

Thinking with drawings - Sketch-based modelling in early science education

Self-constructed external representations can positively affect the course and type of reasoning for various reasons, e.g. by providing a ground for (self-) explanations, by helping to disambiguate learners' mental models of phenomena or by reducing working memory load. Especially in early education, drawings and sketches can be beneficial, since they make use of known and established techniques and do not impose a formal syntax or modelling language. By making use of computer-supported, pen-based input devices, applying sketches in educational contexts can be brought to a higher level, e.g. by supporting the learner with awareness information and feedback, by enabling collaborative experiences, and by literally bringing a learner-created drawing to life. In this contribution, we outline our efforts to utilise learner-created drawings in modelling activities in early science education. We will describe approaches for using sketches in educational contexts called SimSketch, an application to create multi-agent simulations based on drawings. The main purpose of SimSketch is to assist learners in creating executable simulations of scientific topics, using an informal representation based on drawings.

Lars Bollen
Wouter van Joolingen

Contact:

Lars Bollen
University of Twente
Department of Instructional Technology
l.bollen@utwente.nl

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