

ZMATH 06675785

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Tensions in the design of mathematical technological environments: tools and tasks for the teaching of linear functions.

Leung, Allen (ed.) et al., Digital technologies in designing mathematics education tasks. Potential and pitfalls. Cham: Springer (ISBN 978-3-319-43421-6/hbk; 978-3-319-43423-0/ebook). Mathematics Education in the Digital Era 8, 329-348 (2017).

Summary: The design of tasks for the exploration of mathematical concepts involving technology can take several starting points. In many cases the ‘tool’ is predefined as an existing mathematics application with an embedded set of design principles that shape the mathematical tasks that are possible. In other cases, the tool and tasks are designed through a more dynamic process whereby designers and educators engage in a discourse that influences the resulting tasks. The chapter will begin with a brief description of a longitudinal study, and its theoretical framework that resulted in a rubric to inform the design of tasks that privilege the exploration of mathematical variants and invariants. This rubric is then used as a construct for the post-priori analysis of two tasks that introduced the concept of linear functions and that use different technologies. Conclusions will be drawn that highlight subtle tensions that relate to the mathematical knowledge at stake and to the design principles of the underlying technology and task.

Classification: U70 I20 D50 D30

Keywords: digital technology; task design; linear functions

doi:10.1007/978-3-319-43423-0_16