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Competencies developed by university students in microworld-type core mathematical courses.

Nicol, Cynthia (ed.) et al., Proceedings of the 38th conference of the International Group for the Psychology of Mathematics Education "Mathematics education at the edge", PME 38 held jointly with the 36th conference of PME-NA, Vancouver, Canada, July 15–20, 2014, Vol. 2. [s. l.]: International Group for the Psychology of Mathematics Education (ISBN 978-0-86491-360-9/set; 978-0-86491-362-3/v.2). 209-216 (2014).

Summary: We report on an empirical study grounded in our sustained implementation over ten years of a sequence of three-term undergraduate core mathematics courses centred on microworlds. The survey study investigates students' views on 15 competencies potentially developed as they, individually or in pairs, create 12 exploratory objects, i.e., microworld-type environments, on diverse mathematical topics as part of their workload. Results suggest that students develop further the competencies as they repeat designing, programming, and using microworlds to learn and do mathematics, and that original projects in which students start by selecting their own topic, is key to the development of these competencies. No gender differences were found.

Classification: C20 D30 D40
Keywords: competencies; students' views on competencies; microworld-type environments; learning; development of competencies