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From the didactical triangle to the socio-didactical tetrahedron: artifacts as fundamental constituents of the didactical situation.

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Summary: Research on the use of artifacts such as textbooks and digital technologies has shown that their use is not a straight forward process but an activity characterized by mutual participation between artifact and user. Taking a socio-cultural perspective, we analyze the role of artifacts in the teaching and learning of mathematics and argue that artifacts influence the didactical situation in a fundamental way. Therefore, we believe that understanding the role of artifacts within the didactical situation is crucial in order to become aware of and work on the relationships between the teacher, their students and the mathematics and, therefore, are worthwhile to be considered as an additional fundamental aspect in the didactical situation. Thus, by expanding the didactical triangle, first to a didactical tetrahedron, and finally to a “socio-didactical tetrahedron”, a more comprehensive model is provided in order to understand the teaching and learning of mathematics.

Classification: D20 D40 C70 C60

Keywords: artifacts; cultural-historical activity theory; didactical tetrahedron; didactical triangle; digital technologies; instrumental approach; mathematics textbooks; sociocultural perspective; teachers’ practice; tools

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