

ZMATH 2011f.00582

García, Mercedes; Llinares, Salvador; Sánchez-Matamoros, Gloria

Characterizing thematized derivative schema by the underlying emergent structures.

Int. J. Sci. Math. Educ. 9, No. 5, 1023-1045 (2011).

Summary: This paper reports on different underlying structures of the derivative schema of three undergraduate students that were considered to be at the trans level of development of the derivative schema (action-process-object-schema). The derivative schema is characterized in terms of the students' ability to explicitly transfer the relationship between a function and its first derivative to the derivative function and the second derivative. This conscious shift of properties of derivatives is differently manifested by the students in the trans level of development of the derivative schema and can be considered evidence of the different characteristics of the thematization of derivative schema. From here we suggest that there are different underlying structures in the constructed schema due to the consciousness in which students use the relations between a function and its derivative.

Classification: I45 D65 D35

Keywords: derivatives; derivative schema; relationship between a function and its first derivative; consciousness; reflective abstraction; thematization; first year students; empirical investigations; educational research
doi:10.1007/s10763-010-9227-2