INDIGENOUS AND REGIONAL ENGAGEMENT: TACKLING SOCIO-ECONOMIC DISADVANTAGE

Addressing entrenched inequality across Australia's education system is critical to securing Australia's future mathematical capability and capacity. This requires a coordinated approach to lift standards and close the gap for disadvantaged, regional and indigenous students. Importantly, with many industries in regional areas dependent on STEM, the achievement gap threatens future economic stability and skills supply across regional growth areas.

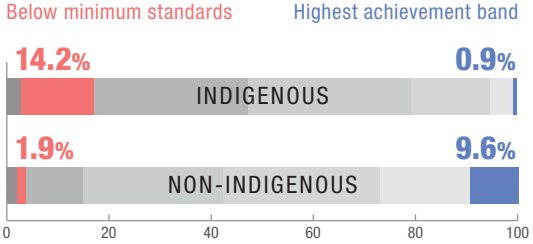
To enhance the mathematical skills of the future workforce, Australia cannot rely on a small minority of well-resourced, high-performing metropolitan schools. Critically, addressing educational disadvantage across the board should enable the creation of a much broader pool of mathematically highly capable students—which Australia will need to, for example, battle current teacher shortages and decrease out-of-field teaching.

The following provides a snapshot of mathematics participation from the classroom to higher education and beyond across regional Australia, low SES schools and Australia's indigenous population.

School Education

The mathematical capability gap between Australia's indigenous and non-indigenous population remains wide. The 2018 NAPLAN data reveal that 17 per cent of Year 9 indigenous students failed to achieve minimum numeracy standards (with results below band 6), compared to only 3.7 per cent of non-indigenous students. While indigenous students in major cities and inner-regional areas tend to perform better than those in remote communities, the gap is still significant. In the highest achievement bands percentages of indigenous students are very low with only 0.9 per cent of indigenous students reaching the highest achievement band 10 compared to 9.4 per cent of non-indigenous students. **See page 17**

Year 9 numeracy 2018 by Indigenous status



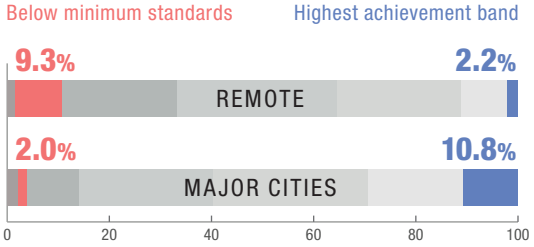
Figures reproduced from table 1.9, Year 9 numeracy in 2018 by Indigenous status, page 17

Nevertheless, some progress has been made in the period 2008–2017. Compared to 2008, the proportions of Indigenous students reaching the minimum standard or above for numeracy were slightly higher in 2017 for Years 5 and 9. In the period 2006 to 2016, Year 12 attainment among Indigenous 20-24-year-olds has also increased, from 47 per cent in 2006 to 65 per cent in 2016, including in remote and very remote areas. **See figure 1.10, page 18**

Students in metropolitan areas are achieving better results in mathematics than their counterparts in provincial and remote areas. The 2018 NAPLAN results revealed that 10.7 per cent of students in remote regions were below minimum standards (with results below band 6). This figure soared to nearly 35 per cent in very remote areas. The number of students in the highest achievement bands is vastly lower in remote and very remote areas than in major cities and inner regional schools. Only 1 per cent of students in very remote areas achieved the highest achievement band 10, climbing to 2.2 per cent in remote areas. This compares to 10.8 per cent of students in major cities. **See pages 20-21**

Students with similar capabilities might have different learning outcomes depending on where they go to school

Year 9 numeracy 2018 by geolocation



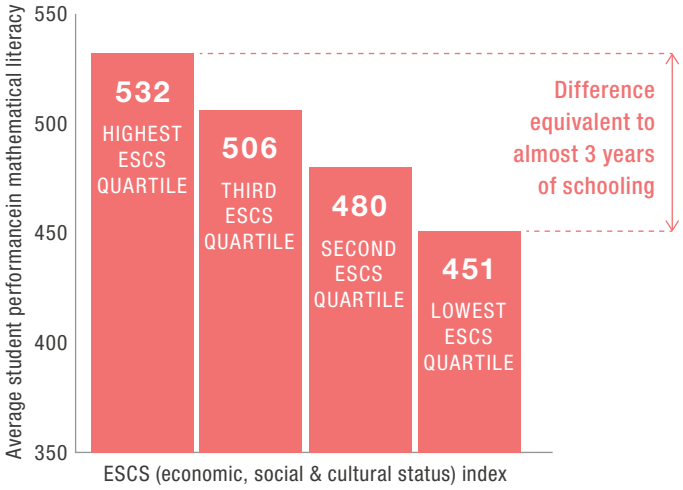
Figures reproduced from table 1.17, Year 9 numeracy in 2018 by geolocation, page 21

In Australia, there are significant differences in mathematical literacy performance between students from the four quartiles on the economic, social and cultural status index (ESCS). In 2018, the difference between students from the highest and lowest quartiles was 81 points, which is equivalent to almost three years of schooling. **See page 17**

Students with similar capabilities might have different learning outcomes depending on where they go to school: Students who go to socio-economically disadvantaged schools tend to make less progress than students in advantaged schools. Students in disadvantaged schools who score high on numeracy in Year 3 end up making on average two years and five months less progress by Year 9 than similarly capable students in high advantage schools. **See page 19-20**

Generally speaking, students in moderately advantaged schools tend to make more than 2 years' worth of learning progress in the two-year periods between NAPLAN tests, while students in moderately disadvantaged schools are likely to make far less. Students should be making one year's worth of learning progress every year, but only students in more advantaged schools tend to reach that goal. **See page 19-20**

Differences in mathematical performance by socio-economic background



Figures reproduced from figure 1.7, Average student performance in mathematical literacy, by socio-economic background, page 17

Teacher supply

Regional and remote schools are the most likely to experience substantial out-of-field teaching. In 2018, 45 per cent of Australian secondary school principals surveyed reported that there were maths and science classes taught by not fully qualified teachers at their school. The differences between states were very substantial, with no less than 63 per cent of principals surveyed from Western Australia, and 68 per cent of principals from Queensland reporting maths and science classes taught by not fully qualified teachers. Secondary school principals also reported that vacancies in the curriculum areas of maths (49 per cent), technology (42 per cent) and science (31 per cent) were the most difficult to fill. **See figure 1.36, page 33**

Excerpt from AMSI publication The State of Mathematical Sciences 2020: 7th discipline profile of mathematics and statistics in Australia