AN ANALYSIS OF THE SIMILARITIES AND DIFFERENCES AMONG A SAMPLE OF OPERATIONAL COMPETENCY BASED TEACHER EDUCATION ASSESSMENT AND REVISION SYSTEMS

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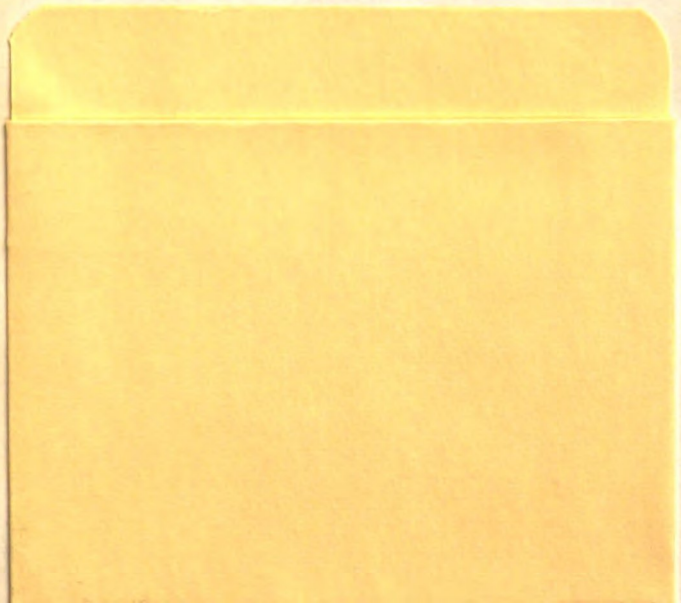

ABSTRACT

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by

Walter Gordon Ritchie

This is an exploratory study developed from a concern that teacher training institutions, converting to competency based teacher education, were neglecting the assessment and revision components.

The purpose of this study was to analyze the similarities and differences in assessment and revision procedures among a sample of institutions using electronic data management systems in their competency based teacher education programs. The research focused on three specific questions:

1. What are the similarities and differences of these systems studied?

2. What are the variables identified that have an effect on the relevance, the effectiveness, and the efficiency of a competency based teacher education assessment and revision system?

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2. What are the variables identified that have an effect on the relevance, the effectiveness, and the efficiency of a competency based teacher education assessment and revision system?

3. What were the major problems encountered in the development of the competency based teacher education assessment and revision systems?

The study was intended to provide insight into the necessary procedures which are considered essential for all assessment and revision systems. It would also identify the necessary support factors, which would enable a program to modify and improve itself. By identifying the significant design variables, recommendations could be made to new competency based teacher education programs to aid in their development of a more effective assessment and revision system.

A survey of judges was used to identify the five institutions to be studied. The judges were selected on the basis of acquired recognition at the national level. This procedure was intended to increase the potential of identifying five institutions with fairly sophisticated competency based assessment and revision systems.

The principal gathering instrument was a questionnaire. The questionnaire addressed the three research questions. An individual, with program development responsibilities, was interviewed at each of the five institutions. Their responses to the questions on the questionnaire were tape recorded. This enabled the respondent to elaborate freely, without the interruptions which hand recording would have necessitated. The data was recorded on the questionnaire after the interview.

The significant design variables identified by this study were used to develop a model assessment and revision system, which was integrated with a data management system. This model is presented as a recommendation to institutions

planning on, or in the process of implementing a competency based teacher education program.

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By

Walter Gordon Ritchie

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TABLE OF CONTENTS

LIST OF FIGURES

Chapter 1

THE PROBLEM

The Need for the Study

During the last several years, there has been a movement toward competency based teacher education (CBTE). Recently this movement has accelerated at a rapid rate. The fact that the CBTE movement is progressing so rapidly verifies, to some extent, its ability to eliminate many of the deficiencies of traditional training programs. Education generally has been under severe attack for many years, as being ineffectual and frequently irrelevant to the needs of society. Teacher education programs have been the target of much of this criticism.

Typical of the charges against teacher education programs is the complaint of Lembo and Olds. "In nearly all teacher training programs, the only semblance of 'training' is the student teaching experience. This is a feeble, one shot, trial and error experiment and screening device. It usually provides no systematic feedback to the trainee or trainer to encourage improvement in the trainee's teaching strategies and fails to prevent many

grossly incompetent and emotionally disturbed people from becoming certified to work with classrooms of children."[1]

In response to the mounting clamor of the 60's, the U. S. Office of Education in 1968, supported the CBTE movement through the Elementary Teacher Education Models Program. Recently the State of Michigan has funded a number of projects for the development of competency based teacher education. For example, in Michigan, the competency based movement has made significant inroads. Of the thirty teacher education institutions in Michigan, seventeen have converted at least some portion of their program to competency based teacher education. The other thirteen have indicated an interest in competency based teacher education and may well develop programs of their own.

To determine if a program is competency based, the definition used by Cooper and Weber can be a yardstick. "A competency-based (or performance-based) teacher education program is a program in which the competencies to be acquired by the student and the criteria to be applied in assessing the competency of the student are made explicit and the student is held accountable for meeting these criteria . . .

Three types of criteria are used: (1) knowledge criteria which are used to assess the cognitive

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[1]John M. Lembo, ed., Learning and Teaching in Today's Schools, (Columbus: Chas. E. Merrill Publishing Co., 1972), p. 14.

understandings . . .; (2) performance criteria which are used to assess the teaching behaviors . . .; (3) product criteria which are used to assess the student's ability to teach by examining the achievement of pupils . . ."[2]

"The most striking feature of competency-based education obviously is competency, which is synonymous with the concept of ability. At the end of instruction, in competency education, the learner is to have acquired the ability or skill to do--something--since doing is the essence of learning."[3]

Burns further asserts the importance of competency based teacher education by saying, "It is the specification of the behaviors to be acquired that gives leverage to the competency-based movement. It is the extra-power--this exact specification of the behaviors to be acquired by the learner--that is making the competency-based education movement more than just another fad in the field of education."[4]

Many institutions across the nation have been deeply involved in this movement. Their experiences have provided some explicit guidelines for continued effort for those involved in competency based teacher education programs.

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[2]James M. Cooper and Wilford A. Weber, "Chapter I, Vol. II, A Competency-Based Systems Approach to Teacher Education." (Typewritten).

[3]Richard W. Burns, "Behavioral Objectives for Competency-Based Education," Educational Technology, November, 1972, p. 22.

[4]Ibid., p. 22.

Gentry and Johnson[5] and Houston[6] have clearly defined the problems and promise in the development and implementation of competency based programs.

One of the major problems confronting competency based teacher education today appears to involve assessment techniques. David Krathwolh predicted CBTE ". . . is certain to fail to reach its ultimate objective if it continues on its present course. This failure will be caused by the almost complete lack of attention given to the assessment of teaching competencies . . . ."[7]

It becomes increasingly evident that assessment and revision procedures are the critical factors in improving educational programs. A competency based program implies that students in the program will move through the instructional packages at their own rates. Prerequisite and pretests would place a group of students all entering the program at the same time, at different entering points. Meeting the criteria of each package will be accomplished in varying amounts of time.

A competency based teacher education is quite a recent innovation, implementation of this procedure for

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[5]Castelle Gentry and Charles Johnson, A Practical Management System for Performance-Based Teacher Education. (American Association of Colleges for Teacher Education, February, 1974.

[6]W. Robert Houston, Strategies and Resources for Developing a Competency-Based Teacher Education Program. (A Joint Publication of New York State Education Department and Multi-State Consoritum on Performance-Based Teacher Education, October 1972).

[7]"Introductory Note" in: Jack C. Merwin, Performance-Based Teacher Education: Some Measurement and Decision-Making Considerations. (Washington, D. C.,: American Association of Colleges for Teacher Education, June 1973) p. v.

preparing teachers, has not yet had extensive research and tryouts. The learning packages may not yet be properly sequenced or inclusive. The strengths and weaknesses are still being discovered.

Changing from traditional methods of training teachers to a competency based program encompasses a great deal of time and money. Add to this the human reluctance to give up the old and the familiar in order to embrace a new unknown program, means that the program should be strongly justified.

The need for individualized instruction, lack of detailed and/or in-depth research, the variety of human resources involved, and the financial burden of making costly curriculum changes, all suggest the necessity of an elaborate and sophisticated data management system.

Because assessment of the competency and eventually its effect on learning is the main ingredient, CBTE programs need a management system that can sort out the strengths and weaknesses of an individual, of the learning package and of the program itself. Feedback to almost everyone involved is a vital part of the management system, so that revisions can be made and the program improved. From these feedbacks, the student, the instructor, the advisor, the developer, and others, should benefit by monitoring their areas of concern. Managing vast amounts of data is a highly complex task. Eventually the system should be sophisticated enough to handle it, or valuable information will be lost. Ideally, a sophisticated system should operate from the very beginning, when revisions are most needed.

During the design, implementation, and evolutionary stages of a competency based teacher program, it is essential that the competencies be accurately and precisely assessed. Considering the numerous variables involved, the assessment and revision system used must be comprehensive and therefore faces the formidable task of generating vast amounts of data. This suggests the need for a management system that would be capable of delivering the appropriate data to the various parties, who are factors relevant to the efficacy of the program. The above concern is the framework around which this study has evolved. Since programs are developing with somewhat different perspectives, the need to study variables which influence program structures in diverse ways, is desirable.

PURPOSE OF THE STUDY

The purpose of this study is to analyze the similarities and differences in assessment and revision procedures, among a sample of institutions using electronic data management systems in their competency based teacher education programs. This study will hopefully provide insight into necessary procedures, which are considered essential for all assessment and revision systems. It should also identify the necessary support factors, which will enable a program to modify and improve itself. By identifying the significant design variables, recommendations can be made to new

competency based teacher education programs to aid in their development of a more effective assessment and revision system.

RESEARCH OBJECTIVES

The objectives of the study are to determine the significant design variables associated with competency based teacher education assessment and revision systems based on operational experience. By identifying the significant design variables, recommendations can be made to new competency based teacher education programs in the development of their assessment and revision systems.

The following questions will be answered.

1. What are the similarities and the differences of those systems studied?

2. What are the variables identified that have an effect on the relevance, the effectiveness, and the efficiency of a competency based teacher education assessment and revision system?

3. What were the major problems encountered in the development of the competency based teacher education assessment and revision systems?

A model assessment system, synthesizing the elements in the analyzed systems, will be generated as a product of this research.

DEFINITIONS

Since there is some disagreement over the proper title to use, it seems feasible to use the two terms, performance based and competency based interchangeably as suggested by Andrews.[8] This study will use these terms interchangeably also. Other terms that need to be defined for this study follow.

The following definitions of Observing, Measuring and Evaluating, and Assessing, have been taken from Ways of Teaching by Ronald T. Hyman.

"Observing involves the intentional and methodical viewing of some object or activity. Observing is more than mere seeing; it entails planned, careful, focused, active attention by the observer.

Measuring is the assigning of numbers (quantitative values) to a set of people, objects, or activities, according to some established rules. Measuring is a descriptive activity that expresses quantitatively the degree or type of characteristic possessed by a person, object or activity.

Evaluating is the judging or rating of persons, objectives, or activities to be good or bad, right or wrong, worthy or unworthy, desirable or undesirable, etc. Evaluating is not, like measuring, a descriptive activity; it is the 'systematic process of judging the worth, desirability,

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[8]Theodore E. Andrews, Atlanta or Atlantis. (A Publication of the Multi-State Consortium of Performance-Based Teacher Education, 1973), p. 1.

effectiveness, or adequacy of something according to definite criteria and purposes. The judgment is based upon a careful comparison of observation data with criteria standards.'

Assessing involves comparison between given measurements, to determine to what degree the measurements meet given objectives or criteria. Assessing does not involve value judgments, since the objectives or criteria of comparison are simply accepted as given.

These four terms are obviously related to one another in that observing becomes one aspect of measuring, and measuring, in turn, is often involved in evaluating, though it is often used to obtain data upon which value judgments are based."[9]

Input Data are the various types and forms of data collected and fed into the data management system.

Output Data are the various types and forms of data generated by the data management system used for advisement and decision making.

"Criterion-referenced measures ascertain an individual's status with respect to some criterion or performance standard. Because the individual is compared with some established criterion, rather than with other individuals, these measures are described as criterion-referenced."[10]

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[9]Ronald T. Hyman, Ways of Teaching, 2nd edition, (Philadelphia: J. B. Lippincott Co., 1974), pp. 333-334.

[10]W. James Popham, Evaluating Instruction, (Englewood Cliffs: Prentice-Hall, Inc., 1973), p. 25.

"Norm-referenced measures ascertain an individual's performance in relationship to the performance of other individuals on the same measuring device. Because the individual is compared to some normative group such measures are described as norm-referenced."[11]

Formative evaluations are judgments of merit made relative to segments of a program.

Summative evaluations are judgments of merit made relative to an entire program.

Student advisor is an individual who is assigned the responsibility of monitoring a student's progress throughout the program, providing guidance and assistance when necessary.

Program developer is a person directly responsible for program revision.

Cooperating teacher is employed by a local school system and is responsible for supervising the student in the field setting.

Field experience is any learning activity that occurs off campus and is normally associated with a public school classroom. This would include a variety of activities, particularly student teaching.

Competencies - A description in performance terms of knowledge, skills, and attitudes that will enable a student to meet performance criteria for classroom teaching.

Module - A cluster of related objectives with its own pretest, posttest, and instructional strategies.

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[11] Ibid., p. 25.

Terminal Performance Objectives - Objectives which state what the learner is to be able to do at the end of instruction. They specify the standard levels of performance in behavioral terms.

Competency Based Teacher Education Programs. The following list of characteristics will be used as criteria in the analysis of the several data management systems. The list was produced by the AACTE Committee on Performance-Based Teacher Education. The first five are considered essential by the Committee. The remaining characteristics are considered as either implied or desirable. Those that are implied are assumed to exist as a consequence of the first five generic elements, which the Committee feels will qualify a program as PBTE or not. The desirable characteristics may or may not be found in a program, but are considered as desirable components of a PBTE program.

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 required 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.
6. Instruction is individualized.
7. The learning experience of the individual is guided by feedback. Feedback also provides information necessary for program revision. Feedback should be timely, comprehensive, and accurate.

8. The program as a whole is systemic. Most systems are product oriented. How accurately these products reflect the system's purpose is the critical measure by which we judge the system's operation.

9. The emphasis is on exit, not on entrance requirements.

10. Instruction is modularized. A module is a set of learning activities (with objectives, prerequisites, pre-assessment, instructional activities, post-assessment, and remediation) intended to facilitate the student's acquisition and demonstration of a particular competency.

11. The program is field-centered.

12. Because PBTE is systemic and because it depends upon feedback for the correction of error and for the improvement of efficiency, it is likely to have a research component; it is open and regenerative.

The impact of PBTE on teacher training programs should show:

a. much greater flexibility.

b. greater attention of specific skill training.

c. greater congruity between objectives and the evidence admitted for evaluation purposes.

d. better rationalization of faculty decisions and demands affecting students.

e. development of new facilities and technology required by PBTE.[12]

OVERVIEW

Much has been written recently on competency based teacher education. In Chapter 2, the pertinent literature on assessment and revision systems will be reviewed.

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[12]Stanley Elam, Performance-Based Teacher Education, What is the State of the Art? (A Publication of the American Association of Colleges for Teacher Education, December 1971), pp. 7-11.

The design of the study will be developed in Chapter 3. The procedure for selection of sample institutions will be explained. The variables to be examined in a competency based teacher education assessment and revision system will be established. A questionnaire addressing these variables will be presented. A description of methodology for analysis and treatment of data collected will be explained. Assumptions and limitations of the study will be identified in this chapter.

Chapter 4 will include the analysis of the data collected and the identification of relevant findings. The matrices for the analysis of the differences, similarities, advantages, and disadvantages among the sample institutions will be used.

An overview of the study will be presented in Chapter 5. This will consist of a summary, the conclusions, recommendations resulting from the study, and implications for future research.

Chapter 2

REVIEW OF THE LITERATURE

This study is devoted to the assessment/revision systems used by operational programs and the data management systems utilized to improve the efficacy of the programs. Particular emphasis will be given to concerns of assessment and revision. Since it appears the level of sophistication of the assessment and revision system dictates the level of complexity of the data management system.

Unfortunately most of the literature on competency based teacher education tends to be quite redundant. This also holds true for those sections discussing assessment and revision procedures. Considering this problem, the review of the literature will concentrate on a limited number of sources, but will explore a few of them in greater depth than would normally be the case. Those selected for in-depth treatment were chosen because of their comprehensive coverage of the subject.

The literature is replete with emphatic concern for a lack of assessment procedures appropriate for competency based teacher education. The concerns also express an apparent disregard for designing an assessment system prior to implementing a competency based teacher education program.

"There is a paradox in education that is hard to explain. It has often been noted that instructional developers may use highly sophisticated techniques in producing instructional programs, only to turn the programs over to management and evaluation systems which are not only outmoded, but in many cases antithetical to the vital processes of new programs. An examination of such a marriage should reduce the wonder regarding the early demise of so many promising innovations. PBTE is a promising innovation that also may fail because of the hostile environment in which it attempts to grow."[1]

This concern is clarified even further by Elam. "But the overriding problem before which the others pale to insignificance is that of the adequacy of measurement instruments and procedures. PBTE can only be successful if there are adequate means to assess the competency of the student. The bulk of the effort in establishing PBTE is most likely to go into the development of new instructional materials, into working out arrangements with the bursar and registrar, into devising ways for practicing teachers and administrators to share decision making, into moving the program into the field, and--most important of all--into developing ways to use faculty and librarians most effectively in the operation of unconventional modules in a conventional system. But

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[1]Castelle Gentry and Charles Johnson, A Practical Management System for Performance-Based Teacher Education (A Publication of American Association of Colleges for Teacher Education, February 1974), p. 29.

when all this is done, an institution will still not have moved beyond current conventional grading procedures unless new methods are found for assessing the complex cognitive and affective objectives which are such an essential part of the training of teachers. Yet this is the foundation stone on which the program rests. Knowing that all they must do is pass a given test, students are going to use those instructional materials that most help them do that and will give short shrift to those that don't. The program designed may think that certain content, theory, or experiences are good for the student, but if all the student must do is to pass the test, then the test controls his motivation and his learning activity. If we merely require him to encounter a variety of experiences regardless of the testing, we may have done little more than cut up old courses into new pieces.

Judging from modules that are currently being developed, evaluation appears to have been an afterthought. It is often crudely devised. The developers' energy, effort, and imagination have gone into producing the materials themselves, not into means of assessing mastery of them.

Thus, one of the elements of PBTE that seems likely to receive only the attention that is left after other needs are taken care of is the very one that is unique to PBTE and critical to its success--adequate evaluation. Unless there is a change of focus on the part of developers--perhaps a concentration of effort involving division of labor among

institutions in some kind of exchange network and unless the federal government, seeing this as necessary, provides massive new resources and support for the creation of adequate evaluation devices as well, PBTE may well fail to achieve more than a fraction of its potential."[2]

The lack of adequate assessment techniques is echoed by Andrews. "People believe that objective evaluation of a prospective teacher will reveal whether the person possesses the competency and whether the program is valid, but there is no evidence now available to indicate that assessment techniques are sophisticated enough to validate any programs."[3]

In fact there are those who predict that this task is considerably more formidable than many realize, as expressed by Schalock. "As experience with performance based teacher education has accumulated the interrelated problems of competency definition and competency assessment have come increasingly into focus. On the one hand it is recognized that teaching competence is something more than the mastery of knowledge and simple teaching skills or behaviors, but on the other it is recognized that as soon as the definition of competency extends beyond the knowledge and skill level, the matter of assessment becomes inordinately complex. In fact,

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[2]Stanley Elam, Performance-Based Teacher Education, What is the State of the Art? (A Publication of American Association of Colleges for Teacher Education, December 1971), pp. 21-22.

[3]Theodore E. Andrews, Atlanta or Atlantis, (A Publication of the Multi-State Consortium on Performance-Based Teacher Education, October 1972), p. 33.

in the eyes of many, it takes on properties that demand more from the technology of measurement and evaluation than that technology has at the moment to give."[4]

"Few competency based programs employ any but the most rudimentary assessment procedures, and fewer still have anything that could be called an assessment system at all. As yet there simply is no sign of an emerging technology of assessment that meets the demands of the competency based teacher education movement."[5]

Schalock goes on to say, "While the general neglect of the assessment function within CBTE is beginning to prove embarrassing, a greater threat to the ultimate success of the movement is the relatively limited concept that most persons in the field have of that function. By and large, the literature of CBTE tends to treat the problem of assessment as if it were equivalent to the problem of measuring teaching performance or 'teaching competency.' Given the emphasis that has been placed on the concepts of demonstrated performance, performance criteria, and the like within the CBTE literature, this is understandable, but it does not serve well the long-term needs of the movement.

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[4]H. D. Schalock, "From Commitment to Practice in Assessing the Outcomes of Teaching; A Case Study." (Paper presented at Multi-State Consortium on Performance Based Teacher Education, New Orleans, 1973), p. 1.

[5]H. Del Schalock, "Notes on a Model of Assessment That Meets the Requirements of CBTE," Exploring Competency Based Education, W. Robert Houston (ed.), (Berkeley: McCutchan Publishing Corporation, 1974), p. 210.

To be sure, measurement problems within CBTE are great. This is particularly so when performance criteria are defined in terms of the demonstration of complex teaching skills under ongoing classroom conditions, or the demonstrated ability to bring about short-or long-term learning outcomes in children. But no matter how complex the performance, measurement is not enough. In addition to the process of measurement judgments have to be made about what has been measured, and decisions have to be made on the basis of those judgments. Obviously, a central question is whether a particular performance meets criterion. But a host of other questions must be attended to as well, e.g., if performance does meet criterion what should be done next? In either case what should be done with the information about performance that has been collected? Who should see it? What form must it be in to be usable? How should it be stored?

In this writer's judgment, the issue of what to do with information once it is collected is as critical to performance based teacher education programs as the issue of what information is to be collected in the first place."[6]

Although the predictions are rather dismal, there is a note of optimism in the literature. McDonald suggests, "I assume that even small progress made in assessing teacher competence will be a great improvement over our present evaluations. Because I assume this, I am willing to urge

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[6] Ibid., pp. 210-211.

the use of procedures and systems which at the present time are limited or even defective--since I also assume that as we use what instruments and techniques are now available, we shall learn more about the nature of teaching competence and progressively improve our methods for evaluating it."[7]

A number of authors offer new directions for developing effective assessment systems. Joyce states,

> Assessment is focused on the program elements rather than on the teacher.
>
> Beyond the testing of the units themselves, it is unlikely that much useful data will come from isolated studies of the effectiveness of program elements or components. Very few modules and only a few major components are likely to account for a significant proportion of teacher behavior. However, the competency based teacher education format requires and makes relatively easy the testing of units (and their revision or replacement). The most important area to assess, however, is whether the program prepares teachers for specifically defined roles.
>
> There is a fork in the road in the near future for the assessment community as it approaches the problem of the competency orientation. It is possible to build an assessment system around the questions asked that are specific to program elements. Such an assessment system would have immediate use for tracking the progress of students and testing the strength of component elements.
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> However, as both McDonald and Schalock point out, it is far more important to search for trustworthy principles that can be used to guide future programs. Assessment systems can be designed to search for principles just as easily as they can be designed to test only specific elements of a program. For example, variations in feedback, modeling, task complexity, staff size, group size,

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[7]Frederick J. McDonald, "The State of the Art in Performance Assessment of Teaching Competence." (Paper presented at Multi-State Consortium at the American Educational Research Association Convention, New Orleans, February 2973), p. 1.

> type of feedback, etc., can be researched if the assessment system is designed to permit them to be studied conveniently. It is important to establish principles for several reasons. In addition to the obvious ones that are needed to learn what will work in teacher education, there is the need to establish the reliability of elements so that we do not have to test every student's acquisition of every behavior that is specified in the program. If we have reliable principles on which to build components, then we can predict that trainees will achieve certain levels of performance if components are built around those principles. We do not necessarily have to assess its outcome every time it is used or for every trainee within a program.[8]

There are a variety of ideas suggested to assure the development of an effective assessment system, which would compliment the promise of precision considered vital to the competency based teacher education movement.

Michael Scriven states that CBTE wears its credentials on its sleeve.[9] He is making obvious reference to the performance objectives, with their precise statements of behavior or products of behavior and the criteria by which they will be judged. Davies elaborates on this topic by identifying the essential requirements for effective learning. "If a student or trainee is to realize the learning objectives with which he has been tasked, then it is necessary to ensure that three basic requirements are met:

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[8]Bruce Joyce, "Assessment in Teacher Education: Notes from the Competency Orientation," Exploring Competency Based Education, W. Robert Houston (ed.), (Berkeley: McCutchan Publishing Corporation, 1974), pp. 205-206.

[9]Michael Scriven, "If the Program is Competency Based, How Come the Evaluation is Costing so Much?" Competency Assessment, Research, and Evaluation, (A Report of a National Conference, University of Houston, March 1974), p. 155.

1. He must know exactly what is expected of him. Unfortunately, in most teaching situations, students are rarely given any precise and concrete information about what is going to happen to them, and what they are going to learn to do. It is not surprising therefore, that a student's view of what is necessary, may be very different to his teacher's view of the same situation.
2. He must be given an opportunity to learn. This is just too obvious. Yet some teachers and instructors behave in such a way as to make learning difficult, if not impossible. An opportunity to learn involves freedom to accept responsibility for one's own learning, freedom to exercise initiative, and freedom to work within the full limits of authority delegated to a student.
3. He must know what progress he is making. This means that his progress in realizing learning objectives must be constantly monitored, and the results immediately fed back to him in a form that is meaningful to both short-term and long-term action. The only really effective way of fulfilling this need is by means of regular and detailed counselling and guidance. This means that teachers are committed to discuss a student's successes and failures in realizing his learning objectives. There is little point in talking to students about such things as the need for hard work, the importance

of trying, and the virtue of being interested; only effectiveness converts resources into results.

Hard work is futile when effort is directed at realizing unimportant or unnecessary learning objectives--particularly when it is done at the expense of objectives which are important.

In order to ensure that such a waste of time and effort does not occur, the importance of a teacher's role cannot be overemphasized. Not only must a teacher define learning objectives and ensure that they are indeed being realized, but he must also discuss them with his students in order to secure and maintain their personal involvement and participation in the learning process. It is possible to talk about the importance of student motivation. It is functionally more useful to gain a student's commitment to a set of agreed objectives."[10]

Davies is indirectly giving direction to the use of assessment data in his requirement number 3.

Other directions are offered to help guide the development of more appropriate assessment systems. Massanari says, "Because CBTE emphasizes competencies and objectives, individualization of instruction, reconceptualization of faculty roles, effective use of the schools, new kinds of training materials, and assessment, new kinds of management procedures are needed to facilitate effective

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[10]Ivor K. Davis, Competency Based Learning: Technology, Management, and Design, (New York: McGraw-Hill Book Co., 1973), p. 234.

operation. A related characteristic is periodic review and modification of the management system based on experience.

While assessment has always been problematic for educators, it is particularly critical for CBTE. CBTE is heavily process oriented because it emphasizes the demonstration of competence. Implementation of CBTE requires assessment techniques to determine the appropriateness of given program competencies, the achievement of the selected competencies, the effectiveness of training materials and procedures, and the effectiveness of program management. CBTE pushes educators to obtain or develop assessment techniques which are applicable to all of these program elements. It pushes them both to develop new assessment techniques and to make clear to the profession and to society that new kinds of assessment techniques are needed and will be used. CBTE pushes educators to break through the narrow assessment boundaries imposed by the scarcity of available techniques."[11]

"Valid assessment instruments are necessary for making that determination, and the measures in that instrument must be directly related to the instructional objective. Put another way, a CBTE program that does not have a match between its instructional objectives and primary criteria

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[11]Karl Massanari, "CBTE's Potential for Improving Educational Personnel Development," Journal of Teacher Education, XXIV, Fall 1973, p. 247.

for determining how well those objectives are met, does not have a competency-based teacher education program."[12]

"The competency-based or performance-based concept is currently viewed by many as a potentially useful educational innovation. It is our contention that competency-based teacher education has certain advantages over other forms of teacher education, but that the odds for its survival are not particularly good.

Previous educational innovations have failed because of the type of criteria applied to them. "Primary criteria," designed to measure the direct effects of instruction on the behavior of the learner, were seldom used. "Secondary criteria," like teachers attitude, administrative convenience, amount of Federal or foundation funding, or popularity of the instructional approach, were used instead. Ironically (considering its meaning), competency-based educational programs are currently evaluated by secondary criteria."[13]

"Whereas nearly all efforts at assessment have in the past been oriented toward the study of the teacher-searching out the most and least effective--the focus in competency based teacher education assessment is the program itself. The program has to be assessed--in terms of particular elements, components, and the totality--in order

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[12]Cass Gentry and others, "For Want of an Assessment System, CBTE Programs are Lost," (Published by the Multi-State Consortium on Performance-Based Teacher Education, Vol. 3, No. 3, September 1974), p. 1.

[13]Ibid., p. 1.

to build a reliable CBTE system whose output of competencies can be assessed in its turn. If there is to be really meaningful within-program assessment, an assessment system has to be built that will yield data about components, units, or modules within components and the program as a whole, all on an ongoing basis which is linked to program renewal and redefinition."[14]

"It is anticipated that the advisor report for both selected and constructed response type objectives will be used to perform at least these three primary functions: (a) early identification of student difficulty, (b) serving as a detailed data source for the advisor in working with the student, (c) providing data on a continual basis to indicate student growth through the program."[15]

"Operationally, an assessment system that serves decision-making must contain specifications on what is to be assessed, standards by which to judge what is assessed, who is to be involved in making judgments about performance as it relates to standards, and rules that spell out what is to occur if performance standards are or are not met. In addition the system must have the data generation, reduction, storage, retrieval, and distribution capability implied by such specifications, including the decision-making structures needed to match data, time, people, decisions, and decision

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[14]Joyce, Op. cit., p. 204.

[15]Gentry and others, Op. cit., p. 8.

schedules. Finally, an assessment system that serves decision-making must contain a well-worked-out design that permits it to interact functionally with the program it supports and with the elements of the program that in turn supports it. Without this close articulation, either the program will function in splendid isolation, or the assessment system will fail to function because of its isolation."[16]

"Management by teams rather than by complex computer management systems is favored. Perhaps the overriding reason is the team structure provides the opportunity to humanize teacher education. This is so because the team structure:

1. Provides supportive relationships among students and between students and faculty.
2. Provides for curriculum building which can focus on the needs of that particular group.
3. Provides for a close counseling relationship that can more adequately personalize a teacher education program.
4. Allows for participation by students, staff, and public school personnel in decision making at a meaningful level."[17]

But Schalock cautions, "Just as CBTE programs are to be continuously adaptive, so must the assessment system that supports such programs also be adaptive. In the language of systems theory, an assessment system must be an "open" system."[18]

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[16]Schalock, op. cit., "Notes on a Model of Assessment Meet the Requirements of CBTE," p. 218.

[17]Gilbert F. Shearron and Charles E. Johnson, "A CBTE Program in Action: University of Georgia," Journal of Teacher Education, XXIV, Fall 1973, p. 192.

[18]Schalock, op. cit., "Notes on a Model of Assessment That Meets the Requirements of CBTE," p. 218.

Schalock continues along this line of thought when he adds, "The point is that the student assessment system must be adaptive to such variation in demonstration contexts, and yet at the point of application in these varying contexts be 'closed' to the point where reliable, trustworthy information can be obtained on each student's performance."[19]

It becomes increasingly obvious that the data management system must be analyzed in terms of the data it processes. It also becomes obvious that the demand for a sophisticated data management system is a direct product of the level of sophistication of the assessment and revision procedures developed. Three data management systems will be cited to show how these institutions differed in their approach to data management.

First, Florida International University developed a computer management system (COMSPEC) with the following objectives.

1. Establishment of a record for each student which includes his planned program of studies (course prescription) and his progress through courses in terms of modules, tasks, and enablers which comprise each course.
2. Reporting to instructors, on a weekly basis, the performance of students in their courses, the reports indicating which enablers, tasks, and modules were attempted and completed by each student. Weekly

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[19] Ibid., p. 219.

reporting on enabler data is optional, being included only at the request of the instructor.

3. Establishment, by instructors, of certain criteria regarding individual student progress on tasks and modules which, if not met, should be reported to them so that they may respond more quickly to difficulties students may be having. A report of this kind is referred to as a Red Flag Report. A Red Flag Report may include, for example, a listing of all students who have unsuccessfully attempted a task two or more times.
4. Providing advisors with a list of students who have registered for courses not included in their original course prescriptions.
5. Providing advisors with a list of students who are carrying one or more No Credit Grades.
6. Establishment of a data base of student performance for the purposes of long-range planning and evaluation of programs in the School of Education.[20]

Secondly, Oregon College of Education addressed its system as follows: "Assessment was seen in the context of the OCE program, therefore, as a mechanism that supports decision making. Put in other terms, it was a targeted information system. Two major classes of decisions were to be served by the system, instructional decisions and program adaptation or design (management and policy) decisions.

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[20] G. Wesley Sowards, "One Year in Retrospect," Published by Multi-State Consortium on Performance-Based Teacher Education, November 1973), p. 11.

Given this concept of assessment, the system was to include measures of teaching competency; performance standards for competency demonstration at particular levels of certification or precertification experience; specifications as to the decisions to be served by particular measures of competency; specifications as to the structure of mechanisms to be employed in arriving at particular classes of decisions; specifications as to the form which the data were to assume to facilitate each particular class of decisions and an information reduction, storage and distribution/retrieval system that permits the efficient handling of the data that comes from the system."[21]

It is interesting to note that the FIU system was almost completely handled by electronic data processing equipment, while OCE handled all the data by hand except summary information, which was stored in a computer for further analysis.

Thirdly, the University of Toledo felt that it would take years to implement all the specifications previously developed into an operational system. Earlier studies had been concerned only with developing a competency based elementary teacher education program. The decision not to wait years and to incorporate the secondary level, required a management system different than previously thought.

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[21] H. D. Schalock, op. cit., "From Commitment to Practice in Assessing the Outcomes of Teaching; A Case Study." p. 9.

"Several principles and rules were adopted for guiding the management system. The most powerful of these we call the 'Principles of Successive Approximations.' Because we were not able to begin our program at the validity and reliability level necessary for a competency based program, we decided to carefully identify the starting condition of the different elements of our program, and to just as carefully determine the necessary steps those different elements would have to go through in order to meet the requirements of a competency based program. In addition, we decided to set up a time line designation when, who, and with what each of the progressive steps would be carried out."[22]

"The use of the Principle of Successive Approximations requires additional conditions for our management system. For one, it requires a well defined assessment system that can pinpoint parts of the instructional system that are effective and efficient, and those which need to be improved. By the same token, our management system must have a revision component that will act on the assessment data to improve the instructional system.

This brings us to a unique characteristic of a management system that is used to develop and maintain a CBTE program through successive approximations. That is, given its imperfect state when first implemented and the intent of the faculty to have it evolve into a truly

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[22]Castelle G. Gentry, "Management System For A Competency Based Teacher Education Program," University of Toledo, (Typewritten), p. 2.

competency based teacher education program, the CBTE management system must maintain continuous assessments and revision processes. This differs from most educational management systems in that most of their energies go to maintaining a system once it is in operation. Our management system must not only maintain the current approximation, but it must collect data for the next approximation, provide resources for the modification of the current approximation, and install the next approximation. None of these tasks occur by chance, and none of them occur without resources and personnel assigned expressly for the completion of those tasks."[23]

"The intent of this successive approximation of our PBTE evaluation system is to provide data which will aid the effective advisement of our students, and to identify ineffective, inefficient, and irrelevant portions of our program so that corrections can be made. Such an evaluation program must also indicate necessary changes in the program organization and the management of the program, as well as changes in the modules of the program. We think this continuous process of assessment and revision will bring existing evaluation approximations ever closer to the ideal evaluation system and, more importantly, toward a valid and reliable program for preparing teachers."[24]

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[23] Ibid., p. 4.

[24] Castelle Gentry and Charles Johnson, op. cit., p. 35.

Influences In The Development of CBTE

It is reasonable to assume that competency based teacher education is a result of many influences. Three of the more recent influences will be identified and explained in this section. First, mastery learning as proposed by Bloom, was explored to point out the similarities to the competency based movement.[25] Mastery learning requires an established level of achievement to be reached by every student. It also recommends that the program be structured to meet the needs of the individual student. Bloom also stressed the need for timely feedback and corrective procedures. It was decided that brief diagnostic-progress (formative) tests were most useful for feedback to both teacher and student. The test results were not used for grading, but were specifically designed for guidance purposes. Bloom asserts, "The success or failure of mastery learning is clearly related to the degree of efficiency of the formative tests in pinpointing the learning needs of the student."[26] A finding, of major importance, was that the elimination of competition between students for grades created a more positive learning environment. The students became cooperative in helping each other attain mastery.

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[25]Benjamin S. Bloom, "An Introduction to Mastery Learning Theory," Schools, Society, and Mastery Learning, New York: Holt, Rinehart and Winston, Inc. 1974, p. 5.

[26]Ibid., p. 5.

The second strategy explored was Keller's Personalized System of Instruction.[27] PSI is an approach to teacher education, which is quite similar to mastery learning. Instead of addressing the components and procedures which are common to competency based education, mastery learning and personalized system of instruction strategies, the major differences between mastery learning and PSI will be identified. This possibly suggests the influences which could account for differences which appear in the design of some CBTE programs. The first difference lies in their conception of mastery. Bloom believed that a comprehensive test should determine mastery. He did not believe that mastery of the parts of a course was synonymous with mastery of the whole. Keller felt that mastery of the parts of a course was synonymous with mastery of the whole course.

Keller also used smaller learning units. The units would consist of one week's work or even less. Bloom's units usually were about two weeks in length. PSI used individualized instruction while mastery learning as Bloom conceived it, was group paced.

The type of feedback tests in PSI were more descriptive as he used a variety of formats for testing, but his tests tended to sample only student achievement. The tests were a random selection of items intended to measure

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[27]James H. Block, "A Description and Comparison of Bloom's Learning for Mastery," Schools, Society, and Mastery Learning, New York: Holt, Rinehart and Winston, Inc., 1974, pp. 15-24.

the units objectives, whereas Bloom's tests were comprehensive. The last major difference was that PSI demanded total mastery of each unit, while Bloom established lower levels of mastery, usually falling between eighty and ninety percent accuracy. There are competency based programs that are using strategies based on either Bloom's or Keller's version of mastery learning. All CBTE programs are using strategies common to both approaches.

The third influence was not an educational strategy, but certainly hastened the development of educational programs, which could provide empirical evidence of the school's role in student learning. The accountability movement was eventually to merge into a chorus of discontent. As to the genesis of the movement, it is difficult to identify a single source and may be of no particular interest at this point in time. More important, is that educators, government, departments of education, and the public are all very concerned about the school's responsibility for positive growth in student learning and that the schools be held accountable. As the movement has gained momentum, collaboration of various groups concerned with accountability was inevitable. "Although systems technologists and behavioral objectivists started their reform movements separately, it was, as Erick Lindman states, 'inevitable that they should discover each other and find they had much in common.' Combined with the pressure of the time, the notion that accountability could and should be more

rigorously applied to education has gained currency. Why should persons employed by the public to provide a service (and given considerable latitude in determining how and under what conditions that service will be rendered) be exempt from standing to account for the results of that service?

It is not likely that the premise of this argument will be seriously (or at least openly) challenged."[28]

Although arguments against accountability do, in fact, occur, it is not the intended spirit of the movement that is resisted, but rather the difficulties in implementing an accountability system. Gronlund states, "This diagram makes clear that teacher competence is just one of many factors that determine student learning. The mental ability and past achievement of students sets limits on their level and rate of learning during instruction, and their attitude toward school and learning determines how wholeheartedly they enter into the learning experience. The quality of the instruction itself is determined not only by the competence of the teacher, but also by the facilities and resources that are made available to the teacher, by the support provided by the administration (e.g., supervision), and by special services (e.g., remedial reading, counseling). One of the major elements in the effectiveness of instruction

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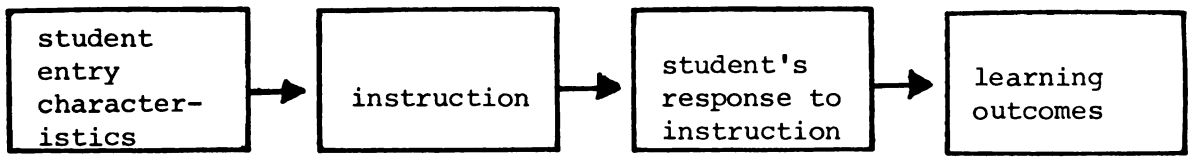
[28]Lesley H. Browder, Jr. and others, Developing an Educationally Accountable Program. Berkeley: McCutchan Publishing Corporation, 1973, pp. 15-16.



mental ability, past achievement, attitude	teacher competence, facilities, resources, administration support, special services	community influences, home influences, peer-group influences, self-concept, aspirations, interests

is the student's response to it. Although the teacher has a certain amount of control over the motivation of the student, this is shaped to a large extent by the student's present and past community and home environments; the attitudes of the peer group; and the student's self-concept, aspirations, and interests. A recent review of research into the factors related to students' school performance has shown that the variables bearing the strongest relationship were of a nonschool nature (Wilbur, 1970). The fact that teacher effects can be submerged by these other factors is supported by studies showing that the amount of student learning brought about by a particular teacher varies considerably from one group of students to another (Rosenshine, 1970)."[29]

In spite of the arguments pro and con, no doubt exists as to the importance of the pressure brought to bear

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[29]Norman E. Gronlund, Determining Accountability for Classroom Instruction. New York: Macmillan Publishing Co., Inc., 1974, pp. 9-10.

on the educational community. This pressure is evident in the attempts to develop teacher education programs that can answer the challenge of accountability. The competence based teacher education movement holds much promise in this regard.

SUMMARY

In review of the literature on assessment, evaluation, and data management systems in competency based teacher education programs, the following concerns have been identified:

1. There is a general neglect in developing assessment and revision systems structured specifically for CBTE Programs.
2. Assessment techniques are not sophisticated enough to validate any program, particularly beyond the assessment of mastery of knowledge and simple teaching skills or behavior.
3. Assessment should be addressed to teaching competence in a demonstration context in addition to the assessment of program components.
4. The need exists for assessment systems to search out principles that can be used to guide future programs.
5. The need is for assessment feedback so that student can monitor his own progress.
6. There must be a precise match between stated objectives and the criteria used to measure how well those objectives are met.

7. The need is for "Primary Criteria" designed to measure the direct effects of instruction on the behavior of the learner.
8. The assessment system should serve to improve the efficacy of decision making.
9. There is a need for the development of decision-making structure to match data, time, people, decisions, and decision schedules.
10. An assessment system that serves decision-making must be so designed that it can interact functionally with the program it supports and with the elements of the program that in turn support it.
11. CBTE programs should be continuously adaptive, including the assessment system.
12. Since a CBTE program should reasonably generate an enormous amount of data, it will require a data management system capable of data reduction, storage, retrieval, and distribution sophisticated enough to serve the needs of the program.

Chapter 3

DESIGN OF STUDY

INTRODUCTION

This research was designed to determine the current state of assessment and revision components of competency based teacher education programs, as exemplified by five recognized, operational programs. In addition, this study identified the structures and procedures of the data management systems of these programs, as they were used to store, manipulate, and distribute the data collected by the assessment and revision systems. This information from the five programs was analyzed to determine significant elements for a model system, which could serve as a guide to developing competency based teacher education programs.

RESEARCH QUESTIONS

In order to make the above determinations, information on the following specific research questions was collected.

1. What are the similarities and the differences among the systems studied?
2. What are the variables having the most influence on the relevance, the effectiveness, and the

efficiency of a competency based teacher education assessment and revision system?

3. What were the major problems encountered in the development of competency based teacher education assessment and revision systems?

SELECTION OF PROGRAM VARIABLES

The selection of the program variables relating to the assessment and revision components of the operational programs to be studied, was based on the following criteria:

1. The AACTE Committee on Performance-Based Teacher Education list of characteristics used to determine whether a program is PBTE or not. (See Appendix A)
2. Identification of a number of concerns regarding assessment and revision procedures from reviewing the literature.
3. On the basis of logic, the apparent appropriate characteristics to enhance the effectiveness and efficiency of any system.

Using the preceding rationale, judgments were made in the selection of variables to be analyzed in operational competency based teacher education programs. Those selected were:

1. Instruments used for data collection
2. Types of data being generated by the system
3. Sources of input data
4. Destination of output data

5. Various forms of output data
6. Intended use of output data
7. Efficiency of data management system
8. Physical characteristics having impact on system
9. Difficulties encountered making transition to CBTE
10. The internal structure variables having inpact on system
11. Proposed revisions or modifications

The above concerns were analyzed in terms of the similarities and the differences that exist among the sample institutions.

INSTRUMENTATION

Five institutions were selected as the sample for the study. Each had a fully developed competency based teacher education program and had incorporated electronic data processing for the management of the assessment and revision data. These five institutions were selected by judges, considered to have expertise in the area of competency based teacher education.

Survey of judges

The judges were selected on the basis of acquired recognition at the national level. The minimum criteria were identifiable expertise in the implementation of a competency based teacher education program and association with the development of the assessment and revision component. The majority of judges exceeded the minimum

criterion, by having served on the AACTE Committee on Performance Based Teacher Education or having been presenters at national conferences on competency based teacher education. All judges have published articles or monographs, which dealt with assessment/revision and/or data management systems in competency based teacher education.

The following sixteen judges were selected.

	Name	Institution
1.	Dr. Hugh Baird	Brigham Young University
2.	Dr. Fred Cook	Wayne State University
3.	Dr. George E. Dickson	University of Toledo
4.	Dr. Norman Dodl	Florida State University
5.	Dr. William Drummond	University of Florida
6.	Dr. Thomas G. Dunn	University of Toledo
7.	Dr. Paul Gallagher	Florida International University
8.	Dr. Castelle Gentry	Michigan State University
9.	Dr. Robert Houston	University of Houston
10.	Dr. Charles Johnson	University of Georgia
11.	Dr. Lorrin Kennamer	University of Texas at Austin
12.	Dr. Karl Massanari	American Association of Colleges for Teacher Education
13.	Dr. Donald Orlosky	University of South Florida
14.	Dr. Rita Richey	Wayne State University
15.	Dr. Del Schalock	Oregon College of Education
16.	Dr. Gilbert Shearron	University of Georgia

A preliminary survey to identify potential institutions was made by reviewing the literature. The purpose of the preliminary survey was to identify several institutions that appeared to have fairly sophisticated competency based teacher education programs. The names of these institutions would be included in the survey instrument in an attempt to gather information regarding an institution's acquired reputation in the literature and how they were rated by the judges. Of particular interest was the level of agreement regarding the sophistication of assessment components of the potential

institutions among the experts associated with each institution and the other experts. This is regarded as an indication of the level of communication between institutions. Each institution identified was represented by a judge.

A cover letter was sent to these sixteen judges, indicating the purpose of the study. The letter solicited their cooperation in identifying appropriate institutions whose data management systems used to service assessment and revision information and decision making, would be analyzed in this study. (See Appendix B)

The judges were asked to respond to the following statement:

> The following institutions have been suggested in a preliminary survey as mature programs that may have a sophisticated system for managing their program data. Would you please react to these suggestions and more importantly, add to the list below, those competency based teacher education programs that you think are using an electronic data processing system for the management of assessment and revision data.

(See Appendix C)

The responses from the judges were to be converted to a numerical value. Given the following options, the value of each is indicated on the right.

Lack information (=0)

Beginning stage of development (=1)

Moderately well developed (=2)

Well developed (=3)

The scores for each institution listed were totaled and then placed in rank order. The five top institutions were selected for analysis purposes.

Interview Instrument

For purposes of analysis, an interview instrument was developed. A visit to each selected institution was made in order to tape record elaborate and in-depth responses. The questionnaire was used to insure the replication in data gathering. (See Appendix D) The questions to be included covered the following:

A. Questions directly related to the structure of an assessment and revision system.

B. Questions indirectly related, but considered to be influential in the development of an assessment and revision system.

C. Questions directly related to data management of assessment and revision data.

D. Questions that are neutral in relationship to the assessment/revision system and the data management system, but have impact on the overall structural development of a competency based teacher education program.

It was felt that the questions to be asked would be divided into four distinct categories.

Category one is concerned with environmental conditions that existed during the implementation stage. These conditions are ones that exerted some identified influence, not only on the initial stages of implementation, but also on the total program. For example, lack of financial support or faculty resistance is considered environmental conditions or constraints.

Category two is concerned with program characteristics. These are the structural components making up the entire competency based teacher education program. For example, it could include the method used to handle advisement. Does an institution use a group of advisees assigned to a single advisor or are the advisees assigned to a group of advisors, depending on program? Are the students required to move sequentially through the program?

Category three is directly concerned with the assessment and revision system. For example, what is the time lapse between student assessment and feedback to student? Another would be, how many times may a student take a posttest?

Questions in category four deal with the data management system. For instance, are all data processed by electronic data processing equipment? And, how is data stored?

The validation of the interview instrument was accomplished through four means. First, a list of common assessment and revision concerns were extracted from the literature. Secondly, a review of the instrument by selected experts was made. These experts were asked to read and critique the survey instrument. They were: Dr. John Doneth, Ferris State College; Dr. William Klingele, University of Arkansas; and Dr. Castelle Gentry, Michigan State University.

A third means of validation was through consultation with Dr. John Schweitzer of the Office for Research Consultation at Michigan State University, who reviewed the instrument and made comments. Fourth, any new relevant questions were added to the interview instrument after each visit to the selected institutions. These questions were products of the concerns of the experts at these institutions. Then telephone calls were made to update the data received from previous interviews, so that all questions would be answered by the five institutions.

Treatment of Data

The questions from the survey instrument are clustered according to an identified concern and then placed in a matrix. The response relative to each question is recorded for each institution interviewed. (See sample matrix on following page.) A series of matrices are presented, each with its interrelated cluster of questions. The content of the matrices is limited to questions relative to assessment and/or revision, and to the data management system.

The concern stated for each cluster will be related to one or more criteria identified as necessary or implied to qualify as a competency based program. Where differences in responses appear, whether structural differences or procedural differences, the rationale supplied by the deviant institution will be provided.

CONCERN: Individualizing Instruction

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
1. Do pretests determine exemption from part of program?					
2. Can pretests exempt students from entire program?					
3. Are there any time constraints for student completion of a learning module?					

Figure 1 Sample Matrix

A search for commonalities will be made. If these commonalities are consistent with the AACTE criteria and appear to have potential to enhance a competency based teacher education program, then they will be considered for recommendations to be included for the model to be developed. This does not necessarily mean that a deviant procedure would be excluded because of its lack of commonality. Innovations frequently appear in isolation from procedures and strategies in common use.

The model will only include those items which could be considered applicable to programs in general. The model will exclude elements that are considered products of institutional peculiarities, school policies which are not generalizable, procedures which are a result of implementation of state law, and practices resulting from limited resources.

SUMMARY

The research questions for this study were stated and the selection of program variables was made based on criteria set by the AACTE and concerns found in the literature. A list of variables in operational competency based teacher education programs was selected to be analyzed.

A panel of experts was asked to identify institutions having acquired some sophistication in their data management system for assessment and revision procedures. The responses were ranked and the five highest ranked institutions were

surveyed. The responses to a questionnaire were organized into matrices developed to determine similarities and differences. The comparisons were then used to determine their potential value for ultimate inclusion of their respective variables in a model assessment and revision component for competency based teacher education programs.

Chapter 4

ANALYSIS AND RESULTS

A compilation of the findings of the study is reported in this chapter. First, are the findings of the survey of judges. Then, the results of the interview instrument are reported. Discussion of data from the interview instrument follows the presentation of each group of findings. The chapter concludes with a summary of all data presented.

SURVEY OF JUDGES

The use of judges was considered important because it was felt that with their involvement in developing competency based teacher education programs and with the competency based teacher education movement in general, they would be familiar with existing programs. The intent was to tap this source of knowledge to identify those institutions to be included in the study.

Of the sixteen judges that were listed in Chapter 3, replies to the survey letter were received from twelve. Data from the survey instrument (see Appendix C) from these twelve replies showed that the following institutions received the highest ratings. Values were given to the responses; Well developed = 3, Moderately well developed = 2, Beginning stages of development = 1, Lack information = 0.

Institution	Number of points
University of Toledo	21
University of Houston	16
Oregon College of Education	15
Florida State University	13
Wayne State University	9
University of Georgia	9

The complete listing of all institutions is in Appendix E.

For the fifth position, Wayne State University and University of Georgia were tied. Of the two institutions, it was decided to visit Wayne State University because their representation had perceived their own program to be well developed in the use of electronic data processing equipment for the management of assessment data, while the representation from the University of Georgia perceived their program as being only moderately well developed.

The examination of the intercommunication among the institutions queried resulted in some findings that were contradictory:

1. An institution which had acquired, through numerous publications and representation at national conferences, a great deal of visibility was perceived by other judges as having a fairly sophisticated data management system, while representatives of the same institution classed themselves as being in the beginning stages.

2. An institution which had hosted several national competency based teacher education conferences and had been

in attendance and in contact with experts across the country, but had not published, was perceived by the other judges as just beginning to develop their data management system for assessment and revision data, while representation of the institution described their program as well developed.

There appears to be a general lack of direct communication and sharing among major CBTE institutions. This finding was demonstrated by the inconsistency of responses by experts regarding various institutions. For example, one institution was rated by five individuals saying they lacked information, while five others said the institution had a moderately or well developed data management system. The data management system for that same institution has a recognized acronym (SIMS) and has been well presented in a national publication.[1]

INTERVIEW OF INSTITUTIONS

Representatives from each of the five selected institutions were contacted and agreed to participate. At each institution, a meeting was scheduled with a person responsible for the operation of the data management system for assessment and revision data. During each interview, the questions from the questionnaire were asked in the same sequence, as a means for reducing variance in the data collection process. So that the dialogue would progress

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[1]John R. Bonar and Walter Dick, "Development of a Computerized Management Information System for Teacher Education Programs," Educational Technology, February 10, 1974, pp. 41-44.

smoothly without interruption, a cassette tape recorder was used during the interview. This enabled the respondent to elaborate freely as he answered each question, and also eliminated the need for hand recording of detailed answers. The data from the tape and any hand recorded notes were combined at a later date to complete an institutional profile.

All the information relevant to data management, assessment, and revision was placed in matrices for purposes of comparison. The matrices were divided into broad areas of concern. The findings of each area of concern will be presented in the following sections of this chapter. The five institutions will be referred to as A, B, C, D, and E.

Qualifying as Competency Based Teacher Education (Appendix F, Matrix 4.1)

The questions in Matrix 4.1 were asked in order to determine what extent the teacher education programs of the five representative institutions are competency based. The representatives of Institutions C and E said that their teacher education programs are totally competency based. At Institution A, by faculty choice, some classroom instruction is not competency based. Institution B has only the field based experiences at the elementary level totally competency based by meeting the criteria of the AACTE. The representative from Institution D stated further that their long term goal is to complete an individualized tract for the entire program.

Only at Institution A are students required to move sequentially through the teacher education program. Only Institution A is running a second teacher training program that is parallel to their competency based teacher education program. All institutions represented have multiple entry points for students, except Institution A.

When asked, "What portion of your program is modular?" and "Do you feel the entire program should be modular?" the representative answered:

Institution A - 50 percent is modular and all shouldn't be modular.

Institution B - All field based experiences are modular and all should be.

Institutions C, D, and E - All of program is modular, as it should be.

At Institutions C, D, and E, all units of instruction are based on stated performance objectives, whether modular or not. At Institution B, all units are not, and at Institution A, most of the units of instruction are based on stated performance objectives.

Alternate delivery systems are available to some extent at all institutions, except at Institution E. One hundred percent of the modules have alternate delivery systems at Institution B; 25 percent are available at Institutions A and C; and 35 percent are available at Institution D. Representatives said that all of their institutions plan to develop additional alternative delivery systems, except at Institution A.

Three of the five institutions qualify as being totally competency based within the framework of the AACTE criteria. At the fourth institution, there are some units of instruction not competency based by faculty choice. The fifth institution has begun to convert the rest of their program to competency based teacher education.

Advisement (Appendix F, Matrix 4.2)

The question, "Is a specific advisor for the competency based teacher education program assigned to each student?" was asked in order to determine if this means of providing continued responsible feedback to the student was available, under the assumption that such feedback is a necessary prerequisite for any CBTE program. Representatives from Institutions A, B, and C answered yes; Institution D said yes, advisors are assigned every quarter; and the representative from Institution E answered no. For meetings between advisor and student, only Institution A has regularly scheduled meetings, daily, weekly, monthly, and quarterly. Institutions B, C, and E have no scheduled meetings, while the representative from Institution D said that it varies from course to course. Requested meetings for advisement are available at all institutions and can be initiated by advisor, student, instructor or school supervisor. The number of advisees for each advisor varies from 15 at Institutions B and D, 20 at Institution A, and 20-25 at Institution C.

When asked if each tested for entry personality characteristics, the representatives from Institutions A,

B, and C said yes, the representative from Institution D answered yes, but informally, while the representative from Institution E said no.

Individualizing Instruction (Appendix F, Matrix 4.3)

The first question in this series dealt with prerequisite skills. All of the institutions, except Institution B, test students for prerequisite skills. When asked if they would admit students lacking in some skills, the respondents from Institutions A, B, C, and D said yes, but Institution D's representative qualified the answer by adding that if this were in language skills deficiency, a student must correct the deficiency by enrolling in a remedial English class. Institution E does not admit students who lack prerequisite skills.

Institutions B, C, and D administer pretests that can determine point of entry into their programs. Of these three, D has pretests that vary from module to module and some modules have the same entry point for all. At Institutions A and E, pretests can not determine student entry point into programs. Pretests may exempt students from part of the programs at Institutions B, C, and E. At only one of the five institutions, Institution E, is it possible for a student to be exempt from an entire program on the basis of pretest scores.

Time constraints for completing learning packages are placed on students at four institutions, A, B, C, and D. Of these, the representative from Institution A said these were not severe constraints. Institutions B and C have no

hard rules, just judgment of the instructors or others associated with the program and at Institution D, institutional policy sets the time constraints. There, a grade of Incomplete may be given if objectives of a learning module are not mastered satisfactorily and the limits of the Incomplete grade are set at two additional quarters. The Incomplete grade must be removed within the two quarters or else it is replaced with a Failure grade. The fifth institution sets no time limits on completing an institutional package.

For completion of the entire program, Institutions A, B, and D do not have precise policies. If students do not complete their requirements within reasonable limits, they would probably be counseled out of the program. At the other two institutions, there are no time constraints for the completion of an entire program, but at Institution D, undue delay may result in an attempt to counsel a student out of the program. The representative of Institution E said that no time limits are placed on students for the completion of an entire program, as well as none on any learning package.

Three institutions, A, C, and D have special facilities for their programs, including testing labs and learning labs, as well as microteaching facilities. Institutions A and C also have one way glass facilities, and A has television monitors available for self-evaluation and for observation by others. Institution D also has a materials lab and an equipment lab. Institutions B and E

have no special facilities available, beyond those that are normally found among traditional programs.

The next two questions dealt with the pacing of modules. The questions asked were, "What percent of your modules are group paced?" and "What percent are self-paced?" At Institution A, 50 percent are group paced and 50 percent are self-paced, with the latter creating many management problems. At Institution B, 50 percent are group paced in the knowledge and skills area and 50 percent are self-paced in the field setting. Institution C has 60 percent of the modules group paced and 40 percent are self-paced. The representative from Institution D answered that the modules are 100 percent group paced and also 100 percent self-paced through recycling. Institution E has no group paced modules, and all modules there are self-paced.

Criterion Referenced Testing (Appendix F, Matrix 4.4)

When asked, "What percent of your objectives are matched with specific strategies and criterion items?" all answered that 100 percent are matched. However, Institution A amended the statement by adding that this is the intended target, but operationally it is less. The next question asked, "What percent of the total number of behavioral objectives in the program must be met by the student at the predetermined criterion level?" All said 100 percent, but in fact, A's representative amended that operationally it is less than 100 percent.

To the question, "How are decisions made for establishing criterion levels?" the breakdown of responses is as follows:

Institution A - faculty and objective analysis is most important; teachers the next most important; and students are least important in the decision making process.

Institution B - faculty and objective analysis is most important; field supervisors and school supervisors are the next most important in the decision making process.

Institution C - faculty are the most important; teachers the next most important; objective analysis when possible; and student input is variable in the decision making process.

Institution D - objective analysis is most important, with the faculty and teachers secondarily contributing to the decision making process.

Institution E - objective analysis is the most important; the faculty is the next most important; and input from a committee the least important in the decision making process.

The next responses considered dealt with the question, "Is criterion referenced testing used with all units of instruction?" The answer was yes for Institutions C, D, and E. The representative for Institution A said no, and the

representative for Institution B said that criterion referenced testing is used only with the objectives in the field experience. The next question dealt with alternative learning packages and they were asked, "Do your alternative learning packages have the same objectives and same measures as your regular units of instruction?" Institutions A, B, D, and E have the same objectives and A, D, and E have the same criterion measures. Representatives from Institution D added that the criterion measures are usually in a different form. Of the two institutions having the criterion, measures varied for the alternative learning packages. Institution B would accept a variety of indicators.

For question 56 which asked, "How are test validity and reliability determined?" the responses varied widely, as demonstrated below:

> Institution A uses goal verification to determine validity and reliability. Content validity is determined by content experts. Predictive validity is also used, as well as test tryouts to establish reliability.
>
> Institution B uses quality assurance and predictions, through follow-up studies.
>
> Institution C uses construct validity through factor analysis. They employ empirical verification during use and also test for internal consistency.

Institution D uses item analysis to determine validity and reliability.

Institution E uses testing services and analysis of the student test data.

Instrumentation (Appendix F, Matrix 5.5)

The institutions were asked, "What types of tests are administered during the instructional process, excluding the simulated experiences and field experiences?" A list was supplied from which to choose. The items on the list were: true and false, multiple choice, matching items, fill in, essay, and others. All institutions were reported as using all of the various types of tests listed.

For simulated experiences, a list containing the following were given: graphic rating instrument, anecdotal record, systematic observations, pupil performance, and questionnaire. Institution A uses all but the questionnaire and in addition, uses peer and self-assessment. Institution B uses peer assessment only for simulated experiences. Institution C uses all of the assessment data listed, plus assessing by videotapes. Institution D uses a checklist, systematic observations, and peer assessment. Institution E does not provide any simulated experiences.

For the field setting experiences, the institutions were supplied with the same list of assessment data and only Institution A reported using all on the list. Institution B depends entirely on systematic observations. Institution C

utilizes systematic observations, plus videotape feedback, and peer assessment. Institution D reports that pupil performance accounts for 50 percent of the student assessment. However, to a lesser degree, the types of assessment on the rest of the list are also used, excluding anecdotal records. The last institution, E, only uses the anecdotal record and pupil performance.

When representatives were asked, "Is your choice of instruments based on specific behaviors to be measured?" only the representative from Institution B said no. Then they were asked, "Is your choice of instrument based on products of behaviors to be measured?" The answers were the same, with only Institution B reporting no.

In the field setting, representatives of the institutions replied that all field experiences have performance objectives that must be met.

Assessing for Mastery (Appendix F, Matrix 4.6)

The next area of concern dealt with assessment of the field experiences by the cooperating teacher. For Institutions B and C, the cooperating teacher participates 100 percent of the time in this area of assessment. For Institution D, the cooperating teacher participates 60 percent of the time, at Institution E it is 40 percent, and Institution A reported 20 percent participation by the cooperating teacher in field assessment, together with 20 percent by the student and his peers. The Institution C representative, who had answered 100 percent, also said that

self-assessment by the student is 100 percent. In addition, the field experiences are assessed by a university evaluator, who makes final decisions. The breakdown for the institutions were: Institution A = 60 percent, B = 100 percent, C = 100 percent, D = 40 percent, and E = 60 percent.

Faculty judgment is the criterion for the number of times a student may take a posttest at three of the institutions--Institutions A, B, and C. Institution D rules permit a student to take a posttest two times, then the student must recycle in the program, and Institution E does not limit the number of attempts to reach success.

The institutional representatives were then asked, "Do the students take the same posttest more than once?" The responses were:

Institution A varies its procedures.

Institution B uses the same posttest in the field setting, and uses a different test in the knowledge areas.

Institution C uses the same posttest 60 percent and an equivalent test 40 percent of the time.

Institution D always uses an equivalent test.

Institution E gives the same posttest 100 percent of the time.

The next question asks "Are there any experiences in the program that are not assessed?" Institutions C and E assess all experiences. Institutions A and B do not assess some field experiences, and Institution D requires students

to contract when they want to be assessed. This does not prevent a student from being involved in some experiences for which he has not contracted.

Two questions dealt with grading practices and the responses indicated that:

Institution A has Pass/Fail in the field experiences and in some of their on-campus courses; other courses are graded in the conventional A, B, C way.

Institution B required that all experiences be graded A, B, C.

Institution C uses Pass/Fail in those areas that tend to be subjective and A, B, C grades in others.

Institution D uses all regular grades of A, B, C as per university policy.

Institution E uses Pass/Fail for all of the CBTE program.

All institutions have instruments for assessing all field objectives.

Content and Use of Feedback (Appendix F, Matrix 4.7)

Among the institutions, the time range for students to get posttest feedback varies from minutes to weeks, depending on the type of tests. For those institutions whose CBTE programs are made up of specific learning packages (A, B, C, and D), feedback is either provided as success with specific objectives of the packages, or on both the objectives and on the competencies that the objectives in the learning package

are designed to meet. Only Institution E does not provide feedback data to cover competency data.

Except for Institution B, data are made available through computer printouts, relative to the success or failure on every objective and also on the credit received at all of the institutions.

For formative evaluation purposes, the following data are used:

Institution A uses tests within courses and between courses covering perceptual, attitudinal, and performance data.

Institution B uses a two week survey for maintenance purposes. They also use an adjustment survey at mid-semester, and a design survey every second semester.

Institution C uses item analysis, student questionnaires, and faculty evaluations.

Institution D uses item analysis and team level decisions.

Institution E uses item analysis, exit tests and questionnaires.

Data on student attitudes toward objectives and strategies are collected at all five institutions. Institutions A, B, and D do not use these data to evaluate faculty for promotion, salary, or tenure purposes, but only for program improvement. Administrators of Institutions D and E do use any and all assessment data from the CBTE program to evaluate faculty for the above purposes.

Evaluation/Research (Appendix F, Matrix 8)

All persons responded that their institutions are conducting follow-up studies and research. Also, they all have received feedback from employers, except Institution E. Of the four institutions who have received feedback, all said that their CBTE graduates are performing very well. As to how this rating compares to previous graduates' ratings, the representative from Institution D didn't know, Institutions B and C's representatives thought it is even better than previously, and the representative from Institution A thought that the rating is unchanged.

Electronic Data Processing System Characteristics (Appendix F, Matrix 4.9)

Institutions A and E use electronic data processing completely for record keeping and the other three use it only partially. The representatives of Institutions B, C, and D thought some data were inappropriate for EDP and it would not be efficient to convert wholly to it. All institutions developed their own data management systems and each system gives item analysis printouts.

The data management systems developed by these five institutions are designed to identify the student having difficulty, four by electronic data processing and at Institution B, by manual data processing. The types of student difficulties that the systems identify include: failures in meeting requirements, attendance, and number of recycles by students of parts of the program. With the exception of

Institution E, all collect data on student characteristics and use this data in counseling, research for predictive uses, self-awareness and self-esteem, advisement, and behavior modification.

The data management systems of all include the number of times a student tries a posttest on individual objectives and on the learning packages. All institutions collect data on the relevance of competencies and objectives, through information from the faculty, students, experts, and empirical research studies.

Data Treatment (Appendix F, Matrix 4.10)

The following people receive feedback at all five institutions; advisors, students, instructors, administrators, and developers. Institutions A and B added public school supervisors to this list, and in addition, Institution C provides feedback data to their counselors.

Each institution responded to the question, "What weaknesses are perceived to exist in the data management systems?" Institution A reported that a major problem is the handling of observational data; Institution B reported that extensive changes were required in that system; Institution C reported that it was difficult to provide a precise answer because they are still in the formative stage of implementing their data management system; Institution D reported that their system should be expanded; and, the representative from Institution E said they regarded the design of their data management system as adequate, but that its successful

implementation suffers because faculty and students are not consistent in complying with the prescribed procedures.

Institutions also reported the strengths of their data management systems. Representatives of Institution A thought that their system was well designed and should be able to meet changing needs; Institution B's research component is reported as the strong point in their system; Institution C reported that the system isn't developed well enough to answer; Institution D reported that the use of accumulated checklists was a strength, and; Institution E reported that this system provides better information on student competency, better class monitoring, than have past data management systems.

In response to the question, "Do people get the right data at the right time?" the answers varied from 50 percent at Institution C to 100 percent at Institution A. In terms of test results, although they are having limited success in handling observational data, representatives from Institution B reported dissatisfaction and are making changes to facilitate communication of information. Institution D reported that appropriate persons do get the right data at the right time, most of the time, but that their system is still evolving. Institution E reported about 75 percent success.

To the question, "What statistical treatment is used for management data?" the following responses were given:

Institution A uses means, gain scores, and significance tests.

Institution B listed correlational or inter-related agreement studies, and multiple regression for research.

Institution C listed item analysis, profiles, single score comparisons to norms, analysis of variance, linear regression, and correlational studies.

Institution D uses item analysis but stores all data for possible statistical treatment at a later date

Institution E uses common descriptive statistics.

Relevant Influences (Appendix F, Matrix 4.11)

Among the factors affecting the successful operation of their assessment and revision system, difficulties were faced by all institutions because of faculty lacking essential skills. Institutions A and B mentioned a real need exists for inservice training. All of the five institutions said that there were some difficulties encountered because of the deviation from normal institution policies, but one thought these were not significant.

Institutions A and B felt that grant money is needed to implement and continue the assessment component and they wondered about the future availability of soft money. Institutions C and E felt that their institutions are providing the necessary financial support, and Institution D said that

the lack of such support had delayed their program's full implementation of its assessment and revision system.

When asked if they would change anything, "if they were starting a data management system again," Institutions B and D reported satisfaction with their systems and would make no changes. Institution A reported the need for better faculty in-service training for using information from electronic data processing. Representatives from Institution D were generally satisfied and felt that their system was continually improving. Institution E indicated a need for outside assistance for the ongoing monitoring of the assessment system, in order to overcome internal bias.

Information Handling of Data Management System
(Appendix F, Matrix 4.12)

Questions 72 and 78 of the survey instrument were extremely difficult to analyze because some of the responses included information about data which do not require the use of electronic data processing equipment. Any inconsistency in the following response pattern, is due to the elimination of hand process data procedures from the findings for a particular question.

Addressing question 72, faculty in all institutions participate in determining what data is to be collected. Institution C indicated that program managers also make decisions relevant to the type of data to be collected, without necessarily getting concurrence from the faculty. Institution D uses an Assessment and Revision Committee

primarily, to determine the particular types of data needed along with the results of objective analyses from the computer program. Institution E uses class profiles for the classes of each faculty member.

The following methods of data collection are common to all institutions: paper and pencil tests, performance checklists, and questionnaires and other subjective data converted to scores for electronic data processing. Institution E differed in that they collected data based on specific planned student programs by module numbers. These data are updated when individual student program changes occur.

All the institutions use evaluation services to treat assessment in order to provide records of student achievement. Item analysis is common to the five institutions. All but Institution E produces summary reports for research purposes. Institution C also collects summative information on each faculty member and compares it to faculty norms. Institution D produces module efficiency reports.

The data for all institutions are stored on computer tapes. Institutions B, C, and D also store some data in hand files and Institution A also uses discs and cards for storage.

Retrieval of data is by means of printouts at all five institutions. The data are in the form of means, individual scores, class profiles, frequency distributions, and cost effectiveness comparison. Data are distributed in

appropriate form automatically to various consumers within the CBTE program. Additional information is made available upon request.

The effect of information is assessed by Institutions A and D through formal analysis of all output data. Institution D uses an assessment and Revision Committee to review data. Institution B informally assesses the effect of the output data through the use of questionnaires. Institutions C and E are not assessing the effectiveness of assessment and revision data that are distributed.

SUMMARY

The survey of judges identified five institutions using electronic data processing for assessment and revision information in their respective competency based teacher education programs. The five institutions are: University of Toledo, University of Houston, Oregon College of Education, Florida State University, and Wayne State University.

An analysis of the survey of judges indicates a low level of communication and sharing among institutions.

Each institution was visited and an in-person interview was conducted. The interview was guided by a questionnaire that had been developed by the researcher and the answers were recorded on a cassette tape recorder. The following findings are considered most important and are common to all institutions.

1. Advisement plays a crucial role in competency based teacher education programs. It facilitates the use of confirming and corrective feedback.
2. Given that individualized instruction is regarded as essential, at least for a portion of the program, then testing could accommodate the time variable in student completion of instructional units. This would increase the student's opportunity to reach proficiency level before testing occurs.
3. Time constraints for completion of the program should be quite liberal. This enables each student to make adaptations to the learning process, which are most likely to help him reach mastery level. Time is less likely to be a factor causing a student to fail.
4. Special facilities increase the effectiveness of the program. They allow higher level assessment to be made of student performance. The facilities provide for a more complex testing procedure and they enrich the total experiences made available to the students.
5. Criterion referenced testing is necessary. Competency based teacher education is committed to assessing a student's achievement relative to a proficiency standard, rather than comparing the students to each other.

6. Content of a test is more important than the type of test, that is, the test items must measure the stated objective behaviors.
7. Assessment feedback to the various consumers is essential and should be made available as quickly as possible. This enables the system to operate smoothly and efficiently. Revisions can be made expeditiously. Corrective feedback can initiate timely remediation, which enables the student to progress more efficiently through the program.
8. The system should be continually monitored through assessment data for revision purposes. Inadequacies should be remedied as quickly as possible.
9. Internal research is necessary for evaluative decision making. It will establish validity and reliability of assessment instruments. It should provide information regarding relevancy of the program components.
10. It is necessary to receive and react swiftly to information indicating that a student is having difficulties. Frequent assessment and timely corrective feedback prevents error accumulation. It also helps prevent student apathy.
11. Electronic data processing is necessary to accommodate the large amount of data generated by CBTE programs. Hand processing would negate

the advantages of frequent assessment because of the time lag between testing and feedback. Electronic data processing allows the system to produce and use more sophisticated information.

12. Inservice training is vital to the effective operation of assessment and data management systems. Each person must understand the precise function which he contributes to the program and the procedures he must follow if the program is to receive maximum benefit from the assessment and data management system.
13. Item analysis is a common procedure for test analysis. A number of norm referenced and criterion referenced techniques are required to interpret data.

Each of these findings will be related to a model assessment and revision system in Chapter 5.

Chapter 5

SUMMARY AND CONCLUSIONS

RECAPITULATION

The purpose of the study was to gather information that will be useful in recommending desirable procedures to new competency based teacher education programs to aid in their development of an effective assessment and revision system. The focus of the plan was to analyze the similarities and differences in assessment and revision procedures among a sample of institutions using electronic data processing systems in their competency based teacher education programs. The result of this analysis was to be incorporated in the development of a model assessment and revision system.

The plan of the study was to determine the degree of commonality among the five selected institutions. To facilitate the study, a questionnaire was developed and the procedure was to conduct an on-site interview at each of the five institutions. The research questions to be addressed were:

1. What were the similarities and the differences of those systems studied?
2. What were the variables identified that have an effect on the relevance, the effectiveness,

and the efficiency of a competency based teacher education assessment and revision system?

3. What were the major problems encountered in the development of the competency based teacher education assessment and revision systems?

The selection of program variables were made based on criteria set by the AACTE and by concerns found in the literature. A list of variables in operational competency based teacher education programs was selected to be analyzed.

A panel of experts was asked to identify institutions having acquired some sophistication in their data management system for assessment and revision procedures. The responses were ranked and the five highest ranked institutions were surveyed. The responses to a questionnaire were organized into matrices developed to compare the responses in terms of the similarities and differences. The comparisons were then used to determine the potential value of relevant and effective variables for ultimate inclusion in a model assessment and revision component for competency based teacher education programs.

The following findings were considered most important and were common to all institutions.

1. Advisement plays a crucial role in competency based teacher education programs. It facilitates the use of confirming and corrective feedback.

2. Given that individualized instruction is regarded as essential, at least for a portion of the program, then testing could accommodate the time variable in student completion of instructional units. This would increase the student's opportunity to reach proficiency level before testing occurs.
3. Time constraints for completion of the program should be quite liberal. This enables each student to make adaptations to the learning process, which are most likely to help him reach mastery level. Time is less likely to be a factor causing a student to fail.
4. Special facilities increase the effectiveness of the program. They allow higher level assessment to be made of student performance. The facilities provide for a more complex testing procedure and they enrich the total experiences made available to the students.
5. Criterion referenced testing is necessary. Competency based teacher education is committed to assessing a student's achievement relative to a proficiency standard, rather than comparing the students to each other.
6. Content of a test is more important than the type of test, that is, the test items must measure the stated objective behaviors.

7. Assessment feedback to the various consumers is essential and should be made available as quickly as possible. This enables the system to operate smoothly and efficiently. Revisions can be made expeditiously. Corrective feedback can initiate timely remediation, which enables the student to progress more productively through the program.
8. The system should be monitored continually through assessment data for revision purposes. Inadequacies should be remedied as quickly as possible.
9. Internal research is necessary for evaluative decision making. It will establish validity and reliability of assessment instruments. It should provide information regarding relevancy of the program components.
10. It is necessary to receive and react swiftly to information indicating that a student is having difficulties. Frequent assessment and timely corrective feedback keep students moving forward. They also help prevent student apathy.
11. Electronic data processing is necessary to accommodate the large amount of data generated by CBTE programs. Hand processing would negate the advantages of frequent assessment, because of the time lag between testing and feedback. Electronic data processing allows the system to produce and use more sophisticated information.

12. Inservice training is vital to the effective operation of assessment and data management systems. Each person must understand the precise function which he contributes to the program and the procedures he must follow if the program is to receive maximum benefit from the assessment and data management systems.
13. Item analysis is a common procedure for test analysis. A number of norm referenced and criterion referenced techniques are required to interpret data.

CONCLUSIONS

Similarities

Several areas of agreement were common among the institutions interviewed.

1. Competency based teacher education programs cost more than traditional programs, but the increases in learning and efficiency and effectiveness in teaching would be greater. Among the cost factors are those primarily due to the requirements of the assessment and revision system of the program.
2. Competency based programs necessarily assess student performance frequently, therefore generating large amounts of information to be processed by the data management system. This

necessitates the use of expensive equipment and the personnel needed to operate the data management system.

3. As a result of the vast amounts of data generated, programs are better able to provide an institution with more detailed information to better analyze student and teacher needs. The institutions interviewed agreed that it was essential to have sufficient financial support for the development, continued operation, and revision of the system.
4. The institutions indicated a need for inservice training and for a procedural handbook. The need for a clear definition of roles and responsibilities was considered necessary. Additional training is necessary in some cases. All institutions agreed that unless faculty and public school personnel receive this needed training, there is a tendency for CBTE programs to deteriorate, because of misinterpretation of the program elements by new faculty. There is also a need to establish a partnership with public school personnel involved, as their commitment is essential.
5. Advisors are needed to help students adapt to the responsibilities of individualized instruction. These advisors may be instructors of their courses or specific people assigned to do the task of

advising. There is a need for advisement procedures to motivate and encourage the student. The role of the advisor is to monitor the students' progress by providing feedback to them and to help those students having difficulties.

6. There is also a need to increase student participation in public school activities. This participation should be early and frequent. Personality assessment of students should be done, so that they may better understand themselves and have the opportunity to modify their behaviors and build self-esteem.
7. It is necessary to match performance objectives with appropriate criterion measures. Otherwise, behaviors may be inadvertently measured other than those stated in the performance objectives. If these other behaviors appear desirable, then it suggests it would be appropriate to establish new performance objectives. But under any circumstances, the criterion measure must be matched to the stated objectives. These are the rules by which the program functions effectively.
8. Quick feedback is most crucial and the data processing system should facilitate this. The feedback services should adequately serve all participating parties and should be in the form most useful for each individual's needs. The

commitment to the input of the data management system is directly proportional to the output efficiency of the system. The system should be rigidly designed in the collection and treatment of the data. However, the system needs sufficient flexibility to meet unanticipated needs. This does not negate the need for continuous improvements. The program, as well as the assessment system, must be constantly monitored, so that needed revisions are attended to as soon as possible.

9. There is the need for further research. Longitudinal studies are needed to determine long term effectiveness and relevancy of the program. The competency based teacher education movement is dedicated to the task of searching out those teaching behaviors that can be identified as making a positive difference in learning. This implies the need for an efficient and effective assessment and revision system.

Differences

Differences between the sample institutions surfaced mainly as the omission of some practices by some institutions, rather than diverse treatment. The following differences were considered to be the most important ones, based on the AACTE criteria for competency based teacher education programs.

1. One institution does not have specific advisors assigned to students. An assigned advisor, analyzing the overall assessment data of a single student, can effectively monitor that student's progress through the program.
2. One institution does not test for personality traits and does not keep any personality records as students move through the program. It seems reasonable to conclude that certain personality characteristics are more suited to the demands of teaching than others. Although sufficient empirical evidence is lacking, researching the various personality traits and relating them to teaching performance hopefully will lead to identification of those traits considered most desirable. Behavior modification may enable a student to acquire or change his personality characteristics, thus encouraging him to pursue a teaching career.
3. One institution does not test for prerequisite skills. Another would not admit students lacking prerequisite skills; the other institutions will. Since there are prerequisite skills, it is desirable to test for them. If a student fails a prerequisite test and it does not affect his entry into the program, then that testing is wasted effort. A student failing a

prerequisite test, should be provided appropriate remedial instruction to remove the deficiencies prior to acceptance into the teacher education program.

4. Two institutions said that pretests are not used to determine entry point in a program. Only one said that it is possible to be exempt from an entire program on the basis of pretest scores. Competency based teacher education is committed to meeting the needs of the individual student. If a student demonstrates mastery of certain objectives or competencies, then he should be exempt from instruction regarding those objectives or competencies. Pretesting is necessary if the program is intended to meet the needs of the individual student.
5. Two institutions have no special facilities for their programs; the others do. Special facilities, (i.e., learning labs, TV monitors, testing labs, etc.) although not essential, are desirable. They can increase the efficiency of the assessment system and provide a rich variety of learning experiences.
6. One institution does not have any simulated experiences; the others do. Because simulation provides increased opportunities for students to actually perform learning tasks, rather than

respond to operations about the task, a higher level of assessment becomes possible.

7. At one institution only, no feedback data have been received from employers. The ultimate assessment of student competence is the performance on the job in terms of pupil learning. Obviously, this information requires follow-up studies.
8. Student records on each objective are not kept at one of the institutions studied. This limits opportunities for long term studies which might indicate needed modification of assessment instruments or revision of the program components to accommodate individual student needs. This type of information could also relate to research on student personality characteristics.
9. One institution studied is not producing summary reports for research purposes. Summary data regarding assessment results are valuable research data, which could ultimately lead to needed revisions in the program. The openness and regenerative characteristics of a CBTE program appear to have high priority.

Important Variables

The variables that have an effect on the relevance, the effectiveness, and the efficiency of a competency based teacher education assessment and revision system were

determined on the basis of concerns identified from the review of the literature and characteristics used by the AACTE Committee to determine if a program is competency based or not.

The variables were used to develop a survey questionnaire. (See Appendix D) Variables identified by the experts at each of the institutions interviewed were added to the instrument and telephone calls were made to update previous interviews.

Major Problems

The major problems encountered in the development of the competency based teacher education assessment and revision systems analyzed were:

1. The need for adequate inservice training
2. Problems resulting from deviating from normal institutional procedures
3. The development and refinement of a data management system to serve the needs of an effective and efficient assessment and revision system.

The above problems will be addressed in the model for an assessment and revision system.

MODEL FOR ASSESSMENT AND REVISION SYSTEM

Defining Program Needs

It is assumed that an institution wanting to implement a competency based teacher education program will have identified the program competencies and selected the performance

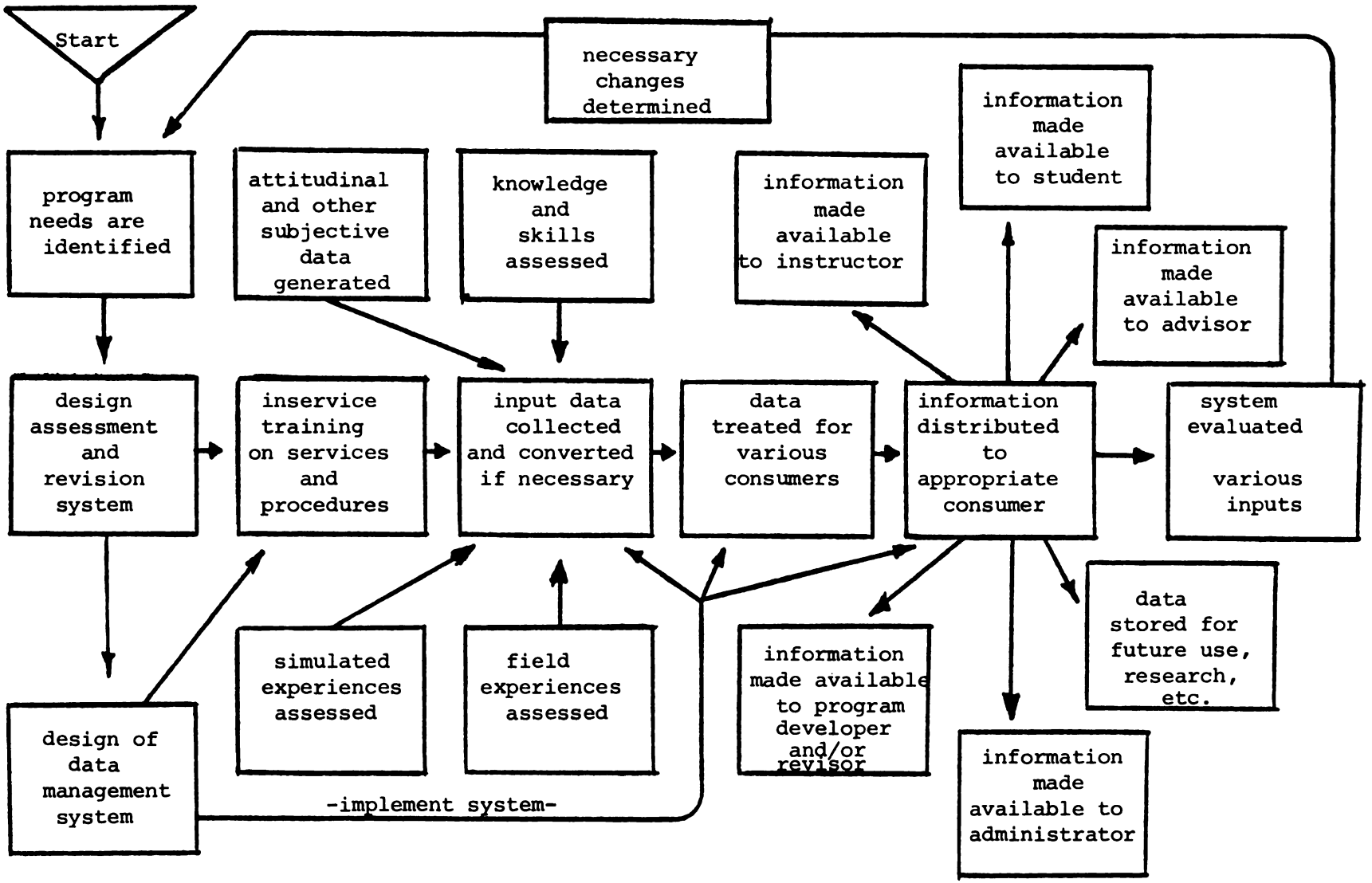
objectives necessary to achieve the stated competencies. It now becomes necessary to develop an assessment and revision system. Figure 2 is a flow chart of a recommended model for an assessment and revision system.

Designing an Assessment and Revision System

The following recommendations are synthesized from those essential elements among the five competency based teacher education programs studied. The system that has evolved was determined by a number of intervening factors. The most obvious is the need for sufficient financial support for the adaption, planning, implementation, assessment, and revision stages. This need is most essential during the planning and implementation stages. This does not suggest that the continued need for additional support will dissipate. Competency based teacher education costs more to operate than conventional programs. As mentioned earlier, one reason for the increased cost is a result of the need for a more sophisticated assessment and revision system. Competency based teacher education generates large amounts of data which are essential to better monitor student progress and to identify areas in which students are competent or not competent. CBTE demands greater amounts of time in the field for both the students and the faculty. This also accounts for a rise in costs.

Because of a general lack of resources to develop and implement a completely validated assessment system, some other strategy, like the adoption of the Principle of

Figure 2 A Model For An Assessment and Revision System



Successive Approximation, may be necessary.[1] The Principle of Successive Approximation suggests that an ideal system be designed and then to design a realistic system that a given institution and personnel can accommodate with their present resources. The next step is to plan a series of intermediate steps between the two, which will ultimately lead to the "ideal" system. The "ideal" system will probably never be achieved, because of new information that will need to be incorporated and because of obsolescence of old information in the system.

Testing procedures will change. Since conventional programs use norm referenced testing, it will be necessary to convert to criterion referenced testing. Competency based instruction is dedicated to each student reaching a stated level of mastery of a skill, knowledge, or attitude, whereas norm-referenced testing measures how well one student compares to another, in terms of their test scores. Criterion referenced testing measures competency achievement. This conversion in testing procedures proves disconcerting or even threatening to some faculty members.

In designing the assessment component, it will be necessary to establish criterion measures through the process of objective analysis. Initially, this procedure should provide face validity to all test items, if the

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[1]Castelle Gentry and Charles Johnson. A Practical Management System for Performance-Based Teacher Education. A Publication of American Association of Colleges for Teacher Education, February 1974, p. 9.

data are to be useful in making decisions for advising students and revising program elements.

It will be necessary to include public school personnel in the assessment and revision process. Their commitment is crucial to the success of the field experience portion of the program and they represent a rich source of support and feedback for continued program assessment.

The availability of specialized facilities will determine the variety of experiences which can be assessed. They also determine the extent to which the program can be designed for individualized instruction. Specialized facilities include testing labs, independent study labs, one-way glass windows and TV monitors for observation purposes, and microteaching labs.

The tests must be related directly to the stated objectives. It is not enough to develop one set of measures; equivalent measures must be developed to enable instructors to use various forms of the same test. An example, Form A can be used for pretest and Form B for posttest. Another form could be used for a delayed posttest. Use of various forms of the same test prevents students from memorizing specific test items as they retake posttests.

Areas of learning that must be assessed can be included under the following three categories. (1) Classroom instruction (may be individualized learning), where type of test would be either a selection type (i.e., multiple choice, etc.) or a construction type (i.e., essay, etc.).

If the test is in essay form, then scores have to be converted for introduction into data management system. (2) Simulated experiences, where a graphic rating instrument can be used and the scores recorded on mark-sense sheets and entered into the data system. Since the structure of a simulated teaching experience can be controlled, it provides an opportunity to present students with a variety of experiences that otherwise could take years before a student was confronted with a similar situation. (3) Field experiences, where a graphic rating instrument (i.e., criterion checklist) may be used to assess a student teacher's performance. The last two categories of data usually require conversion to scores compatible with the data management system. This would also be true for categories like questionnaires and anecdotal records.

Provisions must be made for research studies. Longitudinal studies over several years will provide very important information regarding the success pattern of graduates, feedback on the most relevant components of a program, and possibly indications that portions of programs should be modified or even deleted. Feedback from longitudinal studies might well suggest the inclusion of new areas of instruction. The possible gains of longitudinal research are almost unlimited.

Both short term and long term research studies can look at personality characteristics and student background characteristics to determine what variables might emerge as

influential as predictors of immediate and continued success in the profession.

As research is conducted, it must look at the overall effectiveness of graduates of competency based teacher education programs in terms of the three domains of learner outcomes, cognitive, affective, and psychomotor.

Evaluation of the assessment system will be derived through the use of the following data:

1. Class profiles on student achievement
2. Feedback from faculty, students, and public school personnel
3. Research findings that are relevant to the program

The assessment and revision system should be open and regenerative in nature.

Designing the Data Management System

The data management system must deliver the appropriate data to the appropriate consumer in the appropriate form at the appropriate time. This includes data required by, and generated by the assessment and revision system. If the data management system does not operate efficiently, there will be an overall repressive effect on the whole program, including the assessment and revision system. The need for a specialized expertise in a data management system is recommended by the institutions interviewed. Competency based programs require and generate enormous amounts of data and the capability of processing these data is vital to

the efficacy of the program and the morale of those individuals who depend on data output. One of the more crucial aspects of competency based teacher education reported is the close contact between advisor and student. Immediate feedback on student performance is necessary to strengthen this relationship and allows the advisor to react expeditiously in resolving problems of students having difficulty. It is assumed that immediate feedback also eliminates apathy on the part of students by quickly reinforcing successes.

The preceding paragraph and the section on designing an assessment and revision system have dealt with some general concerns in developing a model of an assessment and revision system. The following sections describe the components of a data management system and will provide specific details of the proposed model. Each of the eight components will be treated in a dichotomized fashion. First, the functions of each component will be identified, and second, how these functions are operationalized will be presented. Figure 3 is a flow chart of the proposed data management system.

Data Selection

It is necessary to provide information on the following functions for selecting the appropriate data for assessment and revision purposes.

I. Assessment of student achievement to determine:
   A. Effectiveness of program in meeting intended objectives as judged by student performance and learner outcomes.

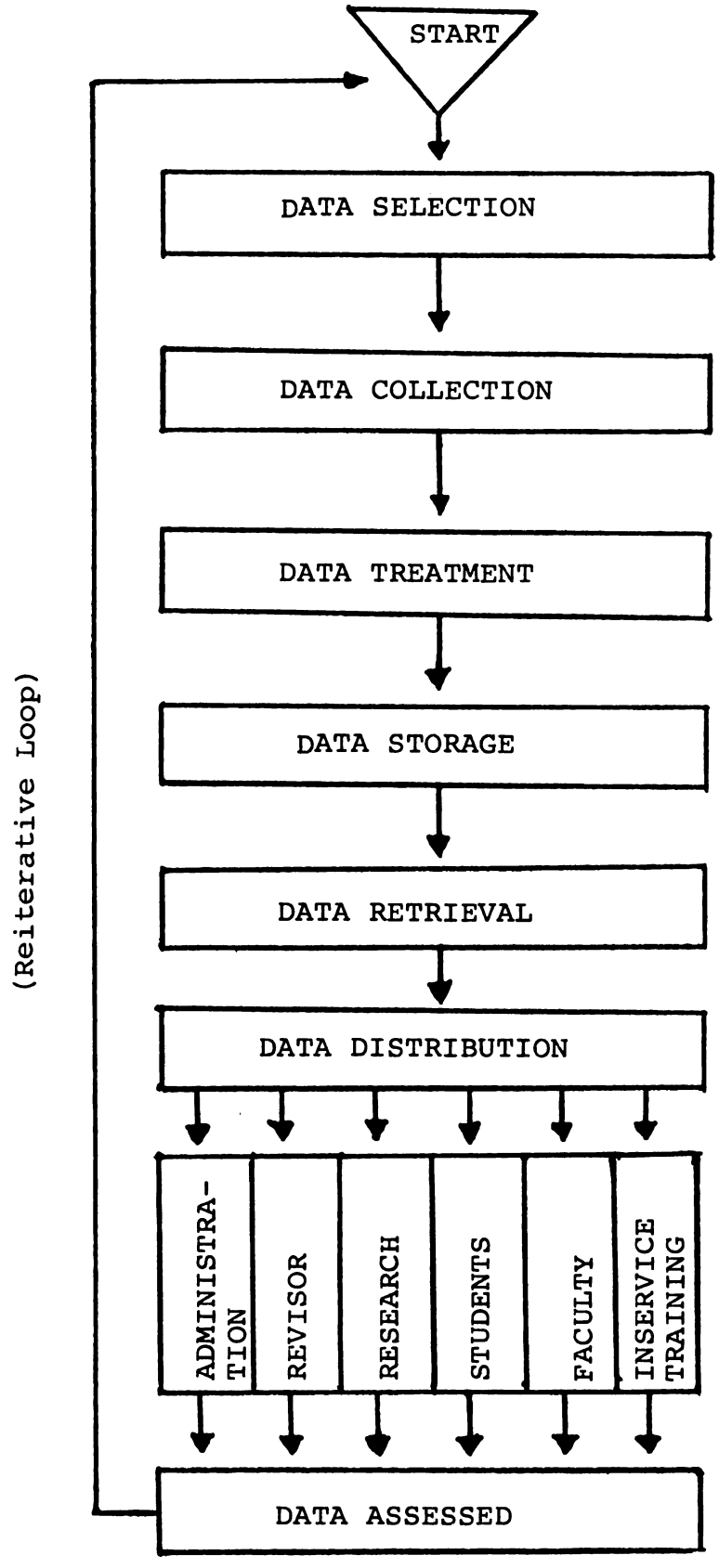

Figure 3 DATA MANAGEMENT SYSTEM

B. Efficiency of program in terms of use of faculty time, student time, and instructional alternatives.

C. Relevance to needs as expressed by the students, faculty, adjunct personnel, and others (e.g., business, industry, parents).

II. Data relevant to administrative decision making:

A. Determine effectiveness of faculty concerns.

B. Resolving budgetary concerns.

C. Monitoring entire program.

To operationalize the above functions, the following procedures are recommended.

I. To measure student achievement, it will be necessary to assess the following:

A. Student success in meeting mastery level of each program objective. The essential information for assessing the effectiveness of the program is the following:

1. Entry behaviors. A pretest will be administered to determine if the student has already achieved mastery level on any of the program objectives, or for placement purposes.

2. Cognitive outcomes regarding achievement level. This will be accomplished by administering a posttest immediately following instruction.

3. Cognitive outcomes regarding retention of knowledge and skills. This may be determined by using a delayed posttest. The application of various forms of the posttest for use as delayed posttests and administered more than once would provide information for possible research. For example, a dramatic drop in test scores might suggest experiments involving changes in sequence patterns for instruction. It might suggest intermittent exercises to reinforce knowledge and/or skills which tend to dissipate over time. It also might suggest that those particular skills could be more efficiently learned on the job.
4. Cognitive outcomes regarding transfer of learning. The most obvious assessment of transfer will occur during the field experiences. It is at this time that observations will be made to assess a student's ability to transfer knowledge and skills required during classroom instruction to actual teaching situations. The ability to synthesize new solutions, consistent with and related to approved practices, will be observed. The ability to transfer knowledge to aid in interpreting

new information is an area which must be attended to with much more rigor than in the past. At the present, there seems to be a paucity of techniques and instruments which enable an accurate assessment of transfer of learning, although there appears to be a general awareness of the need.

5. Affective outcomes regarding changes in students' attitudes and interests. Although the science of measuring affective outcomes accurately is at the moment rather crude, it is encouraging to note that a greater interest is evident. The use of standardized personality tests is desirable if affective outcomes are to be monitored. These tests will enable both the student and the faculty advisor to inventory positive and negative behaviors of students and to provide data for determining the factors required for developing a program to modify behaviors identified as requiring change.
6. Psychomotor outcomes regarding manipulative skills. The students' ability to manipulate objects, operate equipment, and other relevant physical skills can be assessed by using a criterion checklist. The observer will make judgments as to the degree of proficiency demonstrated by the student.

7. Retention of psychomotor skills. The retention of manipulative skills can be assessed at a later date to determine which skills are retained and those skills that will require periodic practice to be maintained at mastery level. A criterion checklist will accommodate this assessment.
8. Transfer of psychomotor skills. Using a criterion checklist to determine a student's ability to perform similar, different, and related complex psychomotor tasks, will assess the extent of transfer of psychomotor abilities.

B. To determine efficiency of programs, the following assessments would be useful.
   1. A comparative analysis between student achievement and the cost of various components of the program.
   2. A comparative analysis between student achievement and various teaching strategies, which would involve different time allocations for faculty and students. Cost would be considered in relation to overall loss or gain in achievement patterns.
   3. An analysis of the number of students who have to recycle through a module one or more times, will provide evidence of the efficiency of that module.

C. Relevance would continuously be monitored by the following activities:

1. Seeking feedback data on performance of graduates of the program.
2. Soliciting feedback from all sources having a vested interest in the program and are sufficiently knowledgeable to provide relatively objective opinions.
3. Measure effectiveness of CBTE graduates in terms of pupil achievement and attitudes toward learning, school, and society.

Data Collection

It is necessary to use various instruments to collect data needed for assessment and revision purposes.

I. Instructional assessment of student achievement.

A. Selection type tests

1. Multiple choice
2. True and false
3. Matching items

B. Constructed response type tests

1. Completion
2. Essay

II. Simulated experience assessment of student performance.

A. Non-quantitative measure of performance

1. Peer group evaluation
2. Self-evaluation
3. Faculty evaluation

B. Quantitative measure of performance

1. Graphic rating instrument (i.e., criterion checklist)

2. Systematic observation

III. Field experience assessment of student performance.

A. Quantitative measures

1. Graphic rating instruments (i.e., criterion checklist)

2. Systematic observation

3. Pupil performance

B. Non-quantitative measures

1. Anecdotal records

2. Questionnaires

3. Unobtrusive measures

IV. Program assessment. Collect value judgments regarding adequacy of program components from:

A. Faculty

B. Students

C. Adjunct personnel

The information collected must be in a form compatible with the data management system.

I. Assessment of student achievement using selection and response type tests.

A. When using selection type tests, student responses should be on mark-sense answer sheets. This allows the test to be scored immediately by machine or by use of a template, then entered

directly into data bank. It is possible to provide both immediate scoring and entering data into the bank in one operation with the appropriate electronic data processing equipment.

B. When using constructed response type tests, it will be necessary to convert answers to a quantitative measure by using a criterion checklist while grading the test. (See Appendix G) The checklist scores may be provided as immediate feedback to the student and also be entered into the data bank for statistical treatment to provide data for revision.

II. Assessment of simulated experiences may be accomplished in two ways.

A. Assessment by discussion, where peers, instructor and student will discuss the performance. This type of interaction can be beneficial to both the student and his classmates, each of whom must go through the same process. This can be considered a practice assessment, providing immediate feedback procedure and data will not be used in grading or revision. This is a limited assessment.

B. An expert with validated criterion checklist while assessing performance, must be certain that data from that checklist will be compatible with other data from selection type and construction type tests. This will allow the computer to treat

data from both simulated and field experiences in the same way. Performances relative to the same objectives may be compared between the simulated experience and the field experience. The cause for any major deviations of performance should be identified. This might suggest a revision in constructing simulated experiences.

III. Field experiences can be assessed in several ways.

A. Quantified measures made during observation of teaching performance. These measures would be related to stated criteria and be provided as immediate feedback and entered into data bank. The success of the student in meeting the objectives of instruction in student teaching should be measured as learner outcomes. An item analysis of pupil performance would provide useful information by which to judge the competency of the student teacher and also provide information indicating areas of weakness.

B. Non-quantitative measures may be made in narrative form, such as anecdotal records and unobtrusive observations. Questionnaires may also be used to acquire useful information. In both cases, the information must be reduced to a numerical count or score, so it may be entered into the computer bank. This information may be used to assess student competency.

IV. Program assessment will depend on objective data collected while assessing student performance and on the responses to questionnaires. The use of questionnaires will be a valuable source of information regarding the opinions of the various parties involved. This type of information will be of particular value to those responsible for program revision. A good questionnaire must ask relevant questions and provide for alternative choices. It should be constructed to provide a maximum amount of information regarding the instructional strategies, assessment procedures, relevance of objectives, faculty roles, adjunct personnel roles, student responsibilities, and available resources to all concerned.

Data Treatment

The data must be treated in a differential manner to accommodate the varied needs of those involved in the professional training of teachers.

I. Data essential for student grading and advisement.
   A. Data directed to student
   B. Data directed to advisor
   C. Data directed to instructor
   D. Data directed to adjunct personnel

II. Data necessary for program revision.
   A. Data directed to instructor
   B. Data directed to revisor
   C. Data directed to administrator

III. Data useful for students' placement records.

There are several conditions which must be met if the various data print-outs are to be of maximum value to the individual consumer. The information must be accurate, comprehensive, relevant, timely, and in a form easily understood by the consumer. The data should be capable of providing information in regards to relevancy and efficiency of program components.

I. Data treatment needed for immediate feedback, grading, and advisement purposes. Specific types of feedback available, resulting from data treatment are discussed in the data retrieval section.

A. The students need to know the successes and failures of their efforts to achieve mastery of each objective. To accommodate this need, a print-out for each student, indicating the results regarding each objective is required. Criterion referenced testing will provide the assessment data.

B. The advisor needs a print-out on each of his advisees. He must be able to identify any objectives where the student's performance falls short of predetermined mastery level. This will enable the advisor to prescribe a remediation exercise which will allow the student to reach the desired level of performance.

C. The instructor needs an item analysis print-out of each class. An item analysis will provide indications of course weaknesses. Further investigation would provide evidence as to where revisions are necessary to strengthen weak areas. The instructor should be sensitive to emerging patterns, rather than waiting for excessive evidence to accumulate before taking action. In addition to achievement scores, the instructor needs feedback indicating the attitudes of the students regarding the various aspects of the course of instruction, including an evaluation of the instructor's work.

D. Adjunct personnel (public school personnel) require student teacher's performance records for grading purposes. They also can use pupil performance records for student-teacher advisement and for additional information in determining a final grade. Student performance can be scored on a graphic rating instrument and be provided as immediate feedback. The rating can be transferred to mark-sense sheets or the initial rating could be made on mark-sense answer sheets. (See Appendix G) This information would enter the data bank. The results of all observations using a graphic rating instrument by various observers would be collated by the computer and be provided as a

print-out. The results of opinion surveys made by student teachers should also be made available in print-out form. This will enable the adjunct personnel to make revisions in their classrooms that appear potentially beneficial. Any apprehensions regarding inappropriate administrative use of student evaluations should be eliminated at the beginning of the program. Otherwise, such differences could cause both college faculty and adjunct personnel to become antagonistic toward the program. The use of college computer services to provide useful and timely information could produce a positive attitude among adjunct personnel and strengthen the team relationship.

II. Data necessary for program revision.

A. The instructor would use both subjective and objective data to identify needed revisions. The instructor's role in revision was discussed in a previous section.

B. The revisor needs data treated across individuals. This will enable him to pinpoint trouble areas in the instruction and to make revision decisions and also to analyze interactive factors between units of instruction. He will also look at data collected over two or more terms (semesters, if appropriate) to determine if problem areas continue to exist. He will work as a consultant

with the instructor involved in modifying any unit of instruction. This not only provides valuable revision input, but also encourages the instructor to be an integral part of the decision making process, which helps maintain a positive attitude toward the program.

C. The administrators should have access to all data, since their responsibilities encompass the entire program. Data regarding an individual instructor's performance should be used to encourage the instructor to improve the effectiveness of his instruction. He should be offered help in making revisions and be made to feel he is part of a team effort. The administration should take great care not to use the assessment data for promotion, salary, or tenure decisions, because of the danger of instructors seeking out ways of "beating the system (i.e., teaching the test)." The administrators should have available information relative to cost of the various instructional activities, since they may be called upon to make revisions in the budget. All the data available regarding effectiveness of the program will help the administration to justify additional costs, as compared to conventional programs.

III. Data for use in student placement records would indicate the mastery level achieved relative to each

competency. That is, the level of attainment of each of the objectives would be related to their respective competencies. The print-out would consist of a list of the mastered competencies and would simplify the task of a prospective employer having to process an enormous amount of data, which in fact, would probably be ignored.

Data Storage

One of the unique advantages of competency based teacher education is the great quantity of data generated. These data enable student competency to be assessed with a high degree of accuracy. The extensive data that are generated provide greater insights into the total program operation, thus enabling the system to be monitored with considerable precision. To accommodate the need for accumulated data, it must be stored so that information can be accessible at any time. Data can be stored on punch cards, computer tapes, and on computer discs.

Data Retrieval

Since all data stored must be retrieved in a variety of forms, it is necessary to code data prior to entry into the data bank. The code will make the desired data available for computer treatment. Computer programs must be adopted or developed to produce the various forms of information needed to effectively operate and monitor the assessment and revision system. Data that are typically included among the readouts are:

1. The identification of the student or students involved in the assessment.
2. The identification of the instructor(s).
3. The identification of the advisor if other than the instructor.
4. The identification of the module or the unit of instruction.
5. The identification of each objective covered in the module.
6. The date the assessment took place.
7. The time spent by each student relative to each objective or each module.
8. The number of times a student has attempted each objective or module.
9. The average time spent by all students successfully completing module.
10. The percentage of students completing module on first attempt, on second attempt, etc.
11. The learning strategy used with each module during presentation.
12. The test items missed by each student on each objective, including the incorrect responses.
13. The collated results of test items missed by all students taking test.
14. The student evaluation of each objective and the teaching strategy employed.
15. The grade received by each student for each objective.

Each of these data is discussed individually below in the elaboration of the five readouts. These readouts are:

1. Student Progress Report
2. Student Value Report
3. Effectiveness Report
4. Course Analysis
5. Efficiency Analysis

Student Progress Report (See Appendix H, Example 5.1)

This example shows a student's achievement relative to each objective in Module 3. This report is intended for the instructor and/or the advisor. The report shows that the student successfully completed objectives 1, 3, and 4. For this particular example, MP indicates the number of correct responses to test items necessary to achieve mastery performance, while AP indicates the number of correct responses to achieve acceptable performance. The "score" indicates the actual achievement of the student. Items missed identify which test question was answered incorrectly. "Incorrect Response" identifies the selection the student made, while "Correct Response" indicates the correct answer to the question. The knowledge of which incorrect answer the student selected helps indicate the particular type of error the student made and therefore aids in helping him overcome the difficulty.

Student Value Report (See Appendix H, Example 5.2)

This value report indicates the student's perception of the value of the objectives and teaching strategies contained in the module. This report is intended for the instructor and/or the advisor. The report also indicates the number of times the student has taken the posttest (cycle 1). In the example, this student has taken the posttest once. The time spent on the module was 22 hours. The time spent on each objective is supplied along with the mean time spent by previous students. This information is useful in making comparisons of time spent on the module and its successful completion (e.g., Student A spent 2 hours; others spent 7 hours).

Referring to the preceding example, if a student reported a low value for this particular objective and data indicate the student spent too little time, then the low value might be considered an affective reaction. "Range of hours" indicates both the minimum and maximum hours spent studying for each objective. This represents accumulated data covering large numbers of students. The value judgments will be discussed with the student to gain insights as to learning difficulties and to determine a pattern of preferences. This information should be helpful in advising students and in prescribing alternate learning experiences.

Effectiveness Report (See Appendix H, Example 5.3)

This report identifies the course, the module, type of posttest, and number of students in the class. This report is intended for the instructor and the revisor. The item analysis consists of two parts: first, the specific responses to each question and second, a compilation of incorrect responses for each question.

An analysis of the specific responses to each item could generate a concern as to why a large number of students select the same incorrect response (e.g., question number 4, 33% of the class selected response number 3). The total of incorrect responses provide immediate indications of problem areas (e.g., question number 4 and question number 12 should be suspect). The problem indicated with these two questions might be some ambiguity in the test item, inadequate instruction, or poorly stated objective.

The additional information regarding domain level,[2] learning type,[3] and teaching strategy will prove useful in diagnosing learning difficulties and provide relevant guidelines for restructuring learning activities for students who must recycle. Teaching strategies identified are: lecture (Lec) in the classroom setting, independent study (Ind) in an individualized learning facility using developed learning packages, and self study (Sel) where the student

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[2]Benjamin S. Bloom, ed., Taxonomy of Educational Objectives, New York: David McKay Company, Inc., pp. 62-200.

[3]Robert M. Gagne, The Conditions of Learning, New York: Holt, Rinehart and Winston, Inc., 1970, pp. 35-62.

determines what materials, resources, and activities are relevant to successful attainment of objectives.

Efficiency Analysis (See Appendix H, Example 5.4)

This analysis is intended for the revisor and the instructor. The analysis of the module in question provides information regarding the time it takes each student to complete each objective, the number of students who failed to complete each objective and the number of attempts by each student to complete each objective. This information is useful in determining time needs in sequencing modules within time constraints of the institution and also to place a reasonable demand on the amount of time a student should spend on each objective.

The number of times it is necessary for students to recycle is important if a large number must recycle or if a student must recycle more than once. A large number recycling could suggest needed improvements in instructional content. A single student failing to complete the objective after two attempts might suggest the use of alternate teaching strategies.

The achievement profile on each cycle will provide more detailed information regarding the proficiency levels achieved during each attempt. The failure of a large number of students to reach mastery performance (MP) might suggest further refinements in the revision of learning activities. In this example, "AP" means acceptable performance and "F" means failure.

Course Analysis (See Appendix H, Example 5.5)

The course analysis report provides information relative to the overall effectiveness of the course. This analysis is intended for the revisor and the instructor. It answers such questions as:

1. Did the majority of students complete each module in a reasonable length of time?
2. Did an unreasonable large number of students fail to complete any of the modules?
3. How do the students value the teaching strategies?

Deficiencies suggested by answers to the above questions would suggest needed revisions either in content of modules or in teaching strategies employed.

Data Distribution

The essential function of data distribution is to get the desired information to the appropriate consumer as quickly as needed. One difficulty that may arise is institutional policy preventing the posting of student achievement print-outs. This will necessitate the inconvenience to the student of having to meet with the instructor to obtain test results. The time lag between taking the test and the delay until an appointment can be made with the instructor, could produce apathy on the part of the student. The use of a template or machine scoring equipment at the test site would, in most cases, overcome the problem by making results immediately available in the selection and

performance type tests. The checklists for construction type tests (essay, projects, etc.) could be mailed to the student immediately after evaluation.

The appropriate print-outs for the other consumers should be made available as soon as possible so that they can react expeditiously to identified problems. The type of print-out needed by each consumer was identified in the sections on data collection and treatment. The consumers identified were:

1. Student
2. Instructor
3. Advisor
4. Adjunct personnel
5. Revisor
6. Administrators

Data Assessment

Each consumer will evaluate the output data provided and decide if it meets his particular needs. It the output data are unsatisfactory in any way, then the consumer should immediately contact the revisor and clarify his precise needs. The revisor then can proceed to determine the corrections needed and where the revisions are needed within the data management system.

Possible problems that could be identified are collecting incomplete data, which would suggest a change in the instrument used, treating the data improperly, which would indicate a revision in treatment to accommodate

consumer needs, or data not coded properly to extract needed information. It is assumed the various data are accurate, comprehensive, in appropriate form, and timely.

The data stored from the operational program, with the addition of data collected on graduates of the program, will be used for research purposes. Research results will be used as indicators of success of the program and also to identify areas of the program where modifications are needed.

Inservice Training

Inservice training should be considered essential. At this time, the various responsibilities should be clarified. Since the professional roles of faculty members will change dramatically, inservice training is necessary to model the values and processes congruent with the demands of a competency based program. The responsibility of every individual directly involved in assessment, revision, and data management systems, would be explicitly defined. Then a training program which clarifies the function aspects of a program, the need for a unified team effort, and the means by which the whole process will come to fruition, should be thoroughly explored. A guide book, presenting a description of procedures to be followed and services available, would be provided as a reference for faculty, adjunct personnel, and administrators.

IMPLICATIONS OF FUTURE RESEARCH

The following three suggestions are recommended for further research.

One, in this study, data collection was limited to interviewing one individual per institution, although additional information was obtained by reading articles about that institution's program and through informal visits with other personnel at each institution. It would be useful to replicate this study and include representatives from a cross sectional representation from each teacher education program, such as interviewing administrators, students, faculty members, etc. The purpose would be to seek out consistency of responses within each institution.

Two, to do a comparative analysis of the facilities, personnel involved, assessment procedures, and time allocation for the field experiences of several major operationally competency based teacher education programs. The target of this study would be to research the assessment of data generated within the system to determine the efficacy of the assessment system relative to the other variables analyzed. The necessary precaution is to limit the study to one part of a program and also to limit the education level. This eliminates the confusion of over-lapping information.

Three, to use some means like the Delphi technique to analyze the rationale for various statistical treatments of assessment data among several operational competency based teacher education programs. As a result of an initial survey,

the common treatments would be recorded and eliminated for further consideration. Any treatment that was identified and was not used by a given institution would be sent to that institution with the query as to why this treatment was not selected. This procedure would continue with all institutions. The purpose would be to gain greater insight as to what the several institutions were looking for in their statistical treatment and the rationale for their decisions. A study of this nature could result in assessment data with relatively strong empirical evidence for recommendations.

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Appendix A

Criteria for Making Judgments From Analysis of Selected Data Management Systems

Criteria for Making Judgments From Analysis of Selected Data Management Systems

The following list of characteristics will be used as criteria in the analysis of the several data management systems. The list was produced by the AACTE Committee on Performance-Based Teacher Education. The first five are considered essential by the Committee. The remaining characteristics are considered as either implied or desirable. Those that are implied are assumed to exist as a consequence of the first five generic elements, which the Committee feels will qualify a program as PBTE or not. The desirable characteristics may or may not be found in a program, but are considered as desirable components of a PBTE program.[1]

The numbers following the criteria refer to related questions of the survey instrument.

1. Teaching competencies to be demonstrated are role-derived, specified in behavioral terms and made public. (20, 70)

2. Assessment criteria are competency-based, specify mastery levels, and made public. (21, 22)

3. Assessment required performance as prime evidence, takes student knowledge into account. (42, 43, 45, 46, 47, 51)

4. Student's progress rate depends on demonstrated competency. (12, 23, 49)

5. Instructional program facilitates development and evaluation of specific competencies. (15, 25, 26, 42)

6. Instruction is individualized. (6, 8, 10, 11, 38, 55)

7. The learning experience of the individual is guided by feedback. Feedback also provides information necessary for program revision. Feedback should be timely, comprehensive, and accurate. (33, 34, 35, 50, 63, 64, 65, 66, 67, 68, 69, 79)

8. The program as a whole is systemic. Most systems are product oriented. How accurately these products reflect the system's purpose is the critical measure by which we judge the system's operation. (57, 58, 59, 62)

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[1]Stanley Elam, What is the State of the Art? (Washington: American Association of Colleges for Teacher Education), December 1971, pp. 6-11.

9. The emphasis is on exit, not on entrance, requirements. (44, 52, 53)

10. Instruction is modularized. A module is a set of learning activities (with objectives, prerequisites, pre-assessment, instructional activities, post-assessment, and remediation) intended to facilitate the student's acquisition and demonstration of a particular competency. (13, 14, 16, 17, 18, 24)

11. The program is field-centered. (48, 54)

12. Because PBTE is systemic and because it depends upon feedback for the correction of error and for the improvement of efficiency, it is likely to have a research component; it is open and regenerative. (30, 32, 70, 71)

The impact of PBTE on teacher training programs should show:

much greater program flexibility. (8, 10, 11, 17, 18, 38, 39)

greater attention of specific skill training. (6, 25, 26, 43, 55, 56)

greater congruity between objectives and the evidence admitted for evaluation purposes. (41, 45, 46, 47)

better rationalization of faculty decisions and demands affecting students. (27, 28, 57, 58, 59, 68)

development of new facilities and technology required by PBTE. (19, 61, 72, 73, 74, 75, 76, 77, 78)

Appendix B

Cover Letter for Survey of Judges

FERRIS STATE COLLEGE | Big Rapids, Michigan 49307 616/796-9971

School of Education

I am planning a study of the data management systems used for assessing competency based teacher education programs. The purpose of this study is to examine the identified programs.

I am soliciting your expertise and familiarity with competency based teacher education to help me identify appropriate institutions. I would appreciate it if you would list the institutions you feel are most advanced in developing an electronic data processing system for management of assessment data for a competency based teacher education program.

I am enclosing a response sheet and a stamped pre-addressed envelope. I would be very grateful for your help in identifying these institutions. If your institution has a competency based teacher education program, please include it if you feel it qualifies.

I would appreciate a response as soon as possible. Thank you for your cooperation.

Sincerely yours,

Walter G. Ritchie
School of Education
Ferris State College
Big Rapids, MI 49307

WGR/rer

Appendix C

Form for Survey of the Judges

The following institutions have been suggested in the preliminary survey as mature programs that may have a sophisticated system for managing their program data. Would you please react to these suggestions and more importantly, add to the list below, those competency based teacher education programs that you think are using an electronic data processing system for the management of assessment and revision data.

Please check the appropriate boxes.

Name of institution	Lack information	Beginning stage of development	Moderately well developed	Well developed
Florida State University				
University of Georgia				
University of Houston				
University of Oregon				
University of Toledo				
Wayne State University				

Appendix D

A Survey of Data Management Components for Assessment and Revision Systems Used in Operational Competency Based Teacher Education Programs

A. Environmental Conditions During Implementation Stage

1. Once you decided to implement an assessment component for your CBTE program, did you experience any of the following difficulties?

Faculty resistance _____
Faculty lacking essential skills _____
Program causing deviation from normal institutional procedures _____
Student attitude _____
Necessity for developing own learning packages ____
Developing effective data management system _____
Developing an efficient/effective feedback system _____
Other (specify) _____

2. Did lack of financial support affect the assessment component of your CBTE program?

Yes _____ No _____
If answer is "yes," how?

Personnel resources _____
Data management facilities _____
Equipment _____
Physical facilities _____
Acquisition of software _____
Other (specify) _____

3. Did you convert entire program to CBTE in one stage?

Yes _____ No _____

If no, what segments of program were first?

Which segments gave most trouble?

4. Since your program has been operational for some time, what is the current faculty reaction to CBTE?

Enthusiastic _____ % _____
Middle of road _____ % _____
Negative _____ % _____

Current student reaction?

Enthusiastic _____ % _____
Middle of road _____ % _____
Negative _____ % _____

B. Program Characteristics

5. Is your teacher education program totally competency based?

   Yes _____ No _____

   If no, which parts are not competency based?

6. Are students required to move sequentially through program?

   Yes _____ No _____

   If no, please explain.

7. Are you running a second teacher training program that is parallel to your CBTE program?

   Yes _____ No _____

8. Are there multiple entry points for students?

   Yes _____ No _____

9. What is the approximate number of students in your CBTE program? _____

   Number of faculty involved? _____

10. Are there any time constraints for student completion of a learning module?

    Yes _____ No _____

    Please explain.

11. Are there any time constraints for completion of an entire program?

    Yes _____ No _____

    Please explain.

12. How many modules must student be successful in? _____

13. What portion of your program is modular?

    100% _____ 75% _____ 50% _____ 25% _____ 0% _____

14. Do you feel entire program should be modular?

    Yes _____ No _____

    Why?

15. Are all units of instruction based on stated performance objectives, whether modular or not?

    Yes _____ No _____

16. Do all modules and/or learning packages have supporting non-print media?

    Yes _____ No _____

    If no, what is the approximate percent that do? _____

17. What percent of your modules have alternate delivery systems available?

    Approximately

    100% _____ 75% _____ 50% _____ 25% _____ 0% _____

18. Do you plan to develop additional alternative delivery systems?

    Yes _____ No _____

    Do you feel they are necessary?

    Yes _____ No _____

    Do you feel that alternative learning experiences can be synthesized at the time of need (based on feedback data)?

    Yes _____ No _____

19. Does your program have specialized facilities?

    Yes _____ No _____

    Testing labs? _____
    Individualized learning labs? _____
    Other? (specify) _____

Given the following definitions:

Competencies - A description in performance terms of knowledge, skills, and behaviors that will enable a student to meet performance criteria for classroom teaching.

20. How many competencies in your program? _____

Terminal Performance Objective - Objectives which state what the learner is to be able to do at the end of instruction. They specify the standard levels of performance in behavioral terms.

21. Approximately how many terminal performance objectives in your program? _____

Enabling objective - Objectives which describe those knowledges, skills, and attitudes which a learner must attain at some intermediate point if he is to acquire the terminal objective.

22. Approximately how may enabling objectives in your program? _____

Module - A cluster of related objectives with its own pretest, posttest, and instructional strategies.

23. How many modules are used in your program? _____

24. What percentage of your modules are:

    Group paced _____%

    Self-paced _____%

25. Are competencies ranked in terms of importance?

    Yes _____ No _____

26. Are objectives ranked in terms of importance?

    Yes _____ No _____

27. What are total credit hours required in professional teacher preparation program?

    Semester _____ Quarter _____ Other _____

    Hours in classroom instruction _____ Percent that is CB _____%
    Hours in simulated experience _____ Percent that is CB _____%
    Hours in field experience _____ Percent that is CB _____%

28. Do you have personnel who have been identified as directly responsible for program revision?

    Yes _____ No _____

    If yes,

    How are they assigned?

    What process do they go through? (time and resource constraints)

29. How are cooperating teachers selected?

    By superintendent _____
    By principal _____
    By volunteer _____
    Other (specify) _____

30. Have you been conducting follow-up studies?

Yes _____ No _____

If no, do you plan to conduct follow-up studies?

Yes _____ No _____

31. Have any students graduated from your CBTE program?

Yes _____ No _____

32. Have you received any feedback from employers?

Yes _____ No _____

If yes, would you rate feedback as being:

Good _____ Fair _____ Poor _____

Do you feel this reaction differs from that of previous graduates?

Yes _____ No _____

If yes, please explain.

C. Assessment and Evaluation System

33. How is student advisement handled?

Scheduled meetings: daily _____
weekly _____
monthly _____
other (specify) _____

By request: by advisor _____
by instructor _____
by student _____
other (specify) _____

34. Is each student assigned a specific advisor to help him through the competency based program?

Yes _____ No _____

If no, how is advisement handled?

35. How many advisees are assigned to each advisor in the competency based program?

36. Do you test students prior to instruction to identify entry personality characteristics of students?

Yes _____ No _____

37. Given that prerequisite skills are skills necessary to enter the CB program, do you test for them?

Yes _____ No _____

If yes,
Once for entire program _____
For each learning package _____
For first learning package only _____

38. If you have pretests, which of the following are they used to determine:

Entry into program _____
Point of entry into program _____
Exemption from program _____
All of above _____

39. Do you admit students who lack prerequisite skills?

Yes _____ No _____

40. Is prerequisite test part of the pretest?

Yes _____ No _____

If no, when do you administer prerequisite test?

Before pretest _____ After pretest _____

41. What percent of your competency based programs performance objectives are matched with specific strategies and criterion items?

_____%

42. Of the total number of behavioral objectives in your program, what percentage of them must be met by the student at the predetermined criterion level?

_____%

43. How is decision made for establishing criterion level?

Teacher judgment _____% of time _____
Faculty judgment _____% of time _____
Objective analysis _____% of time _____
Other (specify) _____% of time _____

44. Is criterion-referenced testing used with all units of instruction, whether modular or not?

Yes _____ No _____

45. What type of tests are utilized during instructional process? (Including prerequisite, pretest, and posttest and excluding simulated and field experiences.)

True and false	_____	%	_____
Multiple choice	_____	%	_____
Matching items	_____	%	_____
Fill in	_____	%	_____
Essay	_____	%	_____
Other (specify)	_____	%	_____

46. What type of assessment data are utilized for simulated experiences?

Observational: Graphic rating instrument _____
Anecdotal record _____
Systematic observations _____
Pupil performance _____
Questionnaire _____
Other (specify) _____

47. Which of the following types of assessment data are collected during field experience?

Observational: Graphic rating instrument _____
Anecdotal record _____
Systematic observations _____
Pupil performance _____
Questionnaire _____
Other (specify) _____

Is choice of instrument based on specific behaviors?

Yes _____ No _____

Or is choice based on products of behaviors to be measured?

Yes _____ No _____

48. What percent of field experiences are assessed by:

cooperating teacher _____%
university evaluator _____%
other (specify) _____%

49. If students fail a posttest, may they retake it?

Yes _____ No _____

If yes, how many times? _____

If yes, do they retake:

same test? _____ % _____ or
equivalent test? _____ % _____

50. How rapidly is posttest feedback data made available to students?

Minutes _____Hours _____Days _____Weeks _____

Does data cover learning package achievement?
Yes _____ No _____
Competency achievement? Yes _____ No _____
Objective achievement? Yes _____ No _____
Credit received? Yes _____ No _____

51. Are there experiences which are not assessed?

Yes _____ No _____

If yes, why are they not assessed?

52. Are any portions of program graded on a Pass/Fail basis?

All _____ Part _____ None _____

If answer is Part, which parts are?

53. Do you utilize grades beyond minimal level of performance, such as:

minimum level = C
above average = B
excellent = A

Yes _____ No _____

Please explain:

54. For objectives designed to be learned in field setting, what percent have assessment instruments? _____%

55. Do alternative learning packages for a specific module have:

    the same objectives? _____
    the same criterion measure? _____

56. How are test validity and reliability determined?

57. What data do you use for formative evaluation purposes?

58. What data do you use for summative evaluation purposes? Please list.

59. Do you collect data on student attitudes toward individual learning package objectives and strategies?

    Yes _____ No _____

60. Does administration use data for faculty evaluation?

    Yes _____ No _____

    If yes, can the faculty member determine what data are included in his promotion, tenure, salary increases files?

    Yes _____ No _____

D. Data Management System

61. Is electronic data processing equipment used for record keeping?

    All _____ Part _____

    If part, do you plan to convert all to electronic data processing?

    If no, why not?

62. Did you use a system from another institution(s) as a model in developing your data management system?

Yes _____ No _____

If yes, whose system did you use?

63. How are records kept for each student?

Total achievement scores for each learning package _____
For each competency _____
Achievement on each objective _____
All of above _____
Other (specify) _____

64. Do you receive an item analysis printout?

Yes _____ No _____

65. Is system designed to identify student having difficulty?

Yes _____ No _____

If yes, is this a separate printout? (divorced from other data)

Yes _____ No _____

What type of difficulties are identified by your system?

Do you collect data on individual student's personality characteristics?

Yes _____ No _____

If yes, how do you use the data?

66. Does data include number of times student has attempted to posttest out of each:

individual objective? Yes _____ No _____
learning package? Yes _____ No _____

67. Who receives feedback data?

Advisor _____	Student _____
Instructor _____	Developer _____
Administration _____	Other (specify) _____

Do all you have checked receive the same data?

Yes _____ No _____

If no, please explain differences.

68. What percentage of the time does your data management system get the appropriate data to the appropriate person, in the appropriate form, at the appropriate time?

_____%

Perceived weaknesses:

Perceived strengths:

69. What changes would you make in your data management system if you were starting again?

70. Are you collecting data on the relevancy of the competencies and objectives of your program?

Yes _____ No _____

If yes, are you using:

student judgment	_____%
faculty judgment	_____%
expert judgment	_____%
empirical evidence	_____%

71. What statistical treatment is given your management data, and for what purpose?

Information handling of data management system

72. Selection - How do you determine what data should be collected?

73. Collection - How are data collected?

74. Organization - How are the data treated to make it appropriate for the consumer?

75. Storage - How are the data stored?

76. Retrieval - How are data retrieved?

77. Distribution - How is the information distributed?

78. Assessment - How is the effect of the information assessed?

79. Does your data management system provide competency level profiles on each graduate for use by prospective employers?

Yes _____ No _____

Reason for action:

80. Could I have sample assessment data collection instruments and electronic data processing readouts for your program?

81. Do all field experiences have performance objectives which must be met?

Yes _____ No _____

Appendix E

Data From Survey of Judges

Data From Survey of Judges

The following institutions have been suggested in the preliminary survey as mature programs that may have a sophisticated system for managing their program data. Would you please react to these suggestions and more importantly, add to the list below, those competency based teacher education programs that you think are using an electronic data processing system for the management of assessment and revision data.
Please check the appropriate boxes.

Name of institution	Lack information 0	Beginning stage of development 1	Moderately well developed 2	Well developed 3	Total
Florida State Univ.	xxxxx	x	xxx	xx	13
Univ. of Georgia	xxxx	xxx	xxx		9
Univ. of Houston	xx	xxx	xxx xxxx		17
Univ. of Oregon	xxx xxx				0
Univ. of Toledo	xx	x	xxx xxxx	xx	21
Wayne State Univ.	xxx xxx		xxx	x	9
Florida Int'l. Univ.		x	xx		5
Univ. of Texas-Denton		x			1
Oregon College of Educ.		x	xxxx	xx	15
Texas A & M				x	3
Brigham Young Univ.		x			1

Name of institution	Lack information 0	Beginning stage of development 1	Moderately well developed 2	Well developed 3	Total
Weber State	X		X		2
West Georgia College		X			1
Univ. of Texas-El Paso		X			1
Michigan State Univ.			X		2
Univ. of Wisconsin		X	X		3
Univ. of Kansas			X		2
Univ. of Texas-Austin			X		2
Western Kentucky		XX			2
Univ. of Nebraska			X		2

Appendix F

Interview of Institutions

Interview of Institutions

CONCERN: Qualifying as Competency Based Teacher Education Matrix 4.1

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
5. Is your teacher education program totally competency based?	no, some classroom instruction is not (faculty choice)	no, only elementary field based experiences	yes	qualified no, need to individualize total program	yes
6. Are students required to move sequentially through program?	no, minimum requirements contractual	yes	yes	yes	yes
7. Are you running a second teacher training program that is parallel to your CBTE program?	yes	no	no	no	no

CONCERN: Qualifying as Competency Based Teacher Education Matrix 4.1 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
8. Are there multiple entry points for students?	no	yes	yes	yes	yes
13. What portion of your program is modular?	50%	field based all	100%	100%	100%
14. Do you feel entire program should be modular?	no	yes	yes	yes	yes

CONCERN: Qualifying as Competency Based Teacher Education Matrix 4.1 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
15. Are all units of instruction based on stated performance objectives, whether modular or not?	no, but most are	no	yes	yes	yes
17. What percent of your modules have alternate delivery systems available?	25%	100%	25%	35%	0%
18. Do you plan to develop additional alternative delivery systems?	no	yes	yes	yes	yes

CONCERN: Advisement Matrix 4.2

	Florida State University	Oregon College of Education	University of Houston	University Of Toledo	Wayne State University
33a. Is student advisement handled by scheduled meetings?	daily, weekly, monthly, quarterly	no	no	varies from course to course	no
33b. Is student advisement handled by requested meetings?	advisor, student, instructor, teacher, and site coordinator	by instructor, student, and school supervisor	by advisor, instructor, student, and counselor	yes, student or instructor	yes, by instructor, student -- printout initiates letter to student
34. Is specific advisor assigned?	yes	yes	yes	yes, assigned by quarter blocks	no

CONCERN: Advisement Matrix 4.2 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
35. Number of advisees to each advisor	20	15	20-25	15	0
36. Do you test for entry personality character-istics?	yes	yes	yes	yes, but informally	no

CONCERN: Individualizing Instruction Matrix 4.3

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
37. Do you test for pre-requisite skills?	yes	no	yes	yes	yes
39. Do you admit students who lack pre-requisite skills?	yes	yes	yes	yes English test for screening	no
38a. Do pretests determine point of entry into program?	no	yes	yes	yes, but varies module to module	no

CONCERN: Individualizing Instruction Matrix 4.3 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
38b. Do pretests determine exemption from part of program?	no	yes	yes	no	yes
38c. Can pretests exempt students from entire program?	no	no	no	no	yes
10. Are there any time constraints for student completion of a learning module?	yes, but not severe	yes, but no rules	yes, no hard rules	yes, after 2 quarters It becomes an F	no

CONCERN: Individualizing Instruction Matrix 4.3 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
11. Are there time constraints for completion of an entire program?	yes, but not defined or demanding	yes, but no rules	yes, no hard rules	no, but may be counseled out	no
19. Does your program have specialized facilities?	yes, testing labs, learning labs, one way glass, TV monitors, TV micro and macroteaching	no	yes, testing labs, learning labs, one way glass, TV monitors, TV micro-teaching	yes, testing labs, learning labs, materials lab, equipment lab, micro teaching lab	no
24a. What percent of your modules are group paced?	50%	in knowledge and skills, 50%	60%	100% through cycling	--

CONCERN: Individualizing Instruction Matrix 4.3 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
24b. What percent of your modules are self-paced?	50%, creates management	50%	40%	100% through recycling	100%

CONCERN: Criterion Referenced Testing Matrix 4.4

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
41. What percent of performance objectives are matched with specific strategies and criterion items?	100% intended but less operationally	100%, only field experiences	100%	100%	100%
42. What percent of behavioral objectives must be met at predetermined criterion level?	100% intended in fact operationally less	100% field	100% of those making up program	100%	100%
43. How is decision made for establishing criterion level?	faculty and objective analysis #1, teachers #2, students #3	faculty and objective analysis #1, field supervisor and school supervisor #2	faculty 100% teachers objective analysis when possible, students variable	objective analysis 100% faculty and teachers informally	objective analysis 100% faculty 30%, also committee input

CONCERN: Criterion Referenced Testing Matrix 4.4 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
44. Is criterion referenced testing used with all units of instruction?	no	only field objectives	yes	yes	yes
55a. Do alternative learning packages have same objectives?	yes	yes	no	yes	yes
55b. Do alternative learning packages have same criterion measure?	yes	no, but various indicators accepted	no	yes, but different form	yes

CONCERN: Criterion Referenced Testing Matrix 4.4 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
56. How are test validity and reliability determined?	goal verification, content validity with content experts, predictive validity, test tryouts to establish reliability	quality assurance and predictions, follow-up studies	construct validity through factor analysis verification during use, internal consistency	item analysis	through use of testing service

CONCERN: Instrumentation Matrix 4.5

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
45. Types of tests used during instructional process	all	all	all	all	all
46. Types of assessment used for simulated experiences	all, but questionnaire add peer and self assess-	peer assessment	all, plus video tapes which are most useful	checklist, systematic observations and peer assessment	have no simulated experienced
47a. Types of assessment data collected during field experience	all plus biographical	all but systematic observation	systematic observations videotape feedback, peer assessment	all, pupil performance counts 50% no anecdotal records	anecdotal record and pupil performance

CONCERN: Instrumentation Matrix 4.5 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
47b. Is choice of instrument based on specific behavior?	yes	no	yes	yes	yes
47c. Is choice of instrument based on products of behaviors?	yes	no	yes	yes	yes
81. Do all field experiences have performance objectives to be met?	yes	yes	yes	yes	yes

CONCERN: Assessing for Mastery Matrix 4.6

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
48a. What percent of field experiences are assessed by cooperating teacher?	20%, student and peers 20%	100%	100%, students (self) 100%	60%	40%
48b. What percent of field experiences are assessed by university evaluator?	60%	100%	100%, makes final decision	40%	60% makes final decision
49a. How many times may a student take a post-test?	varies, faculty judgment and board review	varies, faculty judgment	faculty judgment, varies	two times, then must recycle	no limit

CONCERN: Assessing the Mastery Matrix 4.6 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
49b. Do students take the same posttest more once?	varies	field - yes, knowledge test different	same 60%, equivalent 40%	no, equivalent, test	yes 100%
51. Are there any experiences not assessed?	yes, some field experiences	yes, some field experiences	no	yes, some are not contracted to be assessed	no
52, 53. Are any portions of program graded on a Pass/Fail basis? Do you use grades beyond minimal level of performance?	yes, field experiences and some courses P/F, some courses graded conventional way	no P/F, more information with conventional grades	yes P/F in those areas which tend to be subjective, grades = more information	no P/F, institutional	all P/F

CONCERN: Assessing for Mastery Matrix 4.6 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
54. For objectives designed to be learned in field setting, what percent have assessment instruments?	100%	100%	100%	10%	100%

CONCERN: Content and Use of Feedback Matrix 4.7

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
50a. How rapidly is posttest feedback data made available to students?	minutes, hours, days, weeks, never	hours, days, weeks	minutes, hours, days, weeks	minutes, hours, days	weeks with EDP, days with hand
50b. Does posttest feedback data cover learning package achievement?	yes	no	yes	no	no
50c. Does posttest feedback data cover competency achievement?	yes	yes	yes	yes	no

CONCERN: Content and Use of Feedback Matrix 4.7 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
50d. Does posttest feedback data cover objective achievement?	yes	no	yes	yes	yes
50e. Does posttest feedback data cover credit received?	yes	no	yes	yes	yes
57. What data do you use for formative evaluation purposes?	test within course and between courses, perceptual, attitudinal, performance	maintenance used 2 week survey, adjustment survey ½ semester, design survey every 2 terms	item analysis, student question-faculty evaluations	item analysis, team level decisions	item analysis, exit tests, questionnaires

CONCERN: Content and Use of Feedback Matrix 4.7 (Cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
58. What data are used for summative evaluation purposes?	same as formative	same as formative	same as formative	same as formative	same as formative
59. Are student attitudes on objectives and strategies collected?	yes	yes	yes	yes	yes
60. How are data used for faculty evaluation?	not	not	not	yes student evaluation no faculty option	yes no faculty option

CONCERN: Evaluation/Research Matrix 4.8

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
30. Have you conducted follow-up studies/ research?	yes	yes	yes	yes	yes
32a. Have you received any feedback from employers?	yes	yes	yes	yes	no
32b. Would you rate feedback as being good, fair, or poor?	good	good	good	good	--

CONCERN: Evaluation/Research Matrix 4.8 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
32c. Do you feel that this reaction differs from that of previous graduates?	no, but working on problem	yes, even better than previously	yes, more consistently good	don't know	--

CONCERN: Electronic Data Processing System Characteristics Matrix 4.9

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
61a. Is electronic data processing used for record keeping?	all	part	part	part, hand score all constructed response tests	all
61b. Do you plan to convert all to electronic data processing?	although instructors may keep own records	no, not efficient in terms of time and money	mostly, some data not appropriate for EDP	no, time waste, inappropriate for subjective data	--
62. Did you use another institution's system in developing your data management system?	no	no	no, used a variety of sources	no	no

CONCERN: Electronic Data Processing System Characteristics Matrix 4.9 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
65a. How does system identify student having difficulty?	yes by print-out	yes by hand	yes by print-out	yes by print-out	yes by print-out
65b. What type of difficulties are identified by your system?	failure to meet require-ments	lack of competence, what areas not competent in	test achievement	failure, prescriptive information for students, number of recycles	failure, number of recycles
65c. Do you collect data on student personality character-istics and how do you use data?	yes, counseling and research for predic-tive use	yes, for self-aware-ness and self-esteem, for research purposes	yes, self-behavior modification, advisement, research for predictive validity	yes, infor-mal student interests, for advise-ment	no

CONCERN: Electronic Data Processing System Characteristics Matrix 4.9 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
66a. Do data include number of times student has attempted to posttest on individual objective?	yes	yes	yes	yes	yes
66b. Do data include number of times student has attempted to posttest on learning package?	yes	yes, competence demonstration level	yes	yes	yes
70a. Are you collecting data on the relevance of the competencies and objectives of your program?	yes	yes	yes	yes	yes

CONCERN: Electronic Data Processing System Characteristics Matrix 4.9 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
70b. If yes, whose judgment is used to determine relevancy?	faculty, students, experts, empirical evidence	faculty, students, experts, empirical evidence	faculty, students, experts, empirical evidence	faculty #1, students #2, experts #3, empirical evidence just starting	faculty 100%, empirical evidence 100%, students some
64. Do you receive an item analysis printout?	yes	yes	yes	yes	yes

CONCERN: Data Treatment Matrix 4.10

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
63a. Are student records kept for total achievement scores for each package?	yes	yes	yes	varies from team to team	yes
63b. Are student records kept for each competency?	yes	yes	yes	yes	yes
63c. Are records kept for achievement on each objective?	yes and attitudinal and biographical data	yes	no	yes	yes

CONCERN: Data Treatment Matrix 4.10 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
67a. Do these receive the same feedback data: student developer administration	yes yes yes	yes yes yes	yes yes yes	yes, through advisor yes	yes, through instructor or letter faculty yes yes
67b. Do these receive the same feedback data: advisor instructor	yes yes plus public school personnel	yes - same plus public school supervisor	yes yes plus counselor	yes --- same	yes - came
68a. What are the perceived weaknesses of your data management system?	handling observational data	not satisfied, making changes	hard to say because in the formative stages	needs to be expanded	faculty and students' failure to comply with procedures

CONCERN: Data Treatment Matrix 4.10 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
68b. What are the perceived strengths of your data management system?	well designed, changing to meet needs	research component	hard to say because in formative stage	accumulative checklist data	better information on student competency, better class monitoring
68c. What percent of the right data gets to the right person at the right time?	100% test results, observation-data causing difficulty	not satisfied, making changes	about 50%	most of time, system still evolving	75%
71. What statistical treatment is given to management data and for what purpose?	means, etc., gain scores, significance tests, primarily non-parametrics	correlational or interrelated agreement studies, research, multiple regression	item analy- profiles, single scores, comparisons to norms, analysis of variance, linear regression, correlational	item analysis storing data until later	descriptive

CONCERN: Relevant Influences Matrix 4.11

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
1b. In deciding to implement an assessment component, did you experience the difficulty of faculty lacking essential skills?	some, real need for in-service training	training needed for complicated process	some	little	yes
1c. In deciding to implement an assessment component, did you experience any difficulty caused by deviation from normal institutional policy?	yes	no, only small ones	yes, caused administration of the education department difficulties	yes	yes
2. Did lack of financial support affect the assessment component?	yes, totally built on soft money	no, during implementation had grants, yes on a continuing basis	no	yes, delayed it	no

CONCERN: Relevant Influences Matrix 4.11 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
4. What percent of faculty are negative toward CBTE?	10%	none	10%	15%	10%
69. What changes would you make in your data management system if starting again?	better program for inservice training use of EDP	none	none	generally satisfied, continuing to improve	need for outside assistance for ongoing monitoring of system

CONCERN: Information Handling of Data Management System Matrix 4.12

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
72. How do you determine what data should be collected?	faculty committee	faculty determination	program managers and faculty judgment	teams and A & R committee, objective analysis	student assessment and faculty class profiles
73. How are data collected?	performance/ checklist test instruments/ mark sense, essay converted to scores	many ways	machine scored instruments, hand scored and converted, summarized information from discussions	feedback from students, cooperating teachers, facilitator team and team comment	tests, plans of work, questionnaires
74. How are data treated?	records of students' courses, exams, follow-up, bank/research	design sample for research	student achievement, item analysis compare to other faculty and national norms	objective achievement, module efficiency, item analysis	history reports from faculty and student each quarter

CONCERN: Information Handling of Data Management System Matrix 4.12 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
75. How are data stored?	tapes, discs, cards	computer and hand files	some summarized hand/tape	tape and hand files	computer tapes
76. How are data retrieved?	printout, means	profiles, frequency distribution correlation plot, summary tables	varies with intended use	printout and hand	printouts
77. How is information distributed?	printout, some automatically some by request	printout and by hand	special types to specific consumers	printout and orally to: faculty, individual, team, and student	daily and weekly to student and faculty, quarterly to committee and division head

CONCERN: Information Handling of Data Management System Matrix 4.12 (cont'd)

	Florida State University	Oregon College of Education	University of Houston	University of Toledo	Wayne State University
78. How is the effect of the information assessed?	information good, need training for effective use of data	informally through questionnaires from varied sources; faculty, student, supervisors	not assessed	student success through A & R committee	not being assessed formally

Appendix G

Criterion Checklist and Mark-Sense Answer Sheet

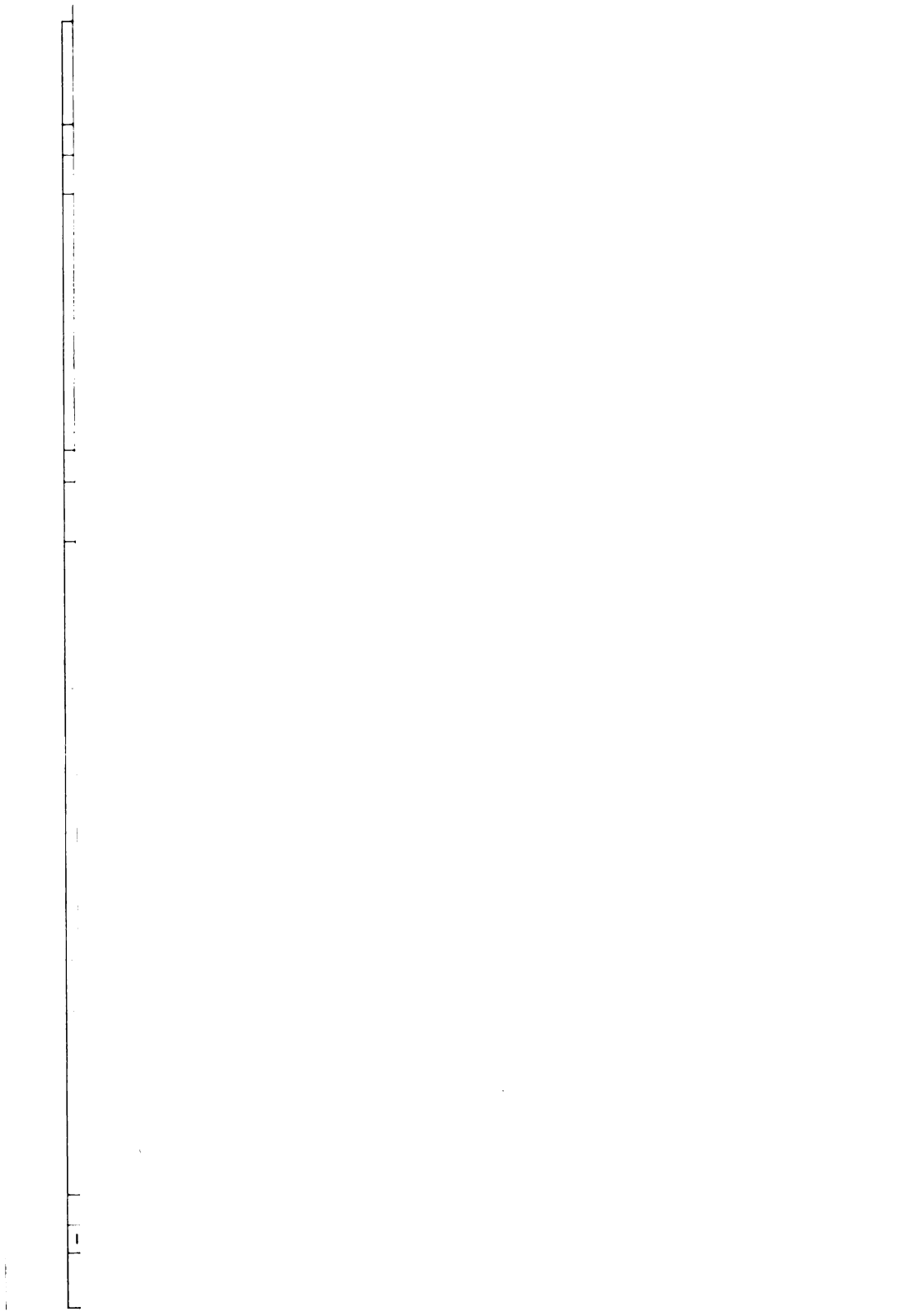
CRITERION CHECKLIST

STUDENT: John Doe DATE: 12/12/75

COMPETENCY: Use of oxy-acetylene torch

	Pass (A)	Fail (B)
1. Selects proper tip for thickness of metal to be welded.	✓	
2. Adjusts proper pressure on tank gauges.	✓	
3. Uses proper safety devices in preparing for welding.	✓	
4. Places work securely on bench and removes articles not needed.	✓	
5. Bends end of welding rod to prevent injury to others.		✓
6. Makes proper adjustment on torch to produce a neutral flame.		✓
7. Tacks pieces of metal together in proper position prior to starting weld.	✓	

(The scores, Pass and Fail, will be transferred to Columns A and B respectively on the mark sense answer sheet, see next page. Note transfer of scores on items 1 through 7.)



Mark-Sense Answer Sheet

Appendix H

Examples of Data Retrieved as Print-Outs

STUDENT PROGRESS REPORT

STUDENT: Doe, John DATE: 12/12/75

COURSE: Edu 300

MODULE: 3

OBJECTIVES

	1	2	3	4	5
MP	6	7	5	7	4
AP	4	6	4	5	4
SCORE	5	*5	5	6	*3
ITEMS MISSED	3	9,12	-	19	27
INCORRECT RESPONSE	2	1,3	-	2	1
CORRECT RESPONSE	4	4,5	-	3	4

*failure to achieve acceptable performance

Example 5.1

STUDENT VALUE REPORT

STUDENT: Doe, John

ADVISOR: Fawkes, Guy

COURSE: Educ 300

MODULE: 3

DATE: 12/12/75

CYCLE: 1

TIME: 22 hrs.

OBJECTIVE

	1	2	3	4	5
Value of objective	5	4	5	5	3
Value of teaching strategy	4	2	5	5	3
Time on each objective	4	3	3	7	5
Established mean time for completion	3.1	3.9	1.5	5	6
Range of hours	2-4	3-7	2-4	3-8	3-8

Value Rated On 1 to 5 scale, 5 = High

Example 5.2

EFFECTIVENESS REPORT

INSTRUCTOR: Fawkes, Guy

DATE: 12/12/75

COURSE: Edu 300

TOTAL STUDENTS: 30

MODULE: 4

Posttest - Mult Choice

Question Number	RESPONSE SELECTED 1	2	3	4	5	Blk	Total Incor Res	Obj	Domain Level	Learning Type	Strategy
1	2		25	3			5	1	Know	Chn	Lec
2		27		2		1	3	1	Know	Chn	Lec
3	1	24	1	1	3		6	1	Know	Chn	Lec
4	17		10	3			13	1	Appl	Disc	Ind
5		1	1	28			2	2	Comp	Rule	Lec
6		30						2	Know	Chn	Lec
7					30			2	Know	Disc	Ind
8	1		29				1	3	Comp	Conc	Ind
9	1	26	2			1	4	3	Comp	Conc	Ind
10	29			1			1	3	Know	Disc	Ind
11				28	2		2	4	Appl	Prob	Sel
12	1	11	2		16		14	4	Anal	Prob	Sel

Example 5.3

EFFICIENCY ANALYSIS

COURSE: Edu 300 Sec. 02 DATE: 12/10/75

INSTRUCTOR: Fawkes, Guy TOTAL STUDENTS: 30

MODULE: 3 OBJECTIVES: 5

Frequency Distribution of Attempts Per Objective

Cycle	1	2	3	4	5
1	27	29	30	28	21
2	2	1		1	5
3	1				1
More					

Achievement Profile on Each Attempt

Cycle	1	2	3	4	5
1 - MP	21	24	23	20	10
AP	6	5	7	8	11
F	3	1		2	6
2 - MP	1			1	
AP	1	1			5
F	1			1	
3 - MP					
AP	1				1
F				1	3

Example 5.4

COURSE ANALYSIS

COURSE: Edu 300 Sec 02 DATE: 1/20/76

INSTRUCTOR: Fawkes, Guy TOTAL STUDENTS: 30

NUMBER OF MODULES: 3

	MODULES		
	M_1	M_2	M_3
Mean number of days required for completion	10	6	19.5
Percent not completing module within time limits	2%	4%	10%
Mean value of objectives	4.6	3.9	4.2
Mean value of teaching strategy	4.4	3.4	3.9

Value Rated On 1 to 5 Scale, 5 = High

Example 5.5