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Identifying and exploring relationships between contextual situations and ordinary differential equations.

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Summary: The aim of this paper is to present and discuss some of the evidence regarding the resources that students use when they establish relationships between a contextual situation and an ordinary differential equation (ODE). We present research results obtained from work by seven students in a graduate level course in mathematics education, where they were involved in solving tasks based on the study of ODEs. The students' mastery of digital tools allowed them to use and articulate different mathematical representations to comprehend how phenomena develop. The use of digital tools helped to enhance the students' interpretation of the relationships between the context and the mathematical model associated with it. We also found that difficulties related to interpretation are grounded in the literal relationship that students make between their mental model of how a phenomenon develops and its mathematical representations.

Classification: I75
Keywords: ordinary differential equations; mathematical models; digital tools; representation registers
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