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ABSTRACT

The Kentucky Model for competency-based vocational education is a system for the instructional program's development and delivery, from identification of incumbent worker tasks to student occupational competence. The components, each of which supports the others and is affected in content by the others, are: (1) instructional objectives derived from specific tasks related to basic jobs with criterion-referenced measures for student performance drawn directly from the objectives; (2) a developmental handbook, to help curriculum writers develop the instructional program from the objectives; (3) student instructional modules, the total group constituting a coherent vocational program; (4) supporting instructional materials; (5) supporting instructional facilities; (6) a program management system, enabling teachers to organize and manage the program, and maintain student records; (7) a teacher's instructional handbook, which includes alternative learning experiences and appropriate affective objectives; and (8) teacher orientation. The final report describes the model, and discusses the individual study module, which is a set of learning activities designed to facilitate the student's acquisition and demonstration of a particular occupational competence. Discussion reactions to local presentations of the competency-based program model, which were used to modify and revise the model, are summarized and a sample study module is included. (AJ)

DEVELOPMENT OF THE KENTUCKY MODEL FOR MODULARIZED COMPETENCY-BASED VOCATIONAL EDUCATION

-FINAL REPORT-

The Curriculum Development Center
for Kentucky
University of Kentucky, Lexington

December, 1974

DEVELOPMENT OF THE KENTUCKY MODEL FOR MODULARIZED COMPETENCY-BASED VOCATIONAL EDUCATION

The Curriculum Development Center and the Bureau of Vocational Education have made a serious commitment to the idea that the concepts and practices of competency-based education can make a significant contribution to the improvement of vocational programs in the Commonwealth. One of the primary efforts in moving toward competency-based education (C.B.E.) has been to identify a broad model of C.B.E. that describes the total program, and a specific model for an instructional delivery system. This must be done before instructional programs can be constructed and instructional materials developed. The effort to identify the models and determine their implementation has involved the direct professional work of a group of leaders within the C.D.C. and the Bureau, and the active response of a great many educators across the region.

The models as presented here are not claimed as being unique, for the several elements can be found in somewhat similar forms in other emerging programs around the country. Rather, the models have been derived from a variety of sources and specifically redesigned to be particularly appropriate to the needs of vocational education in Kentucky. The model for competency-based curriculum development and instructional materials production suggests the following characteristics:

--Appealing enough in concept and appearance to attract the favorable attention of teachers and students who may be unfamiliar with C.B.E. and skeptical of change.

--Flexible enough to permit development, modification, and refinement as suggested by experience in its implementation.

--Simple enough to be produced within severe time limitations and the restraints of not-unlimited resources.

MODEL OF COMPETENCY-BASED VOCATIONAL PROGRAM

The program model is based on several fundamental concepts and assumptions:

--Occupational competence consists of a large number of individual skilled behaviors, applied singly or in combination by the practitioner.

--These skilled behaviors, or competencies, can be identified and can be learned.

--Vocational educators are capable of devising programs that will enable students to become competent in their occupational skills.

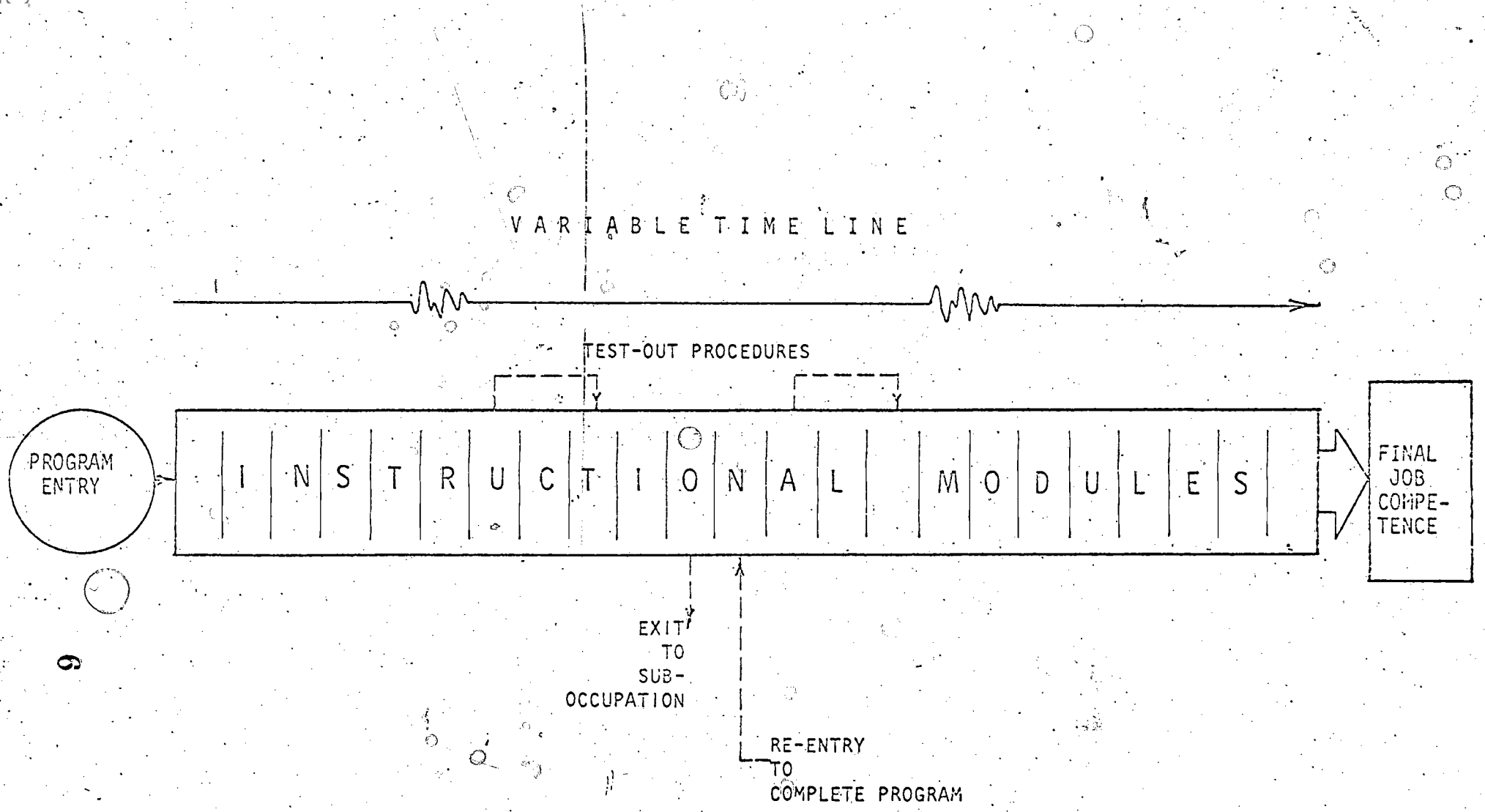
--Instructors can utilize relatively objective means to determine when the student has learned the requisite competencies.

The competency-based vocational program as conceived in idealized form consists a series of learning experiences in which the student progresses from his level of skill at the time of entry (whatever that level may be) to final competence in the skills required of his chosen occupation or sub-occupation. (Figure 1) Each learning experience (the materials for which are packaged in module form) requires successful completion and instructor-observed competent performance before a new experience is undertaken. Organization of the learning experiences is based on educational logic and on teaching/learning efficiency. The model at this stage of its development is basically lineal in design, but it does not preclude later development to a branching form to suit individual student needs.

In the competency-based program the factor of time is a variable, while demonstrated occupational competence is a constant (within, of course, the constraints of school and program administration). This is in contrast to traditional education where, broadly speaking, the reverse is true. The model admits to the fact that there are many ways to learn, including not only the formal learning activities of schooling, but also learning done in other agencies and in general life experience. Thus the test-out procedures in the program allow the student to provide evidence of previously achieved competence.

Student exit from the program may be made at various points depending on the educational and occupational goals of the student. When the identified requisite

competencies for a given sub-occupation have been acquired the student may leave to enter gainful employment. At a later time, he or she may re-enter the program at the appropriate point and then continue to achieve higher level competencies. Final program completion is reached when the student has demonstrated occupational entry-level skill in all of the identified competencies.



MODEL OF COMPETENCY-BASED VOCATIONAL EDUCATION PROGRAM

Figure 1

THE KENTUCKY MODEL

COMPONENTS OF THE COMPETENCY-BASED DELIVERY SYSTEM

The Kentucky Model for competency-based vocational education is conceived as a system for the development and delivery of the instructional program--from identification of incumbent worker tasks, to student occupational competence. As opposed to a collection of discrete or fragmentary program-support materials, in this systematic approach each component supports the others, each is in turn affected in content by the requirements of others. All of the components are directed toward providing an instructional gestalt in which the teacher and student can work in the process of learning. (Figure 2)

The instructional objectives for the Kentucky Model are derived from the V-TECS Catalog of Objectives. These objectives are directly related to the tasks that incumbent workers perform on the job. In turn, the criterion-referenced measures (or student performances of the task) are drawn directly from the objectives. This strong research-based linear relation of worker function to demonstrated student performance is thought to be one of the powers of the Kentucky Model.

The developmental handbook is designed to assist curriculum writers develop the instructional program from the objectives. In the handbook the various components of the delivery system are described and their relationship to each other explained. In particular, instructions and suggestions are given for the development of effective student instructional packages (called modules). The handbook thus provides guidelines for a unified approach to competency-based curriculum materials.

Student instructional modules are the core of the delivery system. Developed and written specifically for student use, the module presents the instructional objective along with the learning activities designed to enable the student to reach that objective, and measures constructed to determine when the objective has in fact been reached. As a vehicle for individualized instruction, the module moves the student through a series of learning experiences and learned occupational competencies toward final program completion and job entry. While each module deals with a single competency or a small cluster of related competencies, the total group of modules constitute a coherent vocational program.

Supporting instructional materials are used by student and teacher while working within the modularized program. These materials support the instructional module, provide basic subject matter content, augment and enrich the program, provide alternative paths to learning, and utilize varied stimuli to promote learning. Supporting materials may include books, reference material, audio and video tapes, illustrations, pamphlets, slides and films, laboratory equipment, and supplies. Each of these is selected and incorporated into the program specifically to aid the student in completing the module successfully, and thus acquiring the requisite occupational competence.

The supporting instructional facilities promote learning through laboratory activities and cognitive study. Work space and the appropriate environmental conditions are facilities needed for the laboratory experiences involved in the modules. In addition, the cognitive or knowledge component of the module requires that facilities be made available for student study. A learning center as one area within the classroom space, or a separate learning center within the school with enough facilities to serve several vocational programs is envisioned. The learning center will contain not only the supporting instructional materials themselves, but the necessary hardware such as slide-tape viewers, tape players, and carrel space.

The program management system is devised to enable the teacher to organize the program, manage its day-to-day operation, maintain the student records essential to competency-based education, and aid in efficient program administration. Because individualized, modularized, competency-based education is not usually a part of the teachers' experiential background, a functional management system is crucial to the installation and success of the model delivery system.

The teachers' instructional handbook is used as a constant reference in the teachers' efforts to implement the model program and promote student learning. It includes a copy of the student instructional modules, a sequential list of modules for the major occupation and sub-occupations, a listing of hardware and software required for each module, final assessment instruments, instructional notes for each of the modules, and details of the program management system. It can also suggest to the teacher alternative student learning experiences, and appropriate affective objectives which the teacher may seek to promote.

Teacher orientation is an integral part of the model, at least in the early stages of its installation. All of the components of the total delivery system are incorporated in the orientation procedures, and the modes of orientation may include readings, personal competency-based learning experience, and intensive workshops.

-THE KENTUCKY MODEL-

COMPONENTS OF

THE COMPETENCY-BASED CURRICULUM

DELIVERY SYSTEM

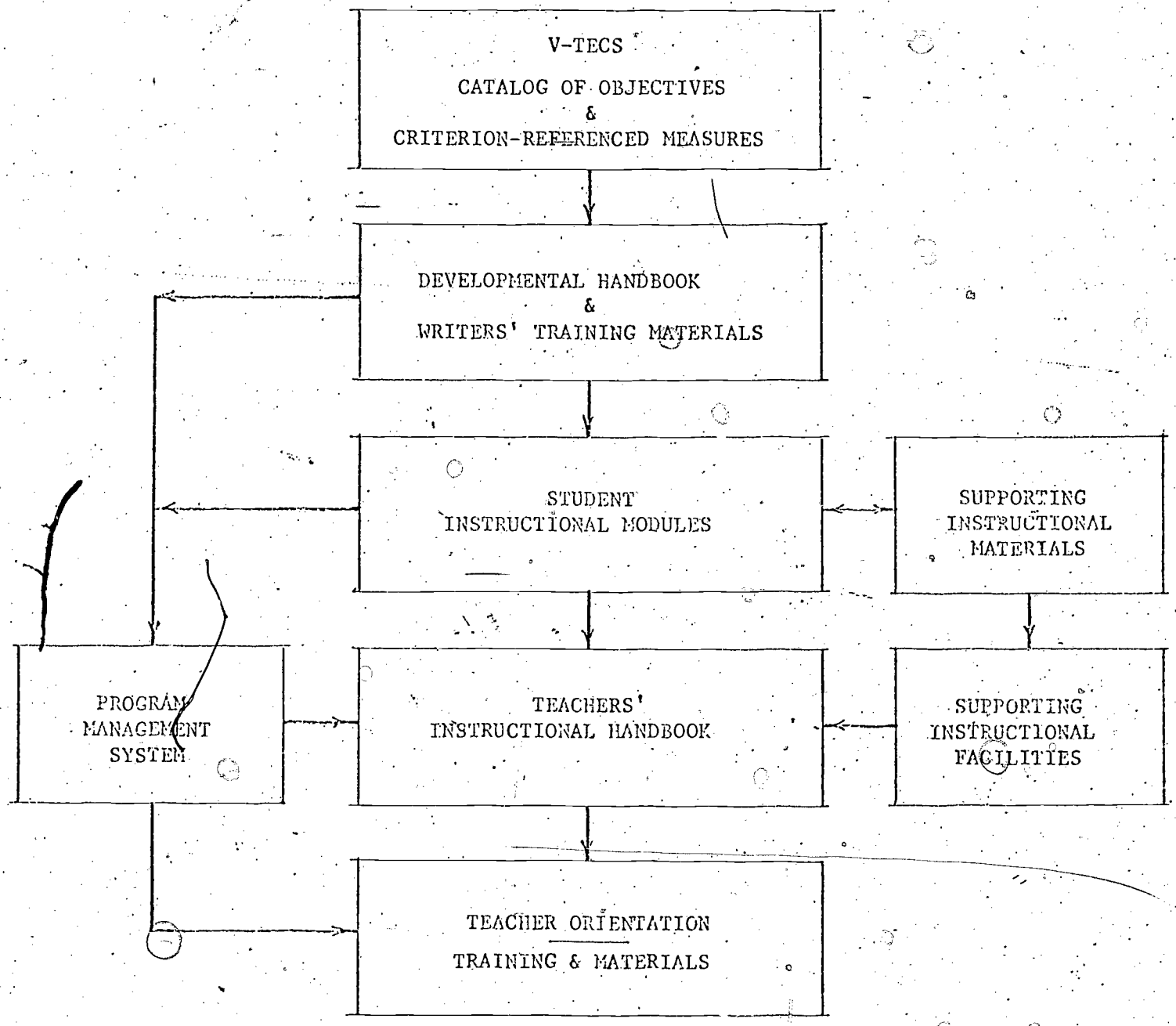


Figure 2

THE KENTUCKY MODEL

THE INDIVIDUAL STUDY MODULE

In the Kentucky Model for competency-based vocational education, instruction is modularized. A module is a set of learning activities designed to facilitate the student's acquisition and demonstration of a particular occupational competence. Organizing the instructional program in module form increases the possibilities for student self-pacing and individualization. It also promotes accurate aim toward specific competencies and incorporates relatively objective evaluation of successful performance.

The instructional module encompasses the learning of a single identified objective or a small group of related objectives that can be learned effectively together. All of the activities outlined in the module are directed toward achievement of the stated objective, and progress toward subsequent objectives is dependent upon the student's demonstration of the objective competence. Basically linear in instructional design, there is, however, provision for individualized learning activity options and for by-passing the learning activities by students who have acquired the designated competence through previous experience.

The three domains of learning are accomodated in this model of modularized instruction. Most of the stated objectives will include a cognitive element and a psychomotor element, the balance and importance of each element varying with the objective. Though it may be unstated in the language of the objective, the cognitive knowledge of facts, theories, data, and procedures is usually essential to the successful performance of the psychomotor task. Provision for the student to acquire the essential knowledge and to develop the required degree of skill is explicitly designed into the learning activities of the module. Many objectives may have either

an intrinsic or implied affective element, though in this model the affective element will not appear in the module objective statement. Opportunity for affective development is possible through special teacher-provided experiences and through the manipulation of the learning environment.

As in the model of the instructional delivery system, the model for the instructional module consists of a number of components, each supporting and contributing to the strength of the whole. Each component is meant to serve a specific purpose and satisfy a particular requirement of the competency-based vocational concept. Because they form a rationally constructed framework for teaching and learning, a member component cannot be removed or substantially modified without seriously affecting the strength of the entire structure. The individual module is intended to be used as an instructional entity, and not as a resource for student activity ideas or evaluation devices from which the teacher might draw.

The instructional module is to be put directly into the hands of the secondary or post-secondary student, and is meant for his or her personal use. As such, the reading level, the psychological approach, the types of learning activities, and the evaluation techniques must be geared to the target student. Real student needs, motivations, and abilities take precidence over teaching convience or education traditions. In the paragraphs that follow the particular components of the model module are described.

The rationale is a brief statement to the student of what he is about to learn, how this relates to his previous learning and to his future learning. It is designed to afford some motivation for the student and to emphasize the particular importance of the competence he is being asked to acquire.

The performance objective, or objectives, of the module are taken directly from the V-TECS Catalog of Objectives for the subject occupation, without change. The performance goals are specified in rigorous detail in advance of learning, and the student is held accountable for attaining a given level of competency in performing the essential tasks of the occupation.

The learning activities are specified by the module developer and are organized to enable the student to achieve the module objective. The activities will include experiences for acquiring cognitive knowledge and understanding, and for skills development. The activity forms may be varied to maintain student matter, and suitable for the expected student abilities and learning styles. The learning activities, while not precluding traditional group instruction or teacher-dominated modes of learning, will be largely self-instructional and individual. The extent and balance of individual and group learning effort is dependent on the needs and instructional problems of the particular occupational area.

The learning activity options satisfy several aspects of competency-based education. One of the basic tenets of individualized instruction is that there are many paths to learning, each valid as long as it leads to student competence. The optional and alternative activities serve to meet the requirements of students' personal learning styles and identified needs for personal growth and development. They also provide varied stimuli to encourage learning and maintain active interest. The learning activity options may be included in the module by the module developer, may be added to the module by the classroom instructor, or may even be devised by the student himself in his effort to achieve the objective.

Feedback or knowledge of results is an important part of the learning process. The Kentucky Model makes provision for student feedback by including self-tests of knowledge and checklists for performance rating. These progress checks may come during or at the completion of the learning activities. Students who find that they need more knowledge or a higher level of skill may recycle through one or more of the learning activities.

Attitudinal experiences related to the performance objectives of the module may be either group or individual experiences, and for the most part will be devised by the classroom instructor. Appropriate for such experiences are student attitude toward work, internalization of group values, personality development, personal expectations of the occupation, and human relations.

Final assessment procedures are particularly crucial to the fulfillment of the concept of performance-based education. Final assessment in the Kentucky Model is based on the Criterion-Referenced Measures of the V-TECS Catalog and is therefore considered an objective and a valid measure of task competence. The Model procedures also meet the requirements of being rigorous in detail, specifying the level of performance and conditions of evaluation, and made public in advanced.

The student who has acquired the necessary skill outside of the modularized program may elect to demonstrate his competence by going through the final assessment without completing any or all of the learning activities. Any student who is not completely successful in the assessment procedures may improve his knowledge and/or skills by re-cycling through some learning activities or selecting learning activity options. For all students, final acceptable performance is required before the student may go on to further learnings in subsequent modules.

-THE KENTUCKY MODEL-

THE INSTRUCTIONAL MODULE -- SEQUENTIAL DEVELOPMENT

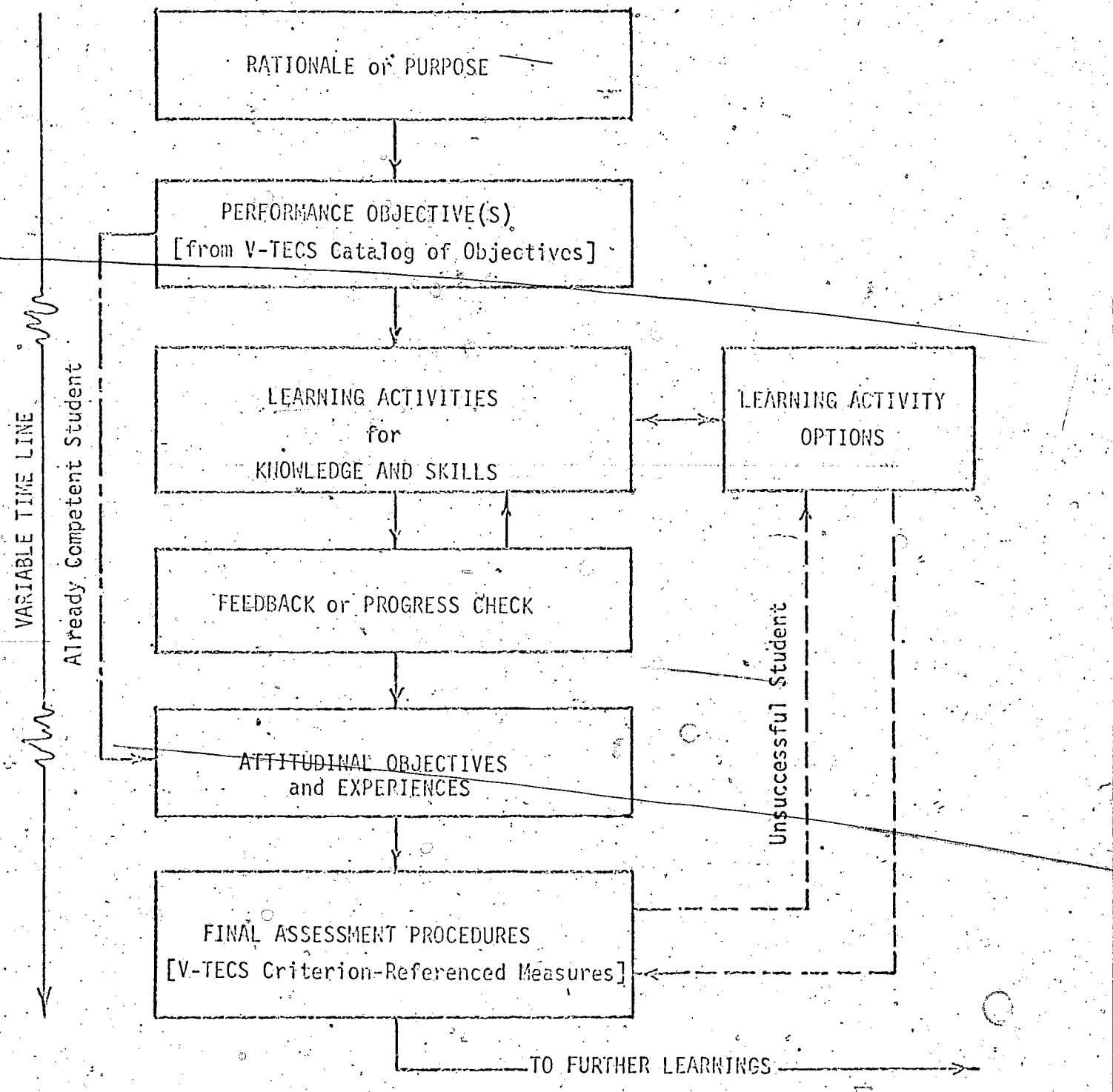


 Figure 3

SUMMARY OF DISCUSSION REACTIONS TO THE LOCAL PRESENTATIONS OF THE COMPETENCY-BASED PROGRAM MODEL

Following is a condensed summary of the notes taken by the team recorders during the discussion periods of the presentations. The comments and questions noted here were selected as being most worthy of examination as the model for the delivery system undergoes revision. General expressions of approval and goodwill, and straightforward attitudes of unthinking opposition are not represented because they are not particularly helpful in this process.

I. READING LEVEL OF MODULE

There was a considerable amount of concern expressed about the reading difficulty of the module itself. Educational jargon and multi-syllable words were criticized, and the general level of reading was thought to be too high. Singled out for particular criticism was the statement of objectives, and several suggestions were made for re-wording them. Module developers were urged to keep readings at the students' level (though a specific grade level was not mentioned).

II. GETTING STUDENTS TO READ

The problem of getting the students to actually read the module and to read the materials listed in the Learning Activities section was of great concern. Statements were made that the students "can't read," or "won't read," or "dislike reading." It appeared to the participants that modularized instruction required a great deal of reading, and therefore less laboratory activity. Some suggestions were made to rely more on oral instruction by the teacher, cut down on the reading, and use drawings, diagrams, and illustrations heavily.

III. ALTERNATIVE LEARNING ACTIVITIES

There seemed to be a feeling that there should be more opportunity for optional or alternative learning experiences. It was said that teachers should be given more scope in assigning learning activities, and should be allowed to insert their own favorite projects. There were few specific suggestions of how this should be done.

IV. FRONT PAGE OF THE MODULE

Quite a few comments pertained to the organization of the module's front page. While it was apparently felt that the page was clear and attractive enough, it was mentioned a number of times that the order of sections should be (1) Introduction, (2) Directions, (3) Objectives.

V. USE IN SECONDARY AND POST-SECONDARY PROGRAMS

A common concern was that competency-based education in general, and the sample module in particular were more suited to the post-secondary than the secondary level. There were some vague doubts as to how the various students would accept modularized instruction. More particularly, the participants were very doubtful about the management problems involved in secondary programs, and whether the modules for secondary students should be less rigorous in content and final evaluation.

VI. PROGRAM MANAGEMENT

The area of greatest concern was that of program management and administration. A great deal of discussion centered around what to do with students who complete the program early, Carnegie Units, daily attendance, student grades, space, equipment, etc. The supposed extra load on the teacher was decried, especially that involved in maintaining student records and in time-consuming evaluations of student performance. The various groups brought up a number of problems and anxieties that will need to be dealt with in due course.

VII. TIME AS AN ELEMENT

Some confusion existed as to the importance of the element of time in competency-based instruction. There was some question as to how much time the students should be allowed in completing the modules. Another question involving time was that vocational competencies should not only be evaluated as to whether or not they are performed at a satisfactory level of accuracy, but also as to whether they are performed at a satisfactory speed. Specified amounts of time for practice of skills were also suggested.

VIII. AFFECTIVE EDUCATION

Particularly in teacher education groups, the question of how competency-based education proposed to deal with attitudes and values was brought up. Questioners seemed to feel that C.B.E. was inadequate in its approach to the affective domain, and that affective education as it now existed would be lost in the shift toward individualized and modularized instruction. There was a notable lack of positive suggestion as to how attitudes, values, and appropriate personality could be taught--within the competency-based approach or in traditional vocational education.

IX. COMPETENCY-BASED EDUCATION NOT FUNCTIONAL

On several occasions comments were made to the effect that competency-based education was probably a good idea for some vocational service areas, but that in the speaker's area it wouldn't work. This opinion was voiced by people in some Industrial Education areas, Home Economics, and in Business and Office Practice. It was difficult to ascertain the specific objections and doubts of the speakers, but it seemed that in fact no real unsolvable problems were presented.

SUMMARY

The comments and questions raised at the group presentations did not cover a great range of concerns. The same items were expressed in meeting after meeting. Much of what negative comments there were, were basically an expression of long-time frustrations, feelings of personal threat and anxiety, and general cynicism. There was a great deal of interest, enthusiasm, and positive feeling that is not summarized here because it would not directly affect the revision and refinement of the model. There were, in fact, little or no basic objections to the theory of competency-based education, and no basic deficiencies were exposed in the model. If a large generalization were to be made, it would be that the group response was positive, interested, and anticipatory.

THE REVISED INSTRUCTIONAL MODULE

A number of revisions and refinements have been made to the model instructional module as a result of reaction and input from many individuals and groups. This input was the result of the 24 formal presentations made to vocational leaders around the state from which verbal discussion and written comments were obtained, informal conversations with persons interested in curriculum development, and our own re-thinking. While no great deficiencies were discovered in the model, and no basic changes were suggested, the following refinements were among those made to the revised module:

--The sentence structure and vocabulary have been reviewed and made simpler where possible, and educational jargon has been largely eliminated. This will also be carried through to the instruction sheets and supporting materials.

--The front page has been reorganized, with the Introduction, Directions, and Objectives being placed in that more logical order.

--The format for the objectives has been given greater clarity.

--The Learning Activities section has been revised to permit optional or alternative learning activities to be readily added by the instructor.

--The "Final Assessment" has been retitled "Check-Out Activities" to be understandable to students.

--Typographically, the module number has been re-placed for easy filing, the C.D.C. logo added, and type and symbols have been somewhat refined and unified.

--Other suggestions, such as instructions to the teacher for alternative activities and affective objectives, will be incorporated in the teacher's handbook.

BANK TELLER

CASHING CHECKS

Introduction

Many of the customers who come to the teller's window will have a check that they wish to cash. Before the check can be cashed, it must be examined by the teller to be sure it is legally acceptable; then it must be processed and the cash dispensed. When batches of checks are presented by the customer, a somewhat more complex procedure is required. In this module you will learn how to cash both single checks and batches of checks.

Directions

Before you start to work on this module, be sure you have completed Module BT-12, "Using the Adding Machine," and Module BT-15, "Making Out Cash Tickets."

If you have completed these modules, read the three objectives below. If you feel that you are already able to perform these tasks, read the test-out activities on the back cover. Then either check with your instructor about doing the check-out activities,

or

If you feel that you need to complete the learning activities in order to be able to do the tasks, turn to p. 2 and go through the Learning Activities in the order given.

Objective

(1) Given a display of three sample checks, examine each and choose the one that is acceptable for cashing.

(2) Given a practice teller window prepared for cashing checks and a teller's stamp, cash a single check. All items on the instructor's checklist should be performed correctly.

(3) Given a practice teller window prepared for cashing checks, a teller's stamp, and an adding machine, cash a batch of checks. All items on the instructor's checklist should be performed correctly.

Learning Activities

1  READ Jones and Laughlin, The Bank Teller: Tasks and Procedures, pp. 81-97

(or)

2  VIEW the slide-tape presentation BT-17, "Cashing Checks," in the Learning Center.

(or)

3  COMPLETE THE PROGRAM in the A.B.A. booklet, Checks, pp. 26-97.

(or)

4  TEST YOUR KNOWLEDGE of examining checks for acceptability by taking the PROGRESS CHECK given in Instruction Sheet I.

5  READ the Instruction Sheet, PAYING CURRENCY.

(or)

6  PLAY THE ROLE of the bank teller in dispensing currency. Ask a fellow student or your instructor to request an amount of money in specific denominations. Using a practice-cash drawer, go through the entire transaction of dispensing the correct currency.

(or)

7  PRACTICE processing batches of checks in the learning laboratory. Get the practice materials for Module BT-17, and use the adding machine to prove your totals. [The correct totals are: (1) $278.10 (2) $1,417.63 (3) $911.29]

8  ARRANGE with your instructor to complete this module by going through the Check-Out Activities listed on the back cover.

Information And Instruction Sheets

This pocket contains the following material:

(1) Instruction Sheet for Learning Activity 4, PROGRESS CHECK.

(2) Instruction Sheet for Learning Activity 5, PAYING CURRENCY.

(3) Instructor's Checklist for Check-Out Activities, Module BT-17.

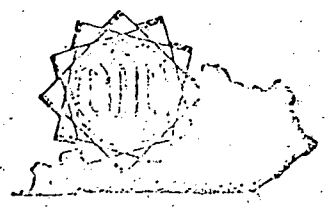
Check-Out Activities

The statements below explain the activities you must be able to complete in order to finish this module. Go through each activity as your instructor uses the checklist EXAMINING AND CASHING CHECKS, to rate your performance.

1 ✓ Your instructor will provide a display of three checks. Examine the face and endorsement of each check. Place an "X" across the one that is acceptable for cashing.

2 ✓ Go to the teller's window. Remove the check from the container labeled "Customer," and cash the check.

3 ✓ Go to the teller's window. Remove the batch of checks from the container labeled "Customer," and cash the checks.



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