

School Achievement Monitoring (SAM)

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Rationale and goals of the test

- Educational assessment – key source of information for policy makers and educators
- What type of information is particularly useful for teachers and school administrators?
 - Identifying/comparing levels of students' mastery
 - Not just overall score, but a substantive characterization of knowledge
- Purpose of SAM – to provide a more in-depth view of students' knowledge/understanding of academic content
 - Current target knowledge areas: mathematics and language
 - Current target age: end of the elementary school (3-5 grade)

Theoretical basis and empirical evidence

- SAM was designed to characterize knowledge in terms of three levels of mastery derived from Vygotsky's theory:
 - Procedural knowledge
 - Conceptual understanding
 - Functional competence
- Test items capture these three distinct levels of knowledge
 - Within each content area, problems vary systematically with respect to the depth of knowledge required to solve them
- Pilot testing (2010-2012)
 - 4639 fourth-graders in Russia; diverse SES; urban & rural areas
- Results were subjected to Rasch analysis
 - Empirically-based hierarchy of difficulty corresponded to the hypothesized theoretically-based hierarchy of knowledge levels
 - Structure of the test reflected three levels of mastery

Contributions to educational practice

- Qualitative, in addition to quantitative, assessment of students' knowledge
 - Understanding the structure of students' knowledge
 - More effective in guiding instruction, revising curriculum, etc.
 - Example: students who receive different math curriculum may demonstrate comparable levels of procedural mastery, but different levels of conceptual understanding or vice versa
- Opportunity for a longitudinal monitoring of student progress
 - Tracking differences in the structure of content knowledge beyond elementary school
 - According to Vygotsky, learning leads development, thus the functional mastery of the content offered in elementary school can be expected to be achieved later
- Conceptual template for assessment across academic areas
 - Currently: Mathematics and Language
 - Can be extended to different areas of STEM