Review

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– Finding leverage points to improve outcomes

HSRC
Human Sciences Research Council

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Cover caption: *Micah Davidson from Westville Primary School, a public school in Mitchells Plain in the Western Cape. The HSRC Review would like to thank Cheryl Baker, the school principal, as well as the grade 5B class and their teacher, Zani Magopeni, for giving their permission to be photographed for this edition.*

In May, Basic Education Minister Angie Motshekga announced an overall 2018/19 budget allocation for the Department of Basic Education of just under R23 billion, somewhat lower than the previous financial year.

This is while spending on tertiary education received a significant boost, mainly to fund fee-free university education for poor and working class students.

"How does the state intervene to boost early childhood education?"

In the ensuing debates, opposition parties, education experts and the media once again raised concerns around resource constraints in public schools and the poor literacy and numeracy skills of primary school learners, arguing that basic education should also be prioritised.

Released last December, the 2016 Progress in International Reading Literacy Study report showed that more than three quarters of South Africa's grade 4 learners who participated in an international study, could not read with comprehension. In the meantime, another child drowned in a pit latrine, a reflection of the struggles of poorly resourced schools.

When faced with highly emotive arguments, as well as demands for other social services such as health and social development, it is crucial that government bases its policy and budget decisions on evidence-based research and analyses. Therefore, a few days after the budget announcement, the HSRC was invited to share its analyses of education spending and outcomes, as well as several other related factors to Parliament's Standing Committee on Public Accounts (Scopa).

In her presentation, the HSRC's Dr Vijay Reddy said that the analyses by her team of researchers showed improvements in education, but that the pace is still too slow. We need to look for leverage points in the system where better investment may have most impact.

She said that literature points to investment in early education. Achievement at the age of 5-6 years predicts later educational achievement, as well as labour market and social outcomes.

The question is: How does the state intervene to boost early childhood education, which includes stimulating activities such as playing word games and reading books, typically seen in middle-class households? The HSRC's education experts believe making grade R and RR compulsory will help, especially for children in no-fee schools.

Reddy said there is already a curriculum in place for grade R, but this should be followed by norms like limiting class to no more than 20 children.

The National Development Plan already proposes two years' pre-grade 1 schooling, but currently, grade R is not compulsory and resources and conditions for grade R teachers are not consistent with other teachers in the school system, she said. Reddy believes we should raise the status of the grade R sector and, together with grade RR, it should be made compulsory with the concomitant budgets and accountabilities.

For this edition of the *HSRC Review*, Reddy and her team produced several articles that analyse South Africa's results from the 2015 Trends in International Mathematics and Science Study (TIMSS), one of the most established studies of educational quality worldwide. The TIMSS provides information on learners, their school and home environments, and how these relate to mathematics and science achievement. In the case of South Africa, the findings emphasise the importance of early childhood stimulation and education.

Helping to identify the leverage points that Reddy referred to in her Scopa presentation, the TIMSS articles focus on several factors, including the effect of being taught in a home language, early stimulation at home, school resources, textbook provision, bullying and school climate, as well as school and individual characteristics that contribute to individual learner resilience and confidence in these subjects. In other words, how does it happen that some children perform despite their impoverished environments?

Please see the contact details of the HSRC researchers below each article. We hope that our existing and future collaborations with government, other institutions and the private sector will help to translate these findings into practical policy, community and classroom interventions. - **Antoinette**

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TIMSS Analysis

TIMSS in South Africa:
Making global research locally meaningful

The Trends in International Mathematics and Science Study (TIMSS) assesses the quality of mathematics and science education on an international scale. TIMSS is one of the most established studies of educational quality worldwide, providing information on learners, their schools and home environments; and how these relate to mathematics and science achievement. In South Africa, the HSRC conducts the TIMSS research in collaboration with the Department of Basic Education and the International Association for the Evaluation of Educational Achievement. *Dr Vijay Reddy* explains the importance of TIMSS.

Learner performance in school mathematics and science are proxy indicators of the health of our educational system. We recognise that the poor performance in these areas continues to contribute to unequal access to the labour market and income. Any change in school mathematics and science performance provides a measure of the extent of transformation since the inception of the democratic state. TIMSS, with its rigorous methodology to measure trends over the last 20 years, allows us an opportunity to track educational progress in the country.

South Africa participated in TIMSS at the grade 8 or 9 level in 1995, 1999, 2003, 2011 and 2015 and in the grade 5 mathematics study, for the first time in 2015. The TIMSS grade 8/9 information provides a unique opportunity for South Africa to monitor the achievement trends and hence the health of our education system since 1995. TIMSS at the grade 5 level provides a new indicator of educational achievement at an earlier stage of educational progress. South Africa will participate in TIMSS 2019 at the grade 9 and grade 5 level.

Table 1 summarises the key findings from the different rounds of TIMSS. For each successive round, the HSRC sought to extend the analysis so that it informs the local context and policies.

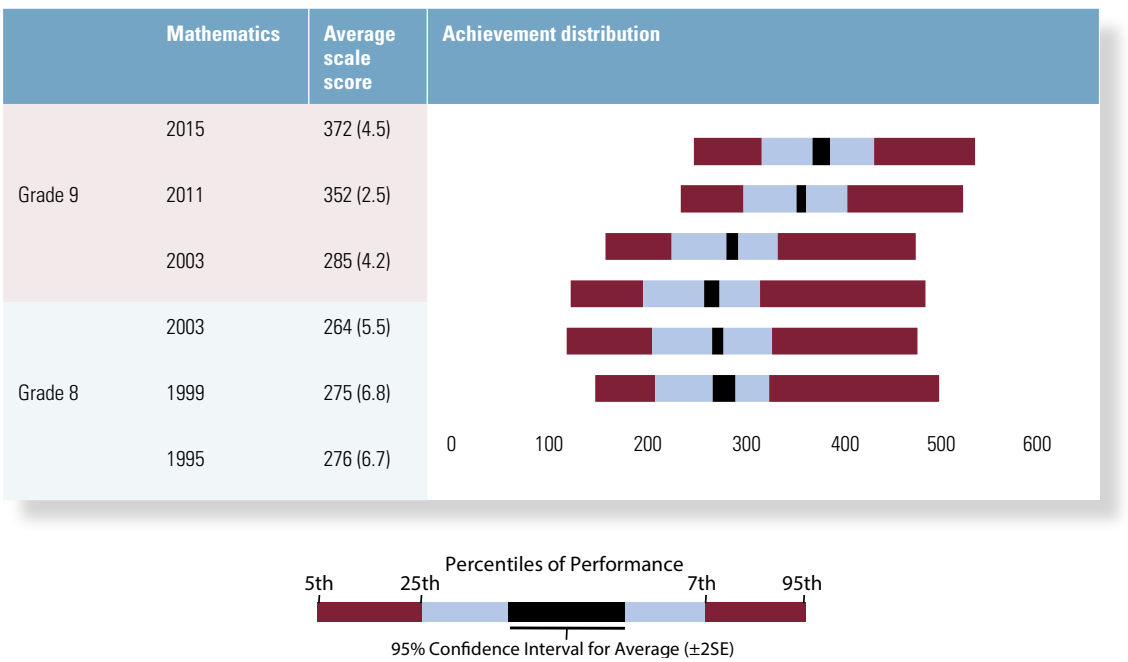
Teacher Zani Magopeni explaining mathematics to the grade 5B class at Westville Primary School in Mitchells Plain in the Western Cape.

Table 1: Summary of South African findings from TIMSS

TIMSS	Summary of South African findings
1999 Grade 8	Low national mathematics and science mean scores Last position on the rank order table
2003 Grade 8 & 9	Low national mathematics and science mean score and last position on the rank order table No change in mean scores from 1995 to 2003 High educational inequalities reflective of the societal inequalities
2011 Grade 9	Low national mathematics and science mean score High, but slightly reduced educational inequalities from 2003 to 2011 Trend analysis from 1995 to 2011 shows an improvement of 67 and 64 TIMSS points for mathematics and science respectively. The role of school context and climate and its effect on achievement is highlighted.
2015 Grade 9 Grade 5	South African achievement improved from 'very low' to 'low', but is still one of the lower-performing countries. Achievement continues to remain highly unequal, but there has been a very slight decline in inequality over time. Both home and school contexts influence educational achievement. The grade 5 study shows the unequal home learning environments and that learners from low-income households start school at a different point than learners from high-income households.

One of the key TIMSS-South Africa findings has been the tracking of mathematics and science achievement in the country since 1995. Figure 1 illustrates this using mathematics performance. The science trend follows a similar pattern.

Figure 1: Trends in mathematics achievement in TIMSS 1995, 1999, 2003, 2011 and 2015



We observe that the average national mathematics score remained the same, statistically, over the 1995, 1999 and 2003 cycles. In contrast, from 2003 to 2015 the average mathematics scores improved by 87 points. This change in the South African mathematics achievement scores means that the education system improved from a 'very low' (1995, 1999, 2003) to a 'low' (2011, 2015) national average.

Although South Africa is still one of the lower performing TIMSS countries, from 2003 to 2015 the country has shown the largest positive improvement of all participating countries in mathematics. We recognise that South Africa started from a very low base and thus had the greater potential to improve.

The highest achievement gains were at the lower end of the distribution. For grade 9 learners, scores at the 5th percentile shifted from 152 in 2003 to 242 in 2015, an improvement of almost one standard deviation. The score improvement for the lowest performing part of the system is a positive sign and is possibly due to the multiple interventions at both the school and home levels for the poorest groups.

The difference in scores between the 5th and 95th percentile measures the inequality in educational performance. From 1995 to 2003, this range was just over 3.5 standard deviations – reflecting the wide disparities in schools and the society leading to the unequal educational outcomes. From 2003 to 2015, the distribution of scores was still wide, but narrowed slightly from 320 points to 287 points. This indicates that educational inequalities are decreasing, albeit slowly.

The outcome from our participation in TIMSS is that a scientifically rigorous trend methodology shows that the educational system is improving. However, the pace of this change is too slow. The low hanging policy amenable interventions identified in the TIMSS analysis, summarised in the following articles, should be explored to facilitate faster improvement of educational achievement.

Author: Dr Vijay Reddy, national research co-ordinator for TIMSS-South Africa

TIMSS
Analysis

A new picture
of early achievement in South Africa

In 2015, against a policy landscape that increasingly places early childhood development at the heart of educational reform and strategies to reduce poverty and inequality, the Trends in International Mathematics and Science Study (TIMSS) was administered for the first time at the grade 5 level. It found that three in five learners do not exhibit the required minimum level of basic mathematical knowledge. *Dr Kathryn Isdale* reports.

Since 1995, South Africa has participated in five TIMSS cycles, charting the slow and steady improvement of grade 8/9 learner performance. But grade 9 is a long way into the educational system and disparities that exist there are often the product of years of compounding inequalities across the system, often beginning before children enter the classroom. Exploring patterns in educational achievement earlier on in the grade system is vital to gaining a better understanding of how and when inequalities manifest and how they might be tackled by policy reform and targeted intervention.

Tameca Lentoor doing mathematics in the grade 5B class at Westville Primary School in Mitchells Plain in the Western Cape.

One of the lowest performers

TIMSS assesses the mathematics achievement of learners in grade 4 or 5 across 49 countries, comparing average scores and proportions of learners at different points in the achievement distribution using established performance benchmarks, the lowest of which is 400 - 475 points. However, with a national average of 376 points, South Africa is one of the lowest-performing countries with 61% of grade 5 learners not exhibiting the minimum competencies in basic mathematical knowledge required of grade 5. Figure 1 compares performance for a selection of participating countries: the five highest-performing countries, five around the TIMSS centre point of 500 points, and the five lowest-performing countries.

In the five highest performing countries – Singapore, Hong Kong SAR, Korea, Chinese Taipei and Japan – almost all learners scored above 400 points, the low benchmark set by TIMSS. All five countries have an average performance in the high benchmark, 550 - 625 points, and in Singapore half of all learners score at the advanced level, that is over 625 points.

The achievement profile of the five lowest-performing countries – Jordan, Saudi Arabia, Morocco, South Africa and Kuwait – shows that 50 - 65% of learners scored below 400 points. While South Africa is one of the lowest-performing countries, it is nevertheless promising to note that 1.3% of learners score in the advanced category. We stand out in this regard as none of the other bottom countries have learners performing at this level.

Provincial achievement

Provinces can be clustered into three broad performance groups:

- Higher (Western Cape and Gauteng)
- Middle (Mpumalanga, Free State, Northern Cape and KwaZulu-Natal)
- Lower (North West, Limpopo and the Eastern Cape)

Figure 2 describes the provincial mathematics achievement and distribution, showing the top-performing provinces of the Western Cape (441 points) and Gauteng (420 points) scoring, on average, above the TIMSS low-level benchmark but well below the centre point of 500 points.

Figure 1: TIMSS 2015 average scale score in mathematics, by TIMSS benchmarks in a selection of countries.

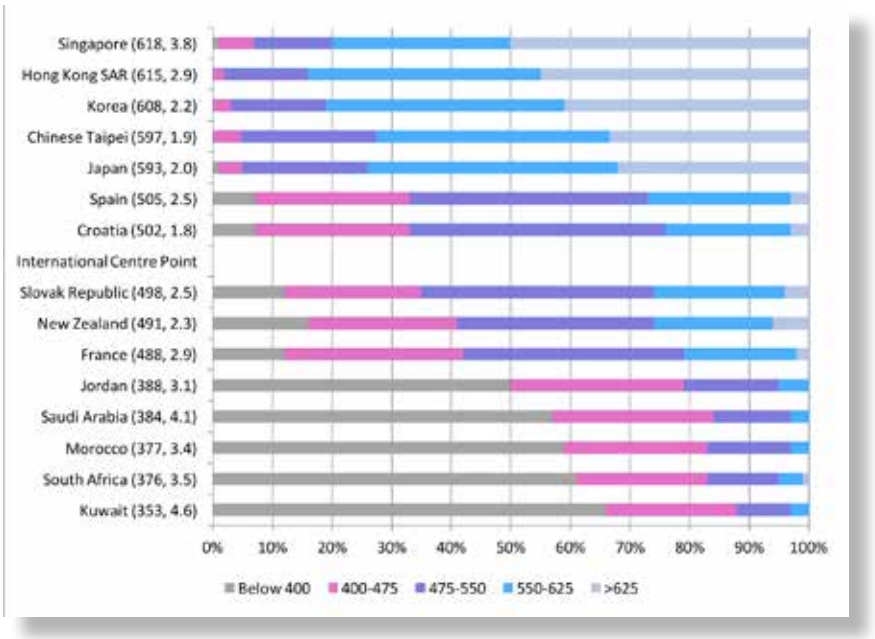
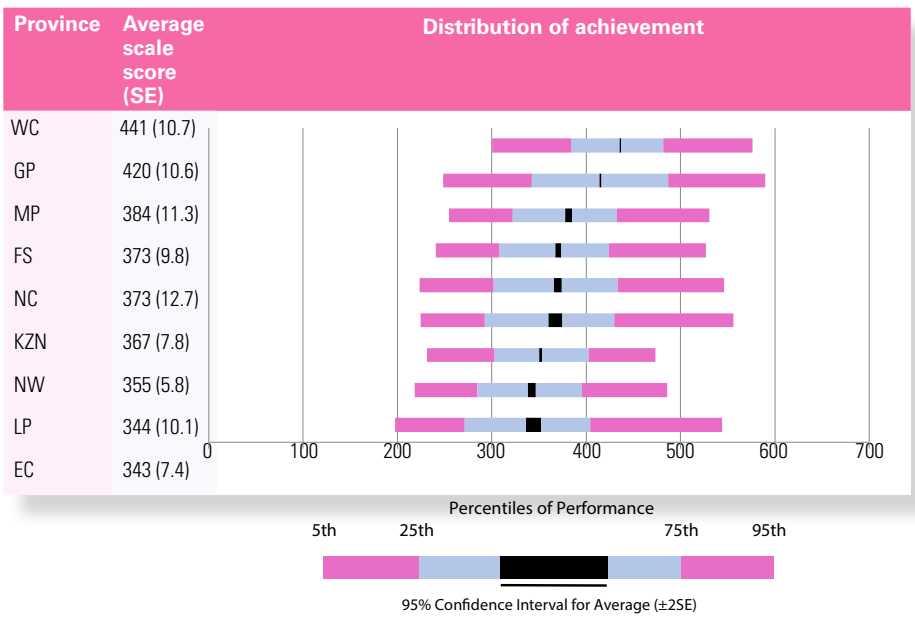


Figure 2: Provincial mathematical achievement and distribution



Differences in average achievement by school type

In the grade 5 TIMSS sample, 69.7% of learners attended public no-fee schools, with 26.7% in public fee-paying schools, and 3.6% in the independent sector, but when achievement is broken down by school type, the patterns further reveal the depth of inequalities in the system.

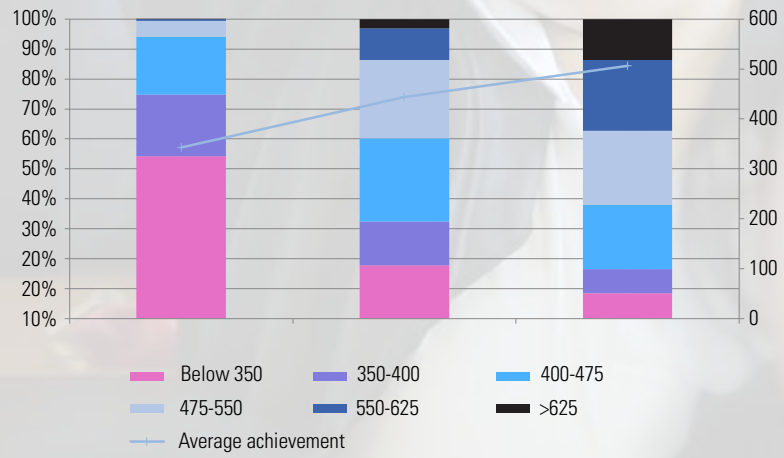
Figure 3 shows that learners in more affluent, better resourced schools score, on average, higher than those in no-fee schools with limited access to resources for teaching and learning. In public no-fee schools, the average score is 343 points, jumping over 100 points – a full standard deviation – to the average in fee-paying schools of 444 points. There is a further jump of 62 points to the small proportion of learners in independent schools who score, on average, 506 points, just above the TIMSS centre point.

In terms of performance benchmarks, approximately 84% of learners in independent schools, 67% of those attending public fee-paying schools and just 25% at public no-fee schools achieved the minimum level of competency.

Jordan Driver is ready with an answer in the grade 5B class at Westville Primary School in Mitchells Plain in the Western Cape.

> "SIX OUT OF TEN GRADE 5 LEARNERS DO NOT EXHIBIT THE REQUIRED MINIMUM COMPETENCIES IN BASIC MATHEMATICAL KNOWLEDGE."

Figure 3: Average mathematics achievement and proficiency benchmarks, by school type



Conclusion:

The results of our study retell the predictable story seen before in South Africa of advantage begetting advantage at one end of the distribution, and compounding disadvantage at the other. Provincially, there are large discrepancies in average levels of attainment and when broken down by school type, the depth of the problem is only amplified.

It is encouraging that nationally, just over 1% of learners achieved the TIMSS advanced level of more than 625 points, including a handful of those in no-fee schools. However, given the advantages afforded to most of these top performers, this proportion should be higher. Improving the academic performance and educational outcomes of South African learners requires a whole distribution shift, not just a pulling up at the very bottom.

The diversity in educational achievements throughout the system suggests differentiated strategies for those at different points on the achievement scale. For those at the lower end of the achievement spectrum, mostly no-fee schools, improved home resources and experiences alongside greater school resources can contribute to better achievement. For those performing at the higher end of the achievement distribution, mostly fee-paying and independent schools, the focus should be on improving in-school and in-class experiences, as well as challenging learners for excellence in performance.

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Dineo Luescher from the German International School in Cape Town

HIGH-PERFORMING LEARNERS also need support

South Africa's participation in the Trends in International Mathematics and Science Study (TIMSS) has enriched our understanding of the South African education landscape. An analysis of our grade 9 results shows improvement, an indication that targeted interventions focusing on poorly performing schools and learners are having a noticeable effect. However, our high-performers might need more support, writes *Dr Mariëtte Visser*.

South Africa is still among the lowest-performing countries that participate in the Trends in International Mathematics and Science Study (TIMSS), however, it is encouraging to note that from 2003 to 2015, the country has shown the biggest positive improvement of all participating countries in both mathematics and science. Over this period, our average mathematics and science achievement scores increased by 87 and 90 points respectively, the equivalent of two grade levels. This indicates that our competency levels in mathematics and science have improved steadily over time.

Since 1994, the Department of Education and subsequently the Department of Basic Education (DBE) have implemented a number of policies, including pro-poor initiatives to promote equity and improve the quality of education in previously disadvantaged schools. This includes the introduction of the

National Curriculum and Assessment Policy Statement (CAPS) in 2012 and the implementation of the policy on learning and teaching support material (LTSM) that supports the provision of core LTSM to schools. These materials comprise textbooks or learner books, workbooks and teacher guides – all considered important for the implementation of the curriculum.

Addressing policy

In South Africa, where the majority of children live in poverty, lack of money can be a barrier to schooling. In 2007, the government introduced no-fee schools to make it easier for low-income households to send their children to school, which resulted in improved school enrolment. Almost all the learners from low-income households are receiving a government-funded school lunch under the national school nutrition programme. Other interventions such as the alcohol and drug prevention and management programme, the care and support for teaching and learning programme, and the integrated school health programme have also been implemented. In addition, through the accelerated schools infrastructure delivery initiative, schools that had been constructed from inappropriate materials are being replaced to provide an optimum environment for learning and teaching. This initiative also aims to address the basic safety norms backlog in schools without water, sanitation and electricity. Further support provided by government to the indigent include the social grant programme, the low-income housing subsidy; municipal rates rebates and free basic water and electricity.

Competency levels

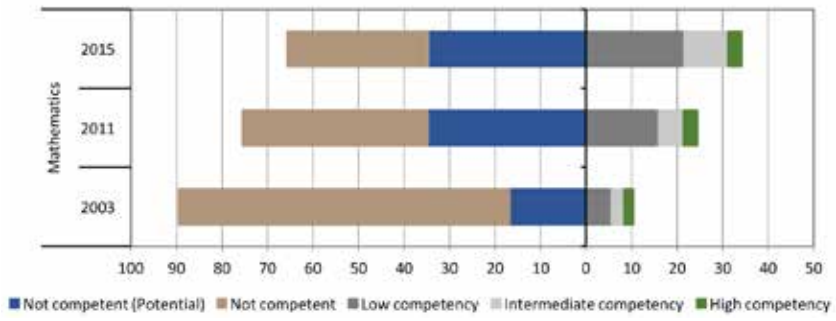
The TIMSS reports achievement at four points along a scale as international benchmarks. These cut-off points are: *advanced* (≥ 625 score points), *high* (≥ 550 and < 625 score points), *intermediate* (≥ 475 and < 550 score points), and *low* (≥ 400 and < 475 score points). The benchmarks are associated with identified capabilities of knowing and applying of content knowledge as well as reasoning abilities. Learners, who have not reached the *low* international benchmark, are seen as not yet competent in the subject at a particular grade level. For South Africa, another benchmark group was added for scores ranging from 325 to 399, and is referred to as the *potential* group. We believe that, although learners who fall in this group are not competent yet, with focused and structured classroom intervention, they can become competent and perform above the minimum competency level.

The TIMSS findings

Figure 1 presents the percentage distribution of South African grade 9 learners by competency level in mathematics. The patterns for mathematics and science are similar. The figure illustrates how competency levels have improved from 2003 to 2015. The percentages of learners performing at the *high* and *advanced* international benchmarks have been combined in Figure 1 in the category of *high competence*.

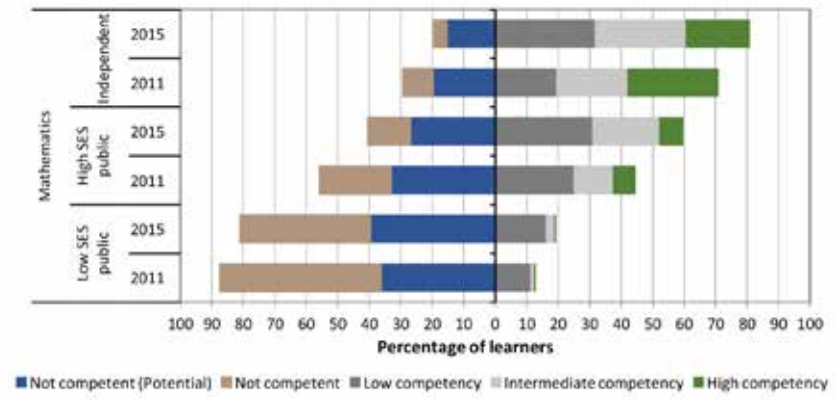
There were significant shifts in competency level between 2003 and 2015. In Figure 1, these are indicated by the shift of the bars to the right, over time. For instance, in 2003, only 10% of learners were competent in mathematics, and the percentage increased to 34% in 2015.

Figure 1: Percentage of learners by competency level in mathematics from 2003 to 2015



Source: Author's own calculations based on the TIMSS data

Figure 2: Percentage of learners by competency level in mathematics and school type, 2011 to 2015



Source: Author's own calculations based on the TIMSS data

Additionally, in 2003, 13% of learners were competent in science, and this increased to 32% in 2015.

When looking at the lower end of performance, one notices an increase in the group of *potential* learners. The percentage of learners in the potential group doubled from 2003 to 2015. Increases of 17 percentage points and 13 percentage points were observed for mathematics and science, respectively. Another significant result is the dramatic decrease in the percentage of learners performing below 325 average score points. For mathematics, this percentage decreased from 73% to 31%, and for science it decreased from 72% to 40%.

Vast inequality

When the achievement scores are broken down by the socio-economic status (SES) of the school, the patterns reveal vast inequalities. In Figure 2, the distribution of learners by competency levels in mathematics and by school SES is compared for 2011 and 2015. The graph shows that within our public school sector we clearly see the inequality divide between low and high SES schools.

The analysis shows that, in 2015, approximately 80% of learners attending independent schools; 60% of learners at high SES public; and 20% of learners at low SES public schools achieved mathematics and science scores above the minimum level of competency. The percentage points increase (from 2011 to 2015) in the percentage of learners who achieved above 400 score points in mathematics were 6 for low SES, 15 for high SES and 10 percentage points for independent schools. Thus, high SES public schools had the largest improvement in learners who achieved at or above 400 score points. On the other hand, low SES schools had the largest improvement at the lower achievement levels with a reduction of 10 percentage points of learners who achieved below 325 score points.

Within this unequal performance, it is also worth noting that in 2015, 3.2% of South African mathematics learners and 4.9% of science learners achieved mathematics and science scores at the *high* level of achievement, which is a score of at or above 550 points. This is higher than other lower-performing countries.

Conclusion

Substantial improvements in the *potential* group, but slight improvements in the high-performers were noted. Achievement gains among lower performing learners show that targeted interventions focusing on poorly performing schools are having a noticeable effect. However, performance at the higher end is a concern. The groups of learners with *high* competence in mathematics and science do not seem to increase sufficiently to sustain and improve excellence in the education system. From 2003 to 2015, there were increases of only one to two percentage points. Experts believe that a country's academic performance in subjects related to science, technology, engineering and mathematics indicates the future economic strength of that country. It is therefore important that the DBE also invest in interventions aimed at supporting high-performing learners towards advanced levels of excellence.

> "THE GROUPS WITH HIGH COMPETENCE IN MATHEMATICS AND SCIENCE DO NOT SEEM TO INCREASE SUFFICIENTLY TO SUSTAIN AND IMPROVE EXCELLENCE IN THE EDUCATION SYSTEM."

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Rising above:
What makes a learner resilient?

Sometimes, a child from a poor background does well in mathematics despite their relatively adverse educational environment. They are known as resilient learners, young people who attend low socio-economic status public schools, fall within the three lowest quintiles of home socio-economic status, but nevertheless achieve above average scores for mathematics. In 2015, these learners comprised 12.5% of the South African grade 9 school population. *Ncamisile Zulu* and *Dr Mariëtte Visser* investigated the characteristics of resilient learners by using the TIMSS 2015 data. The results show that resilient learners are age-appropriate for their grade (i.e. have not repeated grades) and positive about their school, teachers and about learning mathematics.

Mathematics is relevant in people's daily lives and often a requirement for skilled jobs that grow the economy. The subject offers various benefits to learners, such as improving their problem solving ability, logical reasoning, critical thinking, concentration and self-esteem. It also heightens stronger mental visualisation skills and increases memory power while sharpening learners' overall mental formation. Having the right attitude and behaviour towards mathematics plays a key role in a learner's performance. Attitudes are based on the values, beliefs and knowledge that the learners have about mathematics. Positive attitudes towards mathematics are more likely to yield positive behaviour towards the subject.

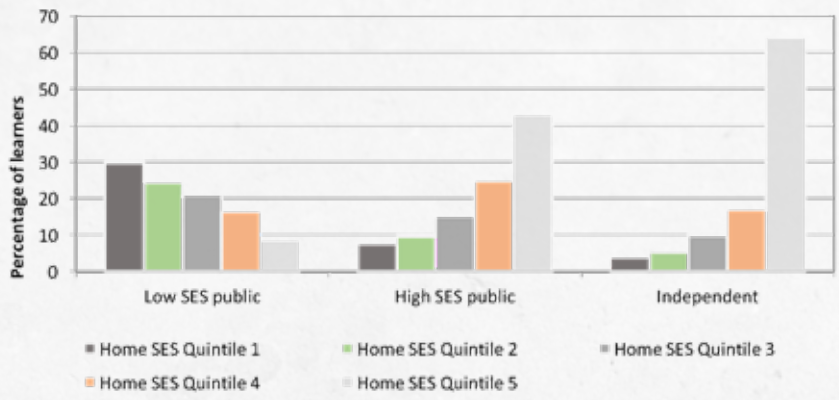
Resilience in learners

Despite extensive literature that associates children who come from low home socio-economic status (SES) with poor mathematics performance, some poor but resilient learners triumph above their circumstances and perform well in mathematics. Resilient individuals primarily focus on how they can attain positive outcomes regardless of challenging and threatening circumstances. In the midst of challenges, resilient young people are able to use their problem-solving expertise and maintain their internal locus of control and value-driven behaviour. Research shows that characteristics of resilient students include active participation in educational activities, mathematics self-efficacy (belief in one's ability to perform a specific task), self-confidence (belief in one's personal worth and likelihood of succeeding) and a positive attitude towards school. Additional skills include good stress management, goal setting, understanding motivation, and making strong connections with adults and peers.

What did we learn about resilient students from TIMSS?

Figure 1 provides a helicopter view of the distribution of the grade 9 learners, who participated in the TIMSS 2015 study, across school type (low SES public, high SES public and independent schools) and home asset-based socio-economic status (home SES). A learner was categorised as resilient if the learner attended a low SES public school, fell within the lowest three home SES quintiles and performed above the average mathematics score of 372 points. Of the total population of grade 9 learners, 48% attended low SES public schools and fell within the lowest three home poverty quintiles. Only 12.5% of the total population of grade 9 learners could be classified as resilient learners.

Figure 1: Percentage of learners by school type and home socio-economic status quintile



Source: Authors' own calculations based on the TIMSS 2015 data

For the purpose of comparison, grade 9 learners who attended low SES public schools and who fell within the lowest three home SES quintiles were divided into two groups: resilient learners (learners who achieved scores at or above the mathematics average: ≥ 372 score points) and their peers (learners who performed below the mathematics average: < 372 score points).

The group of resilient learners included slightly more girls (52%) than boys (48%). The difference in mathematics performance between resilient boys and girls was not statistically significant. Eighty-seven percent of the group of resilient learners were 16 years of age or younger, compared to 59% of their peers. Researchers found that, in general, learners who often spoke the language of learning and teaching at home, usually performed better in school. Only 22% of resilient learners always or almost always spoke the language of the test at home compared to 14% of their peers who were living and learning in the same socio-economic conditions. Another factor that is positively associated with performance, is the education level of either parent. In general, parents with qualifications of matric or higher are able to assist their children with homework and learners

> "RESILIENT INDIVIDUALS PRIMARILY FOCUS ON HOW THEY CAN ATTAIN POSITIVE OUTCOMES REGARDLESS OF CHALLENGING AND THREATENING CIRCUMSTANCES."

in these households usually perform better. There was no difference between the parental education levels of resilient learners and their peers. A third of both groups had a parent with a qualification of higher than matric.

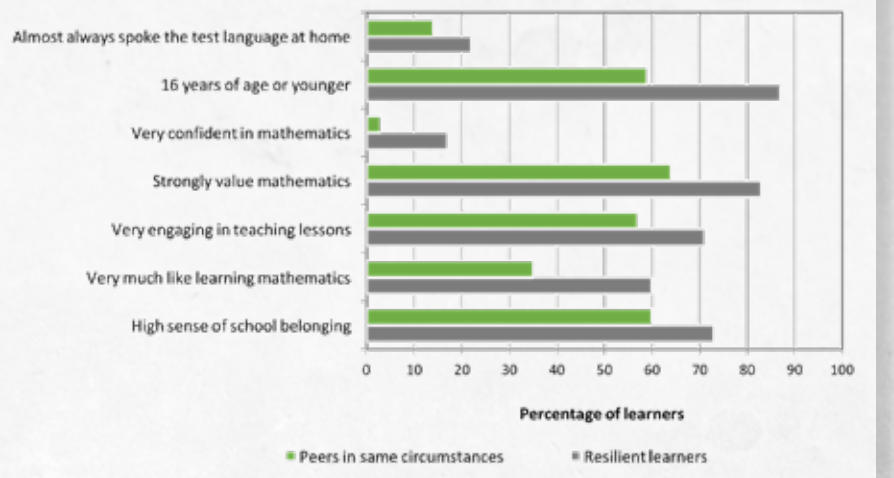
How are they different?

Figure 2 depicts the main differences between resilient learners and their peers.

The analysis showed that resilient learners consistently reported higher levels of positive attitudes and behaviours compared to their peers. The differences between the group of resilient learners and their peers were statistically significant for all characteristics.

attribute that contributed to better performance was engagement in classroom instructions. The study found that 71% of resilient learners, compared to 57% of their peers, positively and highly engaged in the mathematics teaching lessons and had positive attitudes towards their teachers. More attention is also usually given to subjects that are strongly valued. Eighty-three percent of resilient learners compared to 64% of their peers strongly valued mathematics and perceived it as a valuable subject for daily life, university entrance and to get the job they want in future. Although all resilient learners performed at or above the average score of all learners in grade 9 for mathematics, only 17% of them compared to 3%

Figure 2: Percentage of learners in the two groups by selected characteristics



Source: Authors' own calculations based on the TIMSS 2015 data

The data showed that 73% of resilient learners compared to 60% of their peers had a high sense of school belonging. They were proud of their school, liked being at school, felt safe at school, looked forward to seeing their classmates and perceived their teachers as being fair. Sixty percent of resilient learners compared to 35% of their peers liked learning mathematics very much. Another important

of their peers were very confident in mathematics.

Conclusion

Attitudes are shaped by experience or upbringing, and they can have a strong influence on a person's behaviour. The performance of learners in mathematics is associated with their attitudes and behaviour. Factors such as having a high sense of school belonging, enjoyment in learning mathematics, engagement in teaching lessons and valuing mathematics all contribute to higher performance in mathematics, especially for learners who attend low SES public schools. This means that learners from low SES homes can also succeed in mathematics, provided they possess and apply resilient characteristics and skills in their school work. Therefore, we recommend that schools invest in and support interventions to promote learner attributes such as self-efficacy, self-confidence and positive attitudes towards their school, teachers and learning subjects such as mathematics.

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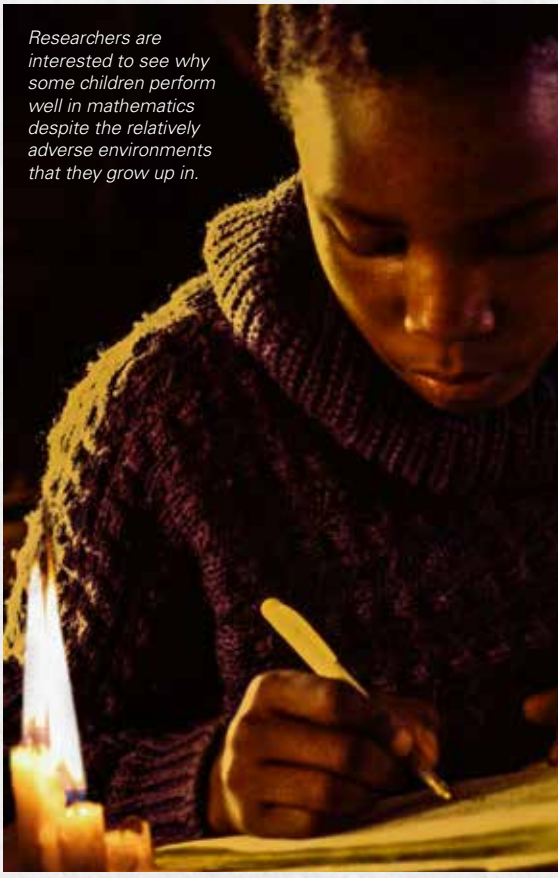


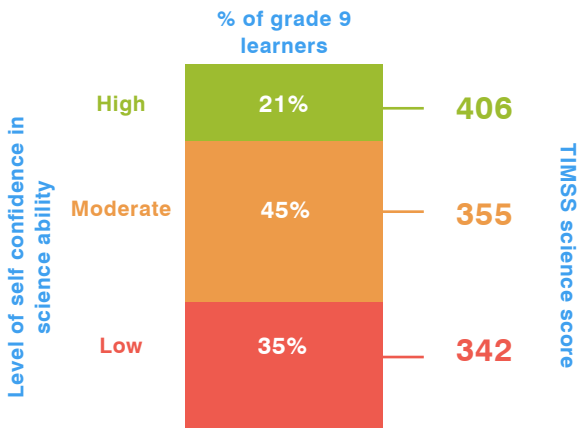
Researchers are interested to see why some children perform well in mathematics despite the relatively adverse environments that they grow up in.

Believing YOU CAN succeed in science

Aaliyah Ismail explains the functions of the human skeleton to her class mates in grade 5B at Westville Primary School in Mitchells Plain in the Western Cape. She already views natural science as one of her favourite subjects that she understands well. According to the TIMSS findings, this confidence in her science ability might support her academic performance as she progresses into high school.

"I think I can! I think I can!" -The well-known story of *The Little Engine That Could* , which overcame a seemingly impossible task, speaks to the role that motivation, confidence and belief play in our lives. This self-confidence in one's ability extends to performing science-related tasks and activities in the classroom. Researchers refer to this as a learner's "science self-efficacy." The strength of this belief has an impact on behaviour. Those who have higher levels are more likely to persevere in an activity until they succeed, no matter what the level of difficulty. Those who have low confidence in their science ability will believe that tasks are more difficult than they are. This belief might lead to stress and anxiety when facing tasks. Studies have shown that low confidence in science ability has a negative effect on academic achievement, and can, over time, create a self-fulfilling prophecy of failure. *Dr Andrea Juan* and *Sylvia Hannan* report.

In the 2015 Trends in International Mathematics and Science Study (TIMSS), only 21% of grade 9 South African learners reported high levels of confidence in their science ability, with 35% reporting low levels of confidence. Learners' confidence in their science ability was positively associated with achievement.



Those learners who had high levels of confidence in their science ability scored 64 TIMSS points higher in the science achievement test than those who reported low levels. While we cannot say whether high confidence in science ability leads to better performance in science or vice versa, we can say that they are positively related. If confidence in science ability matters for learners, then we need to understand how it can be developed.

Dineo Luescher and Daniëla Oosthuizen sharing knowledge about the human body.

Factors shaping learners' confidence

We examined three factors that are related to shaping learners' confidence in their science ability: engaging teachers, parental involvement and gender.

Engaging teachers

We examined teachers' instructional practices to assess classroom interactions between learners and teachers that might influence learners' attitudes and confidence in their science ability. Learners were asked whether they agreed with statements such as:

- *My teacher is good at explaining science.*
- *My teacher does a variety of things to help us learn.*
- *My teacher lets me show what I have learned.*
- *My teacher tells me how to do better when I make a mistake.*

Positive classroom interactions were significantly associated with increases in learners' confidence in their science ability, implying that we need to invest in approaches that inculcate positive attitudes and learning behaviours at school. As learners progress through school, teachers should enhance their confidence in their science ability from early on so that it is developed as a habit. Confidence in science ability and achievement may be enhanced through teaching practices that provide feedback to learners, promote self-evaluation, and goal setting. Strategies to improve confidence in science ability may be as simple as asking learners to solve problems out loud. This slows down the process of critical thinking and analysis, encouraging deliberate thinking and reasoning. Teachers can also pose open-ended, dialogic (in the form of a conversation) questions to learners rather than providing them with answers. Prompts that teachers might use are: "Tell me what you know about X" or "How might you break this problem up into smaller steps?" During this process teachers must also reinforce positive behaviour.

Parental involvement

Parental involvement in checking science homework was positively related to learners' confidence in their science ability and school practices should focus on encouraging parents' active involvement in the educational process. Our study also found that higher levels of home socio-economic status were related to more positive attitudes about science. Encouraging parental involvement, particularly for learners from households of a lower socio-economic status, is therefore critical for increasing learners' confidence in their science ability. We therefore need to promote strategies which encourage parental involvement, such as requiring that parents sign their children's homework books.

Girls require a boost

On average, grade 9 girls reported lower levels of confidence in their science ability than boys. This was the case even when girls and boys scored the same on the TIMSS science assessment. Increasing girls' confidence in their science ability may lead to higher achievement scores. If we are to close the observed "gender self-efficacy gap," we need to understand how the experiences of girls and boys differ in the classroom, and also how science is perceived by the public in general. Traditional gender roles, which are ingrained in society, are that science has been seen as a career for males rather than females. This low level of confidence in science ability may have future implications for subject choice and the representation of women in science, technology, engineering and mathematics careers. We should pay particular attention to gender inequalities in relation to the effectiveness with which schools, and societies as a whole, promote motivation and interest in science.

The need for holistic development

The South African National Curriculum Statement Grades R-12 aims to equip learners with the knowledge, skills and values needed for self-fulfilment, and their meaningful participation in society. This points to the need to focus on the holistic development of learners, rather than only on their academic abilities. The findings of our study highlight the need for policy makers, researchers, parents and teachers to acknowledge the role of attitudes in science achievement. They point to the importance of socialising children early on about the benefits of science, and of promoting interest and confidence in their science ability.

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Building solid LANGUAGE FOUNDATIONS for achievement

Research has consistently shown that language is an important factor in how learners perform academically. As a multilingual country, South African research provides unique insight into the effect of language on learner achievement. The Trends in International Mathematics and Science Study (TIMSS) 2015 included a number of items related to language the help us understand its influence on achievement. *Jaqueline Harvey* discusses the findings for grade 5 and grade 9 learners.

Children encounter the worlds of mathematics and science through language. In the classroom setting, it is through the language of instruction that teachers help learners make connections between abstract symbols and their meaning. In South Africa, there is a mismatch between home language and instructional language for the majority of learners. Despite clear policy aims to remedy the undervaluing of African languages, the common practice is to switch from home language instruction to English, or to a lesser extent Afrikaans, from grade 4 onwards. This privileges learners who are English or Afrikaans home language speakers. Learners who speak other languages at home must learn their new instructional language (attain literacy) at the same time that they are trying to learn the curriculum content. This is a huge burden placed on teachers and learners. It is therefore likely that academic achievement would be impacted upon.

Asa Peter learns mathematics through English medium in the grade 5B class at Westville Primary School in Mitchells Plain in the Western Cape. Her teacher uses extra materials, such as this poster showing prime numbers, to support the learning process in class.

What can large scale assessments tell us?

The Progress in International Reading Literacy Study (PIRLS) 2016 showed that literacy rates in general are low. PIRLS 2016 assessed grade 4 learners on their literacy ability with the results placing South African learners last out of all participating countries. When learners were separated according to language, those who spoke and were tested in an African language achieved significantly lower scores than English and Afrikaans speaking learners (Figure 1). A possible reason is that African language speaking learners are more likely to come from low socio-economic backgrounds and attend poorly resourced schools, limiting their literacy development. Furthermore, there are fewer resources available in African languages than English or Afrikaans.

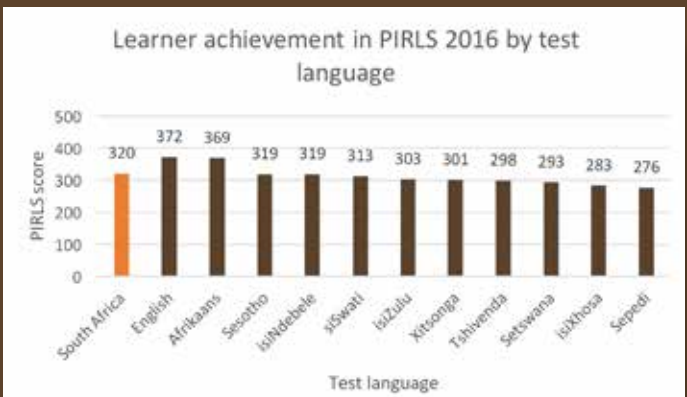

Figure 1: This figure shows the impact of test language on PIRLS 2016 achievement scores (Howie, et al., n.d.).

> "THE RELATIONSHIP BETWEEN THE LANGUAGE OF THE TEST AND ACHIEVEMENT SCORES REMAINS SIGNIFICANT, EVEN WHEN OTHER FACTORS ARE TAKEN INTO ACCOUNT."

In TIMSS 2015, 20% of grade 5 learners spoke the test language at home while in grade 9 it was 30% and a small percentage of learners who never speak the language of the test at home. We found clear advantages for grade 5 and grade 9 learners who reported speaking the test language at home. Grade 5 learners who always or almost always spoke the test language at home scored on average 78 points higher on the numeracy assessment than those who seldom spoke it, the equivalent of nearly two grades. Grade 9 learners who always or almost always spoke the test language at home achieved on average 91 points higher on the mathematics assessment than learners who never spoke the test language at home. Mathematics achievement is the cumulative result of a myriad of factors, of which language is just one. For instance, learners from more advantaged and higher socio-economic status backgrounds and who attend better-resourced schools tend to have higher levels of achievement. Learners from this background are also more likely to have parents who often engage in learning activities with them. Nevertheless, our analysis shows that the relationship between the language of the test and achievement scores remains significant when all these other factors are taken into account.

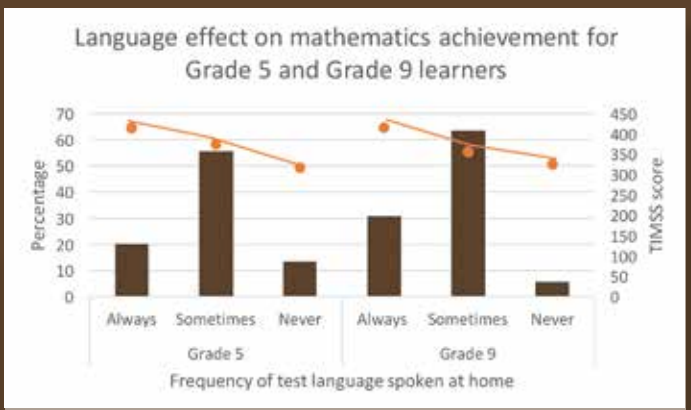

Figure 2: This figure shows the impact of always, sometimes, and never speaking the test language within the home for grade 5 and grade 9 learners. Importantly, note the decrease in achievement scores as the frequency of language use decreases.

Language is only part of the picture, but an important one

While language and literacy development are crucial factors for achievement, they must be considered as only part of the picture. Steps need to be taken to improve resources, education quality, and literacy development. Firstly, early educational contexts and schools need to include adequate stimulation, resources, infrastructure as well as sound bilingual instruction in the foundation years to ensure that all learners are proficient in their home language and in the test language. Already, the Department of Basic Education has introduced the Incremental Introduction of African Languages policy to expand the use of and access to African languages in schools. An additional factor here is parents' literacy in the instructional and test language as this would help them provide homework support to their children. As a second point, teacher training and their practices need to be suitable for diverse contexts. This will assist in ensuring that all learners receive a quality education. These measures will enable all South African learners to effectively use their language resources, ultimately leading to improved achievement.

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South Africa is a very diverse country. Among our school learners, home and school resources are vastly unequal and very low compared to international standards. What parents have is indeed important, but the findings of the 2015 Trends in International Mathematics and Science Study (TIMSS) show what caregivers do during a child's early years is just as important, writes *Dr Kathryn Isdale*.

Daniëla Oosthuizen and Dineo Luescher enjoying a game of chess

THE IMPORTANCE OF THE EARLY LEARNING ENVIRONMENT

Learning starts long before children walk into the classroom on the first day of grade 1. It is a cumulative process that begins with understanding many basic cognitive, linguistic, perceptual and motor processes that provide the building blocks for subsequent skill development.

Socio-economic status indicators, such as parents' level of education and the number of books in the home, are positively related to learner achievement. Those with more often perform better and learners from households with the lowest levels of resources do worse academically. Compounding this disadvantage, the poorer learners are more likely to attend impoverished no-fee schools and less likely to have the language of instruction as their home language.

Early educational activities

As part of the grade 5 TIMSS, parents were asked about the different types of early educational activities that were commonplace in their homes before children started grade 1, including reading books, singing songs, and playing with number toys and word games. Learners whose parents reported frequent engagement across a range of 17 such activities had significantly higher scores in grade 5 mathematics (Table 1).

Table 1: Average achievement of learners by frequency of engaging in early learning activities

	Frequency		
Activity	*Often*	*Sometimes*	*Never*
Read books	401 (5.7)	371 (3.0)	341 (5.5)
Write numbers	386 (3.9)	377 (3.9)	360 (6.5)
Watch educational TV	389 (4.0)	378 (4.1)	350 (6.1)
Sing songs	392(4.7)	370 (3.6)	362 (5.3)
Play with alphabets	403 (5.3)	375 (3.9)	359 (3.6)
Play with number toys	402 (5.5)	379 (3.6)	359 (4.2)

While socio-economic resources in the home and the early educational environments therein are correlated, each has their own unique relationship with academic outcomes. Table 2 summarises the combined influence of socio-economic factors and the level of cognitive stimulation promoted in the home. As each contextual indicator increases, so does learner performance in mathematics.

Table 2: Relationship between early educational activities before school, household education and grade 5 mathematics achievement

			Household educational level					
			Below grade 12		*Completed grade 12*		*Post-secondary*	
		%	45		33		22	
Frequency of activities	%	Average score	343	(3.0)	380	(4.2)	451	(6.3)
Never/almost never	7	339 (5.8)	326	(7.0)	351	(9.2)	428	(18.5)
Sometimes	66	367 (3.3)	340	(3.3)	374	(4.5)	429	(6.0)
Often	27	415 (6.2)	366	(5.4)	410	(6.0)	496	(8.6)

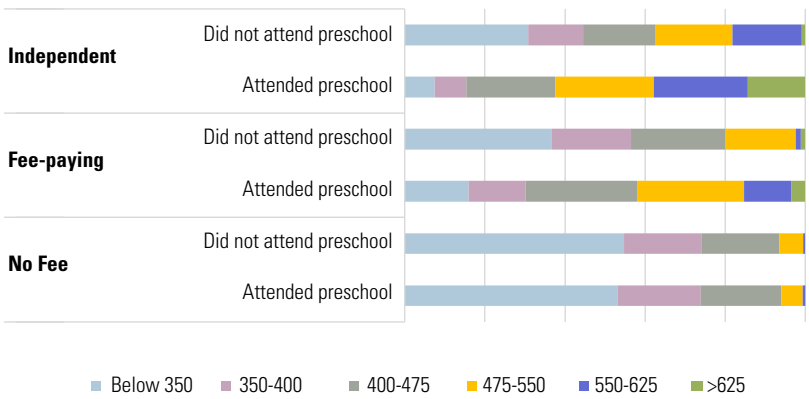
On average, learners in households where there is frequent use of literacy and numeracy activities before school and where at least one parent has a post-school qualification (22% of learners), scored 170 points higher than those from households where early educational activities are a rarity and parental education is below grade 12 (45% of learners): 496 points vs. 326 points. This 170 points difference is equivalent to a difference of around four school grades.

Preschool attendance

Preschool attendance in South Africa has increased considerably over recent years with almost nine out of ten learners having some form of schooling prior to grade 1, compared to just 20% of the population participating in early childhood development programmes in 1996. This is particularly encouraging as the TIMSS data show a positive, incremental relationship between years of attending preschool and mathematics achievement in grade 5. Learners who did not attend preschools, scored an average of 353 points, compared to the 362 points scored by those who attended for one year, 384 points for those with two years' attendance and 390 points for the 48% of learners with a minimum of three years' preschool experience.

These are average scores, however, and on closer examination of the data we see that the benefits of early participation are not universal. Learners who attended preschool but went on to public no-fee schools did not appear to gain the same advantage from attending early education settings as their counterparts in fee-paying and independent schools. Figure 1 shows similar proportions across each of the proficiency benchmarks for learners in no-fee schools, regardless of preschool attendance, while for those in fee-paying and independent schools, learners who attended preschool have a much higher achievement profile than learners who did not.

Figure 1: Average achievement in terms of proficiency benchmarks, by preschool attendance and school type



This may reflect that learners who go on to no-fee schools receive a lower quality of education, or that poorly resourced no-fee schools cannot sustain and build on the pre-schoolers' early learning gains. Regardless, it is wasteful not to capitalise all potential gains associated with high quality early years provision, particularly if it could benefit those at the bottom end of the ladder.

Conclusion

Our findings also show that what parents do matters alongside what they have. Cognitively stimulating environments where caregivers engage frequently in early educational activities are associated with higher performance in grade 5. The activities and experiences a child is exposed to at home and in preschool settings, play an essential role in early development through influencing the language they hear, the interactions they have with others, and skills and abilities that are promoted.

This research shows that the disparities that exist in educational outcomes often begin long before learners start their formal schooling, reflecting a lack of early educational engagement and quality early years' experience. Without intervention, these early inequalities continue to widen through school, into adulthood and across generations. Understanding the role that home and preschool environments play in developing these foundations is vital to improving performance. Parents are more than the resources they have. Just having a "place to go" in terms of early childcare is not enough. To help learners start school with the best possible chances, children need solid exposure to a range of rich educational activities and environments that are cognitively stimulating.

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Lessons to prevent bullying are part of the school curriculum. Here, Indiphile Magqazolo (left) and her class mates, Gemma Hanekom and Thanaa Davids, are role-playing social exclusion and gossiping, forms of non-physical bullying, to the rest of the grade 5B class at Westville Primary School in Mitchells Plain in the Western Cape.

BULLYING - REDUCED WHEN LEARNERS FEEL LIKE THEY BELONG IN A SCHOOL

Research has found that creating a healthy social context within schools is vital for learner success. Are South African schools ensuring that the social needs of learners are met? Based on data from the 2015 Trends in International Mathematics and Science Study (TIMSS), *Lolita Winnaar* and *Unathi Beku* examine the association between academic achievement and bullying and investigate social factors linked to bullying in schools.

Many South African schools are characterised by high levels of bullying, safety concerns and disorderliness. An unsafe and disorderly schooling environment hinders the effectiveness of the learning environment. When the atmosphere in a school is one where learners feel like they belong, are constantly engaged and feel safe, learners are less likely to be victims of bullying, which is linked to better academic results. Bullying involves harmful or aggressive behaviour with the intention to harm an individual who is less dominant physically or emotionally.

Creating a caring and supportive social environment within schools is essential for the academic, social and emotional development of learners. It is directly linked to school climate, which is a multi-dimensional concept that measures the health of the educational system. School safety, a sense of belonging and an engaging learning environment are key components of school climate that describes the intangible elements of the school environment.

Policies for safer schools?

The national Department of Basic Education (DBE) recognises that violence is a major contributing factor hampering effective schooling. This is evident in three key policy initiatives namely, the National School Safety Framework (NSSF) which aims to create a safe and engaged schooling climate (environment) for learners and teachers. It sets out a framework for collaboration and partnerships amongst schools, governing bodies and provincial administration. The DBE-South African Police Service (DBE-SAPS) protocol as well as the Prevention and Management of Bullying Programme sets out the framework for close co-ordination between the two departments. This is to create a safe and engaging learning environment, in which quality learning and teaching can take place. Finally, the Prevention and Management of Bullying Programme is a guiding document for collaboration between the provincial administration and schools.

The DBE prioritises a partnership and collaborative approach to addressing bullying and other school climate issues recognising that schools do not operate in silos, but are part of and influenced by broader communities.

Findings from our research

The 2015 Trends in International Mathematics and Science Study (TIMSS) provides us with the opportunity to examine, the association between academic achievement and bullying at the grade 5 and grade 9 levels.

> "LEARNER SENSE OF BELONGING AND ENGAGEMENT SHOWED TO BE THE HIGHEST PREDICTORS OF BULLYING IN SCHOOLS."

Academic achievement and bullying

The bullying index was calculated to include learners' responses to nine statements linked to aspects of bullying (see Table 1) and ranged from learners exposed to some form of bullying on a weekly basis to learners almost never being bullied. The data shows that 44% and 25% of learners in grade 5 and grade 9 respectively, experience at least one incidence of bullying weekly.

Figure 1 also shows strong associations between mathematics achievement and incidences of bullying in schools. Mathematics scores are lower for learners who are bullied more often. Not only do higher occurrences of bullying occur at the grade 5 level but the score difference between learners experiencing higher levels of bullying is also higher at the grade 5 level (53 points) than the grade 9 level (35 points).

Reducing bullying

Results from a regression analysis shows that boys are more often exposed to bullying than girls. However, more importantly, the social context within a school is strongly associated with incidences of bullying. Social factors included discipline problems, safety and orderliness, learner engagement and learner sense of belonging.

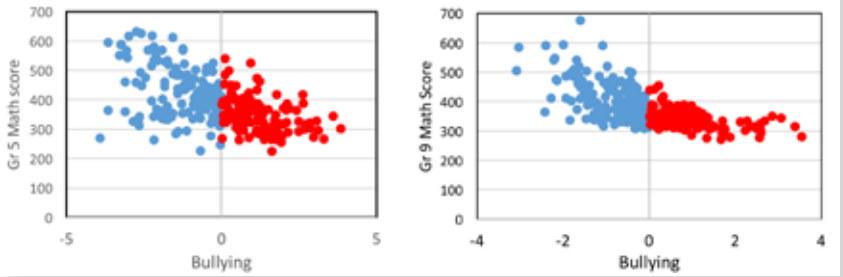
Learner sense of belonging and engagement showed to be the highest predictors of bullying in schools. Learners who felt like they belonged in the school and were constantly engaged within the classroom were less likely to be bullied. This is true at the grade 5 and grade 9 levels.

Learner sense of belonging is the extent to which learners feel accepted and valued by their peers and teachers. If learners feel like they belong, they are more engaged in the classroom and feel less alienated. The latter can make them targets for bullying.

Table 1: Percentage of learners exposed to various forms of bullying weekly

	Grade 5 %	Grade 9 %
Made fun of or called names	39	29
Left out of games or activities	26	15
Spread lies about me	26	14
Stole something from me	33	28
Hit or hurt me	23	10
Made to do things I did not want to	21	8
Shared embarrassing information about me	22	11
Posted embarrassing things about me online		6
Threatened me	23	10
Bullying Index	**44**	**25**

Figure 1: Association between bullying and mathematics achievement



What can schools do?

Effective schools have an environment where learners feel safe, are constantly engaged and feel like they belong. Access to quality physical resources are important to the functionality of a school, however it goes beyond resources. To reduce the achievement gap between learners who have experienced bullying and those who have not, we need to be cognisant of school social factors.

In response to the increased levels of bullying and violence occurring in schools, the DBE has established policies and partnerships with the SAPS to monitor violence in schools. These initiatives are important, however, it is a reactive approach. We need a proactive approach that involves closer relationships between staff members of a school, the community and parents to address concerns about school climate. We should make concerted efforts to understand how the organisational and professional conditions of a school can support learning. This includes addressing issues of management and leadership, placing more emphasis on academic success, ensuring the safety of learners and addressing ill-discipline. The challenges that teachers face should also be reduced and teacher job satisfaction made a priority. Such a holistic approach to addressing school climate concerns will assist in reducing and possibly eradicating bullying in schools.

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WORKBOOK AND TEXTBOOK AVAILABILITY - ADDING LEARNERS' VOICES

Thanaa Davids reading during break time at Westville Primary School in Mitchells Plain in the Western Cape.

In 2012, Limpopo was at the centre of a media storm when textbooks were not delivered to schools in the province. After high-profile litigation, many schools only received their books toward the second half of the year. *Dr Linda Zuze* examines data from the 2015 Trends in International Mathematics and Science Study (TIMSS) to determine the more recent textbook situation in schools across South Africa.

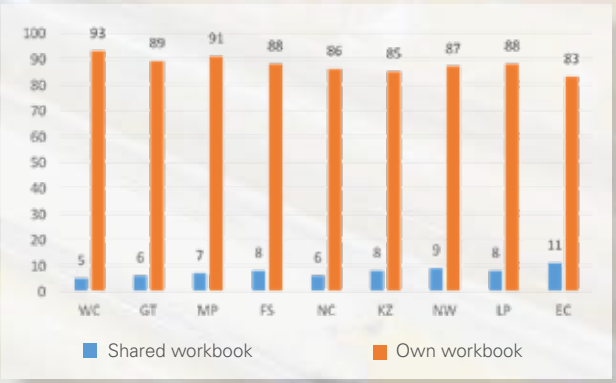
Textbooks, workbooks and teacher guides are core learning and teaching support materials required for curriculum coverage. The South African government has made ambitious promises about textbook provisioning. The Department of Basic Education (DBE) is working towards providing one textbook per learner per subject in every school. However, the process of procurement and delivering these materials varies from province to province.

The gap between policy and practice remains wide in many parts of the country. There have been textbook shortages in other provinces, such as KwaZulu-Natal, indicating that it is a national issue. Turning the spotlight on textbook delivery has been good for raising awareness of a problem of which the general public previously knew little about. In overcrowded classrooms, a textbook may mean that children at least have a more structured approach to covering their curriculum. They don't have to spend valuable class time copying notes from the blackboard and teachers have more time and flexibility to focus on lesson coverage. These crises have also provided us with excellent insights into the complexity of the issue and the many actors involved.

Asking the learners

The discussion about textbook availability usually takes place among policy makers, public interest organisations and legal experts. The 2015 Trends in International Mathematics and Science Study (TIMSS) added learners' voices to the conversation by asking them about whether or not they had their own textbooks or workbooks, shared these resources with other learners or did not have any access to them at all. Among grade 5 learners who took part in the TIMSS study, the vast majority had access to their own workbooks (86% in no-fee public schools, 91% in fee-paying public schools and 83% in independent schools). There were provincial differences with 93% of learners in the Western Cape and 91% in Mpumalanga having greater access to an individual workbook compared to 85% of learners in KwaZulu-Natal and 83% in the Eastern Cape.

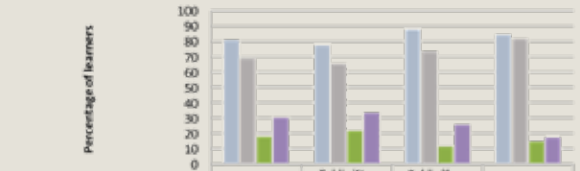
Percentage of learners with access to a workbook by province, TIMSS 2015



Among grade 9 learners, 82% had access to their own mathematics textbook and 69% to their own science textbook. Again, textbook availability was lower in the

country's least resourced no-fee schools. Seventy-eight per cent of learners in no-fee public schools had their own mathematics textbook in 2015, compared with 88% in public fee-paying schools and 85% in independent schools. The gap in science textbook ownership between public and independent schools was even wider. Sixty-six per cent of grade 9 learners in no-fee schools had their own science textbook compared to 74% in fee-paying and 82% in independent schools.

Percentage of learners who own a textbook by school type, TIMSS 2015



	National	Public (No-fee)	Public (Fee-paying)	Independent
I have my own maths textbook	82	78	88	85
I have my own science textbook	69	66	74	82
Share or do not have a maths textbook	18	22	12	15
Share or do not have a science textbook	31	34	26	18

Sole access to grade 9 mathematics and science textbooks also varied across the provinces. In the Eastern Cape, 77% of learners had sole access to a mathematics textbook and in KwaZulu-Natal, only 72%. In the Western Cape (90%) and Gauteng (88%), learners were more fortunate.

Textbook shortage impacts TIMSS

Although workbook and textbook coverage might be better than we thought, we need to consider these findings carefully. The fact that 17% of grade 5 learners in the Eastern Cape did not have their own workbooks is concerning given that this province had the poorest results in TIMSS 2015. Also, the problem was more widespread than just one province. Twenty-eight per cent of grade 9 learners in KwaZulu-Natal were without mathematics textbooks and a staggering 57% of learners in the same province were without science textbooks a few years before their crucial National Senior Certificate Examination.

Not there yet

The December 2015 Constitutional Court judgement was very clear. The right to basic education includes ensuring that every learner has access to required textbooks at the beginning of the academic year. The DBE has set up a call centre so that school representatives can raise concerns about textbook delivery. This shows that the department is trying to address any delays that may arise in the future. While we recognise that many of our poorest learners have a level of access to mathematics and science learning and teaching support materials, there is room for improvement. There are also clear differences between provincial reports on the delivery of these materials to schools and the distribution of books to learners. The 2015 TIMSS results show that full coverage has not yet been achieved and that access to learning and teaching support materials is dependent on the subject area. It also suggests that some of the best information about how textbooks are delivered and used comes from the learners themselves. This needs to be considered when this issue is monitored in the future.

Author: Dr Linda Zuze, a former chief research specialist at the HSRC's Education and Skills Development programme.

Seth Peyton (left) and Ayakha Makunga have their own work- and textbooks in the grade 5B class at Westville Primary School in Mitchells Plain in the Western Cape.

A burnt block of classrooms at a secondary school in Vuwani, Limpopo

> "SCHOOLS ARE PROMINENT SYMBOLS OF LOCAL GOVERNANCE AND THEREFORE VIEWED AS FAIR GAME TO TARGET."

"We were not consulted"

– TRIGGERS OF SCHOOL ARSON IN VUWANI

In May 2016, widespread violent protests broke out in the Vuwani community in Limpopo. Twenty-seven schools were burned down or damaged. What drives a community to destroy infrastructure that is crucial for their children's future? HSRC researchers conducted an exploratory study to learn more. They heard that the community felt that they were not consulted about a municipal boundary re-determination, despite a Limpopo High Court finding otherwise. The HSRC's Prof Modimowabarwa Kanyane presented the findings at a recent seminar.

Since 1994, local government has used municipal mergers and disestablishment including spatial transformation as a common policy approach to improve service delivery. In many cases, they merged economically unviable municipalities to address the need for better fiscal management. Affected communities often expressed their dissatisfaction with these re-demarcations of boundaries, but the reaction of the Vuwani community in Limpopo was exceptionally violent.

Losing a legal battle

The Vuwani area was situated in Limpopo's Vhembe District under the Makhado Municipality until July 2015 when the Municipal Demarcation Board (MDB) proposed new demarcations. Makhado (Masia, Mashau, Vyeboom, Tshino, Davhana, Tshimbupfe, Ramukhuba and Masakona) would be merged with Thulamela Municipality (Malamulela, Tshikonelo, Mulenzhe, Piet Boy and Khakhanwa), which is today known as the Collins Chabane Local Municipality, LIM345.

Not wanting to form part of Malamulela, traditional leaders and community members from Vuwani objected. On 29 April 2016, the Limpopo High Court dismissed an application by Vuwani's Masia Tribal Council, together with eight other applicants, for the setting aside of the MDB decision. The court ruled that the MDB had done everything within its mandate and legal provisions to consult the communities concerned. Two days later, violent protests erupted and to date the conflict has still not been resolved.

No consultation?

Six months after the destruction, a team of HSRC researchers visited Vuwani to explore the deeper reasons for the violent protests. They interviewed traditional leaders, community members, a senior official from the MDB, learners, educators and school principals.

"The silver thread through interviews was that the community felt that they were not consulted, despite the Limpopo High Court ruling that they had been consulted," said Kanyane.

One respondent likened the idea of merging with another municipality to being "bequeathed a wife against your will":

"I cannot just come to you and say, 'this is now your new wife'. You don't know her. You don't know where she's coming from. Then I just come and say, 'this is your wife!'."

The Vuwani community did not accept the rationale of financial non-viability for the dis-establishing of the Mutale Local Municipality and believed that the merger was done to please the people of Malamulele.

Ethnicity

At the seminar, *Sunday Independent* journalist Lebogang Seale said that he had "flashes of fear" when the decision to merge the municipalities was announced, because he knew

that apartheid spatial planning had pitched three ethnic groups against each other in Limpopo. "On the ground reporters saw sentiments around tribalism emerge. The area predominantly comprises Xitsonga and Tshivenda people and the prejudice was from both sides."

Why burn schools?

The Vuwani arson was one of the worst forms of attack on public infrastructure seen in the country. A dominant perspective was that public infrastructure such as schools are prominent symbols of local governance and therefore fair game to target and destroy to ensure that community demands are heard.

"The communities tried to engage the state through court processes, but did not get recourse. The destruction of what is in fact their own property can never be condoned, but it is an indication of the extent of the frustration and anger that led to the violence. There was also the perception – based on protests in other areas such as Malamulele – that they would be listened to if they targeted public property," Kanyane explained.

Infrastructure damage

A preliminary assessment of the damage to the infrastructure of 24 primary and high schools was estimated at R175 million. In addition, 76 new mobile classrooms would cost R27.2 million and the provision of security soon after the fires amounted to R3.1 million. Few of the schools have been repaired.

The cost extended to the disruption of mid-year examinations, the destruction of school records and nutrition centres on which many learners relied for their main meal of the day.

Learners had to stay home for three months. The provincial Department of Basic Education set up safe spaces for matriculants to write their June exams so that they could apply for university entrance, but learners from the other grades felt disadvantaged.

Trauma

The researchers also found that the learners, their families and some teachers experienced significant psychological trauma. Those who lived near the schools witnessed their schools going up in flames. Many were intimidated and threatened with violence by fellow community members, if they did not participate in the protests.

"This trauma was almost worse than the destruction of property. We are trying to build social cohesion, but these events tore the community apart. It was the consequence of our decisions. We need to follow the law, but also we also need to consider community-level satisfaction," said Kanyane.

Jane Thupana, chairperson of the MDB, said the challenge is that specific criteria apply to how municipalities may be demarcated. "If the board gets too sympathetic with views of specific groupings and ignore the criteria, we can be taken to court."

Thupana and Kanyane emphasised the challenges in consulting with entire communities. Most are represented by traditional leaders. Dissenting voices may not be heard, but the board may not prescribe to community members who should represent them.

Recommendations

The report emphasised that dissenting voices should not be underestimated or ignored as they have the potential to cause much damage to society.

"The voices of Vuwani residents show that residents hold different understandings of what consultation should entail as opposed to what the MDB holds and is stipulated by law. It is an indication that the current consultation methodologies might not be ideal," said Kanyane.

"There was a gap between the law and the realities on the ground. If there was more robust consultative engagement to understand the social and cultural dynamics there, we would have come closer to understanding the bone of contention."

The researchers concluded that the MDB should go beyond the requirements of legislation and policy to consult the affected communities thoroughly before and after issuing notices. Before the MDB makes a final decision, it should run a number of tests to make sure that it is not only lawful but also truly unifying. The MDB needs to carry out socio-cultural impact assessments before boundaries are demarcated and wards delimited, similar to the environmental impact assessments normally undertaken before engineering and earthworks.

The researchers also found that laws that regulate the public hearing process should be amended to be more detailed. The MDB also needs a larger budget for research to ensure that the demarcated municipalities are indeed viable.

Kanyane also said that the timing of the merger announcement during local government elections was a problem. "These matters are very emotional. They should not be pursued before local elections to avoid the perception of party political point scoring."

According to Kanyane, there is still an impasse and people are still rejecting that municipality. "We are two years into the process and there are still service delivery and education issues there. We want to conduct a longitudinal study in a second phase to dig deeper into the identities and socio-cultural dynamics. We need to ask what a community is and what it means to be part of it."

Research team:

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Report by Antoinette Oosthuizen

THE SCHOOL TRANSPORT CHALLENGE:

A disproportionate effect on poor learners

Millions of public school learners walk to school or depend on risky modes of public transport. The direct and indirect costs of these modes of commuting to school disproportionately affect learners from poor families. *Dr Peter Jacobs* and his research team argue that a learner transport programme funded from the public purse and targeted at qualifying learners in poor and low-income families, is critical to realise the right to basic education.

"IN 2016, ABOUT 74% OF 13 MILLION PUBLIC SCHOOL LEARNERS WALKED TO AND FROM SCHOOL."

Almost three quarters of public school learners in South Africa walk to school.

Concerns around access, safety, reliability and affordability of learner transportation loom large and continue to make headline news in South Africa. In KwaZulu-Natal, an education rights advocacy group, Equal Education, supported 12 schools in a court case against the provincial departments of education and transport for the provision of safe and reliable transport for learners. The KwaZulu-Natal High Court ordered the two departments to provide transport to qualifying learners at these schools by 1 April 2018. Urging a more proactive approach, the court also instructed government to ensure proper planning and budgeting for learner transport provision. It questioned the conception and design of learner transport policy and called for rethinking how this policy is to be implemented nationally.

Costs of transport

There has been a considerable shift in transport modes to public schools.

In 2016, about 74% of 13 million public school learners reportedly walked to and from school compared to slightly more than 78% of 11,9 million public school learners in 2009. Between 2009 and 2016, the share of learners using taxis and buses

that serve the broader commuting public has hovered around 8% while the use of privately owned vehicles has increased by more than 300% over this period. Gauteng, KwaZulu-Natal and the Western Cape, regions of high-wealth concentration, consistently account for about 70% of learners that use private transportation to and from schools. These learners are most likely from families who own their own vehicles or can afford private transport, but this mode of transport is not accessible to learners from poorer households.

Public transport use declined

Over the period 2009-2016, self-reported use of public transport modes declined from 1,2 million learners to slightly more than one million learners and has been completely overtaken by the use of private transportation. Interestingly, the cost incidence of learners using general commuter transport follows a similar logic as in the case of those using privately owned vehicles. When public school learners use taxis, buses and trains with the rest of the commuting public as their main mode of travel, then the individual family must bear the cost. In some instances, this can be an 'informal lift club' where a commuter minibus taxi also transports learners on the basis of an agreement with a group of parents willing and able to pay the fare per trip. Invariably, this arrangement, typically done informally, is in effect an unregulated learner transport operation often involved in wide-ranging irregularities, malpractices and road accidents.

Rethinking transport provision

The provision of government-subsidised learner transport started well before May 2015 when cabinet adopted the National Learner Transport policy. Even though this policy took several years to construct, finalise and approve, it is a landmark achievement as it introduced norms and standards that form the minimum benchmark for all provinces and school districts. The 2015 policy includes guidelines on intergovernmental relations between the departments of transport and education at national and provincial spheres, norms and standards for fiscal allocation to learner transport, vehicles and operators, and qualifying criteria for leaners to access the transport benefit. This desktop review of provincial evidence found substantial differences in how each province has been implementing the policy.

Who should be responsible?

At national level, the departments of Education and Transport are jointly tasked with policy implementation through a dedicated National Inter-Departmental Committee. Annual budget statements of National Treasury indicate that funding for learner transport is allocated through the Department of Transport (DOT). Provincially, however, the tasks to plan for, coordinate and oversee learner transport differ. In five provinces, the DOT leads implementation whereas in the rest, this role sits with their counterparts in the Department of Basic Education (DBE). It is against this backdrop that this study explored options for greater effectiveness and efficiency in intergovernmental relations across facets of this programme. If the focus is on the functionality and regulation of vehicles and quality of road infrastructure, then the DOT seems the natural and logical lead. Alternatively, if the overriding concern is the best educational outcomes of learners, then the DBE might be the fitting institutional anchor for this intervention. Each option requires a stipulation of roles and tasks that supporting departments are expected to fulfil in view of the multifaceted nature of providing learner transport.

What is actual spending?

In their annual reports, provinces report highly aggregated expenditures on learner transport as well as highly aggregated numbers of learner beneficiaries. Yearly trends based on these aggregates do not shed light on the extent of and reasons for intra-provincial or district variations. Furthermore, administrative reports use figures on anticipated need (demand) to derive planned spending or budgets per year but the determinants and underlying rule-of-thumb for this procedure are not explained. It is therefore not possible to tell why and how expectations differ from observed and actual spending and headcounts of beneficiary learners.

We need better data

Only five provinces responded to requests for data on annual learner transport expenditure coupled with the number of learners transported for the period 2009-2016. Among these provinces, only Limpopo and the Western Cape supplied a complete data set. According to the assembled statistics, provinces appear to be spending more money to transport learners to and from school. However, when this information is standardised as spending per learner (without factoring in inflation), then the inter-provincial differences and fluctuations become harder to explain. A systemic driver, transportation inflation, might account for these discrepancies. We need an in-depth and focussed investigation of learner transport per school district to close this information gap and to inform urgent and results-driven policy action.

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TRANSFORMING HIGHER EDUCATION
– IMPACT OF A GROWING BLACK MIDDLE CLASS

What should a post-apartheid university in South Africa look like and how are students from an exploding African middle class handling the sociological transition into a world of opportunities that was not available to most of their parents? Prof Crain Soudien, HSRC CEO, spoke about these questions at a public lecture held at North-West University.

The idea of what a university should be is in dispute globally and there are no examples or models of existing universities that South Africa could simply adopt to transform the country's institutions, he said.

Speaking to an audience of academics and students earlier this year, Soudien said that debate about the definition of a university often revolves around the tension between access and excellence. "Is everybody entitled to a place in a university? It is a deeply provocative question when thinking about equality. Who should learn, who should teach and what should be taught?" he asked.

An evolving system

Soudien quoted the late Prof Martin Trow, an American academic and expert in sociology of education, who said that academic systems evolve through three phases. They start as elite systems for the privileged in which less than 15% of the population is enrolled. They tip over into mass systems when more than 16% of the eligible population starts attending and finally become universal systems when more than half of the eligible population is in the university.

Soudien believes South Africa is in the midst of tipping over from an elite system to a mass system, but still a long way from a universal system.

"Elites think of their right to access to a university as a right of birth. The moment a system tips over to a mass system, it becomes meritocratic, requiring qualifications to get in. Elite systems are very homogenous. People come into the system from the same social background, speak the same kind of language and share the same kind of social experiences. They have the cultural capital that permits them to do that.

"Mass systems are more differentiated with people coming from all kinds of backgrounds. They are like cities of intellect. We come out of an elite history that was structured around the reproduction of a small group of people who saw the university as a right of birth."

An exploding black middle class

Soudien said that the movement from an elite to a mass system in South Africa is the result of big sociological changes that happened after 1994 as result of the growth of the African middle class, an issue that sociologists have not studied adequately.

"It is a reality that has hit the country like a tornado. In 1994, the African middle class in this country was about 350 000 in a population of 44 million people. This has grown to either 3,8 million or 14,1 million Africans, depending on which sociologist or economist you believe.

"A massive social shift has taken place. It is not about the cars that

they drive, but the fact that people are now making middle-class choices in their lives."

Cultural capital?

Soudien said that this middle class is "fragile". It is not yet established, in the sense that societies become middle-class when people are able to reproduce their social standing. In material terms, their levels of wealth also remain fragile and they are highly indebted. South Africa has one of the highest debt-burden levels in the world with data showing that this new middle class spend a large proportion of their income on education. People are spending up to 60% of their disposable income to send their children to good schools and universities.

"They are thinking about how their children are going to be different to them. They are not like the white middle class that came out of the 1950s after the Second World War when middle class status accelerated incredibly and people were able to acquire property, to send their children to university and to move out of the working class. People who are now classified as white have been middle class for almost three to four generations and that makes a difference, because this process enabled them to accumulate and hold on to economic and cultural capital that made it possible for their children to succeed."

According to Soudien, the new African middle class does not have this capital yet.

"It is still working itself out. People might be driving BMWs, but there are no books in the houses. It is a moment of development that is yet to happen … and this is the dynamic that nobody talks about."

A primary school challenge

A feature of the growth of this middle class is the growth in enrolments in the universities. The African student population at South African universities increased by 261% between 1993 and 2013. But in 2015, 47,9% of students were not finishing their degrees. The dropout rate among black students in their first year was more than 32%.

Referring to the Progress in International Reading Literacy Study (PIRLS) report released in December, Soudien said that poor primary school education is probably at the root of this failure at university.

In 2016, PIRLS tested more than 12 800 grade 4 students from 293 schools and the learners could do the test in any of the 11 South African languages that they chose. Some 78% could not read with comprehension.

"It is an absolute national tragedy," Soudien said about this finding.

Black academics

With half of academics still being white, the demographic shift among university staff has not happened at the same speed as among students. In 2012, there were 303 full African professors in the country.

"University of Cape Town (UCT) vice-chancellor, Dr Max Price, has argued that it takes 20 years for a university to produce a professor. His comments stirred a great deal of controversy with Prof Xolela Mangcu, also from UCT, rejecting the argument, suggesting that racism was responsible for the small number of professors," said Soudien.

He noted that many successful black female academics believe their pathway through the ranks of universities is fundamentally through "giving up their blackness", something he saw as a "deeply troubling accusation". They were not able to concentrate on developing their academic identities. It was their racial identity that the circumstances were forcing them to pay attention to.

Against this example, Soudien referred to the biography of Prof Chabane Manganyi, one of the foremost psychologists in the country. Manganyi, when he realised that he was not familiar with the medical "dialect" that all health professionals all appeared to understand, made it his mission to find literature on neurology and neuropsychology and read himself into any important but unfamiliar knowledge domains to develop a working knowledge of the brain. "He was able to come to a point in his life where racism (that he experienced) was not the most important thing he thought about as he was writing his PhD, but rather what he was able to say to the field about how the mind works."

Decolonisation and black pain

Soudien said that the major contribution from the debate around decolonisation of the curriculum is the issue of black pain, which is prominent in people's minds.

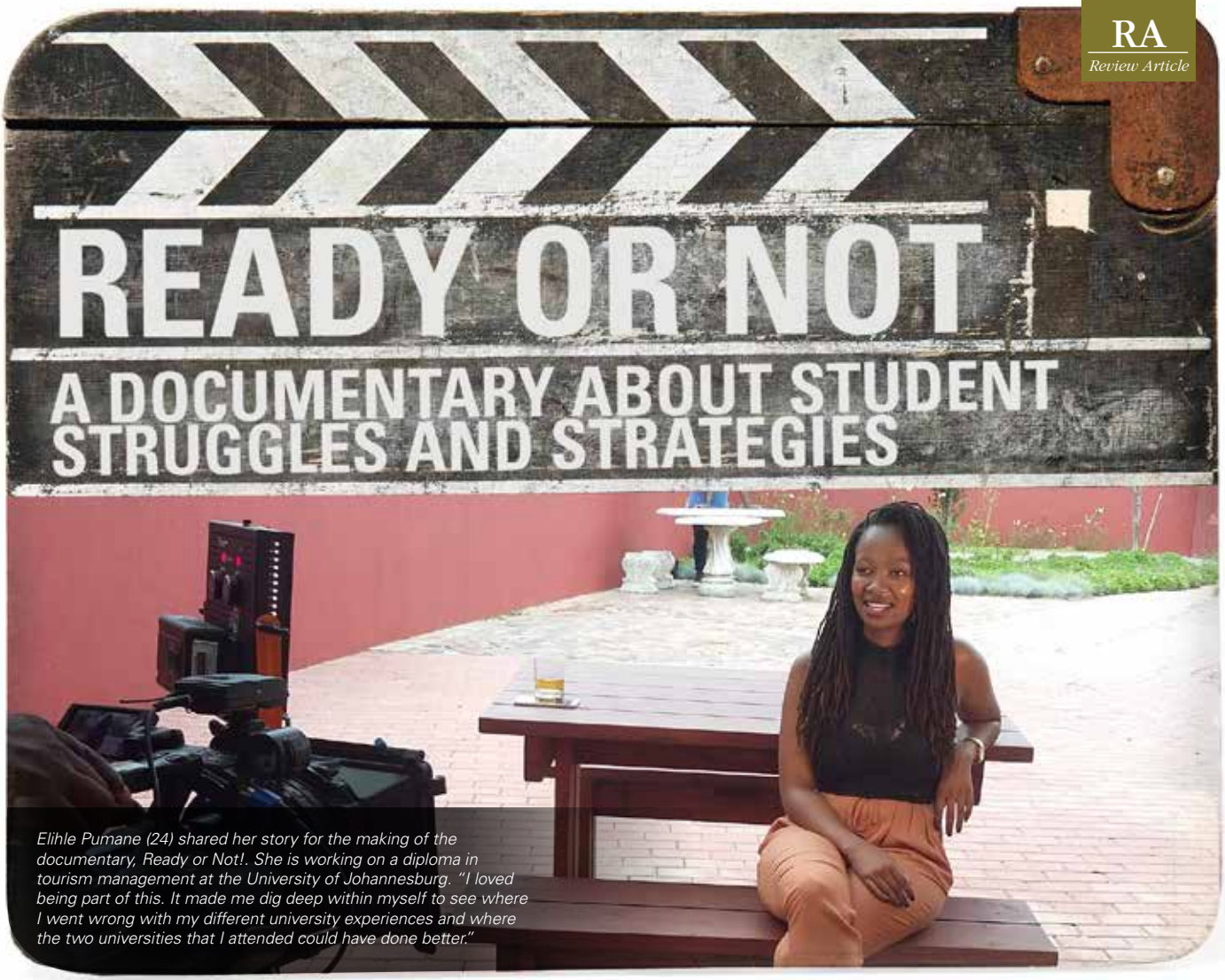
"We have to make it a pedagogical issue to be aware of as we work with our students in the classroom. It is a major existential thing, not just in South Africa, but also around the world. Don't be oblivious to it, or think that you don't have to deal with it or that it is somebody else's business."

Soudien said while speaking about decolonisation is important, the conversation also needs to move beyond that point. "We need to recognise the delegitimised African past to bring it into the full repertoire of knowledges that we have at our disposal. It needs to be as available to us as other forms of knowledge and other approaches to knowledge are. But we have to work with it critically, not romantically, in a way that shows that we can be critical about it and not only seduced by it."

Moving forward

Soudien said people need to be empowered to feel whole again and to move on from what he calls a competitive and disabling "Olympics of anger" circulating amongst people in the country at the moment – 'my pain is more important than your pain.' He believes a university should be a place where students learn methods to consider different points of view. "Our explanations of things can never be brought down to and based on dogma, to a point where one person decides a truth. This is why I came to a university in the first place and it is an idea worth protecting, not to be given up."

Report by Antoinette Oosthuizen



Elihle Pumane (24) shared her story for the making of the documentary, Ready or Not!. She is working on a diploma in tourism management at the University of Johannesburg. "I loved being part of this. It made me dig deep within myself to see where I went wrong with my different university experiences and where the two universities that I attended could have done better."

For the past few years students, staff and the government have been embroiled in a struggle to transform South Africa's institutions of higher education. Despite the recent announcement of fee-free university education for entering undergraduate students, the road to change students' experiences and success rates in universities remains long and arduous. *Dr Alude Mahali* and *Prof Sharlene Swartz* report on how a documentary, produced as part of a five-year long research study into students' experiences at university, offers a unique contribution to ensuring this transformation.

Race, Education and Emancipation' was a five-year study that followed a cohort of students from eight South African universities from 2013 to 2017 portraying their struggles alongside actions to change their circumstances, as well as that of the institutions they attended.

Over these five years, students spoke to a researcher on an annual basis, described and discussed their experiences on a closed Facebook group and became researchers themselves as they interviewed a wide array of people, including teachers, lecturers, administrators, other students, graduates and university dropouts. The data collected covered structural impediments to success, including finances, institutional racism, not feeling welcome, language problems and hunger, as well as issues of intersecting social and sexual identities, such as being female, gay, or having too much freedom.

During the study, we realised that these stories needed to be disseminated, not just as a central part of academic research in its usual formats, but also directly to the students whose lives it is meant to benefit. We subsequently embarked on producing a documentary entitled *Ready or Not!: Black Students' Experiences of South African*

Universities. The documentary includes the testimony of 23 students from the cohort of 80 involved in the larger study. These participants volunteered and had to re-consent to coming out from behind the usual veil of research anonymity.

The documentary was filmed at various university campuses in Durban, Johannesburg, Potchefstroom, Mahikeng, Alice, Bisho and East London. The researchers used a standard interview guide, but also designed specific questions for particular individuals, based on their background, university, degree and particular struggle or strength. We filmed some interviews individually while others were done in groups of two or three, providing an added layer of dialogue as students had both opposing and shared views, experiences and strategies. We sent the film to all of the student participants and anticipate that some will be actively involved with its dissemination at schools and universities country-wide during 2018 and 2019. We also hope that the documentary can be used to engage university staff in conversations about the transformation needed in their institutions.

What a documentary asks us to do differently

In the current debate about decolonising knowledge and its production, a key feature must be the inclusion of participant-centred qualitative research methodologies that are agential and emancipatory to the people whose lives they are meant to benefit, beyond the lifespan of any given project. Our documentary starts to address this, emphasising local contexts and providing students with opportunities to voice challenges they face in their own words and to be 'agents' in their stories and successes. The stories told give us a living, breathing understanding of what it means to go through the South African university system of accessing, starting, staying, passing, stopping, swopping, returning, finishing, graduating and working.

Furthermore, if we want to decolonise research methods, we need to be sensitive to the fact that our emancipatory methods will not necessarily mirror conventional methods. A documentary gives us the opportunity to explore the possibilities of a 'performative' social science that acts as an alternative to - what can sometimes be – the limitations in publications, long reports, conference presentations or policy briefs. A documentary has the potential to create meaningful dialogue with a wider audience.

Beyond traditional methods

The process to produce the documentary resembles the process of any social science-based qualitative project. We conducted interviewing, participant observation and document analysis and even the pre-production phase was about studying the subject, culture, issues, and events that would be central to the film. Such a rigorous methodology offers guidelines for future innovations in how research data is shared, especially where emancipation (or freedom) is a goal.

Storytelling through film enables researchers to think beyond traditional methods when representing sensitive life experiences and narratives. There is tremendous responsibility in researching human experiences and behaviour, especially when these experiences are so embedded with trauma, pain and even survival, as is often the case in South Africa. The process of engaging in the narratives of others empowers us to locate our own distinctive place in the world because watching and listening are actions that require our conscious participation.

The potential impact

After hearing other students' experiences of navigating university, academic pursuits, racial micro-aggressions, university admission processes, transformation concerns and socialising at university – what will students learn and do differently at university? It is up to the film as an audio-visual provocation to open up discussion about the core themes of the study, provide first-hand experience/commentary and offer advice for incoming students in a way that a research report cannot do as effectively for young people. The usefulness of *Ready or Not!* will depend on the potential of the film to prompt reflection in students, in learners, in parents, in teachers, in lecturers, government departments, policy-makers, university administrators and faith-based institutions about alternative ways of being and operating. It is not possible to provide final answers to complex and fluid educational issues, but the documentary has the potential to raise questions about elements of educational policy and practices, and also to revel in the successes of young people who beat the odds.

Key in arts-based methodologies, is that the product is not inanimate. It must be interacted with, poked and prodded in ways that add another layer to the research. As we embark on a comprehensive dissemination process for this documentary to various stakeholders, we are looking to enhance its impact through the development of supportive facilitation material for young people and those with whom they come into contact at institutions of higher education.

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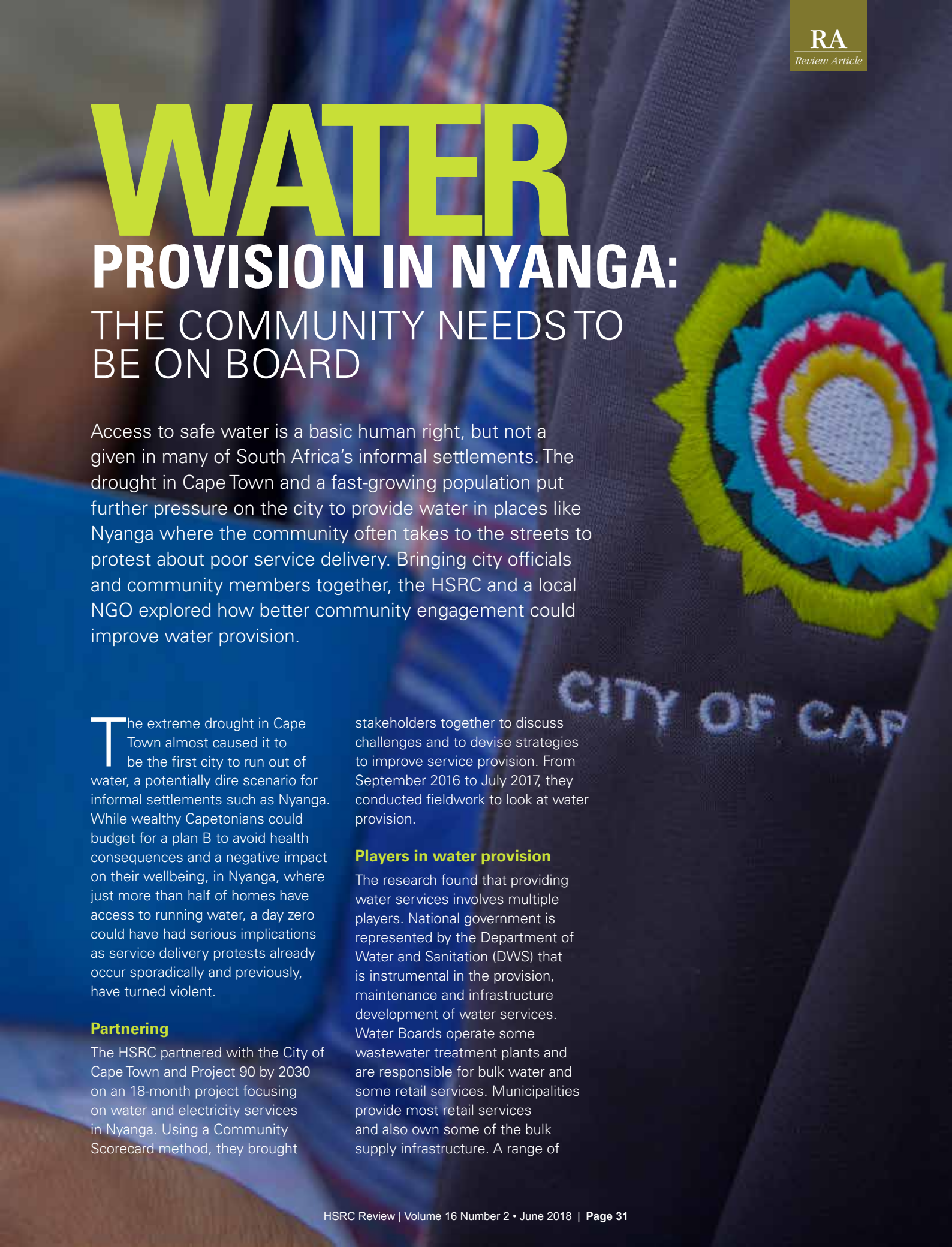
WATER PROVISION IN NYANGA:

THE COMMUNITY NEEDS TO BE ON BOARD



Access to safe water is a basic human right, but not a given in many of South Africa's informal settlements. The drought in Cape Town and a fast-growing population put further pressure on the city to provide water in places like Nyanga where the community often takes to the streets to protest about poor service delivery. Bringing city officials and community members together, the HSRC and a local NGO explored how better community engagement could improve water provision.

The extreme drought in Cape Town almost caused it to be the first city to run out of water, a potentially dire scenario for informal settlements such as Nyanga. While wealthy Capetonians could budget for a plan B to avoid health consequences and a negative impact on their wellbeing, in Nyanga, where just more than half of homes have access to running water, a day zero could have had serious implications as service delivery protests already occur sporadically and previously, have turned violent.

Partnering

The HSRC partnered with the City of Cape Town and Project 90 by 2030 on an 18-month project focusing on water and electricity services in Nyanga. Using a Community Scorecard method, they brought stakeholders together to discuss challenges and to devise strategies to improve service provision. From September 2016 to July 2017, they conducted fieldwork to look at water provision.

Players in water provision

The research found that providing water services involves multiple players. National government is represented by the Department of Water and Sanitation (DWS) that is instrumental in the provision, maintenance and infrastructure development of water services. Water Boards operate some wastewater treatment plants and are responsible for bulk water and some retail services. Municipalities provide most retail services and also own some of the bulk supply infrastructure. A range of

The HSRC joined forces with community members and city officials to look at water provision in Nyanga, Cape Town.

other service providers operate at municipal level. This complex governance system makes accessing information tedious for residents. People in private homes, council homes and informal dwellings are unsure whom to engage when they face problems. Many residents do not have the resources (airtime, a cell phone or the internet) to log complaints or to follow up on the reference numbers they get from the Technical Operations Centre (TOC), a call centre where residents complain or register their requests for municipal services.

The below diagram shows the structure of water provision in Nyanga, excluding contractors.

Figure 1: Structure of water provision in Nyanga

Complex structure

Although it is difficult to portray a complete scenario from this study, an interesting overview emerged from the participating residents.

The DWS and Sewer Services focus on infrastructure installation and maintenance in the public space up to the point where a water meter is installed for private properties (usually council property). The Department of Human Settlements refers installations and repairs for rental homes to its housing maintenance unit. Sometimes, when a matter is urgent, residents will be urged to source a local certified plumber. If the issue is a municipal or city fault, tenants will be reimbursed, but tenants do not always have the resources to initiate claims. This results in persisting water issues and water wastage. Furthermore, private owners are responsible for their own maintenance relying on costly private plumbers. Lastly, the Water Demand Management unit installs and maintains water meters within properties. The TOC handles maintenance requests from residents and usually provides them with a reference number. When call centre staff are unsure where to log a complaint, solutions are delayed.

Talking about water

During fieldwork, the researchers consulted with various stakeholders. Among the participants were officials from 13 city departments as well as community leaders and residents from Nyanga. They found that ineffective communication between city officials and the community further strained the challenges caused by water scarcity, high water demand and ineffective models of water provision.

Problems included limited access to information, a lack of training and skills from TOC staff, poor coordination between departments, between residents and between the city and residents. Most residents do not fully understand service provision and maintenance processes, such as the changing of water meters. Furthermore, access to maintenance sites is also affected by criminal activities including vandalism and threats to the safety and security of city officials. Residents complained that drinking water from household taps came out mixed with sewerage water. They argued that the pipe infrastructure in the area was too small and too old for the growing population. This resulted in frequent breakdowns witnessed on the scorecard day when community members and officials walked the sites together. Challenges are exacerbated by informal businesses such as car washers and meat vendors who are accused of not conserving water and contaminating supplies.

Poor communication between the city and residents led to misunderstandings and challenges with contractors, including a lack of monitoring and accountability. During the scorecard day walkabout, participants witnessed how infrastructure was vandalised. Tampering with water meters and the setting up of illegal water connections become a health hazard when they connect into drains.

Researchers comparing notes with community members and city officials during fieldwork to look at water provision in Nyanga, Cape Town

Moving forward

To enhance water service delivery and education in Nyanga, relationships between the municipality, city, communities and civil society need to improve. Table 1 summarises the recommendations of the research team, who managed to build a good working relationship with the community leaders from these areas and the relevant officials.

Table 1: Recommendations on moving forward

1.	Improve communication.
2.	Implement better water education and awareness.
3.	Enhance capacity and training in the city.
4.	Have officials and contractors wear proper identification to access communities.
5.	The city needs to get the community on board who can act as a network to disseminate information, as well as to be owners of processes and infrastructure.

The study showed that water provision is a complex, pressing and a multi-dimensional problem. Furthermore, water flows across different places, administrative areas, and geographic locations. The management of water involves multiple stakeholders, which imposes major coordination challenges for government. We welcome the fact that the 2018 State of the Nation Address emphasised the importance of water security and the allocation of additional funds to the water crisis in the 2018 National Budget.

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> "POOR COMMUNICATION BETWEEN THE CITY AND RESIDENTS LED TO MISUNDERSTANDINGS AND CHALLENGES WITH CONTRACTORS, INCLUDING A LACK OF MONITORING AND ACCOUNTABILITY."

Source: This article is based on a policy brief produced for the Tirelo Bosha – Public Service Improvement Facility of the Belgian Development Agency and the South African Department of Public Service and Administration

Scenes encountered during fieldwork to look at water provision in Nyanga, Cape Town

RA
Review Article

PERCEPTIONS OF SOCIO-ECONOMIC CIRCUMSTANCES: SURVEY INDICATES A DAUNTING TASK LIES AHEAD

In President Cyril Ramaphosa's first speech in Parliament, during which he accepted his nomination as president, he emphasised the importance of improving the standard of living of all South Africans. In the light of the current perceptions of socio-economic conditions in South Africa, he faces a formidable task, write *Dr Yul Derek Davids* and *Prof Mia Swart*.

The South African Constitution is regarded as one of the most progressive in the world. One of its central features is the recognition of the right of all citizens to certain socio-economic rights including basic housing, healthcare, education, food, water, and social security. Including socio-economic rights in the Constitution has direct, practical implications for government, which is expected to fulfil these rights through concrete action. It is crucial that government's progress in delivering on these expectations is monitored.

The HSRC's South African Social Attitude Survey (SASAS) series is a useful tool to measure the extent to which South Africans are satisfied with their socio-economic circumstances, but the series does not measure the extent to which government has complied with its obligation to progressively realise socio-economic rights. Such a measurement would require insight into the national budget and what portion of the budget the state dedicates to socio-economic goods. However, how South Africans perceive their circumstances matter and it provides valuable insight into how government has fared in providing basic goods such as water, sanitation, housing and electricity.

Having access to healthcare, housing and municipal services impacts positively on the lives of South Africans.

What is the SASAS series?

The HSRC has conducted an annual cross-national opinion survey since 2003. The SASAS series measures the public's attitudes and beliefs on a range of issues such as democracy and governance. The surveys are designed to yield a representative sample of approximately 3 000 people who are 16 years and older and who live in private homes in South Africa regardless of their nationality or citizenship. Figure 1 shows the broad range of socio-economic areas measured by the SASAS survey.

The respondents were asked "How satisfied or dissatisfied are you with the way that the government is handling the following matters in your neighbourhood?" The survey assessed satisfaction levels in terms of a broad range of socio-economic goods, including the supply of water and sanitation, electricity provision, affordable housing and access to healthcare. The findings presented in this article contribute to the work of the HSRC's Democracy, Governance and Service Delivery Transformative Governance project.

Key findings

Given the severe drought in the Western Cape and other parts of the country, the perceptions of government's provision of water is particularly interesting. The lower level of public satisfaction in this area can be attributed to the inadequate manner in which government is dealing with the water crisis. Figure 1 shows that satisfaction with water and sanitation received fairly consistent ratings between 2003 and 2013 (ranging from 57% to 62%). However, the level of satisfaction dropped slightly to 53% in 2014 and 2016. When the data from 2003 to 2016 is disaggregated, we find that rural dwellers were the least satisfied (30%) with water provision, followed by residents of informal settlements (45%) (Figure 2). Consumers in formal urban areas were on average, more satisfied with municipal efforts in providing these basic household services (74%).

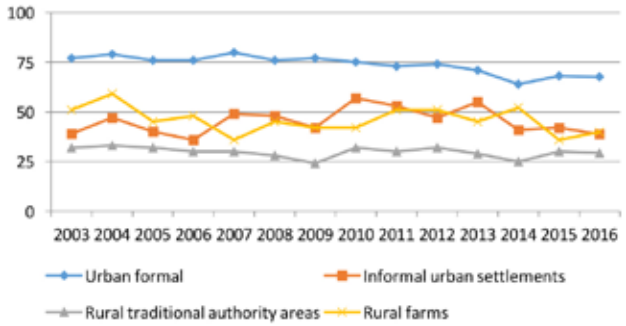
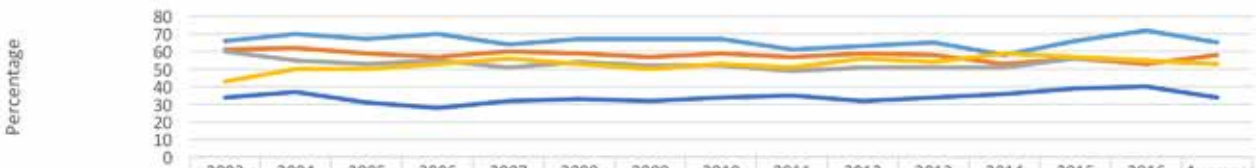


Figure 2: Satisfaction with water and sanitation by geographic location
Source: SASAS 2003 - 2016

Overall, 65% of surveyed South Africans were satisfied with electricity provision (Figure 1). From 2003 to 2016, satisfaction levels for electricity provision were also consistently higher than for water provision. However, electricity provision remains a challenge. This can partly be attributed to problems besetting Eskom, including a management crisis, lack of capacity and maintenance backlogs. It is therefore unsurprising that SASAS reported the lowest level of electricity provision satisfaction in 2014 (53%), when these difficulties were most felt by the public. Black African respondents remained the least satisfied (63%) with the provision of electricity, compared with coloured (74%), Indian (73%) and white adults (73%) (Figure 3).

Between 2003 and 2012, affordable housing was one of the top 10 problems that South Africans faced. It was mentioned by about 11% of survey respondents. While government's major focus has been on the provision of low-cost housing in urban South Africa, there is growing concern about the social and environmental sustainability of housing programmes. Figure 1 shows that, from 2003 to 2016, South Africans were least satisfied with low-cost housing. Although 2016 recorded the highest level of satisfaction (40%), it still remained low for all

Figure 1: Assessments of socio-economic rights (% saying satisfied and very satisfied)
SASAS 2003 - 2016



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Electricity	66	70	67	70	64	67	67	67	61	63	65	58	66	72	65
Water	61	62	59	57	60	59	57	59	57	59	58	53	56	53	58
Refuse removal	60	55	53	55	51	54	52	52	49	51	51	51	56	55	53
Health care	43	50	50	53	56	53	50	53	51	56	54	59	57	55	53
Housing	34	37	31	28	32	33	32	34	35	32	34	36	39	40	34

the previous years with a national average of 34%. Black African respondents were the least satisfied with low-cost housing, with this trend varying since 2010 by marginal percentages (Figure 4). On average, 32% of black Africans were satisfied, compared with 40% of coloured, 42% of Indian and 39% of white respondents.

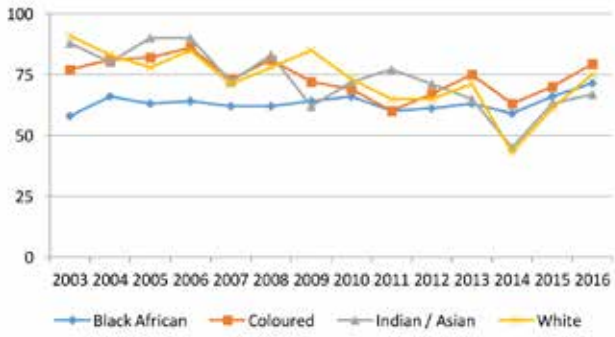


Figure3: Satisfaction with electricity by race
Source: SASAS 2003 - 2016

The health status of black South Africans continued to be lower than other racial groups. There were also large differences in the life expectancy and mortality rates among black, coloured, Indian and white respondents. These stark inequalities can be attributed to higher levels of poverty among most black South Africans. Figure 1 indicates that access to healthcare received fairly consistent ratings from 2004 to 2016 (fluctuating between 51% and 59%). Nevertheless, the fact that just more than half (53%) of South Africans were satisfied with their access to healthcare indicates a crisis in the healthcare system. It is clear that the provision of free basic medical care is insufficient.

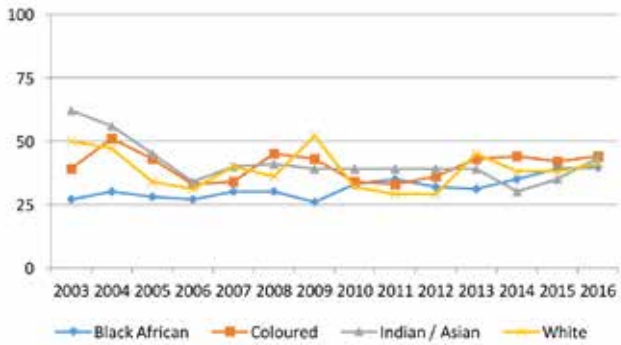


Figure 4: Satisfaction with affordable housing by race
Source: SASAS 2003 - 2016

The overall picture

The survey results paint a fairly bleak picture, particularly as the findings remained relatively consistent between 2003 and 2016, indicating little improvement in socio-economic satisfaction levels over time. The fact that black South Africans were consistently the least satisfied group is not surprising. It points to a failure in fulfilling the constitutional objective of equality. Overall, the low satisfaction levels suggest that the state has not fulfilled its obligation to progressively realise socio-economic rights, and South Africans believe that the government is lagging behind addressing socio-economic inequalities.

Authors: Dr Yul Derek Davids, chief research specialist, and Prof Mia Swart, research director, of the HSRC's Democracy, Governance and Service Delivery programme and visiting fellow at the Brookings Doha Centre.

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South Africans believe that the government is lagging behind addressing socio-economic inequalities.

Ship for World Youth
– Building a global understanding

Recently, the HSRC's Dr Firdous Khan returned from a ship-based international youth exchange programme along with 11 other young South African leaders. The Ship for World Youth programme was sponsored by the Cabinet Office of the Japanese Government and the South African team was part of more than 200 participants from 11 countries, first in Tokyo and then on board the Japanese Nippon Maru ship between 16 January and 4 March 2018.

"We met high-profile people and organisations that we would not ordinarily have crossed paths with, including the prime ministers of India and Sri Lanka as well as the vice-chancellors of the universities of science and technology in these countries," said Khan, a post-doctoral fellow and research specialist in the HSRC's Centre for Science, Technology and Innovation Indicators.

The programme was designed to give an introduction and in-depth understanding of various topics including economic development, burden of disease, inclusion and sustainability through expert-led workshops, discussions, courses and participant-led seminars.

Building sustainable business

One course taught the participants how to map and start out their own sustainable businesses. "It not only focused on us or our business ideas, but also on what we are able to give back to society, which is the aim of a sustainable business. During this course, we worked in teams and competed to develop the best sustainable business concept.

"Education was the focus of the winning proposal. They aimed at connecting recycling companies and big companies to collect materials to make notebooks that could be designed by children from impoverished communities. The concept was environmentally friendly and proceeds from selling these notebooks would be reinvested to strengthen schools in these communities."

Another suggestion involved erecting mobile classrooms built from building blocks that were produced from recycled materials.

"Some teams tackled bigger issues such as the energy crisis, but the emphasis was on projects that could be more productive in the short-term, a 1-3-year plan rather than a 5-10-year plan."

Forging a mutual understanding

Khan also attended a seminar called The Rise and Fall of Democracy. "As we discussed the structures of governance in different countries, we realised that people all around the world have similar issues. We just manage to deal with it in different ways. In one case, delegates explained how their country handles simultaneous governance by a king and parliament successfully. We were told by several delegates how such systems work and why they would not change it. It makes one step back and think about it."

Khan said the programme broadened her global views and taught her key skills in leadership and project management that she can transfer to her current projects. "I had the opportunity to speak openly and publicly about global issues with like-minded individuals and with those with opposing views.
"I have also built a global network of connections with experts in various fields that are able to collaborate on future projects."

Khan holds a PhD in Biotechnology and an MSc in Bioinformatics from the University of the Western Cape. She was selected for this programme by South Africa's National Youth Development Agency and Japanese consulate after being named as one of the 2017 Mail & Guardian 200 Young South Africans in the Health Category.

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Dr Firdous Khan (front), Chipo Jay and Akiko Adaniya disembarking during the The Ship for World Youth programme, a ship-based international youth exchange programme.

> "THE PROGRAMME BROADENED MY GLOBAL VIEWS AND TAUGHT ME KEY SKILLS IN LEADERSHIP AND PROJECT MANAGEMENT THAT I CAN TRANSFER TO MY CURRENT PROJECTS."

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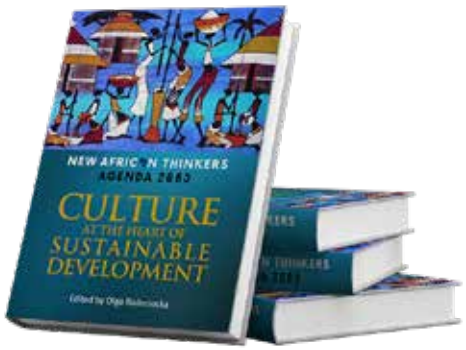

New African Thinkers Agenda 2063 Culture at the heart of sustainable development

Volume editor:	Olga Bialostocka
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About the book

Does the African continent want to be economically and socially sustainable as well as environmentally safe? What is the role of culture and how does it shape development strategies? In *New African Thinkers: Culture at the Heart of Sustainable Development*, the authors argue that culture – defined broadly as the way of life, system of values and controls, and modes of practice and expression – lies at the heart of a re-imagined Africa as a place of prosperity and socio-economic well-being, integration, and self-determination. By contextualising the discourse of development, the authors hope to influence policy and practice towards shifting the narrative from 'one size fits all' to a more morally justified and socially diverse model.

About the editor

Olga Bialostocka (PhD) works for the HSRC's Africa Institute of South Africa. She is interested in the broad field of culture as a pillar of and a resource for sustainable development.

Price R190,00

Moral Eyes

Youth and justice in Cameroon, Nigeria, Sierra Leone and South Africa

Authors:	Sharlene Swartz, Anye Nyamnjoh, Emma Arogundade, Jessica Breakey and Abioseh Bockarie
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About the book

'*Moral Eyes* is based on interviews with university students in four African countries: Cameroon, Nigeria, Sierra Leone and South Africa. Each country exemplifies a distinctive axis of discrimination and privilege—religion, language, ethnicity, and race—though with a good deal of intersectional overlap. The authors use the interviews to theorise about deep issues of injustice, history, and restitution. Through an emphasis on the historical dimension of contemporary injustice, they insightfully expand the familiar moral framework of victim-perpetrator-bystander to include 'inheritors of unjust benefit' and 'resisters'. They also reveal significant differences in how historical memory plays out in these four countries. Global North readers, of whom I hope there will be many, will derive great illumination from seeing familiar issues of social justice discussed in a wholly African context, including a diversity unlikely to be familiar to these readers. Moral Eyes is a wonderful book and an excellent contribution to the literature on moral education, social justice, and the moral character of transitions to a more just society.'

–Lawrence Blum - Professor of Philosophy | Distinguished Professor of Liberal Arts and Education, University of Massachusetts, Boston | Author of High Schools, Race, and America's Future: What Students Can Teach Us About Morality, Diversity, and Community

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TIMSS 2015 Grade 5 National Report

Understanding mathematics and science achievement amongst Grade 5 learners in South Africa

Authors:	Kathryn Isdale, Vijay Reddy, Andrea Juan & Fabian Arends
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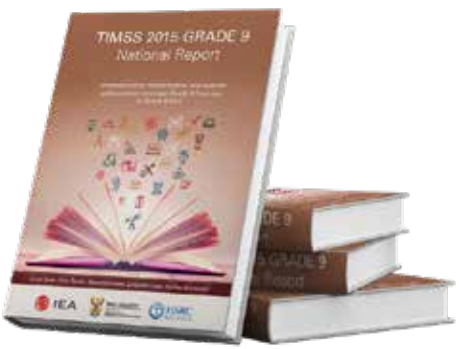
About the book

The 2015 TIMSS grade 5 study was administered for the first time in South Africa in August 2015. The study was led by a team of HSRC researchers in collaboration with the Department of Basic Education and the International Association for the Evaluation of Educational Achievement. Providing the first, nationally representative, internationally comparative compendium of data on grade 5 learners in South Africa, the report is a new indicator of the health of our educational system. The analyses describe in detail the current picture of achievement for learners in the country, highlighting key individual, family, school and provincial differences. The results also include key developments concerning preschool attendance, early learning environments, as well as the importance of educational expectations and academic beliefs, and the damaging effects of bullying. The findings highlight the importance of early achievement and the need to understand the multiple layers of influence on educational pathways, with the conclusions and recommendations highlighting an unequal, yet treatable system.

The grade 5 study sits alongside the grade 9 study which has been carried out in South Africa since 1995, recently completing its fifth round.



Price R100,00

TIMSS 2015 Grade 9 National Report

Understanding mathematics and science achievement amongst Grade 9 learners in South Africa

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About the book

The 2015 TIMSS grade 9 study was administered in August 2015 by a team of HSRC researchers in collaboration with the Department of Basic Education and the International Association for the Evaluation of Educational Achievement. This was the fifth time that South Africa has participated in TIMSS since 1995. In addition to the learner assessment data, the study also collected contextual information from learners, teachers and school principals, making it possible to explore the factors that are related to grade 9 mathematics and science achievement. This report was written to provide some perspective about how the results of international assessments can be used to provide meaningful national insights. Sections of the report bring together the main findings based on descriptive, inferential and psychometric analysis of the data.

The report concludes with recommendations of how the results relate to policy and practice for improving educational quality.