Use Performance Tasks for Classroom Instruction and Assessment

Summary

This strategy focuses on providing teachers with a set of resources, experiences, and tools that can broaden the range of tasks used to assess students' mathematical knowledge and skills. Teachers are given ideas for using and managing the assessments in their own classrooms. Additionally, teachers are provided with an analysis of student work to help guide their thinking about their own students' understandings. This strategy uses high-quality tasks to exemplify the expectations in *Principles and Standards of School Mathematics.*

Challenge addressed

Our assessment lacks balance. Teachers need assessment tasks across a broad range of mathematical content and processes that can provide useful information about their students' mathematical understandings, quality of instruction, and effectiveness of their programs. Teachers need tasks that are aligned with the *Principles and Standards for School Mathematics (PSSM)*.

Implementing the strategy

This strategy may be successfully implemented by selecting tasks that match specific learning goals or local standards. Teachers should work the tasks themselves, using the knowledge and skills that are accessible to their students. Teachers should review the supporting materials and consider how to use the task with their own students.

Teachers can select from a range of tasks and tasks types and use them periodically in the classroom. Tasks could be used at the end of an instructional unit to find out what students know and whether they use the skills that were taught to make sense of a situation. In classrooms where the curriculum is more skills-based, teachers could choose to use the tasks regularly (weekly or monthly) to supplement the existing curriculum.

Tasks may be selected and used prior to formal instruction to see how students are making sense of ideas they learned in previous grade levels. A high-quality performance assessment task is also useful as an instructional activity. Some teachers will incorporate a task into their existing curriculum and use it to teach some important ideas or make connections to skills they've learned.

Teachers may find it professionally stimulating and informative to work with a colleague. Together teachers can share what they are learning as they try different tasks in the classroom.

Likely challenges

Using performance assessments in the classroom requires the teacher to plan for and consider multiple aspects of a students' mathematical ability. The time demands may increase a teacher's reluctance to try constructed response tasks. They may worry about adding to an already full curriculum. The aspect of conducting classroom discussions around

mathematical ideas may not be a routine experience for students and teachers. Teachers may find it challenging to pose questions that probe and extend students' thinking around the mathematics in the task.

The constructed response nature of the task permits and fosters different ways of reasoning when finding solutions to problems. Students often take solution paths that differ from what they may have been taught which may be disconcerting to teachers. Some tasks may even challenge teachers' own mathematical knowledge.

Performance assessments are often viewed as "good" tasks for the exceptional student. Teachers may be reluctant to give tasks that require reading and comprehension to students they perceive to be disadvantaged, challenged, or limited English proficient. Teachers' beliefs about students' abilities have a profound impact on what mathematics gets taught. Teachers may need professional development; time to try out ideas and reflect on what works and what doesn't work, in order to change their instructional and assessment practices. Performance assessment tasks, by design, allow students to enter the task at their own level and the contextualized situation may be more meaningful for this group of students.

Strengths

The use of performance tasks in classrooms allows teachers to assess mathematical understanding in a low-stakes setting using a broad range of task types, mathematical content, and processes. The tasks target problem solving and reasoning which is frequently neglected in many curricula. The tasks are often complex and assess multiple dimensions of learning. Problems in context encourage students to apply their knowledge and skills to situations that resemble real-world situations. Teachers learn more about what their students understand, know, and can do in mathematics. And students' learning may be enhanced by virtue of explaining their thinking and reasoning along with the solution to a problem. Rubrics may be used with students to help them understand what is valued in a mathematical performance.

Tools

Balanced Assessment for the Mathematics Curriculum: Classroom Assessment Packages. The assessment packages were developed with funding from the National Science Foundation for students in grades 3-12. Each package consists of a collection of 15-20 tasks that vary in content, length, task type, mathematical content, and mathematical processes. There are two packages for each level: Elementary Grades, Middle Grades, High School, and Advanced High School. A typical package includes the task, sample student work, and guidelines for using task in your classroom and examining student work. The packages provide support for beginning users of performance assessments as well as for those who are more experienced.

Balanced Assessment in Mathematics Professional Development Series. The workshop series provides a place for teachers to learn more about using performance assessments in the classroom, explore mathematics as a teacher and as a teacher learner; examine student work—look for evidence of understanding and where they might need more work; learn to score what is valued in a students' performance, and to consider next instructional moves.

Balanced Assessment in Mathematics: Practice Tests. These practice tests, currently for Grades 3-10, are aligned with *Principles and Standards for School Mathematics (PSSM).* Each test includes 5-6 short tasks that may be used to prepare students for high-stakes

assessments and point scoring guides. The practice tests are published by CTB/McGraw-Hill. For more information visit http://www.ctb.com/mktg/balanced_math/overview.jsp[1]

Classroom teaching materials such as the *standards-based mathematics curricula*, developed with National Science Foundation support, contain rich problems and tasks. Learn more about the NSF mathematics curriculum projects, related research findings, and implementation studies:

- http://www.tenet.edu/teks/math/resources/nsfhigh.html NSF High School Curriculum Projects
- http://showmecenter.missouri.edu/showme/default.html NSF Middle School Curriculum Projects
- http://www.comap.com/elementary/projects/arc/ NSF Elementary School Curriculum Projects
- http://www.stolaf.edu/other/extend/Resources/nsfproj.html NSF Comprehensive Curriculum Projects for Reform of Mathematics Education

Implementation pitfalls: Finding a "good fit" with existing curriculum materials can be challenging for teachers new to using performance assessment tasks. The tasks often include more than one content and process strand. To assist teachers in making the connections, tasks need to be aligned with local or state standards.

Keywords: mathematics tests, standards, alignment, NCLB, NCTM, PSSM, depth of knowledge, process, problem solving, non-routine, connections, balance, process, performance tasks

[1] All links current as of December 2004