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Seoul National University, Siheung Campus
Korea

The 9th ICMI-East Asia Regional Conference on Mathematics Education (EARCOME 9)

Topic Study Group 3

The Essence of Mathematics Education in Assessment and Evaluation

CALL FOR PROPOSALS

Overview

Assessment and evaluation have long been central to mathematics education, evolving alongside shifts in educational philosophies, mathematics curricular and teaching goals, and societal needs. Traditionally, mathematics assessment and evaluation mainly focused on mathematics procedural fluency and content aspect of mathematics, with summative exams serving as the primary tools for measuring student mathematics achievement. Over time, this has expanded to include formative approaches aimed at supporting mathematics learning processes and fostering deeper conceptual understanding and the affective aspects of mathematics learning as well. Globally, recent trends emphasize mathematics competency-based assessments, problem-solving and posing, mathematics modelling, and higher-order thinking skills, reflecting a shift toward preparing students for complex and dynamic environments.

In the East Asian context, mathematics education assessment and evaluation practices are deeply rooted in cultural and systemic values that emphasize rigor, discipline, and academic excellence. These systems have achieved remarkable success, as demonstrated by the consistently high mathematics performance of East Asian students in international assessments such as PISA and TIMSS. However, this success comes with challenges, including intense pressures from high-stakes testing, limited emphasis on mathematics creativity, and the need for more inclusive and equitable approaches.

In recent decades, East Asia has been actively engaging with global mathematics education trends while navigating its unique traditions. Since the turn of the century, mathematics curriculum reform has been widespread across the region, not only reforming the mathematics curriculum content but also introducing new perspectives on mathematics learning and evaluation. Meanwhile, advancements in digital technologies, particularly the rise of AI, alongside the development of innovative assessment theories and methodologies, are rapidly transforming policies and practices in mathematics assessment and evaluation. These changes present both challenges and opportunities for fostering meaningful, equitable, and forward-looking approaches to assessing mathematics learning in East Asia.

Areas of Interest

Topic Study Group 3 (TSG 3) invites research-based contributions on recent trends and developments in mathematics assessment and evaluation, with a focus on global innovations and specific challenges in East Asia. Key areas of interest include balancing traditional strengths with modern demands for mathematics competencies such as problem-solving, mathematical modeling, creativity, and critical thinking, alongside effective classroom-based assessment practices (e.g., formative assessment). The group will also explore the use of modern developments in general assessment and evaluation theories and methodologies, as well as the assessment and evaluation of teacher education and teaching effectiveness. Another focus of the TSG will be the transformative role of technology and AI in shaping the future of mathematics education assessment and evaluation.

Contributions could report studies addressing (but not limited to) the following themes within and beyond the East Asian context:

- **Theoretical, Philosophical, and Ethical Perspectives on Assessment and Evaluation:** Examining debates surrounding the assessment of mathematics proficiency, including cultural and systemic values influencing East Asian approaches to assessment and evaluation.
- **Alternative Assessment Models and Practices:** Exploring innovative assessment models that move beyond traditional methods, such as competency-based assessments and formative practices.
- **Classroom-Based Assessment and Practices:** Investigating both formal and informal assessment practices in the classroom, and how these influence students' mathematics learning practice and their outcomes.
- **Teachers, Assessment and Evaluation:** Discussing the role of teachers in classroom-based assessment, as well as the assessment and evaluation of mathematics teachers themselves (e.g., various types of knowledge, noticing, ...).
- **Students, Assessment and Evaluation:** Exploring how different types of assessments and evaluations influence student mathematics learning practice and outcomes. The analysis of how assessments address both cognitive and affective development, and the assessment practice of higher-order thinking, problem-solving, critical thinking, and affective outcomes in present curricula.
- **Assessment Design and Administration:** Exploring the innovation of assessment and evaluation in mathematics education, including how various theories, such as classical test theory and item response theory, inform the development of testing items and assessment programs in this increasingly digitalized world.
- **Technology and Computer-Based Assessment:** Exploring the integration of modern technology in assessment practices, including AI-powered tools, adaptive testing, and computer-based assessments, and their application within East Asian education systems.
- **Secondary Analysis of Large-Scale Datasets:** Investigating the use of large-scale datasets (such as TIMSS and PISA) to analyze trends in mathematics assessment and comparative studies between different educational systems.

Submission Guidelines

- Proposal Length: Proposals should be limited to a maximum of 4 pages.
- Language: Proposals must be written in English.
- Format: Please ensure that all abstracts or papers follow the EARCOME 9 template available at template for EARCOME 9.
(https://www.earcome9.org/earcome9/05_view.html?sMenu=05&s=l&bIdx=MTM=)
- Time line:
 - o Full Paper Submission: By February 1, 2025
 - o Notification of Acceptance and Feedback to Authors: By March 31, 2025
 - o Revision Submission: By April 30, 2025
- Submission Platform: Please refer to the EARCOME 9 website at
<https://www.earcome9.org/abstract/01.html?sMenu=01>

Topic Study Group 3 Contact Information

For additional information or inquiries, please feel free to reach out to the team members listed below:

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We are excited to receive your proposals and look forward to the opportunity to share ideas and insights at EARCOME 9.