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Author

LEPPINK, Jimmie

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Abstract

This study investigated the effects of four instructional methods on cognitive load, propositional knowledge, and conceptual understanding of statistics, for low prior knowledge students and for high prior knowledge students. The instructional methods were (1) a reading-only control condition, (2) answering open-ended questions, (3) answering open-ended questions and formulating arguments, and (4) studying worked-out examples of the type of arguments students in the third group had to formulate themselves. The results indicate that high prior knowledge students develop more propositional knowledge of statistics than low prior knowledge students. With regard to conceptual understanding, the results indicate an expertise reversal effect: low prior knowledge students learn most from studying worked-out examples, whereas high prior knowledge students profit most from formulating arguments. Thus, novice students should be guided into the subject matter by means of worked-out examples. As soon as students have developed more knowledge of the subject matter, they should be provided with learning tasks that stimulate students to solve problems by formulating

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arguments. (HRK / Abstract übernommen) Leppink, Jimmie, E-Mail:
j.leppink@maastrichtuniversity.nl