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The use of visualization for learning and teaching mathematics.

Paditz, Ludwig (ed.) et al., Proceedings of the 10th international conference “Models in Developing Mathematics Education”, Dresden, Saxony, Germany, September 11–17, 2009. Dresden: Hochschule für Technik und Wirtschaft (ISBN 83-919465-9-2). 496-500 (2009).

Summary: Based on dissection-motion-operations, DMO (decomposing a figure into several pieces and composing the resulting pieces into a new figure of equal area), a set of visual representations (models) of mathematical concepts will be introduced. The visual models are producible through manipulation and computer GSP/Cabri software. They are based on the *P. M. van Hiele*'s levels [Structure and insight: a theory of mathematics education. Orlando: Academic Press (1989)] of thought development; in particular, level 2 (informal deductive reasoning) and level 3 (deductive reasoning). The basic theme for these models has been visual learning and understanding through manipulatives and computer representations of mathematical concepts vs. rote learning and memorization. The three geometric transformations or motions: translation, rotation, reflection and their possible combinations were used; they are illustrated in several texts. As well, a set of three commonly used dissections or decompositions [*H. Eves*, A survey of geometry. Boston: Allan and Bacon inc. (1972)] of objects was utilized.

Classification: G30 G50 D40 U60

Keywords: transformation geometry; area; visualization; visual justification; diagrams; computer graphics; physical models