

ZMATH 2016f.00233

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On the relations between conceptual and procedural knowledge and the ability to apply functions.

Eronen, Lasse (ed.) et al., Mathematics and education. Learning, technology, assessment. Festschrift in honour of Lenni Haapasalo. Münster: WTM-Verlag (ISBN 978-3-95987-005-4/pbk). Festschriften der Mathematikdidaktik 3, 87-100 (2016).

Summary: This article gives an overview of the methodology and results of my dissertation [the author, Conceptual and procedural knowledge of mathematical function. University of Eastern Finland (Diss.) (2012)], in which I explored how conceptual and procedural knowledge of functions can be measured, what the relationship is between them, and how the student's ability to apply functions within economics and other mathematical tasks depends on the two types of knowledge. The structural equation modelling technique allowed integrating factor analysis and regression analysis into one statistical model to study relationships. Data was collected at three different stages from 476 students in economics. The results support the genetic view that procedural knowledge is a necessary but not sufficient condition for conceptual knowledge. On the other hand, procedural knowledge alone seems to be insufficient for the student to be able to apply functions. A follow-up survey, which was not a part of the dissertation, indicated that evaluations in mathematics where scores on procedural knowledge dominate, do not predict students' achievements in econometrics.

Classification: C30 I20 M40

Keywords: conceptual knowledge; procedural knowledge; functions; econometrics