TSG 1 Early childhood mathematics education (up to age 7)

Co-chairs:
Iliada Elia (Cyprus) elia.iliada@ucy.ac.cy
Joanne Mulligan (Australia) joanne.mulligan@mq.edu.au

Team members:
Ann Anderson (Canada)
Anna Baccaglini-Frank (Italy)
Christiane Benz (Germany)

IPC Liaison person: Mellony Graven (South Africa)

Research in early childhood mathematics education has experienced an increasing growth over the last years. The interest in this topic is induced by the well documented, positive relation between children's early mathematical knowledge and their later mathematics learning and the strong emphasis given on preschool education in many countries. However, countries differ considerably in pre-primary schooling and early years mathematics, in the entrance ages of students to kindergarten and primary school, and also in the education and development of preschool and kindergarten teachers regarding the didactics of mathematics. This diversity in practice across countries increases the complexity and amplifies the constraints of research in the field of early childhood mathematics education.

A recent research direction in mathematics education is the theory of embodied learning in mathematics which is based on knowledge from neuroscience. An interesting and important question is whether, and how, neuro-cognitive studies (integrated or not with other perspectives) may provide new insights into young children's mathematics development and new recommendations for more appropriate and efficient didactical approaches in early childhood mathematics education.

This topic study group of ICME 13 aims to provide a forum for discussion of the recent research trends and developments in early mathematics learning and teaching from around the world, with a focus on children up to 7 years of age, and to strengthen the community of researchers from different research fields interested in early childhood mathematics

education. Overall, the work of the group could contribute to the improvement of knowledge and understanding of the issues that early childhood mathematics education encounters in different contexts and also to proposing ways of advancing research, development and practice in the teaching and learning of early childhood mathematics.

The group invites submissions of substantial research-based theoretical or empirical contributions from different perspectives, including (neuro-) cognitive, developmental and socio-cultural ones, which may enable a deeper understanding of issues in the field of early childhood mathematics education. Contributions could report studies on (but not limited to) the following themes:

- Early mathematics reasoning and new directions to advance our understanding of how young children think and learn in various mathematics content areas
- Approaches in the improvement of pedagogies and assessment, and in particular the role of multimodality and embodiment in acquiring a better understanding of young children's mathematical development and in opening up spaces for early mathematics learning
- Approaches in the development of meaningful learning environments and in the use of tools, including manipulatives, play, picture-books and technology to support early mathematics learning for all children
- The role of educators, including preschool teachers and parents, and interactions, in formal or informal contexts, on the development of young children's mathematical capabilities
- Approaches in the mathematics learning of children with or at-risk for disabilities and mathematics difficulties in early education
- Different aspects that affect mathematics teaching and learning in the early years in both positive and negative ways, including, for example, policy and content, quality and delivery of mathematics curriculum statements, (cross-)cultural perspectives, affect factors, children's transitions in early childhood education, connections between informal and formal knowledge in mathematics.
- Issues and challenges in early childhood mathematics education for teachers' education and professional development.

When reporting their studies, we expect the authors to refer to the context in which the studies have been conducted.