



## **TSG 1**

### **MATHEMATICS EDUCATION AT PRESCHOOL LEVEL**

#### The Organizing Team

Chair: Marja van den Heuvel-Panhuizen, Utrecht University/ Nord University,  
Netherlands/Norway

Cochair: Ineta Helmane, University of Latvia, Latvia

Members:

Regina Célia Grando, Universidade Federal de Santa Catarina, Brazil

Julie Clark, Flinders University, Australia

Xin Zhou, East China Normal University, China

TSG 1 is about the foundations of learning mathematics and the contexts in which the first steps are taken towards achieving mathematical understanding. The aim is to share and discuss contemporary research on early childhood mathematics learning and teaching and their theoretical and methodological frameworks. TSG 1 involves research on children's mathematical development from birth until entering formal schooling in first grade (children up to 6). The nurturing of this development can take place in care centers, preschool, and kindergarten, and at home.

Although it is currently widely accepted that the development of mathematical skills in the early years is essential for later mathematics learning, it is not so obvious *what* mathematics should be fostered in young children. Mathematics as a subject has traditionally been considered above the preschool and kindergarten levels. Moreover, researching young children's mathematical understanding has for a long time been a privilege of psychology and pedagogy. These sciences have provided much knowledge about conditions and variables that influence children's mathematical development but do often not consider very deeply the *mathematics* that is, or has to be, developed by young children and generally do not cogitate about why certain mathematical competences are important or what activities are crucial to stimulate the development of these competences. To gain a better insight in this *what* aspect of mathematics education at preschool level, TSG 1 particularly invites contributions from the didactics of mathematics as well as from mathematicians who are interested in the awakening of mathematics in early childhood. In addition, to complete the possible perspectives TSG 1 also welcomes submissions from (neuro-) cognitive, developmental, socio-cultural and other approaches to the learning and fostering of young children's mathematical

understanding. TSG 1 intends, from multiple perspectives, to contribute to the improvement of knowledge and understanding of issues that early childhood mathematics education encounters in different contexts and come eventually with proposals for advancing research, development and practice in mathematics education at preschool level.

To achieve this TSG 1 invites submissions of substantial research-based theoretical or empirical contributions within the following four subthemes:

*1. Unpacking early childhood mathematics*

Opening up the thinking about the mathematics content (broadly interpreted as knowledge, skills, conceptual understanding, mathematical reasoning and attitude) to be fostered in young children. What mathematics is worth to be developed? What mathematics anticipates future learning and opens the road to future learning?

*2. Pedagogical and didactical approaches in early childhood mathematics education*

What are meaningful learning environments for young children in a school setting or home environment? What tools, including manipulatives and technology, supports early mathematics learning? How can play and story reading be used? In what way can learning environments for young children be improved by embodiment theories on learning?

*3. Assessing mathematical understanding in early childhood*

How to get a better understanding of young children's mathematical development?

*4. Preparing early childhood educators to foster children's mathematical development*

How can professional development provide appropriate support and flexibility to allow teachers, care-givers and parents to develop new knowledge and understanding about mathematics education for young children?