Topic Study Group 2.3: Mathematics and creativity; mathematical competitions; mathematical challenge

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Team details*

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Overview

This TSG not only advances the earlier work on mathematical challenges such as the 16th ICMI Study "Mathematical challenge in and beyond the classroom", it combines the theme of mathematics competitions and other challenging activities (TSG46 in ICME14 and TSG30 in ICME13) and mathematics and creativity (TSG59 in ICME14 and TSG29 in ICME13), to encompass both aspects of creativity with mathematical competitions and challenge.

Although mathematical creativity has been studied as early as in 1900s and published in the French periodical L'Enseigement (1902), education literature on mathematical creativity has been relatively sparse. There lacks a consensus in the definition of mathematical creativity. Despite this, researchers

* *Team details correct at time of print; 28 April 2023*

agree that creativity is crucial in mathematics learning, and ensures the growth of mathematics as a discipline. Thus, there is a need to identify and nurture mathematical creativity.

Mathematical creativity is almost always linked to complexity, hence most school curricula have little to offer in this aspect. Students must be exposed to and engaged in reasonably challenging tasks for a substantial period of time. Some researchers have recognized the creative potential of mathematics competition problems.

There is overwhelming evidence that all students involved benefit from studying mathematics through challenging activities, such as mathematics competitions. Some students will benefit much more than their peers when they are exposed to mathematically advanced tasks. On the other hand, some students might not like the competitive environment of competitions and challenges. How will such challenging tasks benefit this group of students?

Areas of interest

We invite contributions addressing (but not limited to) the following topics:

- Definitions of mathematical creativity and their implications.
- How do we identify mathematical creativity among students?
- Supporting creativity in teachers, and the teaching process.
- Conducive environment to foster mathematical creativity in and out of the classroom.
- Current advancements in IMO-driven national and international competitions and preparatory activities.
- How we help a student identified as talented from an inclusive competition on the pathway towards Olympiads?
- Creating problems for use in the competitions.
- The use of competition problems for mathematics education among general student population.
- The role of competitions and mathematical challenges in the wider education landscape.
- Empirical research on mathematics competition and other challenging activities.
- Mathematics teachers as designers and facilitators of mathematically challenging activities for their students.

How to make a submission to this Topic Study Group

Submissions for Topic Study Group Papers and proposals for Posters open 28 April 2023 via the official ICME-15 website, icme15.org. The website also contains a timeline of dates for the activity of the Topic Study Groups in the lead up to the Congress.

For questions about this TSG, please contact the Co-Chairs using the email addresses provided.