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Gravemeijer, Koen; Doorman, Michiel

Context problems in realistic mathematics education: a calculus course as an example.

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This article discusses the role of context problems, as they are used in the Dutch approach that is known as realistic mathematics education (RME). In RME, context problems are intended for supporting a reinvention process that enables students to come to grips with formal mathematics. This approach is primarily described from an instructional-design perspective. The instructional designer tries to construe a route by which the conventional mathematics can be reinvented. Such a reinvention route will be paved with context problems that offer the students opportunities for progressive mathematizing. Context problems are defined as problems of which the problem situation is experientially real to the student. An RME design for a calculus course is taken as an example, to illustrate that the theory based on the design heuristic using context problems and modeling, which was developed for primary school mathematics, also fits an advanced topic such as calculus. Special attention is given to the RME heuristic that refer to the role models can play in a shift from a model of situated activity to a model for mathematical reasoning. In light of this model-of/model-for shift, it is argued that discrete functions and their graphs play a key role as an intermediary between the context problems that have to be solved and the formal calculus that is developed. (Abstract)

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