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Opportunities to develop algebraic thinking in elementary grades throughout the school year in the context of mathematics curriculum changes.

Li, Yeping (ed.) et al., Transforming mathematics instruction. Multiple approaches and practices. Cham: Springer (ISBN 978-3-319-04992-2/hbk; 978-3-319-04993-9/ebook). Advances in Mathematics Education, 173-197 (2014).

Summary: This chapter intends to illustrate and discuss one developmental project in the context of basic education curriculum changes concerning the early introduction of algebraic thinking on classroom instruction in one fourth grade class. From a more general point of view, this discussion centers on the relationship between the official, planned, enacted, and learned curriculum. Different aspects of these dimensions of the curriculum are exemplified from the analysis of some mathematical tasks and instances of the mathematical communication processes that took place in the classroom throughout one school year. The progress made by the students reveals that the curricular guidelines have several characteristics that altogether contribute to accomplish the general curriculum goal of students' algebraic thinking development: conceiving early algebra as the development of a way of thinking that links arithmetic to algebra, underlying the need to work with valuable mathematical tasks in the classroom, and fostering the students' mathematical communication. However, we contend that the learned curriculum was possible by the project characteristics, where the enacted curriculum reflects the specificity of the class we have been working with.

Classification: H22 H32 D42

Keywords: algebraic thinking; curriculum changes; classroom instruction; dimensions of the curriculum; mathematical communication; mathematical tasks; elementary grades

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