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Categorizing and promoting reversibility of mathematical concepts.

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Summary: Reversibility of concepts, a key aspect of mathematical development, is often problematic for learners. In this theoretical paper, we present a typology we have developed for categorizing the different reverse concepts that can be related to a particular initial concept and explicate the relationship among these different reverse concepts. We discuss uses of the typology and how reversibility can be understood as the result of reflective abstraction. Finally, we describe two strategies for promoting reversibility that have distinct uses in terms of the types of reverse concepts they engender. We share empirical results which led to our postulation of these strategies and discuss their theoretical basis.

Classification: D30 C30 E40

Keywords: reversibility; mathematical concepts; reflective abstraction; task design

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