

ZMATH 2013b.00687

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Tool use and the development of the function concept: from repeated calculations to functional thinking.

Int. J. Sci. Math. Educ. 10, No. 6, 1243-1267 (2012).

Summary: The concept of function is a central but difficult topic in secondary school mathematics curricula, which encompasses a transition from an operational to a structural view. The question in this paper is how the use of computer tools may foster this transition. With domain-specific pedagogical knowledge on the learning of function as a point of departure and the notions of emergent modeling and instrumentation as design heuristics, a potentially rich technology-intensive learning arrangement for grade 8 students was designed and field-tested. The results suggest that the relationship between tool use and conceptual development benefits from preliminary activities, from tools offering representations that allow for progressively increasing levels of reasoning, and from intertwining with paper-and-pencil work.

Classification: I23 C33 M93 D33

Keywords: function concept; functional thinking; modeling; technology; emergent modeling

doi:10.1007/s10763-012-9329-0