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Naftaliev, Elena; Yerushalmy, Michal

Guiding students instruction with an interactive diagram: the case of equations.

Amado, Nélia (ed.) et al., Proceedings of the 12th international conference on technology in mathematics teaching, ICTMT 12. Faro: University of Algarve (ISBN 978-989-8472-68-7). 226-234 (2015).

Summary: The present study focuses on a specific class of interactive text called Guiding Interactive Diagrams (GID) and specifically on the functions of the boundaries designed to guide student's explorations. We report on an experiment in which 14- and 15-year-old students were challenged by an interactive task. The study provides evidence about the guidance's role and the control over the exploration that guiding interactive text grant to students engaged. Following Vygotsky's and Piaget's cognitive and social constructivism, we argue that in forming mathematical concepts students' exploration begins with spontaneous ideas relating to the context of the task, which they then develop with guidance supported by the design of the interactive text. To educators, who are challenged by the design and the implementation of interactive mathematics instructional materials, the study offers ways and terms to think about designs that limit the student's action and so support guidance, and at the same time remain an open space for student ideas.

Classification: U73 D43 H33

Keywords: interactive diagrams; interacting task; mathematical concepts; exploration