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Editorial

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We present here the first 2023 issue of *Revista Educação Matemática Pesquisa*. This year, we are editing Volume 25, sharing with our readers the results of scientific research in mathematics education. This volume commemorates 25 years of dedication from the editors and professors of the Postgraduate Program in Mathematics Education at PUC-SP, who have consistently striven for the excellence of this journal. We are also celebrating the award of Qualis A1 in the evaluation of the 2017-2020 quadrennial, which recognizes all the efforts we have made to continuously improve the editing quality of the works published in this journal over the years.

The articles published in this first issue of volume 25 disseminate results from scientific investigations done by researchers from different regions of Brazil and other countries, covering a diversity of national and international research groups and institutions.

We believe the scientific debate fostered by sharing those articles will contribute to constructing new knowledge in mathematics education. Moreover, the articles published in this issue bring a plurality of theoretical and methodological references that also strengthen scientific research in the field.

Volume 25.1 features 18 articles dealing with mathematical modeling, teacher education, teacher knowledge and professional development, inclusive mathematics education, the use of GeoGebra software, problem solving, and curriculum, among other questions.

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This issue also includes the translation of three of Yves Chevallard's articles. The first is "The transition from the arithmetic to algebraic approach in mathematics teaching in the collège - First part: The evolution of the didactic transposition." The second is "The transition from the arithmetic to algebraic approach in mathematics teaching in the collège - Part two: Curricular perspectives: the notion of modeling." Finally, the title of the third article is "The transition from the arithmetic to algebraic approach in mathematics teaching in the collège - Third part: Approaches and didactic problems."

Next, we introduce the texts that are part of this first issue of 2023 of *Educação Matemática Pesquisa.*

The first article, "Problematizing the emergence of mathematical modeling in mathematics education," is authored by Maria Carolina Machado Magnus, Ademir Donizeti Caldeira, and Claudia Glavam Duarte. It presents an investigation that, based on Foucault's theorizations, analyzes the discourses in master's degree and doctoral theses on the emergence of mathematical modeling in Brazilian mathematics education. As a result, the authors understand that the mathematical modeling discourse emerged amid a crisis in mathematics teaching, which was perceived as distant from reality.

The article "Reflections of teachers on fraction-by-fraction division: Understandings and philosophies" is authored by Bernadette Verônica Schaeffer Hoffman, Jaqueline Magalhães Brum, and Vânia Maria Pereira dos Santos-Wagner. The authors investigated the necessary knowledge for teachers who will teach fraction-by-fraction division in elementary school. As a result, they suggest that it is possible to teach this topic with understanding as long as the teacher has clear objectives and conceptual and pedagogical knowledge of how to teach fractions and operations with fractions.

The third article, by Charlene Origuela Gaspar de Pinho and João Alberto da Silva, is named "Official curricula and molded mathematics curricula in the literacy cycle: An analysis of the coherence of the objectives and activities present in the lesson plans." The authors analyzed the coherence between objectives and proposed activities in mathematics lesson plans for the literacy cycle. As a contribution, they conclude that curricula can lose their strength when planning focuses exclusively on the execution of activities.

Eliane Maria de Oliveira Araman, Lucas do Nascimento Corrêa, Ketheryn Letícia Gomes de Barros, and Maria de Lurdes Serrazina are the authors of the article "'When we take

1, we have to put 1...': Actions that support mathematical reasoning performed by a teacher when discussing an addition task". The authors investigated actions a teacher of the early years took when conducting a collective discussion of an exploratory task in mathematics with 1st graders of the first cycle of basic education. The research indicates that the teacher's actions involved four categories: invite, guide/support, inform/suggest and challenge, and that these led the students in the processes of conjecturing, identifying patterns, validating, justifying, and generalizing.

The fifth article, "Professional knowledge of teachers when teaching geometric transformations: An analysis of classroom situations," is authored by Natalia Nascimben Demondi Munhoz and Vinícius Pazuch. It aimed to identify and understand how the teacher's knowledge impacts their practice in relation to the content of geometric transformations. The researchers used as a theoretical and methodological reference the *Knowledge Quartet* (*KQ*) tool, which indicated gaps in teaching knowledge, and created closed exercises with reduced challenges for teaching this content.

The article "Didactic-pedagogical guidelines for working with problem solving in mathematics classes" is authored by Kaique Nascimento Martins, Larissa Pinca Sarro Gomes, Marlúbia Corrêa de Paula, and Norma Suely Gomes Allevato. The authors investigated didactic-pedagogical guidelines for working with problem solving. As a result, they suggest that problem solving is a way to build new mathematical knowledge and/or reframe it. They value the students' process and reasoning through investigations in collaborative work.

The seventh article, authored by Michele Regiane Dias Veronez and Thayná Felix dos Santos, is: "Attribution of meaning in mathematical modeling in the early years: A semiotic interpretation of mathematical objects." The researchers looked for evidence of attribution of meaning to mathematical objects through the signs associated with mathematical modeling. They conclude that such attribution gains consistency as the signs change, alter, and complement children's cognitive actions.

Gleison de Jesus Marinho Sodré is the author of the article "The Unveiling the notion of situation in school mathematical modeling." The study addresses the issue of reverse mathematical modeling, interpreted by the type of task that consists of finding the situation with the mathematics that can be associated with a mathematical model. As a result, the author

highlights the indispensable role of *habitus* as a durable and transposable perception system mobilized by students.

The article “What does art know about (with) mathematics? Visualities that overflow in a group of students in initial education”, by Adamo Devi Cuchedza, Claudia Regina Flores, Débora Regina Wagner, and Mônica Maria Kerscher-Franco, presents an analysis of the way of looking at and using art to teach mathematics, implied by the act of visualization and visuality, which put into operation specific ways of learning. As a result, the authors point out a decolonial *ethos* that highlights a critical and continuous attitude, aligning with an exercise of making visualities visible to put art into practice with mathematics for teaching.

The tenth article, by Eduardo Goedert Doná, and Alessandro Jacques Ribeiro, is called “Knowledge and beliefs of a teacher educator: Analysis of her practice when teaching algebra in the degree in pedagogy.” The authors investigated beliefs about mathematics, its teaching and learning to understand their role in the development of professional knowledge of a teacher educator in her practice in a teaching degree course. As a contribution, they point to the reorganization of these beliefs in the development, mobilization, and expansion of professional knowledge to teach algebra in the pedagogy degree, especially in the realm of pedagogical content knowledge.

Guilherme Henrique Gomes da Silva, Sintria Labres Lautert, João dos Santos Carmo, Ernani Martins dos Santos, and Diogo Emmanuel Lucena dos Santos author the article “Microaggressions in the context of teaching and learning mathematics: A theoretical-conceptual analysis.” They reflect on microaggressions in the context of mathematics teaching and learning, intending to clarify the concept and highlight some of their possible manifestations in mathematics education. The research also highlights the impacts of microaggressions on teacher education, especially in the relationships established with the degree students.

The Twelfth article is from Marcelo Almeida Bairral and Thuane da Silveira Silvano, “Mathematics degree students interacting in the VMTcG in a task about translation.” The authors carried out a case study in which they analyzed interactions of mathematics degree students in a task about translation in a synchronous device integrated with GeoGebra. In conclusion, they highlighted the importance of a design of tasks that seek to improve the

understanding of transformation and functional relationships when working with isometries in the Virtual Math Team with GeoGebra (VMTcG) platform.

Thaís Philipsen Grützmann, Tatiana Bolivar Lebedeff, Mayummi Aragão Campos, and Helena Pinto da Luz author the article "MathLibras in the amusement park: A linguistic, mathematical, and audiovisual analysis." The text presents an analysis of the video *Adição em Libras – Soma 5* from the project *MathLibras*, which aims to develop math video classes originally in Brazilian Sign Language (Libras) instead of using translations. The analysis starts from critical events selected by the authors about the narrative constructed by the stakeholder/deaf person, considering using at least one of the three parameters: linguistic, mathematical, or audiovisual resources.

The fourteenth article is authored by Ana Eliza Pescini, Luan Padilha, and Mariana Moran, and is named "A praxeological approach to the study of fractal geometry in high school textbooks." The authors present an analysis of four books selected for the first grade of high school in the state of Paraná, considering the content "Fractal geometry." As a result, they demonstrate that the content is present in the books analyzed both theoretically and during the exercises, articulated with other thematic units of the National Common Curricular Base (BNCC).

The article "Academic-professional education and teacher professional development: A shared space?" by Alex Sandro Gomes Leão, Francieli Martins Chibiaque, Maurício Cendón do Nascimento Ávila, Edward Frederico Castro Pessano, and Vanilde Bisognin, presents a reflection on the objectives of the professional development of teachers who teach mathematics in an academic-professional environment, involving degree students, a teaching practice supervisor, and basic education teachers. The results reveal the need to plan new actions that seek mathematics teachers' professional development, focusing on their interests, needs, challenges, possibilities, and limitations.

Sixteenth article, by José Carlos De Souza Pereira, José Messildo Viana Nunes, Fernando Cardoso de Matos and Saddo Ag Almouloud, named "Transition from the arithmetic to algebraic approach in the light of ideas by Yves Chevallard," presents epistemological aspects of the transition from arithmetic to algebraic, revealed in an analysis conducted in some articles by Yves Chevallard. The authors point out that epistemological aspects of the

arithmetic and the algebraic follow an algebraic/numerical mathematical modeling intermediated by the process of didactic transposition.

Seventeenth article, “History, actions, and achievements of the mathematics laboratory at the University of Passo Fundo (RS),” is authored by Luís Gabriel Favaretto Matté and Luiz Henrique Ferraz Pereira. The study aimed to systematize the trajectory of the mathematics laboratory and know the history of its constitution, presenting main contributions to the teaching and learning processes promoted by the lab throughout its existence. The authors indicate that the laboratory needs to be resized for the new challenges of mathematics education in the post-pandemic context.

Finally, the last article, “Shared reflections in an investigation of personal practice: learning trajectory of a teacher involving exploratory statistics teaching” is by Dalva Spiler Brandelero and Everton José Goldoni Estevam. The research presents a basic education teacher’s reflection on her own practice, considering the exploratory teaching of statistics. The results of this study indicate that the reflection of one’s own practice is relevant to the teacher’s professional learning.