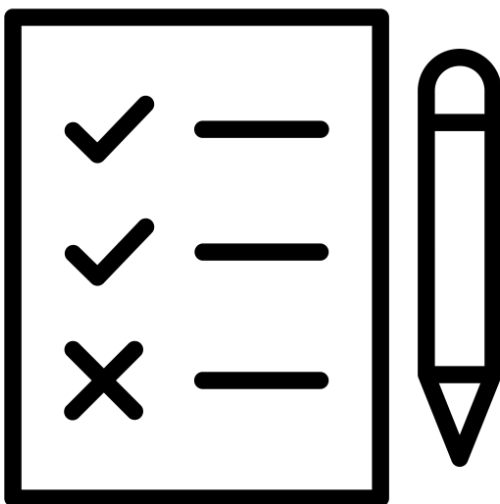


Teacher knowledge and teacher age: What are the levels of in-service teacher knowledge?

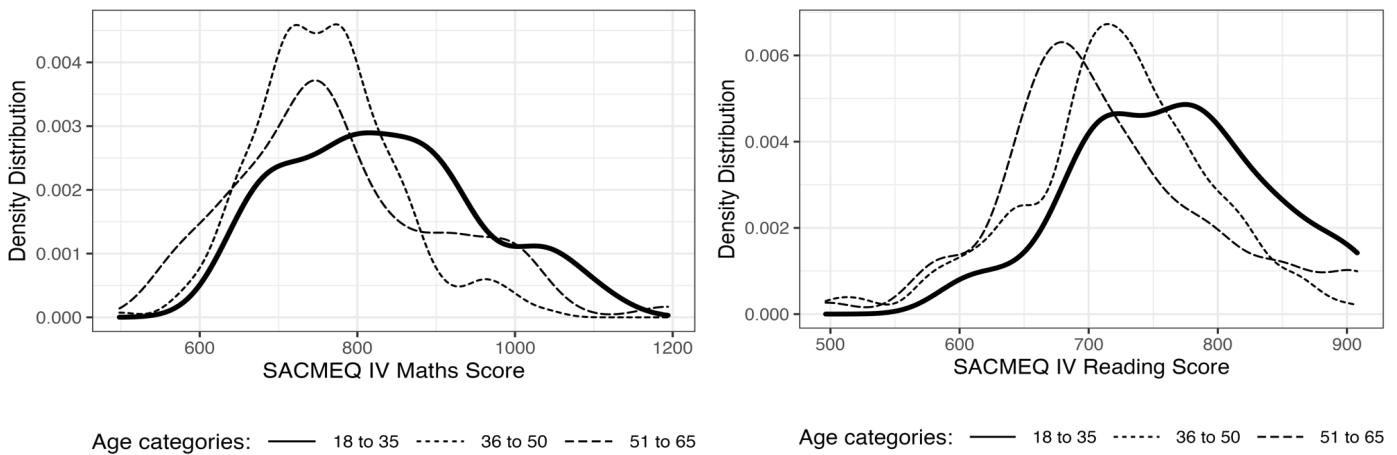
Nic Spaul & Peter Courtney (10 Nov 2022)



Do younger teachers have higher levels of content knowledge than older teachers?

There is only one dataset that can be used to assess the levels of content knowledge of younger teachers compared to older teachers in South Africa, and that is the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ)¹. This is the only dataset that tests a nationally representative sample of Grade 6 teachers on reading and mathematics and has been conducted in 2007 and 2013. Previous analysis on the 2007 data showed that younger teachers have significantly higher levels of content knowledge than older teachers, particularly in mathematics², and that the average Grade 6 mathematics teacher could not score 60% correct on Grade 6 or 7 level items³. In this note we repeat the age analysis but for the more recent 2013 data from 298 primary schools. The figure below reports the distributions of mathematics (left) and reading (right) content knowledge of teachers by age group. The population of teachers is split into three categories by age (18-35yrs, 36-50yrs, 51-65yrs). The youngest teachers (shown by the solid bold line) score significantly higher in maths than older teachers (shown by dotted lines).

Figure 1: Content knowledge levels of South African Grade 6 mathematics teachers (left panel) and Grade 6 reading teachers (right panel) by age category (SACMEQ, 2013)

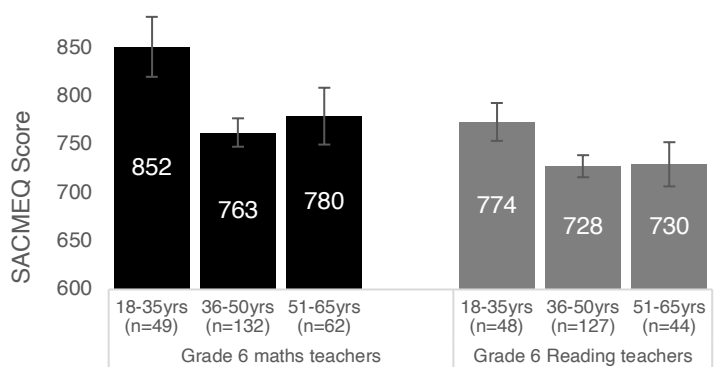


Source: Own calculations using SACMEQ IV data

Differences between younger and older teachers in mathematics are larger than provincial differences between WC and EC.

To provide a sense of the size of the difference between younger and older teachers in mathematics (70-90 points), it is helpful to compare provinces. The SACMEQ IV South Africa report⁴ shows that the average mathematics teacher’s score in the Western Cape was 843 points, and in the Eastern Cape was 781 points (i.e. 62 points). Therefore the gap between younger and older teachers is larger than the average gap between teachers in the Western Cape and the Eastern Cape.

Figure 2: Average teacher content knowledge score for Grade 6 mathematics and reading teachers

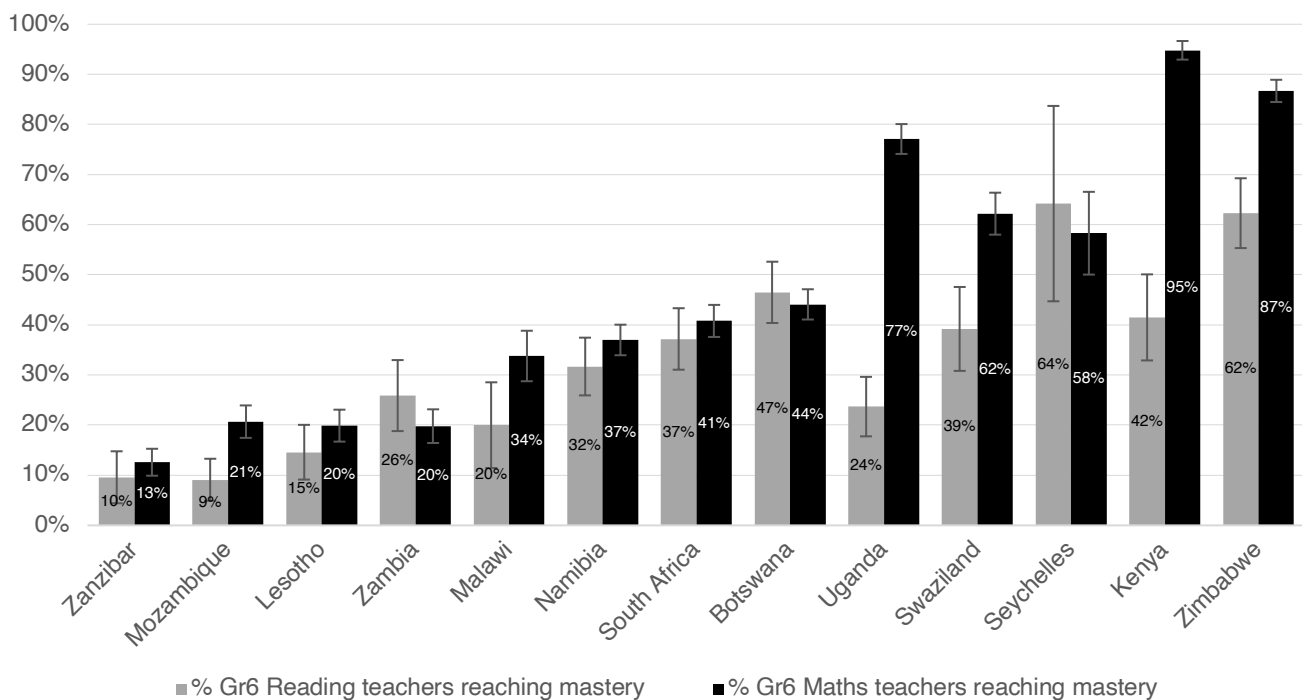


Source: Own calculations using SACMEQ IV unweighted data (90% confidence interval shown)

Younger teachers replacing older teachers could lead to improvements in learning outcomes. Although there are many dimensions to effective teaching that include training, materials, accountability and support, at a base level a teacher cannot teach that which they do not know. It is clear that older teachers that were educated and trained under apartheid have lower levels of content knowledge than their younger colleagues who were trained at universities post-apartheid. This trend is especially evident in mathematics. While this is for no fault of their own, there is some South African research evidence showing that learners learn more when their teachers have higher levels of content knowledge⁵, suggesting that the retirement of older teachers may lead to improvements in learning outcomes in the coming years, other things being equal.

South African teachers have lower levels of content knowledge than those in Zimbabwe or Kenya. The SACMEQ IV (2013) teacher tests in reading and mathematics were the same for all SACMEQ countries allowing comparisons across the nationally representative samples. Figure 3 below reports the percentages of teachers reaching 'mastery' on the SACMEQ teacher tests, as reported in the SACMEQ IV International Report. This shows that in South Africa, only 37% of Grade 6 reading teachers and 41% of Grade 6 maths teachers reached mastery in the subjects. The levels of mathematics mastery among teachers in South Africa (37%) is considerably lower than in Kenya (95%), Zimbabwe (87%), or Uganda (77%).

Figure 3: Percentages of Grade 6 reading and mathematics teachers reaching SACMEQ levels of mastery by country



Source: Awich, M. (2021). SACMEQ IV International Report. Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ), p.62.

Even within existing constraints, current teachers could improve learning outcomes more than at present. Existing research in South Africa shows that Grade 6 learners achieve lower reading and mathematics outcomes for a given level of teacher content knowledge than most other African countries, especially at lower levels of content knowledge⁶ suggesting that there may be other challenges, such as low levels of accountability.

Endnotes

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- [1] SACMEQ IV international report available: http://www.sacmeq.org/sites/default/files/sacmeq/reports/sacmeq-iv/international-reports/sacmeq_iv_international_report.pdf
- [2] Armstrong, P., 2007. Teacher characteristics and student performance: An analysis using hierarchical linear modelling. *South African Journal of Childhood Education*. Vol 5, 2.
- [3] Venkat, H. and Spaul, N. 2015. What do we know about primary teachers' mathematical content knowledge in South Africa? An analysis of SACMEQ 2007. *International Journal of Educational Development*. Vol. 41 Mar. p.121-130.
- [4] Awich, M. 2021. The SACMEQ IV project in international: A study of the conditions of schooling and the quality of education. Gaborone SACMEQ. p.27.
- [5] Armstrong, P. 2015. *Teachers in the South African education system: An economic perspective*. PhD: <https://resep.sun.ac.za/wp-content/uploads/2017/10/Paula-Armstrong-Thesis.pdf>. p.102.
- [6] DBE., 2013. Report on Progress in the Schooling Sector against Key Indicators. Available: <https://www.education.gov.za/Portals/0/Documents/Reports/Report%20on%20Progress%20in%20the%20Schooling%20Sector%20Against%20Key%20Indicators%202013.pdf?ver=2015-02-01-131925-513> p.31