



TSG 24

THE ROLE AND THE USE OF TECHNOLOGY IN THE TEACHING AND LEARNING OF MATHEMATICS AT PRIMARY LEVEL

The Organizing Team

Chair: Michela Maschietto, Italy, University of Modena e Reggio Emilia

Cochair: Silke Ladel, Germany, University of Education Schwaebisch Gmuend

Members:

George Gadanidis, Canada, Western University

Sitti Patahuddin, Australia, University of Canberra

Jiaxia Liu, China, Beijing Institute of Education

The aim of TSG 24 at ICME-14 is to share, discuss, and advance knowledge and understanding of key aspects of the role and the use of technology in the teaching and learning of mathematics at primary level. This TSG intends to continue the discussion of the questions and perspectives arisen in the corresponding TSG at ICME-13 in 2016, its content will be framed by the following sub-themes.

Subtheme 1: Student interaction

In the ICME-13 Monograph Uses of Technology in Primary and Secondary Mathematics Education, several contributions concern students' learning. Some research suggests that digital technologies have the potentiality to support the learning of mathematics, giving a unique experience. At the same time, contributions highlight that few research works focus on student interaction with digital media, why and how these technologies have an impact on learning. So, we are interested in continuing to deal with this theme:

- How does the use of apps enhance students' learning?
- What kinds of activity/task are proposed to students?
- What are the differences, if any, in the use of touchscreen devices (hand-held technologies or not) between touch and multi-touch apps from the perspective of learning processes of specific mathematical content?
- What is the potentiality of coding activities for exploring mathematical concepts?

Subtheme 2: Digital and analog tools

Digital technologies are not considered alone. In many primary schools, depending on the culture of each country, there are physical manipulatives. This is taken into account in some projects, focusing on digital and analog tools, from different perspectives (duo of artefacts, coding to model mathematical relations, DGS simulations). We aim to solicit contributions on this aspect:

- How do analog and digital technologies support students' learning?
- In which specific situations do digital and physical tools display advantages for overcoming students' difficulties?

Subtheme 3: New technologies

From the discussion on technology, it emerges that many kinds of technology (tablets, IWB, personal computer, ...) are available for primary education. Nevertheless, their diffusion and how they are used at school are different from one country to another one (one-to-one tablet, BYOD, IWB, ...). At the same time, new technologies are available and experimented in the classroom (e.g. VR, AR). In this sense, we would discuss:

- Which types of technology use are emerging to enrich and foster mathematics learning in kindergarten and primary school?
- Which digital technology for education do enable primary children to inquire, problem solve and think mathematically and to share their learning?
- Which are the most spread technologies at kindergarten and primary school? Which mathematical contents do they concern?

Subtheme 4: Teacher's role

The very huge number of apps ask the question about the evaluation of these apps. We aim to investigate the different aspects of this question. In particular, which criteria could be suggested to teachers for choosing apps in their teaching and how the spread of the digital technologies at school depends on teacher's engagement (training and practice). A pedagogical approach taken by the teacher is complementary to the potential of the affordance of the apps to influence students' learning. The tasks given to students and the classroom culture the teacher develops are key elements of the learning. So, we aim to deepen the discussion about teacher's role:

- How do school and teachers use technology to enrich mathematics learning at primary level?
- How do teachers choose the technology they use in their classrooms?

A specific question is addressed to each participant, in order to know the state of the art: Which is the standard equipment of digital technologies in kindergarten and primary school classrooms in your country?