

TSG 36: Research and development in assessment and testing in mathematics education

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1. Aims

TSG 36 had the following aims:

1. an overview of the state of the art in the topic, and expositions of recent outstanding contributions to it, as seen from an international perspective;
2. sharing of ongoing work and perspectives;
3. a contribution to new trends of research and perspectives for the future.

This TSG intended to bring together teachers, mathematicians, mathematics educators, mentors and researchers who are interested in assessment and testing issues in mathematics education. The focus of the work was to gather information about theory and practice on the subject and look into the problems related to it.

The theme certainly has relevance. In the last fifty years, assessment and testing have been evolving in the direction of addressing the need of the student, to help him or her learn better, rather than merely making judgments on their achievement. That is, assessment should be more for learning than of learning. Concerns in the past centred around judgments about the existence or not of student learning and achievement; classification, selection and ranking of students; and assessment as an irreplaceable means to regulate learning. But various new questions can be raised.

1. What is the role of assessment and testing in the present era? How do we get social recognition of the new role of assessment? What are the changes in the meaning of criteria such as fidelity and validity? Is pedagogical differentiation an objective that we want to achieve through assessment?
2. How can we contribute to an effective change of practices in mathematics education? (Research has pointed out that good practice arises out of assessment for learning rather than assessment of learning, nevertheless these research results have very few implications for practice).
3. Which kinds of procedures are more effective for assessment for learning? Under what conditions? What are the main difficulties and obstacles that teachers have to confront?
4. Should assessment and testing practices be universally adopted? Assessment and testing are inevitably enmeshed in the wider culture of the community. What is the influence of culture on various aspects of assessment and testing? How should assessment and testing be cognisant with the underlying cultural values of the community?

2. Programme

The programme started with the co-chairs introducing the TSG theme. Then there were twelve presentations in the four sessions. Each had about 10 minutes for presentation, followed by 5 minutes of discussion. For each paper, a team member prepared a critical reaction. In the last session, there was a 35-minute floor discussion. The co-chairs rounded up the TSG at the end.

In introducing the TSG, the following points were raised:

1. the aims of the TSG;
2. new questions in assessment, assessment of learning, and assessment for learning;

3. assessment and the curriculum, curriculum reform worldwide, and proposed changes in assessment;
4. fundamental questions on assessment: why assess, what to assess, how to assess, and how to report the assessment results;
5. the special status of mathematics, mathematics assessment, and culture.

The papers were grouped under the following sub-themes:

1. Diagnostic assessment
2. Formative assessment
3. Self assessment
4. External assessment

The titles of the 12 presentations are as follows:

Arrozal, A. *The development and analysis of the proficiency test.*

Dimitric, R. *Student placement in Calculus Courses. A Case Study.*

Paek, P. *Toward Balanced Mathematics Assessment: Some Findings from the Field.*

Santos, L. & Pinto, J. *The teacher's oral feedback and learning.*

Adjage, R. & Pluvinaige, F. *Four levels of competence for assessment of mathematics achievement.*

McDougall, D. & Karadag, Z. *Tracking students' mathematical thinking online: Frame analysis method.*

Haapasalo, L. *Building a framework for dynamic assessment.*

Pinto; F. & Santos, L. *Definition of assessment criteria / Self-assessment.*

Deitcher, R. *The development of children's self-assessment in mathematics within the framework of a problem-solving lesson: A participatory action research project.*

Dias, P. & Santos, L. *"Reflect before you act" Regulatory practice assessment for learning.*

Little, C. & Jones, K. *Assessment of University-entrance level mathematics in England: an analysis of key influences on the evolution of the qualification during the period 1951-2001.*

Wu, Z. & An, S. *Influence of the New Mathematics textbooks on student achievement and attitudes in China.*

The following topics were covered in the final discussion.

1. Different assessment techniques serve different purposes. How do we select the technique(s) wisely to serve our purpose?
2. Is the role of assessment changing? Theoretical framework; Research (objects, methodology, etc.), and Practice
3. How do we get social recognition of new approaches in assessment?
4. What are the possible risks of assessment?

In summarising, the following points were covered.

1. The meaning of assessment: the main objective is learning.
2. The focus of assessment: Instruments (level of predictability?); Processes (how is it different from teaching?); Object of learning.
3. Methodology: Qualitative and interpretative approach.
4. Main characters: Schools, Teachers, Students.

Finally, the following perspectives for the future were discussed. The relations between:

1. local research results and global knowledge;
2. research results and classroom practice;
3. different perspectives of assessment;
4. assessment results and the use of the results (political dimension: equity, quality, ethics, etc.).