without reading the question, the pupil has a 50 - 50 chance of getting the right answer. This limitation can be overcome, however, by including a large number of true-false items in the test. In a 10-item true-false test, the chances of answering at least 70 percent of the items correctly on the basis of chance alone are about 1 out of 6. If the number of items is increased, the chances are progressively reduced, as follows:
>
> | Number of True-False Items | Chances of Answering at Least 70% Correctly By Chance Alone |
> |---|---|
> | 10 | 1 out of 6 |
> | 25 | 1 out of 50 |
> | 50 | 1 out of 350 |
> | 100 | 1 out of 10,000 |
> | 200 | less than 1 in 1,000,000 |
>
> It is readily seen that, in longer true-false tests, the guessing factor becomes a minor element in achieving a passing grade (p. 12).

Multiple-Choice Questions/Items

Multiple-choice questions consist of a statement or problem with a correct item choice and a number of incorrect item choices or distractors. Because of its adaptability and flexibility, many test specialists believe multiple-choice items are the most effective test item in measuring cognitive achievement (Gronlund, 1976). It can be used for recall items as well as to measure higher order cognitive areas. Multiple-choice questions are difficult to construct, since it is often difficult to develop enough distractors such as "none of the above." Although higher order processes can be measured effectively, in practice rote recall is probably more typically measured. The guessing factor is not a problem in multiple-choice items:

> The guessing factor is considerably reduced in multiple-choice questions, especially if 4 or 5 responses are provided. In a 10-item 4-response multiple-choice test, the probability of obtaining a score of 70 percent on the basis of chance alone is about 1 in 1,000. For a 25-item test, the chance is reduced to about 1 in 1,000,000. To achieve freedom from guessing comparable to that in a 25-item multiple-choice test, a true-false test of 200 items would be required (New York State Education Department, 1968, p. 13).

Multiple-choice tests also require more testing time, particularly when more subtle distinctions are required. Despite these limitations, multiple-choice items are versatile and powerful and are held in high regard by evaluators.

Completion Questions

Completion or recall questions require the learner to supply the answer to the item. Obviously the guessing factor is extremely low if the item is worded well. In actual practice educators sometimes find that learners can identify more than one correct response to an item which seemed to have only one correct response when the test was developed. Completion items are relatively easy to construct compared to other objective test items. However, they are more difficult to score and the tester is often required to make judgments on the basis of spelling or penmanship which limits the validity of the items. These questions emphasize fact recall and vocabulary very heavily. Completion questions can be scored quickly and are effective if the instructional aim is concerned with the learner's retention of specific information or facts.

Matching Questions/Items

Matching questions usually require the learner to match one column of words, phrases, or sentences with a related column of responses. Matching tests are classified as "perfect" when each response can be used only once and an equal number of premises and responses are presented. They are classified as "imperfect" when more responses than premises are presented or when a response can be used more than once or not at all. A large number of items can be administered in a relatively short period of time. The New York State Department (1968) recommends that the optimum number of items on a matching test would range from 5 to 8. Usually scoring is rapid and the guessing factor low. Matching tests are usually limited to factual information which require rote memorization, although it is possible to test how well a student can apply concepts.

The major limitations involve the difficulty of constucting good test items and that it is difficult to find subject matter in which a sufficiently large number of homogeneous responses can be identified.

EXPERIMENTAL EVALUATION DESIGN

When educational researchers and evaluators use the term "experimental design," they refer to the planned arrangement of various conditions or treatments to which subjects will be exposed. Kerlinger (1973) noted that research design involves the plan, structure, and strategy of an investigation developed to answer research questions and control variance and that these questions should be answered validly, objectively, accurately, and economically. A research design, therefore, is a set of specific instructions (or blueprint) which enable an investigator to collect and analyze data while controlling extraneous and error variance.

Some educators seem convinced that it is impossible to apply the concepts of experimental design to classroom situations. They maintain that an experiment can only take place in a laboratory with extensive control of treatments and variables. Others feel that the use of traditional research designs utilizing randomization and control offer strong alternatives to the process of formative education and should be considered an appropriate approach for evaluation.

It is not the intention of the authors to present a detailed consideration of the theory of experimental design. Additional information on the topic is available from a variety of excellent sources (Cochran & Cox, 1957; Stanley, 1961; Winer, 1962; Edwards, 1968). Probably the most lucid and most frequently cited source is the discussion of experimental and quasi-experimental designs by Campbell and Stanley (1963), which also presents a detailed analysis of the factors which jeopardize internal and external validity. Several illustrations from this source may clarify the subject.

Assume that learners are randomly assigned to different instructional programs. For example, one group could be taught a unit in electronics using programmed instruction, while another group could be taught using a traditional lecture method. The two groups of learners would be tested before they began the unit (Pretest-Post-test Control Group Design) or simply post-tested (Post-test Only Control Group Design). During the actual instruction all variables other than the actual treatment modification are held constant. The use of a post-test after the unit is completed enables the evaluator to measure the achievement of each group and to compare the differences in group means statistically, typically by using a t-test. Another design suggested by Stanley and Campbell controls the effect of pretesting by combining both of these designs. Figure 9-5 illustrates this design, which is known as the Solomon Four-Group Design. It assumes that subjects are randomly assigned to each of the groups. In this example the experimental treatment is the use of programmed instruction in teaching the electronics unit, while the control is the use of the lecture method.

The design enables the evaluator to measure the effect of the treatment and the interaction of the pretest with the treatment. A major difficulty is evident, however, in the fact that it involves twice as many subjects as either of the other designs which have been described.

Fig. 9-5. Solomon Four-Group Design

Group 1	Pretest	Experimental Treatment (Programmed Instruction)	Post-test
Group 2	Pretest	Control Treatment (Lecture Method)	Post-test
Group 3		Experimental Treatment (Programmed Instruction)	Post-test
Group 4		Control Treatment (Lecture Method)	Post-test

Guba and Stufflebeam (1968) are prominent evaluation specialists who are critical of the use of traditional experimental designs in evaluating educational programs. They cite four distinct flaws which include:

1. The use of experimental design in the evaluation of educational programs prohibits the evaluator from facilitating the continual improvement of the program. This occurs because the very concept of experimental design prevents any alteration of the treatment, even if the project director has clear evidence that the program could be improved through certain modification.
2. Experimental design evaluations provide useful information for decision making after the project is completed, but is ineffective in assisting project directors to make decisions during the planning and implementation of the project.
3. This type of evaluation is better suited for experimentation conducted within a laboratory, rather than in the classroom, where it is difficult to control extraneous variables.
4. Although internal validity (whether or not the treatment made a significant difference) is enhanced, this is accomplished at the expense of external validity (whether or not the results of the experiment are generalizable or representative).

Although there is some validity to these criticisms, perhaps the best answer would involve a combination of both a formative evaluation and an experimental design evaluation. A treatment group could be established in which a continuous feedback process could be used to monitor and modify the instructional process. These instructional adaptations would be recorded carefully and would become part of the experimental treatment, eventually providing data useful for the evaluative process. Concurrently, a control group could be used to assure that the evaluation had internal validity. This approach is certainly more powerful than limiting an evaluation either to a formative approach or a traditional experimental design and should be used more extensively by evaluators.

MONITORING SYSTEMS

Inherent within the concept of individualized instruction is the necessity for the development of an effective evaluation system which would facilitate decision making by monitoring student progress. This requires the development of criterion-referenced tests which yield measurements directly interpretable in terms of specified performance standards (Glaser and Nitko, 1971). This is an initial step, since individual prescriptions for students must be developed, instructional resources selected, and a comprehensive monitoring system organized. Although individual public school teachers and college faculty can provide some input, it would be unreasonable to expect that they would have the time and/or training to maintain and develop such a system.

Hambleton (1974) described several of the better-known and more effectively developed instructional systems including Individually Prescribed Instruction (IPI) (Glaser, 1970); Program for Learning in Accordance with Needs (PLAN) (Flanagan, 1969); Computer-Assisted Instruction (CAI) (Atkinson, 1968); Individualized Mathematics Curriculum Project (DeVault, Kriewall, Buchanan & Quilling, 1969); and Mastery Learning (Block, 1971; Carroll, 1970). Another system which is worthy of examination is the Comprehensive Achievement Monitoring developed by Gorth, O'Reilly and Pinsky (1975). All of these systems provide information on student progress, are closely keyed to actual instruction and assist in determining whether the student has achieved acceptable performance standards on prestated instructional objectives.

An examination of the Individually Prescribed Instruction (IPI) program in greater detail will provide additional insight into the components of an instructional monitoring system. Any evaluation system involves activities in the following four basic categories and should answer the questions which are listed within these categories (Lindvall & Cox, 1970).

I. *Program or instructional module goals*
   1. Are the statements actually goals and can they be observed and measured in terms of learner behaviors?
   2. Are the stated objectives the real goals of the program or simply desirable educational goals not unique to the program?
   3. Are the goals worthwhile?
   4. Can the goals be attained?

II. *Program or instructional module plan*
   1. Does the plan show promise of contributing to the achievement of the program goals?
   2. Is the plan developed in sufficient detail to enable the evaluator to analyze all programmatic aspects?

3. Are the plans and procedures easily understood by all staff members?
4. Is it probable that the plan can be accomplished?

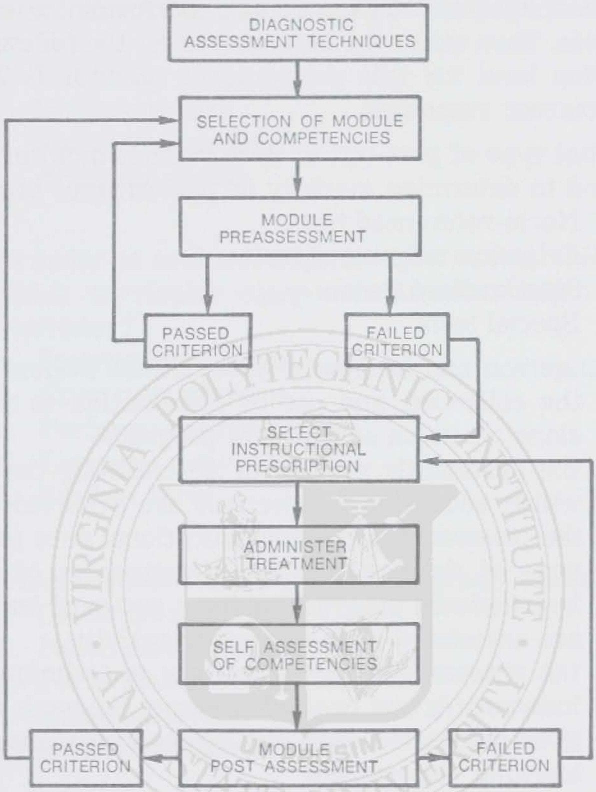
III. *Program or instructional module operation*
1. What specific points should be observed in operational anaysis? (What, for example, should the students or teachers be doing at any point in time during the operation of the program).
2. Are the activities actually being carried out according to the plan?
3. How can the operation of the program be made to conform more closely to the plan?
4. Does the analysis of the actual operation suggest any modification of the plan?

IV. *Assessment of results*
1. Does the plan provide for the assessment of all program goals?
2. Are the assessment procedures reliable and valid?
3. Is the evaluation process sufficiently comprehensive to provide a total analysis of the program?
4. What implications do the results have for modification of the program?

These categories with specific criterion statements could be adapted for a competency-based industrial arts program. Figure 9-6 represents a diagnostic-prescriptive evaluation model for preservice industrial arts teachers. Before beginning an industrial arts program, the learner should complete a battery of diagnostic assessment instruments which broadly sample each domain of learning (knowledge, skills and attitudes) identified within the program. Results are used to place the preservice teacher at the appropriate instructional level and to determine what specific and general skills the student possesses. After the module is selected, a diagnostic preassessment should be used to identify specific skills and deficiencies of the preservice industrial arts teacher. If he/she passes the criterion, the student may select a new module. If the student fails the criterion, he/she may select and use an instructional prescription which may include a variety of methods and media such as reading assignments, films, filmstrips, discussion groups, lectures, and demonstrations.

When the instructor and individual preservice teacher determine that the student is ready to take the post-assessment of the module, the instructor will administer the evaluation instrument. If the student achieves the criterion for the module he/she may, after consulting with his instructor, select a new module. If the student fails to achieve the minimum criterion, he/she may confer with instructors and decide to repeat all or part of

Fig. 9-6. Diagnostic/Prescriptive Evaluation Model for Preparing Preservice Industrial Arts Teachers



the module. For this reason each module should include several optional learning strategies.

Many of the basic elements discussed in this section have been considered in other sections of the chapter. The reader is cautioned that any evaluation system must be tailored to meet the demands of a specific preservice industrial arts educational program. Consequently, the diagnostic/prescriptive evaluation system has elements which could be readily adapted to other educational programs and are considered a model or guide for industrial arts educators.

PERFORMANCE MONITOR

A 10-item multiple-choice performance monitor has been included in this chapter so the reader may assess how effectively the specific objectives cited at the beginning have been mastered. Before beginning the monitor, it might be appropriate to review the chapter in terms of said performance objectives/ competencies. Then select the best answer for the following items. The criterion level for this performance monitor is 70 percent or seven correct responses.

9.1 What type of post-test or performance monitor is usually used to determine mastery of performance objectives?
   a. Norm-referenced tests
   b. Criterion-referenced tests
   c. Standardized tests
   d. Special tests

9.2 Mongerson and McCowan have defined evaluation as:
   a. the collection and use of information to make decisions about an educational program.
   b. the systematic process of determining the extent to which educational objectives are achieved by pupils.
   c. the process of gathering educational data for the purpose of determining the effectiveness of a specific instructional program or for a group of learners who are associated with a learning activity.
   d. the process by which a variety of techniques and/or instruments can be used to assess the goals and objectives associated with the systematic management of learning experiences.

9.3 On which of the following test items would the scoring be most subjective?
   a. Essay
   b. Matching
   c. Multiple choice
   d. Recall/completion
   e. Alternate choice

9.4 Which of the following test questions or items has the highest probability rate for obtaining a correct answer by guessing?
   a. Essay
   b. Matching
   c. Multiple choice
   d. Recall/completion
   e. Alternate choice

9.5 Which type of test is most desirable due to its flexibility and ability to measure simple or complex learning?
a. Essay
b. Matching
c. Multiple choice
d. Recall/completion
e. Alternate choice

9.6 In order to evaluate objectively a lesson, unit, or course, which curricular component is *most* important to the evaluator?
a. Instructional media
b. Curriculum guides
c. Performance objectives
d. Learning activities
e. Student input

9.7 Which evaluation instrument is group oriented?
a. Criterion-referenced
b. Norm-referenced
c. Performance-referenced
d. Behavioral-referenced
e. Instructional-referenced

9.8 Which instructional system is correctly identified as CAM?
a. Computer assisted measurement
b. Comprehensive assisted measurement
c. Curriculum associated mastery
d. Criterion achievement monitoring
e. Comprehensive achievement monitoring

9.9 Who originally developed the summated rating scale?
a. Likert
b. Popham
c. Flanders
d. Saylor
e. Simon

9.10 Which assessment technique *best* measures the interaction of teachers and learners?
   a. Check lists
   b. Criterion-referenced tests
   c. Norm-referenced tests
   d. Observational instruments
   e. Teacher made tests

Answers to the above questions will be found following the References for this chapter.

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ANSWERS AND PERFORMANCE MONITOR

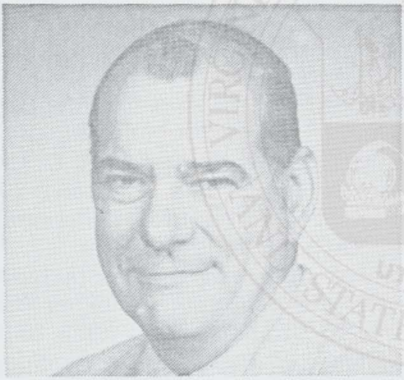
1 (b)	6 (c)
2 (d)	7 (b)
3 (a)	8 (e)
4 (e)	9 (a)
5 (c)	10 (d)

Dr. Brooks has been on the Industrial Arts Education staff at the State University College at Buffalo since 1961. His primary assignments have been in the undergraduate and graduate professional education components of the program. He was primarily responsible for the introduction and development of the Professional Semester Center approach to student teaching, including a Competency-Based Guide for the Professional Requirements.

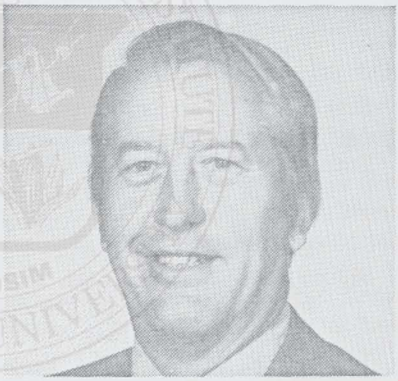
He received his Bachelor and Master degrees from George Peabody College for Teachers in Nashville, Tennessee and the Doctor of Education degree from the University of North Dakota.

In 1964 Dr. Brooks joined a ten-man educational team, sponsored by Teachers College, Columbia University and the Agency for International Development, to serve as advisors to the Minister of Education in Peru, South America.

New York State's early thrust in the competency-based teacher certification movement provided Dr. Brooks the opportunity to serve as Project Director for the State's CBTE pilot project in industrial arts, and since that time he has been actively involved in CBTE activities.



Stanley E. Brooks



Jack C. Brueckman, Jr.

Dr. Brueckman, Professor of Industrial Arts Education at the State University College at Buffalo, has taught in the public schools of New York State from 1954 to 1964. For the past 12 years he has had teaching and administrative responsibilities at the Buffalo State College in the technological areas of forest products, ceramics, plastics and metals, as well as manufacturing and construction.

From 1971 to 1975, he served as a member of the New York State Industrial Arts Trial Certification Project. The mission of this Project was to design a competency-based certification program, whereby, prospective industrial arts teachers would receive initial certification. As a Life Member of AIAA, he has served as a member and chairman of various committees, and has been a frequent convention presenter and delegate at most of the annual conferences.

Dr. Brueckman has recently served as the Project Manager for the design and implementation of a competency-based curriculum, facility and industrial teacher education program for the Achmad Yani Technical Institute in Jakarta, Indone

chapter 10

And Now to Begin Work...

Stanley E. Brooks

and

Jack C. Brueckman, Jr.

If the reader has given serious and responsible attention to the comments and experiences of the writers in the preceeding chapters, there should be present a reservoir of understanding to support the planning for a CBTE program. These writers have described in articulate detail the successes and the pitfalls of their work in action-oriented CBTE programs. They have built a rationale for CBTE and they have made reference to numerous resources that will further the work of the beginning CBTE program developer.

But one slight problem exists today, as the Yearbook Editors share these final thoughts with you .... it is the problem of timing. We are now writing some twelve months after the preceeding chapters were developed and just prior to the publication of this Yearbook. Obviously, the writers in these action-oriented programs have tackled new problems and have solved some old ones, as they continue to progress with their CBTE programs. Thus, the most fulfilling approach to contemporary CBTE developments would be to talk face-to-face with persons involved in full-scale CBTE programs, visit their institutions, review the CBTE resources, talk with the students, staff and administrators and spend time in their classes. Only through this investigation will you fully satisfy the questions and doubts which frequent the minds of those wishing to enter the CBTE "waters."

RECENT CBTE DEVELOPMENTS

During the Summer of 1975, Westbrook and Sandefur surveyed teacher education institutions, which were members of the American Association of Colleges for Teacher Education, to determine the extent of their involvement in CBTE. This study of the 865 member institutions resulted in 570 (66%) replies. The major findings of this most recent study on the nationwide impact of CBTE are noted below:

1. Only 17% of the responding institutions indicated that they were not involved in a CBTE program, nor did they have any immediate plans to initiate one.
2. Fifty-two percent of the institutions were involved in either a full-scale (8%) or a limited (44%) CBTE program.
3. The remainder stated that they were developing plans to initiate a CBTE program (25%) or were seriously studying CBTE developments and alternatives.
4. Within the operational CBTE programs, the institutions had generally begun with pilot programs and had utilized the services of outside consultants and the published resources from other institutions as guides for the preparation of their own resources.
5. Of the 288 operational (total or partial) CBTE programs, only 74 received outside funding to move their program efforts forward.

This study reflects the current institutional attitude towards CBTE and it takes on even greater significance when mirrored against the AACTE study conducted in 1973, *Competency-Based Teacher Education: The State of the Scene.* Westbrook and Sandefur (1975) note that in 1973 AACTE study there were 125 operational CBTE (total and/or partial) programs as compared to the 288 institutional programs in 1975. With respect to full-scale CBTE programs, there were 10 in 1973 and 47 in 1975. The authors of the 1975 study suggest that "with such a significant number of institutions exploring alternative approaches to teacher education, it seems safe to assume that there is a growing dissatisfaction with present approaches." (p. 277)

As proponents of the CBTE concept, the Editors of this Yearbook are most pleased with the findings of Westbrook and

Sandefur and, at the same time, are somewhat discouraged with the slow progress that industrial arts teacher educators are making with CBTE. In Chapter IV the Editors noted a substantial lessening of study and interest in CBTE. One answer to this concern, is simply that while many colleges of education are engaged in CBTE programs within the professional component of foundations, methods and student teaching, the areas of specialization have not made a concerted move, with their college of education colleagues, toward a CBTE mode. Many are the reasons for this lack of action and the writers of prior chapters have addressed a number of them. The Editors of this Yearbook would encourage The American Industrial Arts Association and its affiliates, especiallyACIATE, to sponsor a vigorous educational campaign on the current developments of CBTE and its implications for industrial arts teacher education.

Which Way for New York State???

In early June, 1976, Ewald Nyquist, New York State Commissioner of Education, received a *preliminary draft report* from the Commissioner's Task Force on Teacher Education. Representing college administration, teacher education, public school teachers, and professional association representatives, this 21-member committee recommended:

1. That teachers be licensed as are doctors, lawyers and other professionals.
2. That new teachers serve one-year internships as part of their preparation for licensure.
3. That a new Professional Practices Board be formed to provide for direct decision-making by the profession, including the setting of standards, similar to other professional practices boards. (New York Teacher Magazine, p. 4).

Though these are only recommendations, they are certain to evoke much discussion in view of the State Education Department's positive attitude towards a CBTE orientation.

DEVELOPMENT ASSISTANCE FROM SELECTED AGENCIES

The authors of the preceding chapters have shown judicious understanding of the significant CBTE writings as noted in the chapter References. The readership will be able to assemble a strong CBTE library due to their efforts.

However, the Editors have noted that there has been little mention of several agencies which have assumed leadership roles in the CBTE movement. These agencies have an experienced and researched track record and can be of immeasurable assistance to individuals and institutional faculties.

National Competency-Based Education Centers:

This group consists of nine colleges of education which provide programming and training services for individuals and groups interested in establishing CBE programs. Interested parties can contact any of these Competency-Based Education Centers through the College of Education at the following institutions:

Florida State University —Tallahassee, Florida
Syracuse University – Syracuse, New York
University of Toledo – Toledo, Ohio
University of Wisconsin – Madison, Wisconsin
Teachers College Columbia University – New York, New York
Michigan State University – East Lansing, Michigan
University of Houston, Houston, Texas
University of Georgia – Athens, Georgia
The Competency-Based Education Center
c/o Oregon State System of Higher Education
Monmouth, Oregon

The National Commission on Performance-Based Education:

This agency is housed at The Educational Testing Service in Princeton, New Jersey under the direction of Fred McDonald. It has given special attention to the major problems associated with the research and development components of CBTE, especially assessment and evaluation.

The Multi-States Consortium on Performance-Based Teacher Education:

This group is concerned with the implications of CBTE on each of the member State's teacher training programs and the certification of all school personnel. Their newsletter "PBTE" presents information on recent developments and projects related to the CBTE movement. The Consortium may be contacted at:

Division of Teacher Education and Certification
New York State Department of Education
99 Washington Avenue
Albany, New York 12210

National Center for the Improvement of Educational Systems/Teacher Corps:

These two U. S. Office of Education agencies have been engaged in providing program training, development and implementation of CBTE. Their input on the national scene has been significant.

NCIES
Allen Schmieder
USOE
FOB #6 Room 4171
400 Maryland Avenue, S.W.
Washington, D. C. 20202

Teacher Corps
James Steffensen
Teacher Corps
Reporters Building
7th and D Streets, S.W.
Washington, D. C. 20202

The Southern Consortium:

Based at North Carolina State College, Durham, North Carolina, this consortium of "small" institutions is devoting attention to the development of models of CBE programs which will best fit the needs of the small institution.

American Association of Colleges for Teacher Education Committee on Performance-Based Teacher Education:

Drawing on broad representation from all facets of the professional education community, this committee has been a major leadership force in the CBTE movement. It has sponsored the training of personnel, developed numerous publications, established a PBTE Clearinghouse and has disseminated its findings throughout the profession. The "PBTE" Series, (currently 21 publications) is one of the best collections of contemporary thought and practice, and should be in the library of all serious students of CBTE. The AACTE annual meetings and the AACTE Regional Workshops have further promoted the national understanding and growth of CBTE. Additional information about

AACTE resources and activities may be secured from the Association.

American Association of Colleges for Teacher Education
Suite 610
One Dupont Circle
Washington, D. C. 20036

MORE CBTE MATERIALS AND RESOURCES

Hardly a CBTE project or program exists which doesn't have its publications, competency lists, modules, mini lessons and *its* paradigm for success. Though these materials exist to serve the needs of an individual program or institution, they can often provide clues to those who are seeking direction towards CBTE development. Noted below are several sources which may be of assistance to program developers.

The National Center for the Development of Protocol Materials in Teacher Education:
B. Othanel Smith, Director, College of Education,
University of South Florida, Tampa, Florida

Florida Center for Teacher Training Materials:
William Spino, Director, College of Education,
University of Miami, Miami, Florida

Houston Module Bank:
Wilford Weber, Director, College of Education,
University of Houston, Houston, Texas

The National Center for the Development of Training Materials in Teacher Education:
David Gliessman, Director, College of Education,
University of Indiana, Bloomington, Indiana

Performance-Based Curricula Program:
The Center for Vocational Education,
The Ohio State University, Columbus, Ohio

AND NOW . . . A FINAL THOUGHT

This Yearbook was conceived as a guide for those industrial arts educators who wish to become knowledgable about the competency-based education movement. The examples and resources mentioned in the text should provide positive indication that CBTE is alive . . . and yet it still needs much research and testing to provide our nation's teachers with the kind of preparation they need to best serve their clientele . . . our children and youth. Thoughtful study and discussion of CBTE may well lead up to that kind of alternative teacher education. Sticking our heads in the sand will only bury us and our profession.

LET'S GET ON WITH THE JOB . . . . . HEADS UP ! ! ! ! !

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appendix a

Florida International University CBTE Sample Handbook

Referred to in Chapter 5

EIA 405
Instruction in Industrial Arts

Prepared for

Division of Vocational and Adult Education

School of Education

By

A. Dean Hauenstein, Ph. D.

1975

EIA 405 INSTRUCTION IN INDUSTRIAL ARTS (5)

Competency: Applying educational principles, practices, and techniques to the teaching of industrial arts. Tasks include planning lessons, presenting information, demonstrating processes and equipment, leading discussions, managing safe laboratory activities, evaluating student achievement and teaching effectiveness. Pre-requisite: EDU 311.

Date	Week	Module	Title
________	1	1	Introduction to EIA 405
________	2	2	Preparation
________	3, 4, 5, 6	3	Introductions and presentations
________	3, 4, 5, 6	4	Discussions and applications
________	6	5	Evaluation
________	7, 8, 9	6	Teaching in the schools
________	10	On Campus Seminar	EIA 405 Instructional Resource Package 1, 2, 3, 4, 5

Text. Proctor, James O., *Techniques, Notes, Tips for Teachers,* Delmar Publishers, N. Y. 1968

Reference: Woodruff, Asahel D. *Basic Concepts of Teaching,* Chandler Publishing Co., 1961. Resource Package extracted from Woodruff.

"To instruct someone in these disciplines is not a matter of getting him to commit results to mind. Rather, it is to teach him to participate in the process that makes possible the establishment of knowledge . . . . Knowing is a process, not a product". Bruner.

Teaching Lab Check Lists

Checklist of Tasks

Task

___ 1.1.1 Applying for Student Teaching
___ 1.1.2 Orienting Yourself to Your Responsibilities
___ 2.1.1 Writing a Lesson Plan
___ 2.1.2 Preparing Instructional Aids
___ 2.1.3 Evaluating Lesson Plans
___ 3.1.1 Planning Introductions and Presentations
___ 4.1.1 Leading Discussions and Activities
___ 5.1.1 Assessing Your Teaching Effectiveness
___ 6.1.1 Preparing to Teach
___ 6.1.2 Teaching
___ 6.1.3 Evaluating Your Teaching and Field Experience

Checklist of Diary Materials

___ Field Schedule Form
___ Lesson plans
___ Activity Sheet for Teacher Assistant
___ Teaching Events Checklist
___ Summaries of Supervising Teacher Discussions
___ Special Teaching Laboratory Evaluation Form
___ Check list for Self-Evaluation

Introduction

The approach to teaching encompassed by this course is based on a deliberate and critical selection of things the teacher should know, and the things he/she should be able to do, in order to teach students in school. It is practical and operational in its approach, not theoretical. From the operational ideas presented, a series of principles and practices are gradually distilled and stated. These can be found in the EIA 405 Instructional Resource Package. These principles and practices should be recognized in this course, but not prematurely used as the subject matter. Their best use will occur later, when the student has had some first-hand teaching experience, and turns to the task of analyzing what he/she has done. From that time on he/she should think by means of principles and practices, both to criticize past efforts, and to plan future efforts.

The philosophical concepts used in this course include that common body of ideas about people and their world, prominent among which are the recognition of the dignity of the individual, his/her right to self-determination and to as much development and learning as he/she is willing to obtain, the experimental basis of learning, and the futility of verbal procedures as a substitute for the personal experiences of the individual. They go somewhat beyond the typical pragmatism of some school people, however, to incorporate some of the substantial facts which have emerged from modern sciences, such as the notion of validity as applied to our descriptions of the world and of people and the way they behave and learn. Science today is based on experimental activity, but it also has developed within its methodology some checks on observation. They help us eliminate subjectivity and arrive at facts which are very substantial, very well demonstrated, and very reliable as the basis for constructing a body of knowledge and understanding of the world of education and its part in society. Change is still recognized as a characteristic of life, but is not to be carelessly bailed as a quality of facts once they are established by valid processes. Facts are not fleeting things. Neither are they excess baggage in a world of self determination. Modern industry, outstandingly successful in dealing with nature, is convincing proof that it is possible to know the facts about the world, and to use those facts to satisfy the wants of men.

It is generally agreed among serious students of learning and behavior that such things as attitudes are not primary elements in learning. They are the by-products. Learning is not basically a process of attitudinal change. It is a *process of change in concepts, motor abilities, values, habits, and symbolism*. When these things change, they produce changes in the behavioral manifestations which we call attitudes, appreciations, loyalties, and so on. They also produce better thinking, better problem-solving, democratic tendencies, and other goals of education. One of the purposes of this course is to show how these basic processes operate, and how the teacher uses them in his/her work.

Teachers can safely forget their concern about controlling the variables which affect learning. If they will actually structure their classrooms and laboratory teaching activities so the basic learning procesess are accommodated, the variables will largely take care of themselves.

Teacher education has three major parts, which have not always been distinguished from each other. One of them consists of an intellectual grasp of such fundamental knowledge as the way men behave, learn, and think, and the manner in which we have come to live and work together. This is typically called *general education.* The second consists of methods of teaching or *professional education.* It is very specific to the act of instructing a class or single student. The third is specific knowledge and skill of some aspect of general education. This may be called *technical education* or subject matter specialty. It is the subject matter you are going to teach. The second or procedural part is singled out, simplified and reduced to a set of workable ideas. This is the mission of the teacher.

The faculty which developed the industrial arts education program of which this course is a part regarded the procedural portion of the program as having six stages.

1. A description of the acts a teacher must perform (EDU 305, EDU 101, 241).
2. A period of preparation of teaching materials, largely units and lesson plans, which the new teacher could use in his first practical experience as a student teacher (EVO 306, EDU 311).
3. Immediate experience as a teacher, under very close guidance, primarily for the purpose of finding out what teaching is like, trying out some basic procedures and becoming aware of the demands it makes on a teacher (EDU 311, 312).
4. A post-experience analysis of what happened in the experience phase, using principles as the guides for analysis, and in turn making new plans on the basis of the practical insights and the newly understood principles (EIA 405).

5. A period of further materials preparation and student teaching (EVO 425).
6. Employment as a teacher, with continued in-service and graduate study of the theory of methodology and the theory of curriculum development (graduate program – curriculum and instruction).

All along this core of methodological induction to teaching there should be continuous observation of classrooms and teaching, with as much spot participation as possible, directly tied with the concepts being developed.

At the side of this methodological core, and preferably after the field experience, the student should have solid courses in a graduate program in the substantive disciplines that constitute the foundations of education. They include human behavior, learning, perception, concept formation, and such psychological concepts, basic philosophical notions of the nature of the world (including the man-made world) and the values that are dominant in American tradition, and such other subjects as have the power to help all of us know our world, its conditions, and the institutions within which we work, and for which we are preparing students to live and work.

Entry requirements: Completion of EDU 311

MODULE I INTRODUCTION TO EIA 405

Goal 1.0

> The goal of Module 1 is to facilitate your preparation for EVO 425 and orientation to EIA 405

Task 1.1.1 Applying for Student Teaching

Given the need to sign up for EVO 425 Student Teaching, select a junior or senior high school level, select a geographic area and school, and designate a quarter (Winter or Spring) in which you plan to do student teaching and relay this information to the instructor and submit your application for EVO 425 Student Teaching no later than the third (3rd) week of this quarter to the Student Teaching Placement Office in DM 398.

NOTE:
1. EVO 425 Student Teaching is to be the ONLY course taken during that quarter. It must be taken during regularly scheduled day time schedule of the cooperating school, (usually a morning, afternoon or 9 to 3 program).
2. Filing for EVO 425 must be done the preceding quarter as posted.
3. Assignments will be made by the University in cooperation with the local district office of the county involved. The student must accept the assignment. Every effort will be made to make an appropriate assignment in the area of specialty requested by the applicant. Broward county makes the selection themselves.

Task 1.1.2 Orienting Yourself to Your Responsibilities

Given the need to orient yourself with the scope and tasks of EIA 405, read the balance of the handbook, and ask for clarification until you have a general idea of the requirements for EIA 405 Instruction in Industrial Arts.

Enablers

1.1.2.1. Place "?" or "X" next to items you do not understand. Ask the instructor to clarify.

Instructional Resources

1. EIA 405 Handbook
2. Instructor explanations
3. EVO 425 Student Teaching Applications
4. EIA 405 School Placement Cards

MODULE II PREPARATION

Introduction

All effective teaching starts with well-thought-out lesson plans. Without thinking through what and why you are going to teach, how to teach it, and how you are going to evaluate progress, little purposeful growth or development will result. The value of the lesson plan is the thinking through of your teaching and its effect upon the learner. In addition the lesson plan serves as a record for evaluation, modification and improvement.

Preparation includes developing lesson or unit plans and the readying of instructional aids and materials.

A lesson plan contains all of the essential elements of a plan the teacher will use to help students learn. In a simplistic way a lesson plan can be categorized into five sections: introduction, presentation, discussion, application, and evaluation. A lesson plan provides the framework for coordinating each of these activities. What is to be taught can be categorized as: concepts, skills, habits.

The following shows the segments or elements of a lesson plan and their purpose.

Elements	*Purpose*
Introduction:	to orient, to introduce, to motivate, to provide continuity
Presentation:	to bring student face to face with referent, to show, to explain, to demonstrate, to relate to student experience
Discussion:	to clarify, to expand, to reinforce, to correct, to allow student to verbalize, question, respond, to provide evidence of concept understanding
Application:	to apply concept, to use, to verify concept, to build motor skill, to build habit, to develop attitude through experience
Evaluation:	to periodically provide closure, to modify concept, to correct, to expand divergent thinking, to summarize, to test

Concepts are words or symbols that evoke a meaning which forms a mental picture in your mind. Concepts are abstractions. Concepts are made up of particulars. To understand the whole you must understand the particulars and their characteristics and relationships. All words and symbols are concepts e.g., chair, two, place, dress, H_2O, interchangeable parts, excavation.

Mental structures of concepts have three dimensions which influence understanding; meaning, feeling and symbolism. Symbolism is the word or symbol itself that stands for the concept: e.g., chair, H_2O. Symbols or vocabulary are learned by memory and association. Meanings are the definitions associated with the symbol. Meanings are amplified and clarified by the context in which the concept is used e.g. *love* of country, *love* of spouse, puppy *love*. Your past experince with the concept — what you know about it and how you feel about it influences the mental picture of the concept. This is manifest in your attitude or feeling about it. Preferences and values are developed by experience with a concept.

Habits are automatic modes of behaving. Habits are developed over periods of time through directed experiences, e.g., care of tools, safety precautions, punctuality.

Motor skills are the manipulative hand-eye-body coordination necessary to perform. Motor skills are learned by applying concepts, trying them out, repeating and refining the coordination, and practicing until they become habit. Motor skills involve sensory contact with the thing to be manipulated. The level of precision of motor skill development varies with the goals and objectives of the course.

At junior high school levels skills are not as important as concepts and habits. This is partly due to the physical maturity of the student. At senior high vocational level skills and habits become more important or at least equal to concept formation. Skills should not be out of balance with concepts and habits.

The following may serve as a quick referent for concepts, motor skills and habits.

Concepts			Habits	Motor Skill
Meaning (understanding)	Feeling (preference)	Symbolism (language)	safety	filing
			care of tools	planing
			helps others	drawing
			orderliness	sewing
definitions	value	vocabulary	language	cutting
relationships	attitude	words	social	measuring
contexts	sensitivity	spelling	discipline	cooking
principles	emotion	e.g. tool		
processes	perception			
e.g. tool	e.g. appreciation of tools			

> Your lesson planning will start with this module and continue through to the end of the course. Every lesson you teach must have a lesson plan. This module will help you become familiar with making and evaluating lesson plans.

The following sample lesson plan identifies the elements to be included in a lesson plan and the purpose of each element.

SAMPLE LESSON PLAN

Course: Construction

Grade: 7

Unit: Preparing the Site

Lesson Concept 2. Earthmoving

Motor Skills: None

Objective: An objective must state the act or task, the conditions, and the criterion level of performance.
Given an earthmoving problem and a table of costs factors, (condition) compute (task) the least expensive way to move one acre of top soil and prove why it is the least expensive (criterion level).

Equipment and Supplies:
Teacher: pictures or models of pan, dozer, grader, dump truck, back hoe, front loader, mountain or hill, ditto table of costs.
Students: None

Reference: World of Construction: Earthmoving, Chapter 33

Time Schedule:

5 Introduction	10 Discussion
10 Presentation	15 Application
	5 Evaluation

Introduction (5)

1. Yesterday we learned that in preparing a site the first step was to clear the land. The principle in clearing is to reduce obstacles to a size that can be transported. In clearing we

learned about chaining, sawing, demolishing, blasting, chopping, and burning.
2. Today we'll look at the second step – earthmoving – and we will find out which earthmoving techniques cost the most and the least to move a large amount of land.
3. Can anyone tell me what earthmoving is? What big machines have you seen that are moving earth? How do you think they moved all of the earth to build I-95 or the Palmetto expressway? How did they move the earth to make a place for this school?

Presentation (10)
1. Show pictures of mountain or hill. How can we move this earth for a highway or housing development? By earthmoving equipment. (Write earthmoving on the chalkboard.)
2. Earthmoving is just as the name says. The act of moving earth. There are many ways to move earth. By dozer – show picture, explain use and cost per hour. By pan – show, explain cost per hour. By grader, by back hoe, by front loader, by dump truck.
3. Some earth is removed from the site – transported to other sites. Some earth is used on the site as *fill.* Some earth is stored on the site because it is expensive and rare, such as top soil. It is saved to cover the rough earth and provide for landscaping.

Discussion (10)
1. Hold up pictures and ask for the names and what the equipment does.
2. Ask students if they know of any earthmoving going on around their neighborhood.
3. What is fill dirt? What is top soil? How are they different?
4. Why does one piece of equipment cost more than the other?

Application (15)
1. Here is an earthmoving problem – distribute ditto sheet with problem and cost factors.
2. Pretend you are a contractor and business has been slow. You want to save money and make a greater profit. How would you move the earth to save you the most money?
3. Read and explain problem and table. Work sample problem on the chalkboard.

4. Have students work the problem.
5. Observe students and give aid as necessary.

Evaluation (5)

1. Ask for students to give their responses.
2. Why did the grader turn out to be the least expensive even though the pan could carry more dirt?
3. What conditions would have to exist to make the dozer the least expensive?
4. Now that you have found out how earth is moved, tomorrow we will look at a related step – excavating.

SAMPLE LESSON PLAN

Course: Construction

Grade: 7

Unit: Wood Framing

Lesson Concept 2. Floor Framing

Motor Skills: Measuring, sawing, nailing, inspecting.

Objectives: Given a floor plan and hand tools, read the plan and build the floor frame according to the plan dimensions.

Equipment and Supplies

Teacher: 6′ tape, try square, crosscut saw, hammer, 16 d nails, 2 piece 2″ x 6″ x 8′.

Students: same as above.

Reference: World of Construction: Building Wood Frames Chapter 47.

Time Schedule

5 Introduction
15 Presentation/Discussion
20 Application
5 Evaluation

Introduction (5)

1. Yesterday we learned that in building wood frames there are three basic units: floors, walls, and roofs and that ceilings may be part of the roof structure or like a second floor.

2. Today we will do some floor framing and learn to read the plan, measure lumber, and construct a floor frame by measuring, sawing, nailing, and inspecting.
3. Why do we inspect or check the work after it is done? What kinds of occupations do wood floor framing? What occupations do concrete flooring? Although we will do concrete flooring later, why is it important to know how to do wood floor framing?

Presentation/Discussion (15)

1. Today I am going to demonstrate how to construct a wood floor frame. Please ask any questions you have as I demonstrate.
2. Direct students to gather around demonstration area.
3. Point out use of plans. Ask students to give sizes of floor areas.
4. Show how to interpret plans. What size lumber do I have here? Point out joists and sills.
5. Show how to measure and mark with try square.
6. Show how to start, saw, and finish saw cut. Point out safety precautions. Why do I guide the saw with my thumb knuckle?
8. Have student aid in holding joists and sills while nailing. Show how to hold hammer and nail and drive nails. Point out safety precautions. Show how to remove bent nails.
9. Show how to check joist placement by measurement (16″ centers). Show how to check alignment with tape and square.
10. Briefly review steps of construction. Ask for questions.

Activity (20)

1. Divide students in groups of four to construct floor frame.
2. Supervise as needed. Keep eye on safety.
3. Have students store frames at designated storage area. Supervise clean up.

Evaluation (5)

1. What were the basic steps we used to construct the wood floor frame? Do you think the same process would apply to a ceiling?
2. Do you think the same process would apply to wall framing?
3. What were the names of the tools you used today?

4. Tomorrow we will do wall framing which will follow the same basic process, but the work will be vertical rather than horizontal.
5. Check the partition walls in your house tonight and see if the studs are 16″ on center or if they follow a different spacing.

Goal 2.0

The goal of Module II is to develop proficiency in planning lessons, preparing instructional aids, and evaluating lesson plans.

Task 2.1.1 Writing a Lesson Plan

Select a unit of some technical area, identify a single concept, motor skill, or habit and write a lesson plan that contains: lesson information, introduction, presentation, discussion, application, and evaluation. Organize a Special Teaching Laboratory Diary and keep all notes and records related to the course. Diary will be turned in the 10th week.

Enablers

2.1.1.1 *Read EIA 405 Inst. Res. # 1, 2, 3, 4, 5*

2.1.1.2 Read pages 29-68 and 127-136 in Proctor.

2.1.1.3 Identify specific "ING" words for motor skills or processes. Support the activity with what the student needs to "know" and "feel" to be able to "do".

2.1.1.4 Reference Chapter 3, 4 in Hauenstein, *Curriculum Planning for Behavioral Development.*

Task 2.1.2 Preparing Instructional Aids

Given a lesson plan, prepare any visual aids, demonstration devices, or other instructional aids necessary to present information and to achieve the lesson objectives.

Task 2.1.3 Evaluating Lesson Plans

Given a lesson plan and instructional aids, assess the plan for relevancy, motivation, organization and continuity, appropriateness of objectives and methods, creativity, time allotment, and safety according to the following criteria. Check those that apply to your lesson plan.

1. Relevancy
   a. There was logical connection between what is taught and the real world.
   b. Students at their grade level would find the topic interesting and related to their lives.
   c. Theory or principles were shown in demonstration.
2. Motivation
   a. Student was shown referent.
   b. Lesson has student appeal for interest and activity.
   c. Presentation builds awareness and interest.
3. Organization and Continuity
   a. Lesson had a logic unto itself, e.g., cause effect, simple to complex, general to specific, inductive-deductive, etc.
   b. Lesson plan elements flow together, no abrupt change in thought or process.
   c. Plan shows activity organization and control.
4. Appropriateness of Objectives and Methods
   a. Objectives all expressed in terms of *act, conditions, criteria.*
   b. Objectives were reasonable for time allotment.
   c. Teaching methods used facilitate concept building, habit reinforcement, vocabulary building, attitude development, and motor skills.
5. Creativity
   a. There was flexibility for student differences.
   b. There was more than one way to achieve objectives.
   c. The lesson projected thinking beyond the objectives.
6. Time
   a. Time allotments were reasonable for introduction, presentation, discussion, application, and evaluation.
7. Safety
   a. Safety precautions were pointed out or demonstrated as pertinent to the situation.

MODULE III
INTRODUCTIONS AND PRESENTATIONS

Introduction

As part of teaching, the presentation (showing) of material is much more than verbalizing and demonstrating. How you act, your facial expressions, gestures, composure, attitude, dress, all contribute to your delivery and rapport. The inflections in your voice, its tone, clarity, and volume add to your ability to communicate. However, all of this is for naught unless you have something to say or demonstrate. Remember that a change in behavior starts with a change of concepts, habits and motor skills. In a way you are a salesperson. You are trying to influence students to change by relating the concepts and values of this lesson to them. To do this you need to use vocabulary they understand. New terms or concepts need to be explained and used. To help explain and build concepts the teacher may use media of all sorts: overhead transparencies, chalkboard, filmstrips and films, and other instructional aids and devices.

Teachers should keep their presentations fairly short and concise to allow students time to discuss and apply the concept, motor skill, habit. Presentations should "present a small bit" of knowledge, should be well thought out, should be motivational and interesting and demonstrated when applicable.

Goal 3.0

> The goal of Module III is to provide practice in giving introductions and presentations. Introduction and presentation practice will start the third week and continue through the sixth week. Lesson plans are required for all lessons. The following schedule will be followed in teaching your peers during weeks 3 - 6.

3rd week: Introduction and presentation of a concept meaning.

4th week: Introduction and presentation of a concept involving a principle, plus demonstration, plus discussion.

5th week: Introduction and presentation of process concept plus demonstration, plus discussion, plus application, plus evaluation.

6th week: Introduction and presentation of concept or principle or process, plus discussion, plus application, plus evaluation with a test instrument to assess teaching ability.

Definitions:

Concept: An abstract idea generalized from particulars, e.g. interchangeable parts, electrical circuit, power, excavation.

Principle: A comprehensive and fundamental law, a rule or code of conduct, the laws or facts of nature underlying the working of an artificial device, a distinguishable ingredient that exhibits or imports a characteristic quality e.g., accident prevention or safety, inclined plane, adhesion, cohesion, shearing.

Process: A series of actions or operations conducing to an end, a continuous operation or treatment, especially in manufacture e.g. designing, engineering, contracting, printing, finishing, film developing, casting.

Task 3.1.1 Planning Introductions and Presentations

Write a lesson plan according to criteria in Module 2, prepare for the lesson and give a 10-15 minute introduction and presentation related to a concept (3rd week) principle (4th week) process (5th week) and any of the three above the 6th week. The task will have been mastered when the lesson plan is followed, materials are prepared, lesson information is given, an introduction and presentation is given, and a presentation, discussion and application is conducted with proper language and delivery, and an evaluation is made.

Enablers

3.1.1.1 Read EIA 405 Instructional Resources 1, 2, 3, 4
3.1.1.2 Read pages 1-12, 21-28, 35-40, 69-74, and 75-82 in Proctor

Instructional Resources

Text
EDU 311 Handbook
EIA 405 *Instructional Resources 1, 2, 3, 4, 5*

MODULE IV DISCUSSIONS AND APPLICATIONS

Introduction

Simply telling or explaining or demonstrating something doesn't mean that students understand or can apply what you have said. Teaching is the act of helping students learn how to teach themselves. The teacher is a facilitator of the conditions under which learning takes place. The teacher needs to structure situations, pose examples, arrange for purposeful activity, and provide the means by which students can become the owner of concepts, attitudes, and skills. The teacher establishes the learning environment in which the learner can develop and grow.

For students to apply what they have been made aware of through the presentation they need to explore the concept, principle or process verbally through discussion. The teacher can pose questions, answer questions, clarify, reinforce, and correct misconceptions. Through verbal exploration the student begins to become familiar with the vocabulary, meanings, and attitudes and values. The discussion provides the teacher with feedback as to the level of understanding of the student. Until students have an acceptable level of understanding of what is expected, they should not be expected to apply their knowledge through motor skill activity. When students do not understand, unsuccessful performance is likely to occur. It is essential to establish desired attitudinal levels and conceptual levels to build successful experiences.

Once students have an understanding of the concept, principle, or process they need to see how this is applied in reality. It is in the "doing" that the understanding of concepts are solidified. Application through activity verifies the knowledge, makes it real, enlarges the concept, establishes a frame of reference for future experiences, increases retention and provides transferability. Do you not understand and remember best what you have experienced? Activity brings the senses into prespective — the smell, the texture, force, temperature, or pressure, or the form of shapes, the sounds, and sometimes the tastes. The senses involved in the activity create and implant an attitude or feeling about an experience and the environment.

According to Webster understanding is the ability to generalize from particulars. Activities are the particulars (parts) which when combined with other parts make a whole or build the concept being taught. Activities that are repeated build skills and habits. Activities that are similar but performed under variable conditions build breadth of concept and breadth of understanding and experience.

Activities provide a situation for teacher observation of student performances or application of concepts, skills and habits. Activities provide a means of corrective feedback, divergent thinking, and evaluation or assessment of student growth and development.

In an educational setting, projects are means to an end. Projects are not ends in themselves. They provide a vehicle by which a student can demonstrate his knowledge of concepts, skills and habits.

Industrial arts activities at the prevocational level (grades 7, 8, 9) should be more exploratory; that is, they should build breadth. This means activities *should not* focus on skill building and exercises of a repetitive nature. Activities should be varied and of short duration. A project, if it is used as a vehicle, should be able to be completed within about five periods. Projects requiring the same sets of skills or procedures should be avoided.

Industrial arts activities at the pretechnical level (grades 10, 11, 12) should be based more in the sciences and the applied sciences. Scientific theories, concepts, principles, and processes are in the forefront but combined with laboratory application and demonstration. The focus should be on developing some degree of motor skills (drafting for example) as well as more focus on the underlying theories, principles, concepts, and process upon which the technical practice is based.

Goal 4.1

The goal of Module IV is to provide practice in leading discussions and managing activities which apply knowledge.

Task 4.1.1 Leading Discussions and Activities

After preparing a lesson plan, preparing for instruction, and giving a verbal presentation or demonstration on a concept, principle, or processes — have students apply their knowledge through a teacher - controlled discussion (4th week) and a teacher - controlled discussion and laboratory activity (5th and 6th weeks).

Enablers

4.1.1.1 Real EIA 405 Instructional Resources 1, 2, 3, 4, 5
4.1.1.2 Text pgs. 57-67, 69-74, 75-82, 83-90, 91-100, 101-108, 109-120, 121-126, 127-136, 155-160
4.1.1.3 EDU 311 Student handbook

Instructional Resources

Classroom demonstrations of teaching
Text
EDU 311 Student Handbook
EIA 405 *Instructional Resources 1, 2, 3, 4, 5*

MODULE V EVALUATION

Introduction

As a curriculum is being built, it must be used as the material for testing in detail by close observational and experimental methods to assess not simply whether students are "achieving" but rather, what they are making of the material and how they are organizing it. It is on the basis of "testing as you go" that revision is made. It is this procedure that puts the evaluation process at a time when and place where its results can be used for correction in the enterprise of making curricula and appropriate instructional methods.

Testing is important. Here is where you find out if the instruction "has taken". Through written tests, oral questions, performance tests, observation checksheets, attitudinal check sheets, student demonstrations, and group projects, the teacher can observe and measure progress. Remember, if the student has not learned, the teacher has not taught. Testing tells a lot about the teacher and the learner.

Goal 5.1

> The goal of Module V is to provide an opportunity to assess your teaching via testing the studetns.

Task 5.1.1 Assessing Your Teaching Effectiveness

After teaching a lesson, have students take a short test you prepared as an assessment of your teaching ability. Give the test the 6th week.

Enablers

5.1.1.1 *Read EIA 405 Instructional Resources 5*
5.1.1.2 Read text pgs. 68 and 161-166, 167-198
5.1.1.3 EDU 311 Student Handbook

Instructional Resources
Same as Enablers

MODULE VI TEACHING IN THE SCHOOLS

Introduction

After completing this phase of the course, the participating students should be prepared to observe and participate in actual school teaching situations. To that end, each student will be placed in a suitable shop with an experienced teacher. The instructor will assign the student a school. The student should consult the directing teacher in the assigned school to arrange appropriate hours to be in class. Students are expected to be in the assigned school at least *five* (5) *hours per week for three weeks*.

For Module VI you will be assigned to a school. Each student will be expected to maintain a log of his activities, and to send in a weekly summary of his observations, activities and actual teaching. This report is to be mailed to the university instructor, or given to a secretary in the Division of Vocational and Adult Education Office.

Module VI in this handbook will be used as a guide for the off-campus portion of this course. You will note that there are four forms included, these are to be filled out by your directing teacher, and the student.

Your university instructor will visit you at your school shop during this three-week period.

After the completion of this on-the-job training experience, the class will meet for a final critique and evaluation. This will be on the last evening date programmed for the course.

This module is designed to ease you into the teaching-learning experience under the supervision of your directing teacher. The directing teacher will assign you various teaching tasks as appropriate. If some tasks are overlooked, you will want to remind your directing teacher that you would like to have the experiences. Your directing teacher is responsible for the class, therefore, obtain his or her approval for all of your teaching activities *prior* to the actual classroom or laboratory session. Work with your directing teacher to determine at least four periods during the next three weeks when you can assume complete charge of planning and teaching the lesson.

Entry Requirements: Completion of Modules 1, 2, 3, 4, 5

Goals

The goals of Module VI are:
1. To demonstrate the ability to perform a variety of individual teaching events.
2. To plan for the presentation of at least four lessons.
3. To teach a minimum of four class periods.

Task 6.1.1 Preparing to Teach

Serve as a teaching assistant and complete at least 10 of the activities listed on the Activity Sheet for Teacher Assistant.

Enablers

6.1.1.1 Obtain a copy of the school philosophy and policy. Acquaint yourself with the rules and regulations. File a copy in your Diary.

6.1.1.2 After consulting with your directing teacher, prepare lesson plans for the four periods in which you will teach the entire lesson. File your teaching plans daily in your diary.

Instructional Resources

Teaching Events Checklist and Activity Sheet for Teacher Assistant.

Task 6.1.2 Teaching

Given assigned teaching events and approved plan, perform at least 80 percent (19 items) of items 1-24 listed in the Teaching Events Check List and 100 percent of item 26 within a three-week period.

Enablers

6.1.2.1 Review your plan for teaching and obtain the directing teacher's approval. Perform the event. File Lesson Plans in your Diary.

6.1.2.2 After each class period spend a few minutes recording your observations, activities, and problems encountered. Consult with your directing teacher for suggestions to alleviate instructional problems.

Write a summary of your discussions. Enter summaries in your Diary.

Task 6.1.3 Evaluating Your Teaching and Field Experience

Given the need to evaluate your teaching performance the student will, for the last seminar, (10th week) provide the following evidence of performance for evaluation.

1. Special Teaching Laboratory Diary with all entries as listed in Task 2.1.1.
2. An evaluation by your directing teacher as to your competence, conduct, appearance, attitude toward teaching and attendance. (*Special Teaching Laboratory Evaluation Form and Activity Sheet for Teaching Assistant, and Teaching Events Checklist and Self Evaluation Form*).
3. Be prepared to present your materials and discuss the following:
   a. Brief review of your experience.
   b. Major problems encountered, e.g., discipline, collection of money, lack of materials, machine breakdown, safety, clean up, class organization, lack of interest or motivation, etc.
   c. Solutions to problems.

ACTIVITY SHEET FOR TEACHER ASSISTANT

Assist your directing teacher with at least 10 of the following tasks. Check each activity in which you assisted and have your directing teacher sign the form.

Tasks Assisted With

____ 1. Took attendance
____ 2. Graded papers
____ 3. Filled out school forms
____ 4. Kept student records
____ 5. Inventoried stock
____ 6. Ordered supplies/tools/materials
____ 7. Maintained equipment
____ 8. Prepared visual aids or students materials
____ 9. Reported or handled disciplinary infractions
____ 10. Made a safety inspection of laboratory
____ 11. Checked equipment prior to class
____ 12. Distributed supplies
____ 13. Made announcements
____ 14. Worked with small groups
____ 15. Managed classroom activities
____ 16. Demonstrated a motor skill
____ 17. Supervised cleanup
____ 18. Other ________________________

____
Student

____
Directing Teacher

____
Date

TEACHING EVENTS CHECKLIST

Perform at least 80 percent (19) of the teaching tasks 1-24 and 100 percent of No. 26. Place the date performed in the blank and include comments about the event in your diary for that date. Have your directing teacher sign this form when completed.

PREPARATION

______________ 1. Prepared lesson plan

______________ 2. Prepared instructional materials

______________ 3. Developed teaching aid

ORIENTATION

______________ 4. Called class to order

______________ 5. Reviewed what was done yesterday

______________ 6. Introduced objectives for today

______________ 7. Motivated students

PRESENTATION

______________ 8. Got student face to face with referent

______________ 9. Explained concept, principle and process

______________ 10. Gave demonstration/motor skill

DISCUSSION

______________ 11. Clarified concept, principle or process

______________ 12. Expanded concept through questions

______________ 13. Reinforced concept, recognized student contribution

______________ 14. Corrected misconceptions

______________ 15. Gave positive feedback, praise

APPLICATION

__________ 16. Organized laboratory activity

__________ 17. Controlled laboratory activity

__________ 18. Provided individual instruction — verbal or demonstration

__________ 19. Corrected attitude, habit, motor skill

__________ 20. Supervised cleanup; checked tools/equipment

EVALUATION

__________ 21. Developed a brief test (performance or paper-pencil)

__________ 22. Administered test, graded test

__________ 23. Evaluated teaching effectiveness

__________ 24. Modified instructional materials/lesson plans

__________ 25. Others ____________________

__________ 26. Taught four class periods

____
Student

____
Directing Teacher

____
Date

DIVISION OF VOCATIONAL AND ADULT EDUCATION

Special Teaching Laboratory Evaluation Form

NAME ____
Last First Initial

MAJOR ________________ FIU SUPERVISOR ________________

SCHOOL ASSIGNED ________________ DATES ________________

SCHOOL ADDRESS ________________ ________________

DIRECTING TEACHER ________________________________

EVALUATION OF STUDENT PERFORMANCE

____

INDICATE:

4 — Excellent
3 — Good
2 — Average
1 — Poor
NI — No information

____
Supervising Teacher

____
Date

TOTALS

____ *Preparation*

____ 1. Has a lesson plan which shows plan information, introduction, presentation, discussion, application and evaluation.
____ 2. Has done appropriate study for the lesson.
____ 3. Readies or checks out tools and equipment, materials necessary for demonstration and activity.
____ 4. Readies or prepares instructional aids.
____ 5. Provides examples to relate/motivate.

____ *Knowledge of Subject Matter*

____ 1. Uses appropriate technical language.
____ 2. Uses appropriate technical and safe procedures.
____ 3. Can explain concepts, principles, procedures, relationships.
____ 4. Can demonstrate procedures.

_____ *Rapport* (Ability to get along with students)
_____ 1. Is fair, just, and consistent.
_____ 2. Positive attitudes displayed in response to students questions.
_____ 3. Is democratic rather than dictatorial.
_____ 4. Is pleasant, agreeable, but firm.
_____ 5. Handles discipline infraction of rules in rational manner.
_____ 6. Does not talk down to students, talks at their language level.

_____ *Sense of Responsibility*
_____ 1. Is in class on time.
_____ 2. Knows the objectives and lesson.
_____ 3. Materials have been prepared for class.
_____ 4. Points out and corrects unsafe conditions.
_____ 5. Completes forms on time.
_____ 6. Turns in reports when due.
_____ 7. Knows and carries out school policy.

_____ *Professional Attitude*
_____ 1. Does not demean students or other teachers or administrators.
_____ 2. Has the interest of student at heart.
_____ 3. Shows students how to teach themselves rather than lecture them.
_____ 4. Uses correct verbal and written language, clear speech.
_____ 5. Is friendly, concerned about student problems.
_____ 6. Keeps shop clean, tools, materials in an orderly arrangement.
_____ 7. Can stimulate individual and group activity.
_____ 8. Provides reinforcement and corrective feedback.
_____ 9. Can ask appropriate questions to elicit critical thinking and response.

_____ *Initiative*
_____ 1. Volunteers to help supervising teacher and students.
_____ 2. Conscientiously carries out assignments.
_____ 3. Cooperates with teacher and students.
_____ 4. Works at making learning exciting.
_____ 5. Presents self in appropriate apparel and grooming.

____ *Evaluation*

____ 1. Knows the objectives of lesson.

____ 2. Can compare results to objectives.

____ 3. Can discern why lesson did or did not work, can suggest how lesson can be improved.

____ 4. Can ask questions pertinent to facilitating objectives.

____ 5. Can appraise self behavior and success.

CHECK LIST FOR SELF-EVALUATION

A competent teacher is one who performs the following acts skillfully, and thereby brings about effective learning of the contents of the curriculum by the students: Rate yourself and have your supervising teacher rate you.

4 — Excellent
3 — Good
2 — Average
1 — Poor
NI — No Information

_____ 1. He clearly distinguishes between concepts, skills, and habits in his subject matter.

_____ 2. In teaching conceptual material he:
- _____ a. Plans a lesson around a clearly stated concept.
- _____ b. Presents the referent of the concept vividly to the class.
- _____ c. Sees that students perceive the referent adequately for understanding the stated concept.
- _____ d. Clarifies the concept adequately through exchange of ideas among class members.
- _____ e. Clearly identifies new vocabulary terms required for discussing the referent, and provides for memorization of them.
- _____ f. Clearly identifies the details of the concept which should be remembered, and provides for their memorization.
- _____ g. Coaches the students in altering their behavior to harmonize with the newly formed concepts.
- _____ h. Determines the clarity of each student's concept by means of an appropriate testing procedure.

_____ 3. In teaching skills he:
- _____ a. Helps the student identify the parts of the skill, and the sequence of the parts.
- _____ b. Helps the student develop good form in the skill.
- _____ c. Helps the student know of his progress.
- _____ d. Assists the student in correcting poor form and errors.
- _____ e. Controls practice and rest periods to the best advantage for learning.

____ 4. In affecting habits of students he:

____ a. Distinguishes clearly between true habits and behavior which is conceptually directed.

____ b. Helps students recognize proper and desirable forms of habit-type actions related to the objectives of education.

____ c. Is effective in preventing the recurrence of undesirable habit reactions by students in his classes in

oral language,
written language,
observance of standards of prepared work, and social actions.

and is effective in helping them establish desirable habits.

____ 5. He maintains a workable relationship with his students, i.e., he and the students communicate effectively, free from disturbing clashes.

____ 6. He runs a business-like classroom in which students work seriously and honor the rules and standards of the school.

This is a simple check list. There are others that are much more complex and that deal with many details of the way a teacher and his students work together. Complexity is not necessary. It tends to be confusing. It is strongly suggested that teachers keep their attention on the kinds of things outlined in this check list and described in this book, regardless of how long they remain in the profession. These are the fundamentals of teaching. They will never be outgrown. They are capable of producing all of the objectives we desire in American education if they are intelligently and consistently applied to the task.

Adapted from *Basic Concepts of Teaching* by Asahel Woodruff

____
Student

____
Supervising Teacher

____
Date

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