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Number pattern: developing a sense of structure with primary school teachers

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ABSTRACT

The importance of early algebra has been demonstrated by numerous researchers. At primary and pre-school levels a focus on early algebra has been shown to improve numeracy outcomes in young learners. Supporting relational understanding at an early age, can enhance a learner's ability to work with the structure embedded in a set of sequenced items. Understanding and working with structure will foster the ability to reason algebraically and work at more sophisticated levels of mathematical engagement. In the South African curriculum, content area 2 provides the opportunity to support and encourage learners to enter the domains of structure and relational thinking. This study focuses on six Grade 2 teachers' approach to teaching sequencing, and using structure to work towards the goals of early algebra. The study includes a document analysis of the curriculum and resource texts, a series of intervention workshops to introduce teachers to structure and relational thinking, and lesson data that was collected pre- and post-intervention. The study shows that there is a disconnect between curriculum specifications and the resources materials. The findings indicate that the majority of activities in classroom texts operate at a low level of cognitive demand, and do not facilitate the development of relational thinking and structural exploration. The initial teaching of pattern most frequently resembled counting. Post intervention, the teachers could transform their teaching of sequencing and foreground structure and the relational attributes of dealing with sequences at Foundation Phase. The convergence of various pedagogical attributes resulted in a typology that groups relational features together in a hierarchical way, to progressively foreground structure in sequencing. This typology could support teachers and teacher educators to support a more sophisticated notion of structure in the early grades, and provide a basis for further research.

Keywords

Foundation Phase patterns; sequencing; structure; growth sequences; relational thinking.