## TSG 26
## THE ROLE AND THE USE OF TECHNOLOGY IN THE TEACHING AND LEARNING OF MATHEMATICS AT UPPER SECONDARY LEVEL

The Organizing Team

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**Introduction**

The ICME-14 Topic Study Group 26 "The role and the use of technology in the teaching and learning of mathematics at upper secondary level" will aim at highlighting the theoretical and epistemological framework of the integration of technology and its relationships with tangible tools and methods in teaching and learning mathematics, as well as at considering the new perspectives of teaching and learning offered by emerging technology.

**Core themes**

The TSG 26 will be focused on five core interrelated themes:

A)  Theoretical and methodological aspects: current/new frameworks for developing and analysing new technologies integration in mathematics teaching and learning from didactical, cognitive and epistemological perspectives.

- Which cognitive, epistemological and didactical frameworks can be used to study interactions between actors in a technological environment?

- Which research methodologies may better support scholars in studying the introduction of technology in teaching and learning processes?

B)  Role of emerging devices and technologies, as tablets, smartphones, virtual learning environments, augmented reality environments, and haptic technologies.

- How these devices and technologies may activate new forms of maths education?

- How can they mediate new forms of access to mathematics?
- How can researchers say that they represent the future of maths education with technology?

C) Interrelations between technology and the mathematics taught at this age level.
- How technology is used to make connections across mathematical topics or other topics like physics, chemistry, biology etc.?
- How digital technology can be combined with other tools in the teaching and learning process?
- How to connect technology use in mathematics teaching and learning with students' everyday life use of technology? Is it necessary, appropriate, suitable in the perspective of mathematics teaching and learning?
- How teachers can orchestrate different technologies and "ordinary" tools in the class?
- How do teachers face the relation between new technologies integration and the national curriculum constraints and possibilities?

D) Students' education and the relationships between teaching and learning.
- How technologies can or cannot promote access to a diverse population of students in terms of needs, background, and culture?
- How students' everyday life technology (some examples are: internet and social networks, products as videos, images, memes, texts, and so on) can or cannot contribute to their learning processes in mathematics?
- Which changes in learning assessment can be highlighted by the use of technologies? How does technology modify (or not) the learning assessment process?

E) Teachers' professional development
- Which are the new challenges and opportunities for teachers to reflect on their practices with the use of new technologies?
- How to include teachers to integrate technology in their practice?
- How is it possible to disseminate research results within teachers' professional development?
- How researchers can organise teacher professional development, in order to let teachers working and learning together in communities and improve their competencies in introducing technologies in the classroom?

These areas of discussion and their intersections will be addressed by considering integration of technology for mathematics learning and teaching referred to the age group (14 to 19), but acknowledging the long-term references across the grades.

*When submitting a paper, the author can indicate one of the previous core themes as a priority of choice. The organizing team will do the best to group the papers according to these core themes.*