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Investigating the representational fluency of pre-service mathematics teachers in a modelling process.

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Summary: This article reports the results of a study that investigated pre-service mathematics teachers' modelling processes in terms of representational fluency in a modelling activity related to a cassette player. A qualitative approach was used in the data collection process. Students' individual and group written responses to the mathematical modelling activity, video-taped and transcribed group discussions, and classroom observations, were the main sources of data. This study was conducted during the spring semester in 2010. Fifty-five pre-service teachers were the participants in the study. Systematic coding and descriptive statistics were used in analysing the data. The data showed that a difficulty with modelling was closely related to the difficulty in the transformation of semiotic representations. During the modelling process, the two types of transformations, which were the treatments within a register and conversions between registers, occurred concurrently. In addition, the challenging and motivating nature of the modelling process in terms of directing participants to form consistent transformations between and within different representation registers was observed.

Classification: M59 G49 D59 C49

Keywords: mathematical modeling; problem solving; representational fluency; semiotic representations; transformation of representations

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