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Guest Editorial: Brazilian research in Mathematics Education

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This TME special issue builds on the Brazilian tradition in Mathematics Education research, whose contribution to the international debate is well recognized, with examples including U. D'Ambrosio's (1985) ethnomathematics research and T. N. Carraher, D. W. Carraher and Schliemann's (1985) psychological studies. Brazilian research has expanded in many directions, and researchers have published their results in various international journals and have consistently reported their findings at international conferences, such as PME Conferences and ICME.

There are currently dozens of research groups on mathematics education throughout the country, most of them involved in Master's and Ph.D. programs. The *Brazilian Society for Mathematics Education* – which acronym in Portuguese is *SBEM* - brings together their research members in fifteen distinct working groups that cover different research agendas. There are previous publications that provided an overview of Brazilian scholarship to an international audience, such as a special issue of ZDM (Borba & D'Ambrósio, 2010) and a book published by Springer (Ribeiro, Healy, Borba & Fernandes, 2018).

Now, *The Mathematics Enthusiast* presents an update on the current state of Brazilian research in mathematics education for the international audience by publishing original and cutting-edge research findings from the Brazilian context. They appear in this issue (volume 18, issue 3) and are published in the next two (volume 19, issues 1 e 2). As the reader could notice, the papers cover different research agendas and theoretical and methodological perspectives, and they were produced in different regions of the country. The papers are closely articulated with international literature so that their results contribute to the debate on mathematics education worldwide. In this first issue of the special edition, we have eleven papers written by colleagues belonging to research groups located in the cities shown in **Figure 1** below.



Figure 1: Locations of the authors of TME papers in the vol. 18, no. 3.

The first paper here is written by Maria Laura M. Gomes and Antonio Vicente M. Garnica and is entitled *History of Mathematics Education in Brazil - an overview of secondary education*. The authors present a historical study of mathematics in secondary education in Brazil and focus on the training of teachers who have worked at this level at different times. It is an essential entry in the historiography of mathematics teaching in the country.

Next, Saddo Ag Almouloud discusses the role of theory in research in Mathematics Education in his paper *Metasynthesis of research in Mathematics Education - foci and theoretical-methodological foundations*. Starting from the discussion of six previous studies, the author points out the theories' limitations and suggests the need to articulate them to have more complete explanations.

The provocative paper by Sonia M. Clareto and Giovanni Cammarota invites us to rethink our view of the classroom. In the article *How to engender learning in the learning process? Mathematics, events and the invention of a mathematics' education*, based on G. Deleuze's philosophy, the authors problematize events in the math class, making us reflect on what seems naturalized and normalized and bringing new questions to research in Mathematics Education.

In the sequence, Daniel C. Orey and Milton Rosa present their perspectives on what they call Ethnomodeling. In the paper entitled *Ethnomodeling as a glocalization process of mathematical*

practices through cultural dynamism, the authors argue that such an approach creates the conditions to explore mathematical knowledge in the light of different cultures. In this study, an original articulation between Ethnomathematics and mathematical modeling perspectives can be read.

In the following two papers, the authors present studies that focus on the math textbook. One of them is by Everaldo Silveira, entitled *A study on the indications to the use of base ten blocks and green chips in mathematics in Brazil*. The other is by Beatriz F. Litoldo and Rubia B. Amaral-Schio, whose title is *Mathematics textbooks as subject of study: producing knowledge on the presence of geometry*. Although they focus on different mathematical contents, both studies bring essential insights about the textbook. Although both recognize the central role of this curriculum material in student learning, the studies are evident in presenting limitations of them and their uses and problematizing the textbook's place in teaching and learning mathematics.

In the next paper, entitled *A theoretical model of mathematics for teaching the concept of function*, Graça Luzia D. Santos, co-authored with me, Jonei C. Barbosa, presents a discursive perspective on mathematics for teaching. Building from different sources, we have elaborated a theoretical model that describes the communicative realizations of the concept of function, which can be used to analyze teaching and learning situations and describe mathematics for teaching shared by teachers.

In the sequence, Juliana A. Montenegro, Rute E. S. R. Borba, and Marilena Bittar offer us a paper entitled *Registers of semiotic representations aiding the learning of combinatorial situations*. The authors report two studies that allow us to conclude that intermediate representations (such as trees or systematic listings) are adequate in the transition from natural language to numerical expressions, thus presenting implications for productive teaching strategies to develop combinatorial reasoning.

Next, we read the paper *Statistics education from the perspective of statistical literacy - reflections taken from studies with teachers*. In it, Carlos Eduardo F. Monteiro and Liliane Maria T. L. Carvalho discuss the challenge of initial and continuing teacher education in the light of statistical literacy. Besides bringing implications for the practice of training teachers, the paper problematizes questions for future research.

In what follows, Rosa M. Paulo, Anderson L. Pereira and Elisangela Pavanelo present a study on a classroom experience using the app GeoGebra Augmented Reality. In the paper entitled *The constitution of mathematical knowledge with augmented reality*, the authors assume a phenomenological attitude and show how students develop explorations through interactions between them, showing the potential of apps of this nature.

Finally, the last paper of this issue is by Jany S. S. Goulart, Luiz Márcio S. Farias and H. Chaachoua. It is entitled *An analysis of the influences of a hybrid learning environment in the solution of vector tasks according to the Anthropological Theory of the Didactic (ATD)*, in which the authors present innovative aspects for the teaching of vector from a study implemented in the light of Didactic and Didactic Engineering.

As we can see, this issue of *The Mathematics Enthusiast* presents a rich repertoire of research with original contributions to different research agendas. What unites them is that their insights have been generated from the Brazilian context and can represent new perspectives, new questions in the current debate of Mathematics Education. These characteristics lead me to reinforce the reader's invitation to engage in the reading of the papers and build a dialogue with the authors.