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The instructional quality of classroom processes and pupils' mathematical attainment concerning decimal fractions.

Int. J. Math. Teach. Learn. 2015, 21 p. (2015).

Summary: The objective of our study is to understand and analyse what significance cognitive and emotional networks of classroom processes have in mathematics learning. The subject of the study includes two classrooms from Year 5 of a teacher training school, their pupils ($N_A = 17$, $N_B = 19$) and student teachers ($N = 4$). The course on decimals, which consisted of 17 lessons, was carried out in both classrooms. Research results are based on the analysis of 34 video-recorded lessons and the statistical analysis of pupils' mathematic attainment before and after the course. The teaching in classroom A emphasised instructional coherence, cognitive activation and emotional support. Classroom B's teaching represented lower levels of coherence, cognitive activation and emotional support on average. The pupils' skills concerning decimal fractions developed in both classrooms, but in classroom A the average change in the score from the pre-test to the post-test was more powerful ($p = .04$). The change was particularly clear on pupils in the middle level ($p = .00$). According to the main findings, teaching courses including instructional coherence together with cognitive activation and emotionally supported students produces better mathematical attainment.

Classification: C73 F43

Keywords: instructional quality; instructional coherence; cognitive activation; teacher-pupil relations; mathematical learning; decimal fractions

<http://www.cimt.plymouth.ac.uk/journal/pitkaniemi.pdf>