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**Learning velocity graphs - The case of Laura and Fiona. Variation as a critical feature for learning.**

Bergsten, Christer (ed.) et al., Challenges in mathematics education. Proceedings of MADIF3, The 3rd Swedish mathematics education research seminar, Norrköping, Sweden, January 23–25, 2002. Linköping: Svensk Förening för MatematikDidaktisk Forskning (ISBN 91-973934-0-X). Skrifter från Svensk Förening för Matematikdidaktisk Forskning (SMDF) 2, 152-156 (2003).

One line of educational research has put the variation of the object of study as critical for learning. In her presentation, the author illustrates how learning is dependent on the pattern of variation - such as what is varying, what is invariant, what is left out or taken for granted. For example, by changing one essential feature of a demonstration, the teacher may insert one necessary dimension of variation but take another one for granted. In the case shown in the paper the bi-directional property of a velocity was kept invariant but the variation of the horizontal-vertical dimension of movement was taken for granted, thus causing learning problems.

*Classification:* I23 D40 C30