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EXPLORING THE PREDICTIVE POWER OF EARLY ASSESSMENTS IN MATHEMATICS IN SOUTH AFRICA

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ABSTRACT

A significant body of evidence in mathematics education points to a set of early mathematical competencies being particularly powerful predictors of later mathematical learning. Many international studies highlight the importance of structural thinking in the early years for later performance.

However, such a study has not been done in South Africa at this scale. This study aims to find qualitatively and quantitatively the extent of the predictive power of structural thinking for later performance in mathematics in South African primary schools.

Therefore, the overall question my study addresses is, "Does my evidence support the international confirmation of the importance of structural thinking in the early years?" This longitudinal study will help demonstrate whether learners with sound mathematical structural thinking in Grade 2 are more likely to perform well in mathematics by the time they reach Grade 6.

An essential aspect of structural thinking in the early years of schooling is an awareness of number relationships underpinned by knowledge of the base ten build-up of our number system. The awareness of number relations leads later to learners using sophisticated strategies that include mental calculations and creatively finding answers to new problems.

My study is within the Wits Maths Connect Primary project (WMC-P), where I am a member. This research study is a mixed-method longitudinal study over just less than five years, with initial data collection taking place in February/March 2011, when the participants were in Grade 2, and later in November 2015 when they were in Grade 6. The sample is 64 participants from eight government schools in one province in South Africa. The participants were from four townships schools (n=38) and four schools in suburban areas (n=26).

The study explored quantitatively and qualitatively whether mathematical structural thinking in Grade 2 predicts later mathematics performance in the South African context. I am exploring the predictive power of structural thinking by investigating the correlations between tests.

The results show that structural thinking is essential in the early years of primary school in order to perform well in higher grades. Teachers should ideally teach to make learners constantly aware of the relationship between numbers and mathematical structure.

Keywords:

Structural thinking, awareness of relationships, strategies, mixed-method, assessment, unit counting, predictive power, correlations, sophisticated strategies, relationship between quantities, unenumerated quantities.