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Teachers' professional knowledge and noticing: the case of multiple representations in the mathematics classroom.

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Summary: Teachers notice through the lens of their professional knowledge and views. This study hence focuses not solely on teachers' noticing, but also on their knowledge and views, which allows insight into how noticing is informed and shaped by professional knowledge. As a discipline-specific perspective for noticing we chose dealing with multiple representations, since they play a double role for learning mathematics: On the one hand they are essential for mathematical understanding, but on the other hand they can also be an obstruction for learning. This comparative study takes into account pre-service as well as in-service teachers in order to explore the role of teaching experience for such professional knowledge, views and noticing. The participants answered a questionnaire addressing different components of specific knowledge and views. For eliciting the teachers' theme-specific noticing, vignette-based questions were used. The data analysis was done mainly by quantitative methods, but was complemented by a qualitative in-depth analysis focusing on how the teachers' theme-specific noticing was informed by different components of their professional knowledge. The results suggest that pre-service as well as in-service teachers do not fully understand the key role of multiple representations for learning mathematics in the sense of their discipline-specific significance. The participating in-service teachers distinguished themselves however from the pre-service teachers especially regarding their theme-specific noticing. Moreover, the evidence indicates that teachers' noticing of critical instances of dealing with multiple representations draws on situated as well as on global knowledge and views.

Classification: C39 C29

Keywords: teacher professional knowledge; teacher noticing; multiple representations; in-service teachers; pre-service teachers

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