

## Editorial

With this nineteenth issue we have entered the tenth year of our dear journal *Didattica della matematica. Dalla ricerca alle pratiche d'aula*. Ten years of dedication from the institutions that support us, the members of the scientific and editorial committees, the graphic designers, the authors who have contributed over the years, and all the readers who faithfully follow our new issues. An innovative journal based on the convergence of two worlds: that of research and that of classroom practice, by receiving significant support both nationally and internationally. This is evidenced by the expansion of the scientific committee – which now comprises 36 members based in Switzerland, Italy, France, Spain, Cyprus and Canada – and the establishment of a new “teaching and learning experiences” committee made up of 19 teachers from pre-primary, primary, lower secondary, upper secondary and professional schools, who will be specifically responsible for the *Esperienze didattiche* section as promoters and reviewers.

In particular, the journal’s tenth anniversary will be celebrated with the release of the next issue, the twentieth. This will be a special issue featuring several research projects in mathematics education that have had significant impacts on the school world over the years, accompanied by articles with testimonials from teachers who have changed their classroom conceptions and practices thanks to these projects. Even the reviews in this special issue will be tailored to the specific theme.

This issue, however, follows the classic format. The *Riflessione e ricerca* section contains three articles. The first contribution, also available in English, explores the role of argumentation for future citizens and, in particular, in mathematics education, adopting the pragma-dialectical perspective on argumentation as a theoretical framework; the paper proposes five theoretical elements (verbalization, awareness of reasons, dialogue, difference of opinion, and incentive to argue) useful for analyzing argumentative mathematical tasks; the purpose is to distinguish them based on the pragma-dialectical characterization of argumentation, while identifying certain task design factors that can encourage these elements. The second article presents the research project “Comparing without Calculating”, developed within the ArAl project to promote a relational teaching of arithmetic by encouraging the comparison of mathematical expressions, which are to be interpreted as objects for reflection and argumentation rather than as calculations to be performed; the paper analyses fifteen episodes drawn from classroom experiments conducted in primary school<sup>1</sup> and lower secondary school<sup>2</sup> in Italy, to identify teaching strategies for developing these relational skills in students, as well as the skills necessary for teachers to adopt such strategies effectively. The third paper investigates the potential of the multi-touch environment, specifically the app *TouchCounts*, in fostering the development of number sense in four-year-old children; the study analyses the schemes adopted by children when interacting with the app and shows how intentionally designed tasks and competent adult mediation enable them to mobilize specific aspects of number sense, especially the management of ordinal and recursive structure, as well as finger gnosis.

The *Esperienze didattiche* section includes four articles. The first article describes an educational path implemented in a fifth-grade class to foster strategic thinking in problem-solving and strategy games; the didactical experience emphasises the use of graphic representations and reasoning by

1. The primary school in Italy lasts five years and corresponds to the grades from 1 to 5.

2. The lower secondary school in Italy lasts three years and corresponds to the grades from 6 to 8.

analogy for guiding students to recognize, develop, and reuse effective problem-solving strategies. The second contribution presents a museum workshop on catoptric anamorphoses with a cylindrical mirror, based on models from the *Collezione Macchine Matematiche* within the *Sistema dei Musei e Orto Botanico* of University of Modena and Reggio Emilia; the workshop, aimed at lower secondary school students, allowed them to learn practically and collaboratively how to create an anamorphic image, serving as an example of informal mathematics education. The third contribution proposes a hands-on workshop to introducing square roots in lower secondary school, inspired by Ausubel's theory of meaningful learning; through the folding of origami, the use of tools and of didactical games, which proved effective even for a blind student participating in the program, the students were able to build a solid understanding of the mathematical concepts involved. The fourth contribution presents a rubric for evaluating argumentative skills in mathematics in lower secondary school, tested by both the teacher and the students for self-assessment in an eighth-grade class; the analysis of the students' work shows how the tool can support the production of clearer and more informed argumentations and can be effectively integrated into everyday teaching practice.

We wish you all a pleasant reading of these articles and reviews, and do not miss the next special issue of number 20!

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