

Editorial

Educação Matemática Pesquisa, in this special issue **20.3**, is entirely devoted to articles that use in their studies the anthropological theory of didactics, which today has a prominent place in the research in didactics of mathematics internationally. Since 2005 several international meetings - CITAD - entirely dedicated to the topic have been held, therefore, the relevance of dedicating an issue of this journal, with fourteen articles, to show the contributions of Brazilian researchers to the dissemination and enhancement of that theory.

The first article, a theoretical essay entitled *The Anthropological Theory of Didactics: A Theoretical Trajectory Directed to the Practice of Mathematics Teaching*, written by Verilda Speridião Klut and Saddo Ag Almouloud, presents a study of Chevallard's articles on the theory based on the phenomenological philosophical hermeneutics proposed by Gadamer, deepening the understanding of the notion of praxeology.

The second work, by Marcio Silveira Ramos, José Fernando Santos Rodrigues Junior and Afonso Henriques, entitled *A Praxeological Study of Polyhedra in a Mathematics High School Textbook*, analyses a textbook of the second year of high school based on the praxeological and ecological aspects of the TAD for polyhedra. They conclude that the textbook under study presents a complete praxeology for such content, since the two (usual and modelled) models used complement each other timidly.

The third article, by Edelweis Jose Tavares Barbosa and Anna Paula Avelar Brito Lima, *The Personal Institutional Relation of the Teacher in the Classroom from the Perspective of the Anthropological Theory of the Didactic*, from a qualitative ethnographic study, shows that the three teachers investigated used in their lessons some adapted sequences suggested in textbooks.

The following article, written by Teodora Pinheiro Figueroa and Saddo Ag Almouloud, *Reflections on an Epistemological Model of Reference, Considering the Studies of the Institutional Relations about the Mathematical Object Limits of Functions*, aims at contributing to the process of teacher training of a specific institution by analysing textbooks, teaching plans and students' notebooks, that is, from the dominant epistemological model. The authors conclude that there is an incompleteness in such model and suggest an epistemological model of reference.

In the fifth article, *The Work with Functions in the Light of the Incompleteness of Institutional Work: A Theoretical Analysis*, Luiz Marcio Santos Farias, Edmo Fernandes Carvalho and Bartira Fernandes Teixeira presuppose the incompleteness of the institutional work to discuss on the *raison d'être* of the course of study and research, focusing on its context and its construction for the content of functions. This analysis allows the identification of constraints and, consequently, the dominant and reference praxeological models.

Polygon: A Line or a Region is the title of the article presented by Joaby de Oliveira Silva and Gilson Bispo de Jesus, in which they present an institutional analysis regarding the definition of polygon, aiming at teaching in a class of sixth year of elementary school. To this end, they hold discussions based on historical, epistemological and didactic analyses in *The Elements*, geometry books, PCN, BNCC and a textbook for the sixth year. They conclude that the official documents are indifferent to the definition adopted, while *The Elements* and the textbook assume the definition of polygon as region, and the references used the definition of polygon as line.

Alexandre Luis de Souza Barros and Paula Moreira Baltar Bellemain, in the article titled *Personal and Institutional Relations with the Pythagorean Theorem* show that the personal praxeologies used by the students differ from institutional praxeologies because they use different techniques. The results show that the ostensibles present in the statements little evoke the non-ostensible Pythagorean theorem, rather they evoke other knowledges.

In the article *Contribution of the Anthropological Theory of the Didactic in an Institutional Analysis on the Probability Knowledge for High School*, Cecília Manoella Carvalho Almeida and Luiz Marcio Santos Farias present the mathematics organisations in official documents and in a high school textbook in order to observe the existing incompleteness.

The article entitled *The Cognitive Dimension in the Anthropological Theory of the Didactic: Proposition of a Model to Investigate Cognition as a Situated Phenomenon*, by José Luiz Cavalcante, Anna Paula Avelar Brito Lima and Vladimir Lira Veras Xavier de Andrade, presents a model to investigate the cognitive dimension in this theory. This - perhaps still incomplete - model was organised in three dimensions - the institutional dimension; the dimension of the functioning of the didactic system; and the personal dimension - that lead to characterise the place of the psychological aspect in studies with

the ATD. In the study, it was possible to identify what the authors called dissonances, which include the conflicts and contradictions to which the individuals are subjected in the didactic system.

In the article *Conflict of Paradigms in the Transition Between the Initial and Final Years of Elementary School: the Case of the Perimeter and the Area*, by Lúcia de Fátima Durão Ferreira and Paula Moreira Baltar Bellemain, the authors show, as a result of the comparative analysis carried out, that the internal and external pressures caused by the levels of codetermination in a specific school bring to the surface the conflict of paradigms of questioning the world and visiting of visiting the works for the objects perimeter and area, in the transition between the initial years and final years of elementary school.

The Research Cycle of Mathematical Modelling proposed by Gleison de Jesus Marinho Sodr e and Renato Borges Guerra deals with the development of school mathematical modelling inspired by the five gestures that characterise a research in the ATD. The results, which are still provisional, are encouraging for both teacher training and future research.

Elisangela Bastos de Melo Espindola, in her article *Didactic Decisions and Factors that Influence them in the Teaching of Trigonometric Ratios* aims to study the documentary work and the didactic decisions of a teacher during the elaboration of a sequence and a revision class for the teaching of trigonometric ratios. The author, in her analysis, articulated theoretically the didactic documentary approach, the levels of teacher activity and the ATD. The results show that the didactic decisions made by the teacher were triggered by epistemic factors or related to didactic history.

The Role of Non-Mathematical Knowledge in Mathematical Modelling: Studying how to Calculate Income Tax is the title of the article presented by Claudia Fernandes Andrade do Espirito Santo and Renato Borges Guerra, discussing the non-mathematical knowledge indispensable for the use of mathematical models for the calculation of a natural person's income tax. The authors used the mixed praxeological model for analysis.

Jany Santos Souza Goulart and Luis M arcio Santos Farias, in the article *A Dialogue on the Anthropological Theory of Didactics - ATD Intermediated by an Introductory Course on Vectors* present possible interlocutions between the teaching and the learning

of vectors based on the ATD from the productions of students of a degree course in mathematics.

Finally, in the article *An Epistemological Model of Reference*, Maria José Ferreira da Silva and Sado Ag Almouloud present an epistemological model of reference, from the re-reading of a previously published article, for the construction, with the aid of Geogebra, of a planning of triangular pyramid surfaces of a given height, verifying conditions and restrictions for such construction. The EMR presented may justify future didactic organisations for teaching.