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The importance of dialogic processes to conceptual development in mathematics.

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Summary: We argue that dialogic theory, inspired by the Russian scholar Mikhail Bakhtin, has a distinct contribution to the analysis of the genesis of understanding in the mathematics classroom. We begin by contrasting dialogic theory to other leading theoretical approaches to understanding conceptual development in mathematics influenced by Jean Piaget and Lev Vygotsky. We argue that both Piagetian and Vygotskian traditions in mathematics education overlook important dialogic causal processes enabling or hindering switches in perspective between voices in relationship. To illustrate this argument, we use Piagetian-, Vygotskian- and Bakhtinian-inspired approaches to analyse a short extract of classroom data in which two 12-year-old boys using TinkerPlots software change their understanding of a probability problem. While all three analyses have something useful to offer, our dialogic analysis reveals aspects of the episode, in particular the significance of the emotional engagement and the laughter of the students, which are occluded by the other two approaches.

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