

MATHEMATICS TEACHER UNDERSTANDING AS AN EMERGENT PHENOMENON

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This study examined the research question “In what ways do mathematics teachers grow in their understanding of mathematical processes within the context of professional conversation?” An enactivist view of cognition is used as a frame to consider teacher understanding. Within the professional conversation of four teachers about mathematical processes, individual understanding, collective understanding, and understanding within the body of mathematics was noticed as emerging. Narrative inquiry is used to describe the emergence of mathematics teacher understanding. Two detailed narrative accounts are included to highlight the complexity and complicity of teachers’ conversations. From the two narrative accounts, five moments are selected and interpreted further through the frames of individual understanding, collective understanding, and understanding within the body of mathematics. Pirie and Kieren’s (1994) theory of dynamical growth of mathematical understanding is used to interpret emergent individual understanding; Davis and Simmt’s (2003) work on collective understanding is used to interpret emergent collective understanding; and Davis’s (1996) work around understanding within the body of mathematics is used to interpret emergent understanding within the body of mathematics. Some of the patterns that emerged in the interpretations of the selected moments are mathematics teacher understanding is intertwined with teachers’ lived histories and student understanding; a teacher may not overtly express their understanding to others, yet changing understanding has occurred; teacher understanding of mathematical processes is affected by the way in which they themselves experienced the processes; changing collective understanding emerges in the collective; developing a shared or distributed understanding within a collective is possible; because conversation itself is an emergent phenomenon, we can see emergent understanding within it; the Pirie-Kieren theory can be used to describe emergent mathematical understanding; and mathematics lives in mathematics teacher conversations.

References:

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