

EXPLORING THE EPISTEMIC FACET OF THE DIDACTIC-MATHEMATICAL KNOWLEDGE REQUIRED TO TEACH THE DERIVATIVE

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In Pino-Fan et al. (2012) we presented the results obtained in the first part of a study that explored what we call the epistemic facet of prospective secondary teachers' didactic-mathematical knowledge about the derivative. The study as a whole involved three stages: 1) design of a questionnaire using the Onto-Semiotic Approach (OSA) (Godino, et al., 2007) to evaluate teachers' knowledge about the derivative; 2) analysis of the results obtained in a pilot application of this questionnaire; and 3) based on the information gathered in stage 2, development and application of a final version of the questionnaire, and analysis of the results obtained. This third stage also included interviews in order to obtain a more detailed understanding of prospective teachers' knowledge. The results of our research show that the variable 'type of cognitive configuration activated in the prospective teachers' answers are useful for understanding the kind of didactic-mathematical knowledge they possess. This variable was analysed by means of a tool that we refer to as the 'configuration of primary mathematical objects and processes', one which facilitates the analysis and categorization of certain features of the epistemic facet of prospective teachers' didactic-mathematical knowledge. The design of the questionnaire used in this study, as well as the responses of prospective teachers to it, reveal the complex set of mathematical practices, objects and processes that are brought into play when solving tasks related to the derivative. Teachers need to become aware of this complexity during their training so that they will be able to develop and assess the mathematical competence of their future students.

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References

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