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Mathematical machines: from history to mathematics classroom.

Zaslavsky, Orit (ed.) et al., Constructing knowledge for teaching secondary mathematics. Tasks to enhance prospective and practicing teacher learning. Berlin: Springer (ISBN 978-0-387-09811-1/hbk; 978-0-387-09812-8/ebook). Mathematics Teacher Education 6, 227-245 (2011).

Summary: The aim of this chapter is to present some issues concerning secondary teacher education, drawing on the activity of the Laboratory of Mathematical Machines at the Department of Mathematics of the University of Modena and Reggio Emilia (MMLab: <http://www.mmlab.unimore.it>). The name comes from the most important collection of the Laboratory, containing more than two hundred working reconstructions (based on the original sources) of mathematical artefacts taken from the history of geometry. In this chapter we intend to discuss, in the setting of teacher education and within a suitable theoretical framework, a single case, i.e., an ellipse drawing device, from different perspectives (historic-epistemological, manipulative and virtual), to develop expertise in selecting and adjusting appropriate tools for the mathematics classroom.

Classification: A39 U69 G49 U79 R29

Keywords: artefact; history of mathematics; mathematical laboratory; mathematical machine; semiotic mediation; manipulative materials; teaching aids; dynamic geometry software; geometric constructions; pre-service teacher education; elementary geometry

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