

Editorial

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We present here the first 2024 issue of *Educação Matemática Pesquisa*. This year, we are editing volume 26, sharing the results of scientific research in mathematics education with our readers.

The articles published in this first issue of volume 26 disseminate results from scientific investigations of researchers from different regions of Brazil and other countries, covering a diversity of national and international research groups and institutions. Moreover, the articles published in this issue bring a plurality of theoretical and methodological references that strengthen scientific research in our area.

This issue presents 26 articles that cover topics such as mathematical modeling, ethnomathematics, teacher education, curriculum materials, inclusive mathematics education, geometry, probability and statistics, and financial education, among others.

Below is a brief presentation of the texts included in this first 2024 *Educação Matemática Pesquisa* journal issue.

The first article, “Alternative praxeological model for identifying prime numbers,” is authored by Gladys Maria Bezerra de Souza, João de Ribamar Silva, and José Messildo Viana Nunes. It theoretically reflects an alternative praxeological model for identifying prime numbers in any range of numbers based on the anthropological theory of the didactic. Two formulas were constructed based on reference models from basic algebra and concepts from number theory.

The article “Knowledge of mathematics and chemistry incorporated into integrative curricular materials” is authored by Jackelany de Souza França Durães Machado and Gilberto

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Januário. This documentary research investigated mathematics and chemistry incorporated into integrative curricular materials in natural sciences evaluated and approved within the scope of the PNLD 2021. The result suggests a lack of transparency in the conceptualization of curricular integration, in working with projects, and in organizing content. The authors state that this lack of transparency can restrict professional teaching knowledge and imply teaching practices that may diverge from the purposes of the curriculum material.

The third article, by Patricia Rosana Linardi, Viviane Cristina Almada de Oliveira, and João Ricardo Viola dos Santos, is called “From mathematical content to meaning production processes: A possibility for the education of mathematics teachers.” The authors reflect on the (mathematics) education of mathematics teachers, problematizing the construction of formative possibilities for/with mathematics teachers. One possibility is organizing teacher education processes, using activities based on everyday categories as a reference.

Janaína Mendes Pereira da Silva, Evonir Albrecht, and Regina da Silva Pina Neves are the authors of the article “The professional academic trajectory of a mathematics teacher educator.” They reflect on narratives of a teacher educator about the characteristics of the Linear Algebra subject in a mathematics degree course and how the academic/professional profile of this teacher influences the planning of the subject for teaching systems of linear equations. The authors indicate that more studies are needed on the roles and identities of mathematics teacher educators.

The fifth article, “Analysis of narratives/scenes on screen: Intersectionalities with mathematics lesson plans that problematize genders and sexualities based on streaming,” is authored by Maurício Rosa and Agnaldo da Conceição Esquincalha. This study investigates how scene analysis and the construction of mathematics teachers’ lesson plans on genders and sexualities can contribute to the understanding/constitution of these participants’ social responsibility in the face of these issues. The authors used queer theory, elements of intersectionality, and gender decoloniality and pointed out that the propositions of mathematics classes on themes linked to genders and sexualities based on the analysis of cinematographic works help to establish the understanding/constitution of the social responsibility of teachers in an initial and still fearful view regarding trans issues.

The article “Articulations between the history of mathematics and mathematical modeling: Some understandings from a systematic literature review” is authored by Érica Gambarotto Jardim Bergamim and Lilian Akemi Kato. The authors reflect on possible connections between the history of mathematics and mathematical modeling. As a result, the

potential arising from connections between them for mathematics teaching and learning was highlighted, justifying why making them is important.

The seventh article, authored by Maria Elizabete Souza Couto, Edicarlos Pereira de Sousa, Dennys Leite Maia, and Clóvis Lisboa dos Santos Júnior, is called “The professional development of elementary school teachers: An analysis of a remote formative process on statistical concepts.” The authors investigated elements of teachers’ professional development that emerged during a remote formative course on statistical concepts during the pandemic. The result revealed that professional development is continuous, and teachers still have formative demands concerning concepts and pedagogical practices. Furthermore, time was one of the most mentioned factors in the data, with discussions about school, profession, person, and family.

André Lima Rodrigues and Márcia Cristina de Costa Trindade Cyrino are the authors of the article “Movement to establish the professional identity of prospective mathematics teachers within the scope of Pibid and the Supervised Practicum.” The study seeks to analyze actions in the context of the Institutional Teaching Initiation Scholarship Program and the Supervised Practicum that promoted the movement of establishing mathematics teachers’ professional identity. Such actions impelled the movement of constituting the professional identity of prospective mathematics teachers and highlighted the need to promote initial education processes that offer spaces that provoke reflections on topics such as professional self-knowledge, emotions in teaching work, and the social role and responsibilities of the mathematics teachers.

The ninth article, “Lesson study in Brazil and the initial education of mathematics teachers: A literature review,” is authored by Roselene Alves Amâncio and Samira Zaidan. The study aimed to present an overview of scientific productions related to lesson study carried out within the scope of mathematics teachers’ initial education until 2021. The result highlighted that lesson study could contribute to prospective mathematics teachers’ education, mainly to the connection between theory and practice and the rapprochement between the university and basic school.

The article “Teaching algebra for the visually impaired: Contributions of triggering situations,” authored by Natalia Mota Oliveira and Maria Lucia Panossian, presents an investigation that seeks to recognize the appropriation of algebraic knowledge by visually impaired people based on situations that trigger learning. The authors conclude that the situations created allowed symbolic and instrumental mediation, enabling the appropriation of the conceptual nexuses of algebra (variation, field of variation, and fluency) and some selected

school content (recognition of unknowns, dependence on variables, and operations with monomials and polynomials).

The eleventh article, by Lourdes Maria Werle de Almeida and Rosangela Maria Kowalek, is “The validation process in mathematical modeling activities: In search of a framework.” The authors investigated the organization of a framework for validating activities through data triangulation to give coherence and cohesion to the result. They concluded that the efficiency of validation resides in the validation of the entire modeling to generate reliability in what can be said about a reality situation through mathematics.

Damião Michael Rodrigues de Lima, Francisco José de Lima, and Roberta da Silva are the authors of the article “The ‘Inclusive Education’ curriculum component in initial teacher education: A case study in a mathematics degree course.” The authors discuss the contributions of the Inclusive Education subject in mathematics teachers’ initial education. As a result, they point out that the subject aroused interest and instigated the search for subsidies that favor professional practice that promotes learning in diversity.

The thirteenth article, by Ana Karine Dias Caires Brandão, Maria José Ferreira da Silva, and Saddo Ag Almouloud, is called “The inclusion of the language dimension in the analysis of the didactic problem.” The authors carried out a study on the language dimension in the analysis of the didactic problem, considering the relevance attributed to the epistemological, ecological, and economic dimensions when studying a mathematical object. As a result, they point out that the language dimension was relevant to the development of abductive reasoning and to the students’ co-authorship in creating and solving question statements in the studied mathematical content.

Mariana da Silva Soriano and Edméa de Oliveira Santos authored the article “Dialogues about the ongoing challenge of combating racism in ‘people’s’ sport: Critical mathematics education in the classroom.” They investigated the construction of knowledge of statistics and percentage content from a critical mathematics education perspective, contextualizing the ongoing challenge of combating racism in soccer. They conclude that the proposed activities can promote more meaningful mathematics teaching for students.

The fifteenth article, by Fredy Coelho Rodrigues and Marco Aurélio Alvarenga Monteiro, is entitled “The nature of global argumentation structures in a teaching context based on collective argumentation.” The authors present a case study on the nature of global argumentation structures in a teaching context based on collective argumentation during a mathematical investigation. The study revealed that the teacher’s support during collective argumentation interferes with the anatomy/design of the structures used.

The article “Probability for high school in books of knowledge of the PNLD,” by Anderson Rodrigo Oliveira da Silva and Gilda Lisbôa Guimarães, presents an analysis from the perspective of probability teaching in high school textbooks approved by PNLD 2021. As a result, the authors point out an asymmetry concerning meanings with a predominance of the classical meaning, the expressive use of discrete sample spaces, and limitations in the conceptual approach to important theorems, such as the conditional probability for the composition of events.

The seventeenth article, “Ethnomathematics: A systematic review of academic works,” is by Antonio Alison Pinheiro Martins, Isabel Cristina Rodrigues de Lucena, and Jeirla Alves Monteiro. The authors investigated Brazilian academic research in ethnomathematics from 2005 to 2023. As a result, they highlight that the mapped research focuses on issues involving the teaching and learning process, the curriculum, models aimed at mathematics education, and describing or presenting parts of ethnomathematics. Furthermore, they emphasize that the studies cover a diversity of cultural contexts, with a predominance of investigations focused on rural and indigenous cultures.

Jaqueline Magalhães Brum, Janete Magalhães Carvalho e Sandra Kretli da Silva are the authors of the article “The philosophy of difference crossing mathematical education: Cartography of the discourses presented in ANPED GT-19.” The study displays a cartography of the compositions woven in the last ten years between mathematics and the philosophy of difference in the works published in the proceeding of the Mathematics Education Working Group (GT-19) carried out by the National Association of Postgraduate Studies and Research in Education (Associação Nacional de Pós-Graduação e Pesquisa em Educação - ANPEd). It concludes that there is a minor mathematics concerned with the movement of forces that resist and re(exist) from the perspective of a less prescriptive and more inventive mathematics.

The nineteenth article, “Epistemological study of the concept of standard deviation,” is authored by Khadidiatou Gueye, Moustapha Sokhna, and Sounkharou Diarra. Through an epistemological study the notion of standard deviation, the authors seek to show how the study of the evolution of concepts can help us understand their meaning and serve as a resource for teaching them. They also discuss computational and theoretical aspects that left little room for a clear understanding of the concepts studied at school.

The twenty article, “State of knowledge: A historical study on arithmetic problems,” is authored by Robert Rene Michel Junior and David Antônio da Costa. The text presents some continuities and transformations, at different historical moments, of the meanings and purposes of the “problems” for mathematics teaching. As a result, the authors point out that the term

“problems” had its meaning dissociated from the term “exercises”, and became a character of support for teaching and as a teaching method to be followed. But recently, problem solving has gained space in research in mathematics education.

Bruna Larissa Cecco and Luci Teresinha Marchiori dos Santos Bernardi are the authors of the article “Reflections on the concept of mathematical literacy: The relational dynamics.” They present a theoretical essay addressing the movement of concepts produced within the scope of mathematical education to refer to the term mathematical literacy. And conclude that, despite the lack of unity of the meaning of “mathematical literacy,” there is a historical perspective on the construction and evolution of ideas about being mathematically literate.

The twenty-second article, “Experiences of teachers who teach mathematics that lead to the challenge of the exercise paradigm,” is authored by João da Cruz Neves Silva Neto and Jonei Cerqueira Barbosa. The authors investigate how teachers who teach mathematics in basic education relate their experiences to their learning aimed at challenging the exercise paradigm. They also highlight the relevance of establishing a connection between teachers’ life experiences and initial and continuing training courses and programs so that different modes of professional activity are provided.

Twenty-third article, authored by Jonata Souza dos Santos and Claudia Lisete Oliveira Groenwald, is called “Integrating school financial education into the elementary school curriculum: An analysis of public policies and pedagogical strategies.” The work discusses school financial education as a component of the elementary school curriculum. As a result, the authors infer that students still have difficulties in formulating numerical expressions and interpreting problems, indicating areas that may need reinforcement or different pedagogical approaches.

The Twenty-fourth article by Gerson Pastre de Oliveira is entitled Mathematical aspects of the n-queens problem and the construction of knowledge by Computer Science students. In it, the author reflects on a proposal to solve a question related to the n-queens problem, a generalization of the original problem, which consisted of arranging 8 queens on a chessboard, taking into account different positions, so that the pieces don't capture each other. The aim is to propose a generalization whose application would provide the number of diagonals to be considered for solving the problem on any n by n board, with n greater than 3.

The article entitled “Problem solving and the teaching of 2nd degree equations: a meta-analysis of two professional master's degree studies”, written by Fernando Francisco Pereira and Marcelo Carlos de Proença. The aim is to analyze proposals for teaching 2nd degree equations in postgraduate research focusing on problem solving and the conception of algebra.

The results show that both studies are interested in approaches to teaching 2nd degree equations related to problem solving. However, there is a lack of understanding between theory and practice regarding the limitations and potential of each problem-solving approach.

Saul Rodrigo da Costa Barreto, José Pinheiro da Costa Júnior, and Deusarino Oliveira Almeida Júnior are the authors of the article “Methodology focused on the order of chemical reactions based on a problem of the development of students’ and teachers’ skills and competencies.” The article reports an action-research of teaching practice, following a qualitative documentary research methodology applying the anthropological didactic theory and the theory of meaningful learning to chemical kinetics. They highlight that respecting the teaching time regarding the content and the learning time of the apprentices, the strategy used in the research proved to be effective in the significant areas of transposition and adopted praxeology.