

Pedagogical Variation with Computers in Mathematics Classrooms: A Cultural Historical Activity Theory Analysis

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Abstract : South Africa's crisis in mathematics attainment is well documented. To meet the need to develop students' mathematical performance in schools the government has launched various initiatives using computers to impact on mathematical attainment. While it is clear that computers can change pedagogical practices, there is a dearth of qualitative studies indicating exactly how pedagogy is transformed with Information Communication Technologies (ICTs) in a teaching activity. Consequently, this paper addresses the following question: how, along which dimensions in an activity, does pedagogy alter with the use of computer drill and practice software in four disadvantaged grade 6 mathematics classrooms in the Western Cape province of South Africa? The paper draws on Cultural Historical Activity Theory (CHAT) to develop a view of pedagogy as socially situated. Four ideal pedagogical types are identified: Reinforcement pedagogy, which has the reinforcement of specialised knowledge as its object; Collaborative pedagogy, which has the development of metacognitive engagement with specialised knowledge as its object; Directive pedagogy, which has the development of technical task skills as its object, and finally, Defensive pedagogy, which has student regulation as its object. Face-to-face lessons were characterised as predominantly Reinforcement and Collaborative pedagogy and most computer lessons were characterised as mainly either Defensive or Directive.

Keywords : computers, cultural historical activity theory, mathematics, pedagogy

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