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Towards a hypothetical learning trajectory for rational number.

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Summary: A hypothetical learning trajectory *M. Simon* [J. Res. Math. Educ. 26, No. 2, 114–145 (1995)] based on Kieren’s sub-constructs for rational number was developed and used as a framework in a year-long design experiment in a New Zealand middle school. Instructional sequences were designed using the trajectory. Case studies of six 12–13-year-old students provided evidence of their progression through phases of the hypothetical learning trajectory. The patterns of progress for individual students were displayed using visual maps which revealed considerable variability across the sub-constructs and predicted growth within sub-constructs. The findings supported the usefulness of the hypothetical learning trajectory as an instructional tool supported by other forms of pedagogical-content-knowledge. Developmental connections between the sub-constructs were also suggested.

Classification: F43 C33

Keywords: hypothetical learning trajectory; rational number; pedagogical-content knowledge

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