Problem Solving Assessment

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Problem Solving Defined
The term problem solving is used whenever people act to eliminate a difference between conditions that they currently sense or perceive and alternative conditions that they desire. In short, problem solving occurs when people act to reduce the discrepancy between “what they want and what they get.” In education, the perceived differences that motivate problem solving are those discrepancies between students’ present levels of development and some other expected or desired level of development. This conception leads to the conclusion that problems exist in the eye of the “beholder.” Thus, as long as someone perceives a discrepancy, a problem exists for that person, and problem solving occurs when the person undertakes to reduce or eliminate the perceived discrepancies.

Developing a successful a problem solving approach in education requires that, initially, a problem be clarified and defined. To do so typically involves:
- Objectively describing a student’s current level and rate of development.
- Specifying the desired level and rate of development.
- Establishing the importance of the difference.

While the first and second steps in clarifying a problem can be done objectively, even quantitatively, accomplishing the third step is certainly subjective, and based in values.

Educational Problems
The current emphasis on “standards” and high stakes assessment creates the context for identifying the discrepancies perceived by policy makers when they view where students are and where they want them to be. Discrepancies in literacy and math have been identified as the most fundamental, followed by science.

Problem Solving through General and Compensatory Education
Two major types of intervention occur in education. The first, general education, is the mainstream instructional program created for all children. A second, smaller set of interventions are the various special and compensatory education programs created for students from diverse cultural and economic background and for students with disabilities. Different from general education interventions, this second set of interventions is intended for smaller subsets of the student population and is characterized by increased intensity, because they occur when a student’s response to general education instruction is not satisfactory.

Norms, Standards, and Consequences in Establishing Problem Importance
In the history of educational and psychological testing, norms have weighed heavily in the judgment of student performance. Indeed, “problems” have traditionally been identified through establishing the difference between an individual’s level of performance and the mean performance for age and grade. When this normative perspective is used to define problems, the magnitude of a student’s problem is established by scaling the normative difference. If nothing else, the standards based school reform movement that relies on benchmark testing makes it abundantly clear that academic problems can be criterion-referenced as well as norm-referenced. Even more clearly, the movement has revealed that the magnitude of the consequences associated with failure to meet expectations establishes the significance or importance of academic problems. High stakes have been attached to success and failure, and students can be denied grade promotion or even a high school diploma. Schools can be labeled as substandard and placed on probation; school
districts can be required to pay for supplementary programs.

The dramatic increase in pressure on schools to document student attainments has resulted in a much sharper focus on assessment procedures. Successful implementation of progress monitoring can create more and clearer occasions for educational professionals to engage in problem solving. The early identifications of discrepancies between desired and projected levels of accomplishment indicate that risk exists and a need exists to intensify problem-solving efforts.

**Problem Solving as Hypothesis Testing**

A basic assumption in this conception of problem solving is that we cannot predict with certainty those interventions that will successfully eliminate perceived discrepancies. Even when using “evidence-based programs” we cannot say with certainty that any one program will be effective for all students. For that reason, it is useful to view problem solving as hypothesis testing where reducing the discrepancy is the dependent variable.

**A PROBLEM SOLVING MODEL AND PROBLEM SOLVING ASSESSMENT**

The basic steps common to most problem solving models are identified in the five step IDEAL problem-solving model described by Bransford and Stein (1984) --- (1) Identifying the problem to be solved, (2) Defining the problem, (3) Exploring alternative solutions, (4) Applying the chosen solution, and (5) Looking at the effects. When the decision to be made, and the assessment conducted to provide data for decision making are added to the model a framework for educational problem solving is created that is illustrated in the table below:

<table>
<thead>
<tr>
<th>Problem Solving Steps</th>
<th>Assessment Procedures</th>
<th>Evaluation Decision</th>
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<tbody>
<tr>
<td>1. Problem identification</td>
<td>Observing or recording</td>
<td>Does a problem exist?</td>
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<td>2. Problem definition</td>
<td>Quantifying the perceived discrepancy</td>
<td>Is the problem important?</td>
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<tr>
<td>3. Designing intervention plans</td>
<td>Identifying alternative solution hypotheses</td>
<td>What is the best solution hypothesis?</td>
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<tr>
<td>4. Implementing intervention</td>
<td>Monitoring fidelity of intervention &amp; data collection</td>
<td>Is the solution attempt progressing as planned?</td>
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<tr>
<td>5. Problem solution</td>
<td>Re-quantifying the discrepancy</td>
<td>Is the original problem being solved through the attempted solution?</td>
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It is important to point out that while the outcomes of assessments in this model are intended to be factual; the evaluation decisions are necessarily inferences from the data.