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Investigating addition and subtraction strategies of grade 3 learners within the context of a maths club.

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Abstract

This study was concerned with any shifts that could be seen in the use of addition and subtraction strategies by Grade (Gr) 3 learners, and the link between these strategies and resources made available to the learners within the context of the Maths Club (MC). The critical questions that I sought to answer were, a) What addition and subtraction strategies do learners display at the start of maths club?; b) What addition and subtraction strategies and resources does maths club suggest to learners?, c) What shifts in addition and subtraction strategies can be seen during the course of the maths club?

My conceptual framework which I later used as an analytical framework was drawn from various literature reviewed for the study with the work of Carpenter, Fennema, Franke, and Levi (1999) being the foreground. The framework consists of modeling strategies, counting strategies and number facts. Progression within and across strategies forms a large part of the exploration of the study.

The sample used for the study was six Gr 3 learners together with 2 Student Teachers (ST) conducting lessons within the MC. Data collected during the sequence of the 7 videotaped maths club sessions involving the 6-learner group held across the year formed the dataset for my analysis. Various data sources were used for this study, with videotaping forming the key data source. Field notes with feedback from the student teachers were also used. Lesson plans and workbooks used within the MC sessions were collected and analysed.

Findings show that learners relied on concrete strategies with 'unit counting' and 'counting from' dominating. Learners seemed to be using resources based on their availability. Where resources were used there did not seem to be any promotion of their use from concrete strategies to more sophisticated abstract strategies, partly because of the way ST introduced the resources to the learners. Though there was evidence of the use of abstract strategies, there was no evidence of a linear progression from concrete to abstract strategies as the learners often reverted to concrete strategies.

The implications of this study are that learners at grade 3 level need to be helped to progress from concrete use of strategies to more abstract use. One of the ways to help learners with this progression appears to be the incorporation of appropriate resources into the execution of strategies which implies that teachers need to be much more careful in their planning of what

resources are available, when and in what sequence. In addition to the incorporation of appropriate resources emphasis on structure such as 10 structure on a bead string or beans for example would need to be a focus so that learners may be able to shift from *modeling of* a situation to *modeling for* representation of mathematical reasoning.