Delineating and Measuring Professional Competencies

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DAVID KRATHWOHL, who vigorously supports performance-based teacher education, recently predicted that PBTE

> . . . 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. . . .[1]

This article addresses the question, "What is the character and quality of the work being done by PBTE programs in delineating and measuring professional teaching competencies, and what might be done to improve this work?" To organize my answer to this question, I have taken three criteria that seem to me to deal with fundamentals of the competency approach to teacher education:

1. Is a defensible basis being used for selecting competencies? Are competencies being identified and organized according to some rationale or conceptual base?

2. Are competencies "stated so as to make possible explicit assessment of a student's (teacher's or prospective teacher's) behavior in relation to specific competencies"?[2]

[1] "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.

[2] Stanley Elam. *Performance-Based Teacher Education: What Is the State of the Art?* Washington, D.C.: American Association of Colleges for Teacher Education, 1971. p. 6.

What is being done in PBTE programs to delineate and measure teaching competencies? What can be done to improve this work?

3. One basic premise of the competency approach is that competencies, however and whenever developed by a person, should be the currency honored for a teaching position. Are measurement procedures emerging that can serve as "legal tender"?

Statements of competencies are, of course, derived from an analysis of teaching functions. Teaching functions take their meaning from the influence they have on pupil behavior. More accurately, we ascribe meaning to teaching behaviors according to the influence we *presume* they have on pupil behaviors. As a profession, our presumptions have ranged in soundness on a continuum from stereotyped notions to verified hypotheses.

One would hope that developers of PBTE programs would start at the latter end of the continuum in delineating competencies. That is, they would identify and organize competencies on the basis of a solid theory or rationale and an analysis of relevant educational research findings. Actually, it appears that very few program developers have proceeded that way.

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Rosenshine and Furst, in a review of research on teacher performance criteria, note: "Although hundreds of teacher performance criteria are specified in the U.S. Office of Education's Model Teacher Education Programs, the programs do not describe how these particular criteria were chosen. None of the proposals contain a detailed review of the literature upon which the model builders based their decisions." [3] (Their latter statement, I think, does not apply to the Teachers College—Columbia Program and is only partially true for the Syracuse Model.)

Elfenbein, in reviewing 13 other performance-based programs, comes to a similar conclusion.[4] One of the 13 programs, at the University of Utah, was singled out as having a well developed conceptualization.[5] In the descriptions of 10 other programs I found in current literature, the substantive basis for selection of specific competencies is not mentioned.

I know of one clear exception to the pattern. The "Improving Teaching Competencies Program" of the Northwest Regional Educational Laboratory (not the NWREL elementary model) is based on an operationally defined theory, carefully constructed from the works of theorists and researchers.[6] The instructional design, as well as the substance of the competencies, is developed on that foundation. This seems to me an excellent model for development of a rationale.

PBTE program developers do report the procedures used in constructing sets of competencies. One procedure commonly used is soliciting suggestions for competency statements from concerned parties and then dis-

[3] Barak Rosenshine and Norma Furst. "Research on Teacher Performance Criteria." In: B. Othanel Smith, editor. *Research in Teacher Education*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971. pp. 38-39.

[4] Iris M. Elfenbein. *Performance-Based Teacher Education Programs, A Comparative Description*. Washington, D.C.: American Association of Colleges for Teacher Education, October 1972. pp. 21, 27, 30, 61.

[5] *Ibid.*, p. 24.

[6] *Improving Teaching Competencies Program: Basic Program Plans*. Portland, Oregon: Northwest Regional Educational Laboratory, April 1972. See especially: pp. 13-75.

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tilling that list by a consensus process. In many cases, faculty members brainstormed competency statements. Frequently, school personnel and the public have been brought into the process. The University of Kansas used a systematic consensus process, the Delphi technique, to get a tight consensus among five groups on a slate of competencies.[7] It is interesting to note that agreement is strongest on competencies that are stated in the more abstract terms.

The identification of competency-objectives by the consensus process has severe drawbacks. The definitive criticism of the process was made by Bode 50 years ago.[8] The fact that consensus is easier to obtain on objectives that are more vaguely stated points out one weakness. An eclectic collection of competency statements derived by consensus is not a sound substitute for competencies drawn from a theory base. On the other hand, the consensus process can be used successfully to obtain debate and understanding, and to gain a negotiated acceptance of competency-objectives and their underlying theory base.[9]

In summary, PBTE programs generally have been launched with competency-objectives not clearly rooted in theory and research. The consensus process has not drawn the profession closer to a set of universal teaching competencies because agreement usually has been reached on generalizations disconnected from any theoretical context.

Competency Statements as Guides to Measurement

Are PBTE program developers stating competencies so as to make possible assessment of a person's behavior in relation to specific competencies? Or, in a different phrasing, how adequately do competency statements serve as guides to specifying means of measuring a person's attainment of the competencies?

In most of the PBTE programs reviewed, the means of measuring competencies are specified in instructional modules. Because modules contain the basic elements of instruction—objectives, learning activities, and evaluation—they are perhaps the best source of clues as to how well competency statements guide the measurement process.

My co-workers and I analyzed over 200 modules developed by many institutions, and we also have had the experience of preparing and field-testing 30 modules for in-service teachers. One of the criteria we applied in analyzing modules, and in designing them, was whether measurement procedures and performance criteria were consistent with the competency-objectives.

The results of our analysis of modules surprised us:

1. In two-thirds of the modules, measurement procedures and criteria were inconsistent with competency statements in some substantial way. The most frequent inconsistency was between objective and the type of competency measurement. For example, a paper and pencil test of information or memory outcomes was often taken as a measure of *performance* when the competency statement implied performance in the sense of making, leading, experimenting, etc.

2. In almost half the modules, specific evaluative criteria were not given. The student was given specifications for a task, but the evaluation was to be accomplished by a test or some other measure outside the module, the criteria for which were not named in the module.

3. In half the modules, the measurement procedure did not cover the range of outcomes implied in the competency statement.

4. Activities required or suggested in one-third of the modules were judged not likely to generate the *kind* of evidence of competency indicated by the competency-objective. For example, the activity of successfully practicing a skill in a micro-teach lesson with peers was taken

[7] Dale P. Scannell. "The Use of the Delphi Technique To Gain Consensus on the Professional Education Components of Teacher Certification Requirements in Kansas." Lawrence: University of Kansas, August 1972. ERIC ED072 025.

[8] Boyd H. Bode. *Modern Educational Theories*. New York: Vintage Books, 1927. pp. 80-82.

[9] For one example, see: Gordon Lawrence and Charles Branch. *Guidelines for Competency-Based In-Service Teacher Education*. Gainesville: Florida Educational Research and Development Council, 1973. Section IV.

Behavior Outcome	*Kinds of Evidence*	*Kinds of Evaluative Criteria*
Information/Memory	Telling, showing, reciting, etc.	Right answers
Conceptual understanding	Explaining, evaluating, predicting, etc.	Sound problem-solving strategy
Performance	Making, experimenting, leading, etc.	Emerge from tasks; students share in the decision process
Disposition	Asserting a value, acknowledging feelings, etc.	

Figure 1. Relationships Between Behavior Outcome, Kinds of Evidence, and Evaluation Criteria

as evidence of ability to use that skill successfully with children.

We did not tally the incidence of another problem, but it was often present. "Command performance"—performance that the student knew was being watched for certain effects—was taken as evidence that a student had incorporated a competency into his or her behavior system. *Assumption:* that, because he *could* use it when watched, he probably *would* use it when not watched; that his disposition had been affected by a prescribed task.

As depressing as this analysis may sound, we did come away from it with a confidence in the potential of the module as a vehicle of instruction, with a list of modules we regarded as sound and suited to our purposes, and with some practical criteria for constructing modules. One of those criteria is appropriate to the topic here. A statement of a competency-objective will be an adequate guide to measurement of that competency if it specifies a kind of behavior outcome, a kind of evidence, and a kind of evaluative criterion that are consistent, each with the other. We named four kinds of behavior outcomes—information/memory, conceptual understanding, performance, and dispositional outcomes—and the kinds of evidence and criteria appropriate to each.[10] The summary in Figure 1 gives an indication of these relationships.

[10] Gordon Lawrence. *Module on Modules.* Tallahassee: Florida Center for Professional Development Materials, Florida Department of Education, 1973. pp. 22-24. This is one of the series, "Florida Modules on Generic Teaching Competencies," published by FCPDM.

Measurement Procedures as Legal Tender?

When teaching certificates are awarded on the basis of demonstrated competencies, rather than on course completions, the college transcript needs to be replaced or supplemented by a portfolio containing records of demonstrated competencies. The ideal records would be those that give a clear picture of each teacher's specific and unique set of capabilities. That ideal is far from realized now, but promising measurement procedures are emerging from which some solid, meaningful records can be built.

Generally, the more promising procedures would be labeled "low-inference" measures. Procedures for measuring behavior range along a continuum from high to low inference. Rating scales, for example, are high-inference measures, requiring the rater to make an inferential leap from a number of bits of observed behavior to global value judgments (friendly-aloof, democratic-authoritarian, etc.). Teacher rating instruments have been shown to have poor capacity to predict teacher influence on pupil gain of any kind.[11]

In using low-inference measures, on the other hand, the measurer is asked to *report* sensory data (events, facts, behaviors) and include little or no inferring as to the meaning or value of the data. Low-inference data have the virtue of conveying the same or similar messages to different people.[12] That characteristic is especially important to competency portfolios.

Records of demonstrated competencies and measurement procedures appropriate for competency portfolios include the following types:

- *Data gathered by systematic observation instruments.* More than 100 instruments have been carefully constructed to measure teacher

[11] Dorothy G. Mueller. "How To Evaluate Teaching." Report of the ERIC Clearinghouse on Teacher Education in: *Journal of Teacher Education*, Summer 1971. pp. 229-44.

[12] For further discussion of low-inference measurement of competencies, see: Lawrence and Branch, *op. cit.*, Section III.

and pupil behaviors and learning conditions.[13] Ad hoc instruments can be developed. (It is important to check reliability of a new instrument by assuring close agreement of measurements made of the same events by different observers.)

• *Samples of pupil products and descriptions of pupil achievements attributable to the teacher.* In many instances, these data are self-evident records of teaching competencies when competencies are stated in terms of pupil outcome.

• *Data gathered by diagnostic tools that measure change in pupil attitudes, perceptions of self and others, motivations, feelings, etc., as these reflect teacher influence.*[14]

• *Records of concrete accomplishments of the teacher (trainee) according to stated criteria.* These products, or concrete outcomes, include lesson plans, analyses of problems, evaluation tasks, experiments, etc.

All of these records named involve relatively low-inference interpretation by someone who wishes to "read" the portfolio. If such records also identify the quality criteria associated with each and a statement of conditions under which each record was made, then the portfolio content approaches that clear picture of each teacher's set of capabilities. Samples of these procedures can be found in instructional modules now in use.

A Strategy for Advancing the State of the Art

In September 1972 the Florida Department of Education brought together nine specialists in educational research from around the country and 12 policy makers in teacher education for a two-day seminar on teacher education research.[15] Three of the recommendations of that group speak directly to the issues raised in this article. I cite them here because I believe they offer important guidance to the profession as it deals with the issues.

1. "Select competencies on a conceptual base, rather than by an eclectic approach." The training institution needs to begin with a statement of philosophical position and then operationalize that position "in terms of some conceptual model of teaching roles or teaching styles. Then the decision makers can specify the competencies required to support the model(s) of teaching described. . . . (If) teachers were trained in at least two different conceptual models, they could better meet the requirements of varied classroom situations."

2. "Do not use student learning measures for evaluating individual teachers. . . . However, it is critical to use change in student performance as a criterion against which the (teaching) competency is validated so that the (validated) measure of teacher behaviors could be used in the long run" in training programs to measure the attainments of trainees.

3. "Build research into the design for testing training materials and procedures. . . . (Research) and Development conducted in isolation of operational programs provides little information or value to decision makers."

To these strategy recommendations, I would add two implied in this article. First, the need for low-inference measures. Second, the need for consistency between competency-objectives, measurement procedures, and criteria—without which the objectives "become empty, verbal; too remote and isolated to have more than an emotional content."[16] □

[13] For observation instruments, their theory base and applications, see: Anita Simon and E. Gil Boyer. *Mirrors for Behavior II, An Anthology of Observation Instruments.* Philadelphia: Research for Better Schools, Inc., 1970. See also: Barak Rosenshine and Norma Furst. "The Use of Direct Observation To Study Teaching." In: Robert W. W. Travers. *Second Handbook of Research on Teaching.* Chicago: Rand McNally & Co., 1973. pp. 150-54.

[14] For examples of such instruments, see: Robert Fox and others. *Diagnosing Classroom Learning Environments.* Chicago: Science Research Associates, Inc., 1966. See also: Orval G. Johnson and James W. Bommarito. *Tests and Measurements in Child Development: A Handbook.* San Francisco: Jossey-Bass, Inc., 1971.

[15] "Report—Conference on Teacher Education Research, September 11-12, 1972." Tallahassee: Florida Educational Research and Development Program. (Mimeographed, four pages.)

[16] John Dewey. *The Sources of a Science of Education.* New York: Liveright Publishing Corporation, 1929. p. 59.