

ONTOSEMIOTIC ANALYSIS OF PROSPECTIVE ELEMENTARY SCHOOL TEACHERS IN PROBABILITY TASKS

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For the development of basic mathematical competencies in primary school students, it is essential that future teachers acquire and develop a mathematical and didactic knowledge of school mathematics as part of their training. Godino and collaborators (2007) propose the Ontosemiotic Approach to Mathematical Knowledge and Instruction (EOS) to analyse different aspects of the process of teaching and learning mathematics. They suggest that the ontosemiotic configuration of mathematical objects that emerge from mathematical practices brought to light by future teachers is a valuable element in training processes (Godino et al., 2017). The resolution of a problem–situation brings into play certain knowledge, and analysis of the problem-solving process gives us relevant information about the mathematical activity.

Based on the ontosemiotic configuration, in this work a task was proposed to future primary school teachers. The task consists of justifying the most convenient selection to bet, between two sets of six-sided dice. The first game consists of throwing one die, whereas in the second game, two dice are thrown and their scores are added up. In both cases, the game is won when an even number is thrown and lost when an odd number is thrown. Using the responses of 116 participants, qualitative research was carried out. To determine the specificity of mathematical objects (linguistic elements, concepts, procedures, properties, and arguments), the task was previously carried out by the research team.

The results show a great diversity of linguistic elements in teachers' responses, highlighting the verbal and symbolic elements versus the tabular and diagrammatic elements. As for the probabilistic concepts, we highlight the possible event, the sample space, and equiprobability, the latter being the property with the highest presence. In general, we observe a predominance of the use of Laplace's rule as the procedure used and a certain limitation when arguing the solutions to the task. These results are consistent with results obtained by other researchers proposing similar tasks (Hernández-Sólis et al., 2021; Mohamed & Ortiz, 2012).

This research favours the identification of the specific mathematical knowledge of future teachers on probability and the detection of potential semiotic conflicts. The research provides a valuable resource in teacher training plans because it provides fundamental information to improve the design and management of problem-situations.

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