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Abstract

In design research, design principles involve the development of theory and practice. This paper refines a set of humble design heuristics into a set of design principles in the third iteration of a design research project. The set of design principles aims to exercise (meaning "to put into practice") students' mathematical communication competency when using a dynamic geometry environment (DGE). Based on an analysis, which includes perspectives on the instrumental approach, semiotic registers and mathematical language, the set of design principles is refined by transforming an analysis of two 9th grade (15–16 years old) students' interactions with the task design into prescriptive principles. The overall principle of *separate – join – new separate* indicates that it is crucial to relate mathematical representations across registers in the different steps, individually and in collaboration.

Cecilie Carlsen Bach

Cecilie Carlsen Bach is a postdoc in Mathematics Education at Danish School of Education, Aarhus University. Cecilie has a background as a school teacher and she has a special interest in mathematical communication, the use of digital tools, mathematical competencies as well as students who experience difficulties when learning mathematics.