



International Workshop

MATHEMATICS EDUCATION RESEARCH AND METHODOLOGIES

JUNE 14-15, 2022

Sala Blu
Palazzo del Rettorato
Via Verdi 8, Torino

Organizzato da:



DIPARTIMENTO
DI MATEMATICA
GIUSEPPE PEANO
UNIVERSITÀ DI TORINO

Con il patrocinio di:



UNIVERSITÀ
DEGLI STUDI
DI TORINO

MATHEMATICS EDUCATION RESEARCH AND METHODOLOGIES

June 14, 2022

[9:30 – 12:30]

Opening

Speaker: Christina Krause, *University of Graz*

Gestural modality and learning mathematics:

Resources, challenges and issues for research

Reactor: Andrea Maffia, *Università di Pavia*

Short discussion

Break

Group work and final discussion

Lunch break

[14:30 – 17:30]

Speaker: Ricardo Nemirovsky, *Manchester Metropolitan University*

On the origins of geometry

and the idea of crafting mathematics

Reactor: Oi-Lam Ng, *The Chinese University of Hong Kong*

Short discussion

Break

Group work and final discussion

June 15, 2022

[9:30 – 12:30]

Speaker: Miglena Asenova, *Libera Università di Bolzano*

Ontological, epistemological and methodological reflexivity

in Mathematics Education Research

Short discussion

Break

Interactive activity and final discussion

Closure

Program

Comitato scientifico-organizzatore:

Francesca Ferrara, Giulia Ferrari

Dipartimento di Matematica "Giuseppe Peano"

MATHEMATICS EDUCATION RESEARCH AND METHODOLOGIES

Christina Krause, *University of Graz*

Gestural modality and learning mathematics: Resources, challenges and issues for research

This presentation is a nod to Moschkovich's (2010) collage of "resources, challenges, and issues for research" that inter- and cross-disciplinary perspectives on the relationships between "language(s) and learning mathematics" bring and can bring to the field of mathematics education. Initially starting from the related topic of sign language(s) as extending Moschkovich's work presented in the chapter, the talk will take a turn to focus on the modality in which sign languages are articulated. It will first consider how a change of modality offers a new perspective to the discussions about languages related to mathematical thinking and learning and therefore, also to the points discussed by Moschkovich. It will moreover explore the intersections with research on the roles of gestures in mathematical thinking and learning for a wider description on resources, challenges and issues for research as related to the peculiarities of the gestural modality.

Moschkovich, J. N. (2010). Language(s) and learning mathematics – Resources, challenges, and issues for research. In J. N. Moschkovich (Ed.), *Language and mathematics education: Multiple perspectives and directions for research* (pp. 1–28). IAP Information Age Publishing.

Ricardo Nemirovsky, *Manchester Metropolitan University*

On the origins of geometry and the idea of crafting mathematics

In an unfinished essay written in 1938, Husserl (1989) articulated a perplexing status for geometry and, more generally, for mathematics in our era, as being detached from the original activities that confer, now and then, meaning to them. Among these original activities or "primal sources" Husserl emphasized what we might call "craftwork". As opposed to only noticing shapes and patterns present in the environment, craftwork — a synthesis of functionalism and esthetics — involves making them by the exercise of collaborative bodily skills, suitable tools, and material transformations, in concert with complex measurements and socio-ritual practices. In this talk I will outline a framework — Crafting Mathematics — rooted in the epistemological status of craftwork and complex processes of idealization. I will elaborate on how Crafting Mathematics is related but different from Ethnomathematics. The talk will then orient itself towards research methods for Crafting Mathematics borrowed from archeology and anthropology.

Husserl, E. (1989). *Origin of Geometry*. Lincoln and London: University of Nebraska Press.

Miglena Asenova, *Libera Università di Bolzano*

Ontological, epistemological and methodological reflexivity in Mathematics Education Research

Starting with the fundamental questions that a research paradigm should answer, the ontological, epistemological, and methodological constraints of some current research paradigms are discussed. Then the pragmatist approach to scientific knowledge acquisition is interpreted in reference to Peirce's pragmatism and semiosis, as well as to the notion of theory in Mathematics Education. Finally, a general methodological tool that fits with the pragmatist approach and with the idea of semiotic bundle (Arzarello, 2006) is presented and discussed.

Arzarello, F. (2006). Semiosis as a multimodal process. In L. Radford & B. D'Amore (Eds.), *Semiotics, Culture and Mathematical Thinking* [Special Issue]. *Revista Latinoamericana de Investigación en Matemática Educativa*, 9(1), 267–299.