

ZMATH 2016f.01126

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Reasoning about variables in 11 to 18 year olds: informal, schooled and formal expression in learning about functions.

Math. Educ. Res. J. 28, No. 3, 379-404 (2016).

Summary: This study examines expressions of reasoning by some higher achieving 11 to 18 year-old English students responding to a survey consisting of function tasks developed in collaboration with their teachers. We report on 70 students, 10 from each of English years 7–13. Iterative and comparative analysis identified capabilities and difficulties of students and suggested conjectures concerning links between the affordances of the tasks, the curriculum, and students' responses. The paper focuses on five of the survey tasks and highlights connections between informal and formal expressions of reasoning about variables in learning. We introduce the notion of 'schooled' expressions of reasoning, neither formal nor informal, to emphasise the role of the formatting tools introduced in school that shape future understanding and reasoning.

Classification: I20 E50

Keywords: reasoning about variables; functions; informal expressions; schooled expressions; formal expressions

doi:10.1007/s13394-016-0171-5