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Initial fraction learning by fourth- and fifth-grade students: A comparison of the effects of using commercial curricula with the effects of using the rational number project curriculum.

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This study contrasted the achievement of students using either commercial curricula (CC) for initial fraction learning with the achievement of students using the American Rational Number Project (RNP) fraction curriculum. The RNP curriculum placed particular emphasis on the use of multiple physical models and translations within and between modes of representation - pictorial, manipulative, verbal, real-world, and symbolic. The instructional program lasted 28-30 days and involved over 1600 fourth and fifth graders in 66 classrooms that were randomly assigned to treatment groups. Students using RNP project materials had statistically higher mean scores on the posttest and retention test and on four (of six) subscales: concepts, order, transfer, and estimation. Interview data showed differences in the quality of students' thinking as they solved order and estimation tasks involving fractions. RNP students approached such tasks conceptually by building on their constructed mental images of fractions, whereas CC students relied more often on standard, often rote, procedures when solving identical fraction tasks. These results are consistent with earlier RNP work with smaller numbers of students in several teaching experiment settings.

Classification: F42

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