Effects of Teachers’ Mathematical Knowledge for Teaching on Student Achievement

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This study explored whether and how teachers’ mathematical knowledge for teaching contributes to gains in students’ mathematics achievement. The authors used a linear mixed-model methodology in which first and third graders’ mathematical achievement gains over a year were nested within teachers, who in turn were nested within schools. They found that teachers’ mathematical knowledge was significantly related to student achievement gains in both first and third grades after controlling for key student- and teacher-level covariates. This result, while consonant with findings from the educational production function literature, was obtained via a measure focusing on the specialized mathematical knowledge and skills used in teaching mathematics. This finding provides support for policy initiatives designed to improve students’ mathematics achievement by improving teachers’ mathematical knowledge.

KEYWORDS: educational policy, mathematics, student achievement, teacher knowledge.

In recent years, teachers’ knowledge of the subject matter they teach has attracted increasing attention from policymakers. To provide students with “highly qualified teachers,” the No Child Left Behind Act requires teachers to...