

# **Ingeniería didáctica basada en el enfoque ontológico Semiótico del conocimiento y de la instrucción matemáticos**

Godino, J. D., Rivas, H., Arteaga, P., Lasa, A., & Wilhelmi, M. R. (2014). Ingeniería didáctica basada en el enfoque ontológico-semiótico del conocimiento y la instrucción matemáticos. *Recherches en Didactique des Mathématiques*, 34(2/3), 167-200.

## **Abstract**

We develop a broad vision of didactic engineering, which is conceived of as a specific type of design – based research. As a research methodology, didactic engineering is intended to create knowledge about ways of building and communicating mathematical knowledge. This didactic knowledge is necessarily supported by a theoretical approach, which underlies the various phases of the methodology. Here, we analyze how each phase of didactic engineering maybe grounded on the onto – semiotic approach to mathematical knowledge and instruction. The analysis of these phases (preliminary study, design, implementation and evaluation), according to the epistemic, cognitive and instructional dimensions is exemplified by a case study related to teaching statistics for prospective primary school teachers. The theoretical tools used serves to highlight significant didactical facts which, on the one hand, determine guidelines for determining suitable didactical trajectories for teaching the statistical topic and on the other hand, provide fundamentals to evaluate didactic engineering as a research methodology that can be extrapolated to different theoretical approaches..

## **Keywords**

Instructional design, Didactical analysis, Teacher education, Descriptive statistics, Onto, Semiotic approach, Diseño instruccional, Análisis didáctico, Formación de profesores, Estadística descriptiva, Enfoque ontológico, Semiótico.