ZMATH 2005b.00610

Dörfler, Willi

Objectifying relations: fractions as symbols for actions.

Clarke, Barbara et al., International perspectives on learning and teaching mathematics. NCM/Göteborg University, Göteborg (ISBN 91-85143-01-4). 299-311 (2004).

Fractions and rational numbers in mathematics enjoy the status of abstract objects which are represented by symbols or diagrams to which operations can be applied. The field Q is the general-abstract expression of this view. In this paper, a hypothetical learning trajectory is presented which is first a model for a theoretically conceivable cognitive development and second an epistemological reconstruction of the genesis of rational numbers as objects. This trajectory is a pathway leading from material actions via their symbolizations to the abstract objects which are conceived as types of symbols. Further, it is organized and informed by the view of fractions and rational numbers as relationships and by the notion of protocols of actions. Rational numbers emerge as an abstract way of speaking about a complex network of actions, symbols and operations with those symbols. Thereby the complexity of this concept is underlined and explicated.

Classification: F40