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Perceiving calculus ideas in a dynamic and multi-semiotic environment – the case of the antiderivative.

Ubuz, Behiye (ed.) et al., CERME 8. Proceedings of the eighth congress of the European Society of Research in Mathematics Education, Antalya, Turkey, February 6–10, 2013. Ankara: Middle East Technical University (ISBN 978-975-429-315-9). 1616-1625 (2013).

Summary: The present case study was designed to analyze the objectification processes of making sense of the antiderivative concept when it is being studied graphically in a dynamic and multi-semiotic technological environment. This study is guided by sociocultural theory, which considers artifacts to be fundamental to cognition and views learning as the process of becoming aware of the knowledge that exists within a culture. The case study focuses on two seventeen-year- old students. In the course of the discourse micro-analysis I identified three essential foci in the objectification processes 1) objectifying the relationship between a function and its derivative 2) objectifying the relationship between a function and its antiderivative 3) objectifying the vertical transformation of the antiderivative graph.

Classification: I54 U74 C54

Keywords: antiderivative; dynamic and multi-semiotic technological environment; integral concept