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Mathematical modelling as a professional task.

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Summary: Educational research literature on mathematical modelling is extensive. However, not much attention has been paid to empirical investigations of its scholarly knowledge from the perspective of didactic transposition processes. This paper reports from an interview study of mathematical modelling activities involving nine professional model constructors. The research question was: How can mathematical modelling by professional mathematical model constructors be characterised? The analysis of our interview data inspired by the coding procedure of grounded theory led us to the description of three main types of modelling activities as a characterisation of mathematical modelling as a professional task. In data-generated modelling the models are developed principally from quantitative data drawing on no or only some assumed knowledge of the system being modelled, while in theory-generated modelling the models are developed based on established theory. In the third activity, model-generated modelling, the development of new models is based on already established models. For all types, the use of computer support and communication between clients, constructors and other experts are central aspects. Finally, the three types of modelling activities are related to existing theoretical descriptions of mathematical modelling and the relevance of the study for mathematical modelling in education is discussed.

Classification: M10 U70

Keywords: mathematical modelling; workplace mathematics; computer support; didactic transposition

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