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A spatial-semiotic framework in the context of information and communication technologies (ICTs).

Khine, Myint Swe (ed.), Visual-spatial ability in STEM education. Transforming research into practice. Cham: Springer (ISBN 978-3-319-44384-3/hbk; 978-3-319-44385-0/ebook). 173-194 (2017).

Summary: This chapter is devoted to the spatial thinking process in ICTs from a semiotic perspective. Initially, I review particular research (limited to geometry and mathematics education) in order to analyze and elaborate subjects' ways of spatial thinking, while they are using 3D modeling software. Thereafter, certain analyses are conducted through the perspective of learning (2D and 3D) geometry, visualization and spatial thinking frameworks, semiotics and multimodal paradigm perspectives in order to provide underpinning for a spatial-semiotic framework in the context of 3D modeling software. Thereafter, I look at two case studies on the use of 3D modeling software (in particular, SketchUp®) to evaluate the proposed framework. The data is analyzed through a semiotic lens, including different kinds of resources, not only for words, but also extra-linguistic modes of expressions and inscriptions (drawings or sketches) to relate attached signs in the use of software for the process of spatial thinking. Finally, I discuss the results to ameliorate the proposed framework.

Classification: C40 U70 U50

Keywords: spatial thinking; ICT; visualization; learning geometry; multimodal paradigm

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