

Editorial

We have reached the tenth issue of the journal *Didattica della matematica. Dalla ricerca alle pratiche d'aula*: an important result for the members of the editorial team and the scientific committee who, with commitment, passion and dedication, have been carrying on this ambitious project for six years. The goal is always the same: to share significant research contributions and effective didactic experiences.

It is in this context that fruitful contacts and exchanges between researchers and teachers were born, thus contributing to bring the world of research closer to the scholastic world and to keep together a community interested in deepening the complex and delicate teaching/learning process of mathematics.

As usual, there are three articles in the section *Riflessione e ricerca*. The first one focuses on the importance of problem-solving activities in mathematics. Starting from the necessity in mathematics to manipulate the abstract, symbols and logic, the article proposes examples of "didactic situations of problem solving" in the perspective of Brousseau (1986), with the aim of showing how problems can stimulate a meaningful learning of mathematics. The second contribution is part of the project *Italmatica. Comprendere la matematica a scuola, tra lingua comune e linguaggio specialistico* funded by the Swiss National Science Foundation. The paper presents a strictly interdisciplinary study over mathematical didactics and argumentation studies, in which the classical rhetorical categories (*inventio*, *dispositio*, *elocutio*) are applied to the analysis of argumentative portions of geometry textbooks, highlighting in particular the great variety of possible communicative choices, which may have effects on the readers/students. The third contribution focuses instead on the introduction of the relational paradigm in the Italian lower secondary school;¹ starting from some considerations concerning the importance of graphical representations that can support students in their first approach to algebra. The authors propose an example of a teaching sequence, and evaluate its effectiveness using an assessment tool that includes all five components of mathematical learning following Fandiño Pinilla (2008), noting a particular effectiveness in terms of strategic and communicative learning.

In the section *Esperienze didattiche* there are four articles. The first contribution concerns an investigation carried out in a third-year class of an Italian primary school,² having as focus of interest the analysis of argumentative skills during problem solving, with the aim of assessing its impact at the educational level in the participatory and motivational processes of the students. The results of the experimentation agree with recent studies and researches concerning the development of argumentative competence in mathematics. The second contribution describes a didactic itinerary carried out in a kindergarten in Canton Ticino, focused on the interdisciplinary relationship between mathematics and visual education. The article clarifies the didactic steps, which, starting from a statistical survey proposed to the pupils, led them to explore the creation of pictograms useful to meaningfully represent mathematical concepts and relations. The third contribution proposes a didactic experience carried out in some classes of upper secondary school in Italy³ to introduce the peculiarities of

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

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

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

mathematical modelling, through the examination of a problem based on a competitive game. After a theoretical introduction on the importance of developing descriptive modeling skills that also use mathematical symbolism, the phases of the experience are described in a punctual way and useful coordinates are provided, thanks to which it is possible to adapt and expand the didactic experience according to the didactic context. The last contribution also deals with mathematization and mathematical modelling: two didactic experiences of emerging modelling are presented, the first referred to the primary school, the second to the upper secondary school in Italy. After describing the theoretical and didactic point of view of the experiments, the phases of the experiments are described and analyzed, in terms of the mathematical processes; finally, the importance of supporting students in a process of re-invention (Freudenthal, 1991) of mathematical concepts starting from their informal solving strategies is reaffirmed.

We thank all the authors and reviewers who, with their commitment, dedication and patience, have written the articles in this issue, and we hope that all readers will be able to grasp useful viewpoints and insights for their profession.

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