

## Editorial

Mathematics education is a constantly evolving discipline, and can now count on several studies, of varying scope, which over the decades have produced theories, constructs, methodologies, strategies, useful for analysing teaching-learning situations or to be applied in the classroom to make the learning experience meaningful and effective. This set of tools, both theoretical and pragmatic, is constantly being updated, and in the same way as a toolbox contains tools that are a little outdated, but reliable and indispensable, together with new tools that are more effective in dealing with situations of need. Therefore, our discipline makes use of tools from both the history of didactics and its most current developments. The fifteenth issue of the *Didattica della matematica. Dalla ricerca alle pratiche d'aula* journal presents some of the tools in the mathematics education toolbox in their usual double guise, theoretical and applicative, seeking to show that theories developed several decades ago are still indispensable for interpreting classroom phenomena, but also opening up to new constructs, new contexts, and new forms of communication.

The first article in the *Riflessione e ricerca* section of this issue deals with the case of Dario, a upper secondary school<sup>1</sup> student with persistent difficulties in mathematics and an failure identity in mathematics; the study shows how from a commognitive framework it is possible to identify a *mathematics learning profile* from which to implement an ad hoc designed pathway for the recovery of difficulties in mathematics; the results show that this pathway produced in Dario an openness to change, albeit of a small extent, in his *mathematics learning profile*. The second article in this section deals with the cognitive process of anticipation in the algebraic context; after recalling the theoretical, didactical and psychological references underlying the construct of anticipation, the article presents a study conducted through the administration of a questionnaire to upper secondary school students and subsequent focus group work; the results highlight that the development of anticipation can be affected by the emergence of ontogenetic, epistemological and didactical obstacles, which could be resolved with appropriate didactical interventions. The third article presents an investigation involving fourth and seventh grade students in the Canton of Ticino (Switzerland) and in Italy; the aim of the contribution is to verify that linguistic inhomogeneities in the grammatical category of *number*, present in the treatment of polygons in various textbooks in use at school, may cause difficulties in the students' comprehension and processing of the text, resulting in misinterpretations of the numerosity of a polygon entities; in this way, it is confirmed that apparently minor linguistic elements are in fact important for the construction of knowledge.

There are four articles in the *Esperienze didattiche* section. The first article presents an educational experience aimed at Italian lower<sup>2</sup> and upper secondary school students through the construction of a virtual escape room; the experience involved over 50 schools and 1500 students on the occasion of Pi Day 2023, the International Day of Mathematics; the article focuses on the design of the mathematical problems presented and on the methods used to create a virtual context that faithfully reproduces the escape room game experience; the authors highlight how the role of the narrative tool and clues stimulates exercise in the representation of mathematical problems and the use of models and analogies in the resolution process. The second article describes the experience of introducing the

1. The upper secondary school in Italy lasts five years and corresponds to the grades from 9 to 13.

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

mathematical Work Schedule in two fifth-grade primary school<sup>3</sup> classes, with reflections on context and method; the contribution describes the first steps and the implementation of the Work Schedule, its articulation in space and time, and a reflection on the evolution of children's attitudes towards mathematics, with some hints on the possibilities of using the tool also after primary school. The third article presents an experiment carried out in a second primary school class using Mathemart, an approach that employs Social and Community Theatre as a means to teach mathematical concepts; the contribution describes the various phases of the experience, analysing its teaching potential and limitations, in particular by referring to affective aspects and the role of bodily experience. Finally, the last article describes the most significant activities of the experience carried out by a first-grade primary school class on a mathematical path focused on problem solving; the main objective of the experimentation concerns the establishment of a learning environment in which the mathematical problem can be tackled without stereotypes and rigidity, with the use and sharing of several solving strategies, and with the stimulation of both oral and written communication and argumentation.

We wish a pleasant read to all those who follow us, whether teachers, researchers, students, so that they may have a toolbox with an increasing and varied number of instruments with which to experience and interpret the process of teaching-learning mathematics.

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