TSG 27
THE ROLE OF THE HISTORY OF MATHEMATICS IN MATHEMATICS EDUCATION

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Aim
TSG 27 aims to provide a forum for participants to share their research interests and results, as well as their teaching ideas and classroom experience in connection with the integration of the history of mathematics in mathematics education. Special care is taken to present and promote ideas and research results of an as broad as possible international interest, while still focusing due attention to the national aspects of research and teaching experience in this area. Every effort will be made to allow researchers to present their work, get fruitful feedback from the discussion, and stimulate the interest of newcomers by giving them the opportunity to get a broad overview on the state-of-the-art in this area.

This TSG refers to all levels of education – from primary school to tertiary education, including in-service teachers' training – preferably on work and conclusions based on actual classroom experiments and/or produced teaching and learning materials.

Rationale
Mathematics is a human intellectual enterprise with a long history and a vivid present. Thus, mathematical knowledge is determined not only by the circumstances in which it becomes a deductively structured theory, but also by the procedure that originally led or may lead to it, and which is indispensable for understanding processes of change in mathematics. Therefore, learning mathematics includes not only the "polished products" of mathematical activity but also the understanding of (implicit) motivations, the sense-making actions, and the reflective processes of mathematicians, which aim to the construction of meaning. Hence, teaching mathematics should

include giving the opportunity to students to "experience mathematics in the making." That is, although the "polished products" of mathematics form that part of mathematical knowledge that is communicated, criticized (in order to be accepted or rejected), and serving as the basis for new work, the process of producing mathematical knowledge is equally important, especially from a didactical point of view. This perception of mathematics should be central in the teaching of mathematics, and the image of mathematics communicated to the outside world.

In this perspective, putting emphasis on integrating historical and epistemological issues in mathematics teaching and learning constitutes a possible natural way for exposing mathematics in the making that may lead to a better understanding of specific parts of mathematics and to a deeper awareness of what mathematics as a discipline is. This is important for mathematics education, in order to aid in the realization that mathematics:

- is the result of contributions from many different cultures;
- has been in constant dialogue with other scientific disciplines, philosophy, the arts and technology;
- has undergone changes over time, underscored by shifting views of what mathematics is and how it should be taught and learnt; and
- has constituted a constant force for stimulating and supporting scientific, technical, artistic and social development.

This helps to improve mathematics education at all levels and at the same time to also realize that although mathematics is central to our modern society and although a mathematically literate citizenry is essential to a country's vitality, historical and epistemological issues of mathematics are also worth studying. The harmony of mathematics with other intellectual and cultural pursuits also makes the subject interesting, meaningful, and worthwhile. In this wider context, history and epistemology of mathematics have a yet more important role to play in providing a more robust education of the community. This is most important, and especially today where many countries are concerned about the level of mathematics that their students are learning and about students' decreasing interest in mathematics at a time when the need for both technical skills and a broader education is rising.

Themes

The program of TSG 27 will be structured around the following main themes:

1. Theoretical and/or conceptual frameworks – in particular from general mathematics education research – for integrating history in mathematics education;
2. History and epistemology implemented in mathematics education: Classroom experiments and teaching materials, considered from various perspectives; e.g., cognitive, didactical, pedagogical, affective, etc.;
3. Surveys on the history of mathematics as it appears in curriculum and/or textbooks;

4. Original sources in the classroom, and their educational effects;
5. The role of history of mathematics in relation to the use of digital technologies in the teaching and learning of mathematics;
6. History and epistemology as a tool for an interdisciplinary approach in the teaching and learning of mathematics and the sciences by unfolding their productive interrelations; and
7. Cultures and mathematics fruitfully interwoven.