HIGH SCHOOL LEARNERS' BACKLOGS IN NUMBER

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There is significant concern about the mathematical backlogs that learners enter high school with in South Africa. For example, learners attending schools in poorer areas are three to four grade levels behind their expected grade level (Spaull & Kotze, 2015).

The research reported in this communication is linked to a larger project investigating key levers for helping early high school learners from disadvantaged backgrounds succeed at mathematics. In the component of this research reported here, we analysed learners' performance on tasks related to number to identify key aspects of number work requiring remediation. We draw on two data sets: 1) responses of a nationally representative sample of South African learners to the released items on number concepts from the grade 8 Trends in International Mathematics and Science Study (TIMSS); 2) responses of grade 8 learners in ten South African high schools in disadvantaged areas to multiple-choice items focusing on whole and rational number from a baseline test.

We used Yang and Lin's (2015) five components of number sense as a framework to analyse learners' performance. Overall, the analysis indicates weaknesses across all five components of number sense. For example, 1) learners had difficulty in recognising number size with 76% of the learners unable to identify the largest fraction from a list of common fractions with the same numerator, but different denominators; and 2) 86% of the learners lacked sufficient understanding of place value and operations to arrange the digits 1; 2; 3 and 4 to create two two-digit numbers with the smallest product. The analysis of learner performance also suggests lack of fluency and versatility in basic calculations. We argue that learners' difficulties working with the properties of and operations on number are likely to hinder their access to high school mathematics and thus require careful attention in programmes supporting early high school learners.

References

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