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Connecting Performance Assessment to Instruction: A Comparison of Behavioral Assessment, Mastery Learning, Curriculum-Based Measurement, and Performance Assessment

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A major impetus for the performance assessment movement has been the need to reconnect large-scale and classroom assessment to learning so that assessment affects learning positively, enhancing instruction.

IN WHAT WAYS CAN ASSESSMENT ENHANCE INSTRUCTION?

When teachers are better informed of the learning progress and difficulties of their students, they can make better decisions about what a student needs to learn next and how to teach that material in a manner that will maximize the student's learning. Teachers make three types of decisions using assessment results:

1. Instructional placement decisions—what the student knows and where he or she should be in the instructional sequence—i.e., what to teach next.

2. Formative evaluation decisions—information to monitor a student's learning while an instructional program is underway—how quickly progress is being made, whether the instructional program is effective, and whether a change in instructional program is needed to promote the student's learning.

3. Diagnostic decisions—which specific difficulties account for the student's inadequate progress so the teacher can remediate learning progress and design more effective instructional plans.

WHAT CRITERIA SHOULD ASSESSMENTS MEET IF THEY ARE TO INFORM INSTRUCTIONAL DECISIONS?

These assessments should meet seven criteria:

1. Measure important learning outcomes.
2. Address all three purposes of assessment.
3. Provide clear descriptions of student performance that can be linked to instructional actions.
4. Be compatible with a variety of instructional models.
5. Be easily administered, scored, and interpreted by teachers.
6. Communicate the goals of learning to teachers and students.
7. Generate accurate, meaningful information (i.e., be reliable and valid).

HOW DOES PERFORMANCE ASSESSMENT COMPARE TO OTHER METHODS OF LINKING ASSESSMENT TO INSTRUCTION?

Other methods of linking assessment to instruction include behavioral assessment, mastery learning, and curriculum-based measurement.

• **Behavioral assessment.** Behavioral assessment relies on direct observation and recording of target behaviors, using repeated observations in the setting where the behavior occurs. Environmental factors (i.e., the situations in which the behaviors occur) and their effect on the behaviors are examined. For example, if a teacher wanted to instruct a student in grocery shopping, she would first analyze the tasks associated with grocery shopping, put them in order, and design behavioral objectives that measure each task. Tasks might include creating a shopping list, finding the items in the store, and finding the price of each item. The teacher would then collect data on each task to identify those in which the student needed instruction. The teacher would begin instruction at the point in the task sequence where the student was unable to correctly complete the task. Once the student could correctly complete a task, the teacher would move on to the next step, moving through the sequence until all of the tasks were mastered. Behavioral assessment meets some but not all of the criteria for assessments listed above. It can inform the teacher about the student's placement in the instructional sequence and can help the teacher reach formative evaluation and diagnostic decisions. It communicates clearly what the essential learning content is, and it is feasible to administer, score, and interpret. In addition, its repeated measurements support the reliability of assessments. However, behavioral assessment tends to focus on discrete tasks that do not necessarily add up to important outcomes. It is limited to observable behaviors, and its small units of instruction can be difficult for students to piece together and apply to real-world outcomes. Additionally, the assessment system dictates a behavioral approach to instruction, which can limit the teacher's instructional options.

• **Mastery learning.** In mastery learning, a curriculum is broken down into a set of subskills, which are then ordered in a hierarchy of instructional objectives. For each step in the instructional hierarchy, a criterion-referenced test is designed, and a performance criterion indicating mastery of the subskill is specified. The teacher starts at the lowest step in the hierarchy, pretests, teaches the objective, and posttests on the material. If the student does not demonstrate mastery, the teacher uses corrective strategies until mastery is achieved. The teacher then advances the student to the next, more difficult step in the hierarchy. Like behavioral assessment, mastery learning provides information for instructional placement, formative evaluation, and diagnostic decisions. It communicates clearly to teachers and students about what is important to teach and learn. However, mastery learning suffers from the same limitation as behavioral assessment: it focuses on discrete behaviors in both assessment and instruction. Because little emphasis has been placed on its reliability or validity, users do not know what exactly is being assessed, how to interpret the resulting information, and how to use the measures effectively. Moreover, the measurement system dictates a specific approach to instruction, leaving the teacher few instructional choices. The focus of measurement changes each time a student achieves mastery of a step in the curriculum, and the steps may be of unequal difficulty, so progress cannot be judged over time. Finally, because different students need to be measured simultaneously on different steps of the curriculum, mastery learning systems can become unmanageable for teachers.

• **Curriculum-based measurement (CBM).** The focus of CBM is long-term. The teacher establishes a broad outcome for the student such as competently performing mathematics at the third-grade level at the end of the school year. Then the teacher uses CBM methods to measure student proficiency: he or she creates a pool of equivalent assessments, each of which samples the key problem types from the third grade curriculum. Each week, the student completes one or two assessments. Because each assessment is of equal difficulty and incorporates all of the important problem types to be learned over the year, the CBM data base produces a total score graphed over time to show progress over the year. Analysis of the student's performance on separate skills embedded in the assessment can also be conducted for diagnostic problem-solving to improve the instructional program.

CBM satisfies six of the criteria for assessments. It addresses the three purposes for assessment, and it incorporates standardized measurement techniques, providing reliability and validity. It offers detailed information on a student's performance on specific skills and can be used to determine how to improve an instructional program. Its measurement framework is not tied to any particular model of instruction, so a broad range of instructional options can be used. A teacher can use widely varying methods with the same child to see which method is most beneficial. Students know how they are evaluated and can set personal learning goals. In addition, the assessment demands are manageable in classroom settings, and to make them even more easily manageable, computer programs have been developed to administer assessments and manage the data.

However, CBM has two drawbacks with respect to the criteria for assessments. The system requires longer time periods to reveal growth, and the connection between assessment results and instructional decisions is not as clear as with behavioral assessment or mastery learning. Controversy also exists about the importance of the learning outcomes associated with CBM. That is, it relies on pencil and paper tasks in math and spelling and one-dimensional assessments in reading, while current discussions about outcomes stress the utility of multidimensional measures that can cut across curriculum areas.

• **Performance assessment.** Three key features of performance assessment are: (1) students construct, rather than select, responses; (2) assessment formats allow teachers to observe student behavior on tasks reflecting real-world requirements; and (3) scoring reveals patterns in students' learning and thinking. An example of a performance assessment task is provided below:

A group of five families on your block is going to have a garage sale in which clothes, toys, and books will be sold. Your family has 12 items to sell and will need 18 square feet to display these items; the Hamletts have 13 items and need 20 square feet; the Phillips, 7 items and 10 square feet; the Garcias, 15 items and 15 square feet; the Nguyens, 10 items and 30 square feet. Rental tables measure 6 feet by 2.5 feet and cost $6.00 a day. The garage where the sale will be held is 20 feet by 30 feet. Newspaper advertising costs $11 for the first 10 words and $1.50 for each additional word.

1. How many tables will you need? Explain how you got this number.
2. Draw a diagram showing how the tables can be arranged in the garage to allow the customers to move about with at least 4 feet between tables.
3. Write an ad for your sale that includes enough information.
4 How much money do you have to earn from your sale for the families to break even?

The students are aware of the scoring system and the criteria used to determine the scores. Their responses will be classified as exemplary, competent, minimal, inadequate, or no attempt based on a rubric that specifies the characteristics of responses in each of these categories. This problem offers one version of what a teacher's use of performance assessment might look like. In practice, many varieties of performance assessment are used. This problem measures massed mathematical concepts that include addition, multiplication, decimals, data analysis, perimeters, area, spatial sense, graphic representation, money, and communication about mathematics. Students take about 50 minutes for the assessment, and it can be completed individually or in small groups. The problem is anchored in a real-life, age-appropriate situation and represents real applications of mathematics.

HOW WELL DOES PERFORMANCE ASSESSMENT SATISFY THE SEVEN CRITERIA FOR ASSESSMENT?

Today, performance assessment is relatively new, undeveloped, and yet to be studied systematically. Many practitioners are experimenting with its use and contributing to its development and refinement. Yet they are often in the undesirable position of interpreting vague design features and operationalizing those features into specific assessments on their own. These assessments take a variety of forms, some of which are closer than others in approximating the conceptual and theoretical underpinnings of performance assessment.

1. Measure important learning outcomes. The extent to which performance assessment measures important student outcomes depends on the specific assessment problem or task. Performance assessment tasks should reflect important, real-world performances that are tied to desired student outcomes that are relevant to the workplace and everyday life. They should connect meaningfully with specific instructional methods that can be realistically managed in school settings.

2. Address all three purposes of assessment. It is unclear how performance assessment can be used to formulate instructional placement or formative evaluation decisions. Ideally, alternate forms of the problem could include the same concepts administered over time in order to yield information about individual students' progress. Although performance assessment offers the promise of addressing all three assessment purposes, specific methods for doing so have yet to be developed.

3. Provide clear descriptions of student performance that can be linked to instructional actions. When performance assessment tasks address a variety of concepts in age-appropriate, real-world situations, teachers can form a picture of student performance across skills and identify the student's problem-solving strategies. However, this depends on the teacher's skill in identifying student competencies, gleaning information about students' strategic behavior, and relating these observations to specific instructional techniques. Consultation methods or computerized strategies for generating profiles of student competence are needed.

4. Be compatible with a variety of instructional models. Theoretically, performance assessment could be used with a variety of instructional approaches. Teachers should experiment with a variety of instructional methods as they implement performance assessment, especially with students who have serious learning problems.

5. Be easily administered, scored, and interpreted by teachers. Performance assessment can require large amounts of teacher time to design and administer assessments and to scrutinize student performances. It is easy to see how this type of assessment could generate so many different plans for intervention strategies for different students that teachers in a classroom situation with 20 or 30 students would be unable to manage. Performance assessment developers need to solve the problem of how to implement plans based on performance assessments within the constraints of classroom life.

6. Communicate the goals of learning to teachers and students. When it is clearly apparent that an assessment is aligned with instructional goals, teachers should be able to use that assessment to direct their instruction, and students should be able to use it to establish personal learning goals. This depends, however, on the extent to which the scoring rubric used is clear, concrete, and visible.

7. Generate accurate, meaningful information (i.e., be reliable and valid). Performance assessment represents a vision that can shape the future direction of classroom-based assessment, but it requires much additional scrutiny and development before it can fulfill its promise. REFS Derived from Fuchs, L. (1994). Connecting Performance Assessment to Instruction. Reston, VA: The Council for Exceptional Children. (Product #P5058).

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