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Department of Basic Education and HSRC release TIMSS 2019 Grade 5 Study

Pretoria, Tuesday 8 December 2020 – South Africa participated in TIMSS 2015 and 2019, at the Grade 5 level, in order to monitor educational progress in the primary education system. The Mathematics achievement in TIMSS 2015 and 2019 remains the same. "This is different to the TIMSS results at the secondary level, where an improvement in mathematics achievement was observed, suggesting the need for greater attention from the state and other stakeholders to the primary education sector to improve the acquisition of knowledge and achievements " says Dr Vijay Reddy, Principal Investigator of TIMSS 2019 and Distinguished Research Specialist at the Human Sciences Research Council.

The Human Sciences Research Council released the results of the South African participation in the Trends in International Mathematics and Science Study 2019, in the highlights report TIMSS 2019: Highlights of South African Grade 5 Results in Mathematics and Science authored by Vijay Reddy, Lolita Winnaar, Andrea Juan, Fabian Arends, Jaqueline Harvey, Sylvia Hannan, Catherine Namome and Ncamisile Zulu. TIMSS is a project of the International Association for the Evaluation of Educational Achievement (IEA) headquartered in Amsterdam. The IEA, with the TIMSS International Study Centre, which is based at Boston College, released the international results of the study on the 8th December 2020.

TIMSS was conducted for the first time at the Grade 5 level in South Africa in 2015, and then as part of the TIMSS 2019 cycle. This study is an opportunity for South Africa to, firstly, estimate its achievement in relation to other countries and, secondly, to establish a trend in mathematics performance.

A total of 64 countries and entities took part in the TIMSS 2019 Grade 4/5 study. The top five ranked countries were from East Asia – Singapore, Hong Kong SAR, Republic of Korea, Chinese Taipei and Japan. The five lowest performing countries were Morocco, Kuwait, South Africa, Pakistan and the Philippines.

The TIMSS 2019 mathematics and science achievement scores are 374 and the 324 TIMSS points respectively. In terms of ability levels, 37% of learners demonstrated that they acquired basic mathematical knowledge, and 28% demonstrated that they acquired basic science knowledge. Reddy elaborates on the implications of the mathematics non-improvement between the TIMSS 2015 and 2019 cycles. "The Medium Term Strategic Framework's (2019–2024) Grade 5 TIMSS mathematics score target of 426 in 2023 does not look attainable".

South African achievement continues to be unequal and socially graded. Achievement gaps continue to be linked to socio-economic backgrounds, spatial location, attending fee paying or no-fee schools, and the province of residence.

The three provinces top performing provinces for mathematics and science achievements are Western Cape, Gauteng and Free State. The achievement gap between the highest and lowest performing province is 110 points for mathematics, and a wider 141 points in science.

Learners attending fee-paying schools achieve much high scores than learners in no-fee schools. The achievement gap between learners attending fee-paying and no-fee schools is 109 points for mathematics and 150 points for science. There is a continuity of home disadvantage to schools, and the disadvantage affects science learning more than it does mathematics.

There is a gender difference, at the grade 5 level, in mathematics and science achievement, with girls achieving significantly higher scores than boys. Schools (and policy) must pay additional attention to the learning patterns of boys and the support that must be provided to them.

Science achievement is lower than mathematics achievement, and there is higher variation in science ability levels. Numeracy learning starts from Grade 1, while the Natural Science and Technology learning is introduced in Grade 4. The lower science scores is more apparent in the more disadvantaged schools and provinces, and suggests that additional challenges (e.g. language of instruction, resources for teaching science, educator knowledge and familiarity with the type of TIMSS assessments) may have an impact on the teaching and learning of science. National and provincial education authorities must support the science subjects in the same way that they have done for mathematics.

Learners performed better in items that required them to select a response (multiple choice question) than in items where they had to write a response (constructed response). Learners were unable to write descriptions or explanations. Learners must be given writing exercises in class. The national reading strategy must be expanded to become a reading and writing strategy.

In addition to collecting achievement data, TIMSS also collected data about the home, school and classroom conditions and environments in order to understand the context in which learners live and learn. The grade 5 study collected data from parents and this provides a unique window to view the home educational activities. We will focus on findings related to home activities.

Learners start from unequal home conditions. The different socio-economic conditions lead to different early educational environments for young children. The extant literature points to the importance of early numeracy and literacy development, and later educational achievement. Just over a quarter of South African parents, as compared to 42% internationally, reported that they often engaged with their children on literacy and numeracy tasks like reading books, singing counting songs or playing with counting blocks. In households where parents may be unable to participate in educational play with their children, an alternative could be the state providing high quality stimulating educational programmes through public radio and television.

Good quality preschool settings offer another important contextual boost for learners. Pre-school attendance in South Africa is almost universal, with almost nine out of every ten learners having some form of schooling prior to Grade 1. Both in South Africa and internationally, the more preschool education received by learners, the higher their average mathematics score. We also found that three-quarters of learners attended Grade R classes in the same primary school that they are now in for Grade 5.

A quarter of learners are rated as numerically ready, and half as literacy ready, when they enter school. This means that there is a school readiness gradient amongst learners when they enter foundation phase classes. Schools and educators must take this into consideration in planning the additional support for learners who may otherwise be left behind.

Notes to the Editor

The TIMSS Grade 5 Highlights of Results Report is on the TIMSS-SA website (www.timss-sa.org.za).

About the Human Sciences Research Council (HSRC)

The HSRC was established in 1968 as South Africa's statutory research agency and has grown to become the largest dedicated research institute in the social sciences and humanities on the African continent, doing cutting-edge public research in areas that are crucial to development.

Our mandate is to inform the effective formulation and monitoring of government policy; to evaluate policy implementation; to stimulate public debate through the effective dissemination of research-based data and fact-based research results; to foster research collaboration; and to help build research capacity and infrastructure for the human sciences.

The Council conducts large-scale, policy-relevant, social-scientific research for public sector users, non-governmental organizations and international development agencies. Research activities and structures are closely aligned with South Africa's national development priorities.

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