

ZMATH 2015f.00163

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Exploring the impact of knowledge of multiple strategies on students' learning about proportions.

Middleton, James A. (ed.) et al., Large-scale studies in mathematics education. Cham: Springer (ISBN 978-3-319-07715-4/hbk; 978-3-319-07716-1/ebook). Research in Mathematics Education, 61-73 (2015).

Summary: Proportional reasoning is widely considered to be a major goal of mathematics education in the middle grades. The literature identifies three strategies that are commonly used by students in solving simple proportion problems: cross multiplication, equivalent fractions, and unit rate. In past research, scholars have expressed concern that students rely too heavily on cross multiplication when solving these types of problems and have advocated delaying instruction on cross multiplication in favor of both the unit rate and equivalent fractions strategies. As part of a study evaluating a 6-week curriculum unit on ratio, proportion, and percent problem solving, we assessed students' strategy repertoire for solving proportion problems and the extent to which students' prior knowledge of one or more strategies impacted their learning from the curricular intervention. Results indicated that students relied almost exclusively on the equivalent fractions strategy for solving simple proportion problems, and that students who had prior knowledge of more than one strategy learned more from the intervention than those who knew one or no strategies.

Classification: C30 F70 F40 D20

Keywords: strategy use; proportional reasoning; multiple strategies; cross multiplication; equivalent fractions; unit rate

doi:10.1007/978-3-319-07716-1_4