

District-based, criterion-referenced tests possess the potential to allow school districts to control and guide their own destiny.

District-based, criterion-referenced tests: a major tool for curriculum evaluation

by Gerald D. Bailey

The 1980s have witnessed a resurgence of curriculum development as a high priority for school districts throughout the nation. With this renewed interest in curriculum has come greater emphasis on material development which possesses a high degree of specificity. School districts have placed much energy and money into the creation of these materials. Never before have curriculum documents reflected such a high degree of clarity in terms of student outcomes. With the creation of quality curriculum materials, the potential for objective, systematic evaluation has reached an all-time high. Traditionally, schools have depended on standardized tests, student followup, accreditation studies, consultant evaluation and self-directed evaluation measures. However, the new emphasis on specificity in curriculum documents makes district-based, criterion-referenced tests a major curriculum evaluation tool which is not only feasible but highly desirable.

District-based, criterion-referenced tests are those examinations created by the school district which have specific reference to goals, competencies and objectives exclusively established for that school district. For those school districts who are seriously considering the creation and use of district-based, criterion-referenced tests, the following steps should be considered:

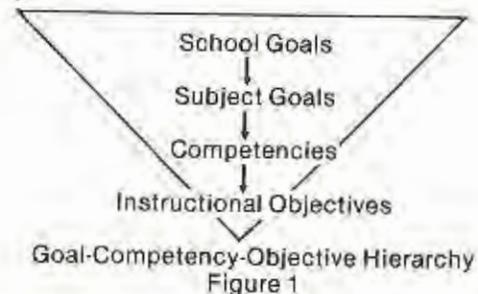
1. Creating highly detailed and specific curriculum documents. At the minimum, they should contain school district goals, subject matter goals, competencies and instructional objectives.
2. Identifying subjects and grade levels to be evaluated by the criterion-referenced tests.

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3. Creating criterion-referenced tests and matching competencies-instructional objectives with criterion-referenced items.
4. Administering and analyzing criterion-referenced tests.
5. Dissemination of test results.
6. Engaging in curriculum revision to improve school district curriculum.

Step One: Creating Highly Detailed and Specific Curriculum Documents

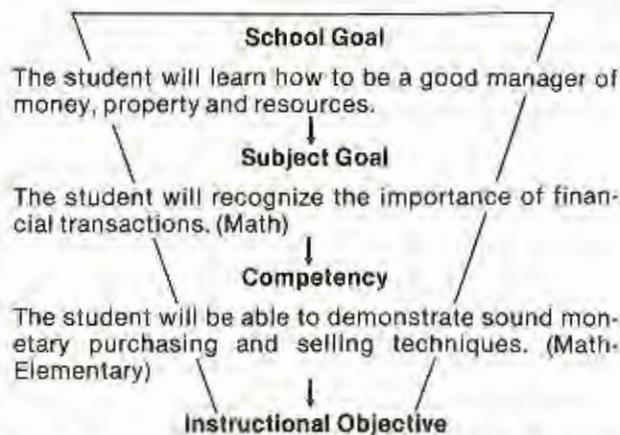
As was stated previously, any serious attempt at district-based, criterion-referenced tests must be tied to curriculum documents which illustrate specific student outcomes. Bailey and Littrell identified these kinds of materials as the Goal-Competency-Objective Hierarchy' (See Figure 1).



The hierarchy is emblematic of an inverted pyramid which illustrates that each curriculum component is derived from the preceding component. School goals represent the content and experience outcomes which students will attain in their K-12 experience. The purpose of these statements is to depict what the school district expects of all students.

The second curriculum component is labeled subject goals. Subject goals are derived from the school goals. The purpose of these statements is to show with somewhat more specificity how the respective subject areas are reaching the individual school goals. Subject goals are broad statements of student behavior related to each of the subject areas found in the curriculum. The third curriculum component contained in the hierarchy is called competencies. A competency is a specific statement concerning student outcome found in each subject area. Competencies identify skills, behaviors and attitudes which the student is expected to demonstrate. Instructional objectives is the last concept found in the inverted pyramid. Instructional objectives represent highly specific statements of student skills, behaviors and attitudes. They are statements which have elements illustrating the student type of activity, conditions and criterion or criteria which makes the student act measureable. Ultimately, instructional objectives show where and how the school goals, subject goals and competencies are being achieved. The purpose for engaging in this type of curriculum material creation is to show the what and where of student achievement in the school district's curriculum. Illustrations of a goal-competency-objective hierarchy are found in Figure 2.

¹Gerald D. Bailey and J. Harvey Littrell, "A Blueprint for Curriculum Development; Establishing a Systematic Design," *NASSP Bulletin*, 65, No. 443, March 1981, 22-28.



After large group class discussion and in a designated role-playing exercise depicting the local grocery store, a student will be able to make correct change for any item purchased by a customer. No item will be more than five dollars in value. (Math-Elementary)

Goal-Competency-Objective Hierarchy
Figure 2

Step Two: Identifying Subject Areas and Grade Levels to Be Evaluated.

Once the school district has established a comprehensive set of goals-competencies-objectives for each subject matter in the K-12 curriculum, the task of selecting the subjects and grade levels to be evaluated by criterion-referenced tests is a relatively simple task. The curriculum director must decide which subjects should be included and the order of their evaluation. Subject areas which may be evaluated include: art, mathematics, physical education, science, language arts, fine arts, foreign language, health, vocational agriculture, industrial arts, social studies, business, special education and guidance. Obviously, districts may have additional areas which they wish to evaluate using criterion-referenced tests.

Step Three: Creating District-Based, Criterion-Referenced Tests and Matching Competencies-Instructional Objectives with Criterion-Referenced Items.

The creation of district-based, criterion-referenced tests requires a number of major decisions. First, a decision must be made concerning whose responsibility it is to create the test. The curriculum director and/or superintendent can create the tests or teachers can be requested to submit respective items for each competency-instructional objective. Logically, the central curriculum official should compile the test, but it is very important that the creator recognize that each test item must relate to the competency-instructional objective under consideration.

Curriculum materials must reflect these kinds of student outcomes if criterion-referenced tests are to be used as a major curriculum evaluation tool.

Subject Area: Language Arts

Competency	Instructional Objectives	Criterion-Referenced Test Items
1. The student will be able to write complete sentences.	Grade 4	Grade 4
	1. After workbook activities and board demonstrations, the student will be able to identify two simple sentences. Each sentence will contain a complete thought.	1. Identify the two simple sentences which contain a complete thought. a. The dog and cat. b. The both of them. c. Good friends enjoy. d. The dog and cat are good friends.
	Grade 5	Grade 5
	1. After a lecture and board work, the student will be able to select two compound sentences. Each select sentence will contain a complete thought.	1. Select the two compound sentences which contain a complete thought. a. At exactly 4:00 p.m. the ill-dressed gentleman arrived home and the policeman was there to greet him. b. Hundreds of birds and animals can be found on the beach. c. In a few years, he was an outstanding speaker. d. Pig iron is defined as melted iron which hardens into a bar and the word pilgrim is defined as a person who travels to holy places to worship.
	Grade 12	Grade 12
	1. After filmstrip and seatwork exercises, the student will be able to write a 200-word short story using simple and compound sentences. Each sentence will contain a complete thought.	1. Write a 200-word short story about your field trip to the state capitol. Use several simple and compound sentences in your essay. Each simple and compound sentence should contain a complete thought.

MATCHING COMPETENCIES-OBJECTIVES WITH CRITERION-REFERENCED TEST ITEMS

Subject Area: Science

Competency	Instructional Objectives	Criterion-Referenced Test Items
K-12	Grade 4	Grade 4
1. The student will be able to use the scientific method.	1. After being introduced to the six steps of the scientific method (text and seat work exercises), the student will be able to define the terms hypothesis and conclusion.	<p>— 1. Select the correct definition of the term hypothesis found in the six steps of the scientific method:</p> <p>a. a guess b. a decision c. a fact d. a process of gathering information</p> <p>— 2. Select the correct word that illustrates the meaning of the term conclusion used in the scientific method:</p> <p>a. a guess b. a decision c. a fact d. a process of gathering information</p>
	Grade 8	Grade 8
	1. After reviewing the steps in the scientific method, (workbook, filmstrip, board work), the student will be able to list and define the six steps found in the scientific method.	1. List the six steps found in the scientific method. List them in the order of their most common use. 2. Define each of the six steps found in the scientific method.
	Grade 12	Grade 12
	1. Using a scientist's approach known as the scientific method and given the condition of jack rabbit overpopulation, the student will propose a solution for balancing the food chain. The solution will contain the labeled scientific steps used in solving the problem.	1. Overpopulation of jack rabbits pose a serious crop threat to farmers in western Kansas. Using the scientific method as a way of solving this problem found in a food-chain, identify how you might solve this problem. Present viewpoints of conservationists, farmers and environmentalists. Label each of the scientific method steps that you use in solving the problem.

MATCHING COMPETENCIES-OBJECTIVES WITH CRITERION-REFERENCED TEST ITEMS

Figure 4

Those individuals creating the test must possess technical knowledge of test construction principles. Knowledge of rules governing the correct item construction are paramount. For this reason, the curriculum director and/or superintendent must carefully monitor this process. Several test items are possible in criterion-referenced tests: essay, multiple-choice, matching, true/false, completion and short answer. Traditional standardized tests use multiple-choice items because of their ease of construction and ease of scoring. However, the school district need not restrict itself to this single-item format. Detailed instructions on item creation, reliability measures and validity measures should be considered. Texts such as Norman E. Gronlund's **Constructing Achievement Tests**, provide an excellent overview of these tasks.²

A good deal of preplanning should go into the construction of the district-based, criterion-referenced test. Ample time for construction is an important consideration. Depending on the number of subject areas and grade levels involved, several months may be required to com-

pile the test items. A good rule of thumb is to prepare many more test items than will likely be used in the test. Second, it is important to plan sufficient time so that reliability and validity tests may be undertaken for the tests.

Test construction should involve careful planning of how the test is arranged. Test arrangement includes grouping test items around each competency-instructional objective which is to be evaluated. Test items should be arranged so that all items are in order of increasing difficulty. Tests should be structured in a manner which allows careful scoring. Usually blanks to the left of each stem facilitate this task.

Each criterion-referenced test item measures a major competency. Criterion-referenced test items should be derived from the list of instructional objectives formulated. However, it is important to recognize that the criterion-referenced test item is created from a larger body

²Norman E. Gronlund, **Constructing Achievement Tests**, Third Edition, Prentice-Hall Inc., Englewood Cliffs, N.J., 1982.

of instructional objectives. Not every instructional objective used by the teacher will be found in the district-based, criterion-referenced test. A graphic illustration of the relationship from competency to instructional objective to criterion-referenced test item is found in Figure 3 and Figure 4.

Step Four: Administering and Analyzing Criterion-Referenced Tests.

Administering the criterion-referenced tests involves careful consideration of the proper environment which allows students to maximize their academic potential. Proper testing conditions include: (1) decorum that permits few, if any, disruptions or interruptions, (2) adequate directions that allow students to proceed through the test with minimum confusion and (3) seating arrangements which minimize the potential for student interaction and/or cheating.

Since district-based, criterion-referenced tests involve many subjects and grade levels, some form of systematic scheduling will need to take place. As a result, considerations such as time of the year and previously scheduled curricular activities are very important.

The central issue of criterion-referenced tests is whether or not the student achieves the proficiency level found in the instructional objective. The instructional objective should specify the minimum performance level designated by the school district. As a consequence, the vast majority of students should achieve the stated objectives. If the test results show that a significant number of students have failed to achieve the competencies objectives, the curriculum leader may want to pursue the following questions in analyzing the test results:

- a. How much time was allocated to the competency objective in the classroom?
- b. What kind of materials were used to teach the competency objective?
- c. What kind of methods were used to teach the competency objective?
- d. Were there mitigating circumstances involved when the competency objective was taught?

Based on the answers to the preceding questions, the school district will need to determine how they can assist students achieve a higher level of proficiency on the established competencies objectives.

Step Five: Dissemination of Test Results

If the district-based criterion-referenced test results are to be useful to the school district, some form of dissemination should be considered. Dissemination is largely a matter of individual school district preference. However, the following ideas should be considered:

1. A report card should be issued which illustrates student achievement with reference to the competencies objectives. No letter grades or comparisons with other students are found in the criterion-referenced reporting system.
2. A written report should be submitted to the school board which allows the group to determine what aspects of the curriculum are being achieved.

The critical reason for gathering criterion-referenced test data is to provide information about the total curriculum. Optimum use of criterion-referenced test data can only be made by comparing the results to other sources of information such as standardized tests, student followup,

accreditation, expert or consultant evaluation and self-evaluation results. Therefore, these additional sources of information should be included in any publication of curriculum evaluation results.

Step Six: Curriculum Revision

After the criterion-referenced results are compiled and adequate analysis of the results is compared to other sources of information concerning the curriculum, the school district is in a position to engage in curriculum revision. Several activities can be undertaken:

1. The curriculum leadership of the school can reaffirm the elements found in the goal-competency-objective hierarchy.
2. The curriculum leadership of the school can modify the statements found in the goal-competency-objective hierarchy. If the curriculum materials are modified, the teachers who are responsible for teaching them must be heavily involved. All changes must be reflected in the written curriculum documents.
3. The curriculum leadership can schedule the next criterion-referenced tests for the subject area which need to be evaluated.

Conclusion

District-based, criterion-referenced tests as a major curriculum evaluation tool have come of age. They possess the potential to allow school districts to control and guide their own destiny. District-based, criterion-referenced tests provide a mechanism which sustains curriculum development as a process which is continuous and systematic. Those curriculum leaders who recognize the full potential of district-based, criterion-referenced tests have reaffirmed them as a powerful tool of curriculum evaluation. More important, they recognize that district-based, criterion-referenced tests have allowed their school district to achieve a higher level of curriculum excellence.

References

- Bailey, Gerald D. "Relating Curriculum to Facility Planning," *Educational Considerations*, 3, No. 2 (Winter 1976), 14-15 + 18.
- Bailey, Gerald D. and J. Harvey Littrell. "A Blueprint for Curriculum Development: Establishing a Systematic Design," *NASSP Bulletin*, 65, No. 443 (March 1981), 22-28.
- Bailey, Gerald D. and J. Harvey Littrell. "The Leadership Hierarchy in School-Based Curriculum," *Educational Considerations*, 10, No. 1 (Spring 1983), 18-21.
- Educational Goals and Objectives, *A Model Program for Community and Professional Involvement*. By Commission on Educational Planning, Bloomington, Indiana.
- Gronlund, Norman E. *Constructing Achievement tests*, Third Edition, Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1982.
- Hunkins, Francis P. *Curriculum Development, Program Improvement*. Columbus, Ohio: Charles E. Merrill, 1980.
- Littrell, J. Harvey. "Evaluation of Proposed Curriculum Changes," *Kansas School Board Journal*, Winter 1977, 14-16.
- Littrell, J. Harvey and Gerald D. Bailey. "Accreditation: Focusing on the Advantages," *NASSP Bulletin*, 60, No. 401 (September 1976), 68-70.
- Littrell, J. Harvey and Gerald D. Bailey. "Administrators, Teachers—Stop Writing Curriculum Guides That Won't Be Used," *NASSP Bulletin*, 65, No. 443 (March 1981), 29-36.
- Taba, Hilda. *Curriculum Development: Theory and Practice*. New York: Harcourt, Brace, Jovanovich, Inc., 1962.
- Wiles, Jon and Joseph Bondi. *Curriculum Development, A Guide to Practice*. Columbus, Ohio: Charles E. Merrill, 1980.