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Understanding the development of mathematical work in the context of the classroom.

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Summary: According to our approach to mathematics education, the optimal aim of the teaching of mathematics is to assist students in achieving efficient mathematical work. But, what does efficient exactly mean in that case? And how can teachers reach this objective? The model of Mathematical Working Spaces with its three dimensions – semiotic, instrumental, discursive – allows us to address these questions in an original way based on a multidimensional approach to the use of tools and instruments and on the notion of complete mathematical work. The Mathematical work is considered complete when a genuine relationship exists between epistemological and cognitive aspects, and when the three dimensions of the model are appropriately articulated. Two teaching situations in probability for Grades 9 and 10 (age 14 and 15) are used to illustrate how the model can help identify either misunderstandings that are not acknowledged by the teacher, or complete mathematical work despite some differences between intended and actual work.

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