



TSG 60

SEMIOTICS IN MATHEMATICS EDUCATION

The Organizing Team

Chair: Ricardo Nemirovsky, Manchester Metropolitan University, UK

Cochair: Christina Krause, University of Duisburg-Essen, Germany

Members:

Kazuya Kageyama, Hiroshima University, Japan

Francesca Ferrara, University of Torino, Italy

Suanrong Chen, Yangzhou University, China

Semiotics is the study of signs and their use in all realms of life. The aim of the TSG 60 at ICME-14 - Semiotics in Mathematics Education - is to explore the significance of semiotics by understanding better the use of signs in the teaching and learning of mathematics at all levels. The importance of semiotics is reflected in a large body of literature in mathematics education, an overview to be found in the ICME-13 monograph “Signs and Signification: Semiotics in Mathematics Education Research.” TSG 60 will expand on this, addressing relevant themes including the following:

- **General Topics of Semiotics in Mathematics Education:**
 - Semiotic perspectives within mathematics education, including teacher education;
 - Sign use and mathematics meaning-making processes;
 - Modes of mathematical narrative through different sign systems;
 - Relationships between sign systems (e.g., natural language, diagrams, pictorial and alphanumeric systems) and transformations between sign systems in mathematics thinking and learning;
 - Inventing and generalizing with visual, alphanumeric, and other sign systems;
- **Sub-themes:**
 - Semiotics and Technology
(e.g.: Design of activities and tasks based on visual-kinesthetic interactions; interplay between physical manipulatives and virtual entities, and roles of diagrams, animations, and video as instructional tools)
 - Semiotics in Specific Areas of Mathematics
(e.g. Episodes of sign-use in calculus, geometry, algebra, arithmetic, etc.)

- Semiotics Inside and Outside Mathematics Education
(e.g. differences and similarities between semiotic usages in art, linguistics, or cinema, and mathematics)
- Semiotics in Relation to Feeling and Expression
(e.g. gestures, embodiment, more-than-human agencies, affects, aesthetics, and rituals)