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An analytic conception of equation and teachers' views of school algebra.

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Summary: This interview study takes place in the context of a single small district in the United States. In the algebra curriculum of this district, there was a shift in the conception of equation, from a statement about unknown numbers to a question about the comparison of two functions over the domain of the real numbers. Using two of Shulman's [Shulman, L. S. (1986). Paradigms and research programs in the study of teaching: A contemporary perspective. In Wittrock, M. C. (Ed.), Handbook of research in teaching (3rd ed., pp. 3–36). New York: Macmillan] categories of teachers' knowledge – pedagogical content knowledge and curricular content knowledge – we explore whether in this context teachers' content knowledge give signs of being reorganized. Our findings suggest that the teachers see this conception of equation as useful for equations in one variable. They struggle with its ramifications for equations in two variables. Nonetheless, this conception of equation leads them to reflect on the algebra curriculum in substantial ways; two of the three teachers explicitly spoke about their curricular ideas as being associated with this conception of an equation or with their earlier views. The third teacher seems so taken with these curricular ideas that he explored their ramifications throughout the interview. We argue that the consideration of this new conception of equation was an important resource that the teachers used to construct their understandings of alternative curricular approaches to school algebra. As they work with this new conception of an equation, we find an analogy to their situation in Kuhn's description of the individual scientist in the process of adopting a new paradigm.

Classification: B50

Keywords: mathematics teachers' knowledge; curricular change; graphing technology; school algebra; equations; functions; educational research

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