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Measuring change in mathematics learning with longitudinal studies: conceptualization and methodological issues.

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Summary: Learning is fundamentally about growth and change. Longitudinal studies of mathematics learning must therefore conceptualize, measure, analyze, and interpret changes in students' mathematical thinking. This chapter provides a perspective on how researchers can deal with issues entailed in researching such change over time, drawing on the authors' experiences with two longitudinal projects in the USA and China. Both the LieCal (Longitudinal Investigation of the Effect of Curriculum on Algebra Learning) project and the China project studied the effects of curriculum on student learning. Based on these projects, several challenges are discussed, including the complexity of conceptualizing and measuring change in mathematical thinking, the importance of appropriate analytic techniques, the need to consider long-term change, and critical concerns when interpreting the correlates or causes of observed change.

Classification: D20 C30

Keywords: longitudinal studies; measuring changes; mathematical thinking; LieCal project; mathematics learning; curricular effect

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