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Algebraic expressions of deaf students: connecting visuo-gestural and dynamic digital representations.

Oesterle, Susan (ed.) et al., Proceedings of the 38th conference of the International Group for the Psychology of Mathematics Education “Mathematics education at the edge”, PME 38 held jointly with the 36th conference of PME-NA, Vancouver, Canada, July 15–20, 2014, Vol. 3. [s. 1.]: International Group for the Psychology of Mathematics Education (ISBN 978-0-86491-360-9/set; 978-0-86491-363-0/v.3). 49-56 (2014).

Summary: This paper explores the algebraic expressions of deaf learners as they explore and construct sequences using the digital microworld Mathsticks. More specifically, it attempts to identify how the deaf students coordinated bodily, discursive and digital resources in order to attribute their own personal senses to the notion of variable. Examples of their interactions with the tasks and tools are analysed to identify evidence of the presence of the three conditions of algebraic thinking, indeterminacy, denotation and analyticity. Our findings suggest that the creation of a shared sign “secret number” to represent the idea of variable was central in facilitating the students to adopt algebraic rather than arithmetic approaches and to appropriate the idea of a general term.

Classification: H20 H30 C40 C50 U70

Keywords: algebraic expressions; deaf students; interaction; visuo-gestural representations; dynamic digital representations; algebraic thinking