

ZMATH 2015e.00403

Star, Jon R.; Newton, Kristie; Pollack, Courtney; Kokka, Kari; Rittle-Johnson, Bethany; Durkin, Kelley

Student, teacher, and instructional characteristics related to students' gains in flexibility.

Contemp. Educ. Psychol. 41, 198-208 (2015).

Summary: Flexibility in problem solving has been widely recognized as an important skill for students' mastery of mathematics. Here we utilize the Opportunity-Propensity framework to investigate student characteristics, teacher characteristics, and teacher instructional practices that may be associated with students' gains in flexibility in algebra. Teacher and student data were collected from 8th and 9th grade Algebra I teachers in Massachusetts as part of a larger study on the impact of a researcher-developed year-long supplementary curriculum that focused on improving students' flexibility. We explore student demographics, teacher background characteristics and teacher instructional practices as predictors of student gains in flexibility. We further investigate instructional practices associated with flexibility gains through an analysis of teacher questioning in the classroom for teachers whose students achieved the greatest gains in flexibility and those whose students achieved the least gains. Our results indicate that prior knowledge is a reliable predictor of flexibility gains and that gender is an important student background characteristic associated with the development of flexibility. In addition, although high and low gain teachers did not differ in their implementation fidelity, high flexibility gain teachers asked more open-ended questions that prompted students to verbalize the main ideas of the lesson.

Classification: D53 C43 H23 C49 C73

Keywords: flexibility; algebra; discussion questions; teacher characteristics; student characteristics
doi:10.1016/j.cedpsych.2015.03.001