



THE MCKELL INSTITUTE

Setting the Standard

IMPROVING EDUCATIONAL OUTCOMES IN AUSTRALIA



NOVEMBER 2022

ABOUT THE MCKELL INSTITUTE

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This report was written on the lands of the **Darug** and the **Eora Nations**. The McKell Institute acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Owners of Country throughout Australia and their continuing connection to both their land and seas.

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FOREWORD

Since international standardised testing began in 2000, Australia's educational standing has steadily declined relative to our peers. Of the 35 countries whose maths results were lower than Australia's in their first PISA assessment in 2000, sixteen of them now have scores that outrank Australia.

These rankings are based on the Program for International Student Assessment (PISA) which is used as a proxy for education standards. PISA is not perfect, but it is the most extensive international standardised testing available.

Australian mean PISA scores have fallen in all three categories of reading, mathematics, and science since testing began in 2000. Particular attention must be paid to NSW, the largest state where declines have also been the most severe. Addressing Australian education outcomes must start in NSW.

With an increasing reliance on the services industry, advanced manufacturing, computer technology, and research, Australia's prosperity relies on the passion, intellect, ingenuity, and skills of its people. The education of young people represents a fundamental investment in the economic prosperity of Australia.

Despite the importance of education for students and the economy, policymakers have not valued education and educators as they should. Australia is in the midst of a teacher

shortage. Administrative workloads have increased, more teachers are in temporary positions, they are increasingly teaching out of field and are seeing declining wages compared to other professions.

It is a myth that billions of dollars have been added to education budgets with nothing to show for it. Education expenditure has been steady in real terms with only slight increases since 2014 (too late to show up in PISA testing). These funding increases were targeted to specific cohorts and coincided with an improvement in NAPLAN scores among some of the most disadvantaged student cohorts. Yet international comparisons judge education expenditure as a proportion of GDP, and in this regard, Australia is failing.

Addressing falling education outcomes is achievable. This paper reviews the evidence from international randomised control trials to identify many educational programs that have proven to increase student outcomes. Not all will work in the Australian context. But new investments in education will allow programs to be developed that will arrest the decline in our education rankings.

Part 1 of this report examines where education outcomes are declining while Part 2 identifies the significant proportion of students whose education is underfunded. Part 3 reviews randomised control trials of education interventions globally to assess whether new policies can improve standards. Finally, we chart a path towards improving education outcomes starting with the funding mechanisms that enable teachers and administrators to deliver the best education programs available.



MICHAEL BUCKLAND
CEO, MCKELL INSTITUTE

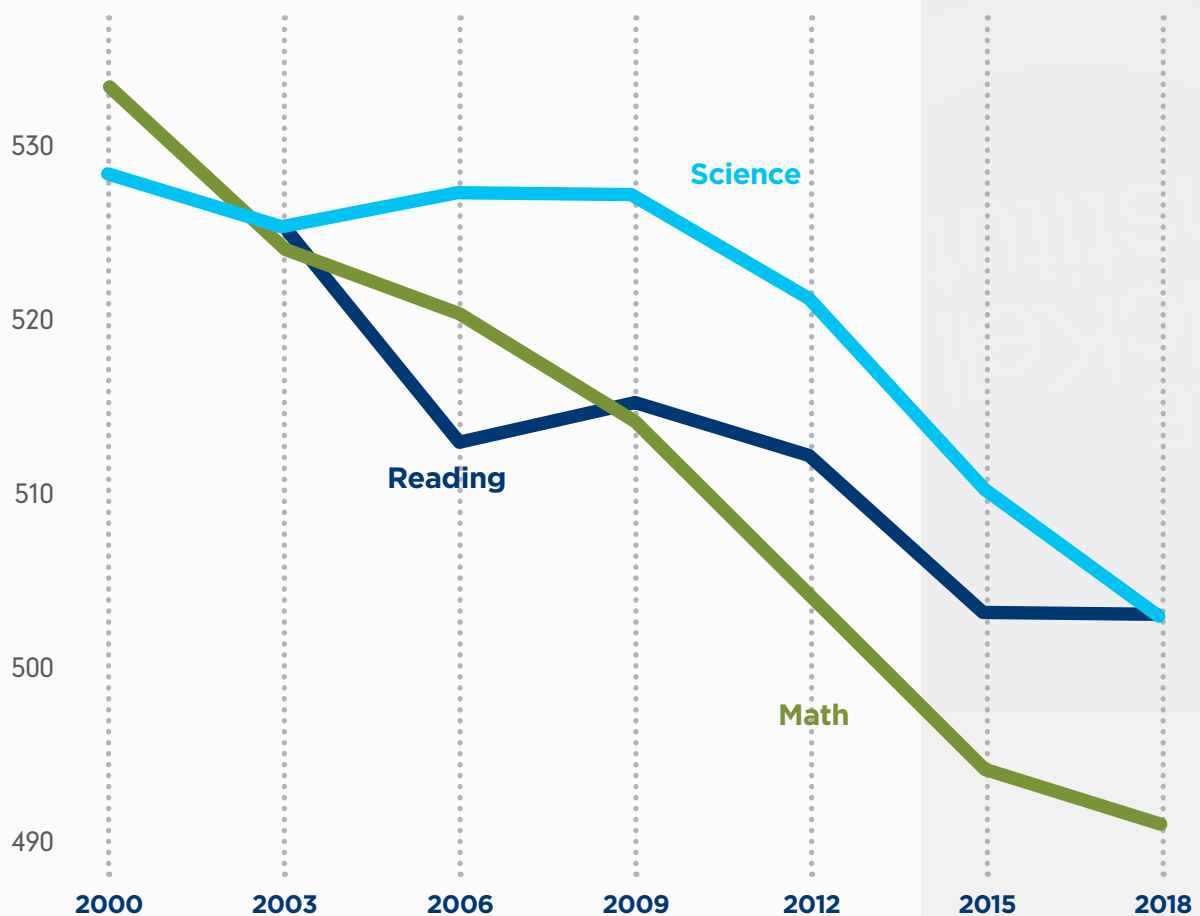
EXECUTIVE SUMMARY

65.1 per cent of students attend Government Schools, 19.5 per cent attend Catholic Schools and 15.4 per cent attend Independent Schools.

According to the OECD Teaching and Learning International Survey, Australian teachers spend the 3rd highest number of hours on management and administration in the OECD.

Since Australia first participated in PISA in 2000, **Australia's PISA scores have been steadily declining in all three categories (reading, mathematics, and science).**

FIGURE 1 AUSTRALIAN AVERAGE PISA SCORES OVER TIME



Source: Author calculations and PISA scores provided by ACARA

16 countries have overtaken Australia in

mathematics PISA scores since 2000 (including Canada, Switzerland, United Kingdom, Belgium, France, Denmark, Iceland, Sweden, Ireland, Austria, Norway, Czech Republic, Germany, Poland, Latvia, and Portugal).

NSW has experienced the largest decline in education standards of any state and territory in Australia:

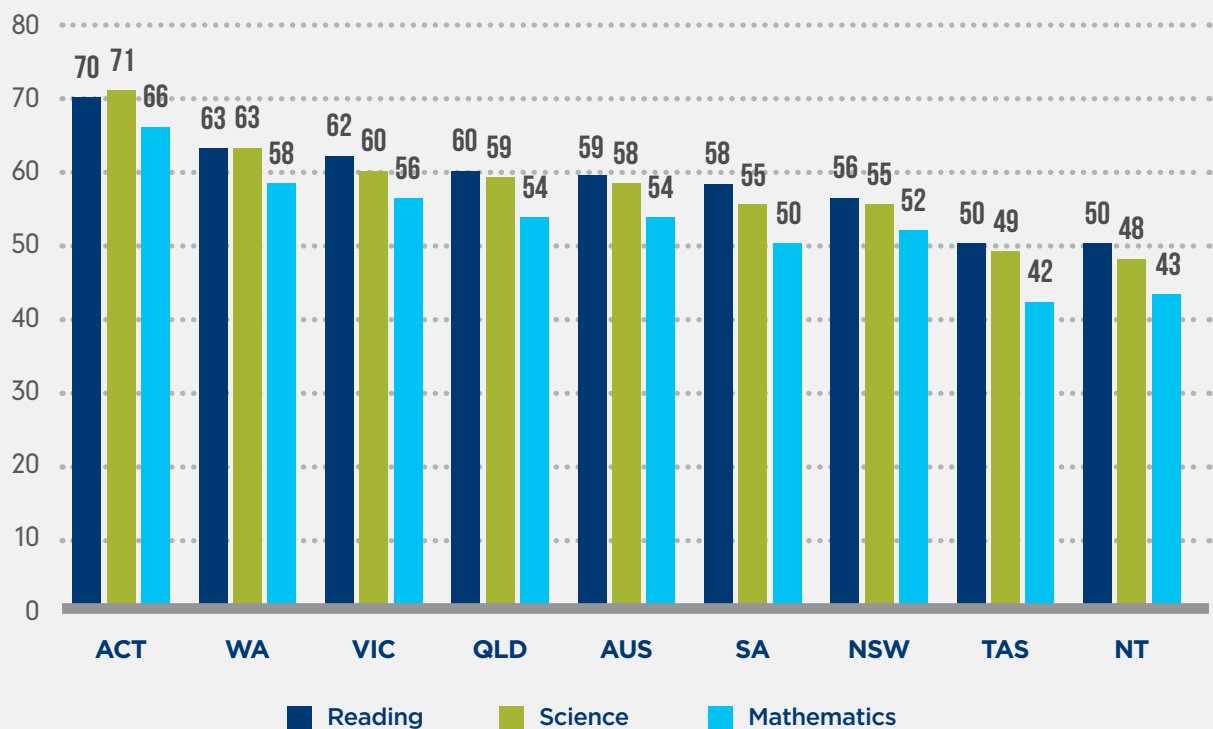
- NSW has experienced the largest decline in mean reading literacy of any state and territory in Australia since 2000.

- NSW had the largest decline in mathematics scores since 2012 and was one of only four states to record declines.

- All jurisdictions experienced declines in scientific knowledge since 2015, except Victoria and the Northern Territory.

- Just 56 per cent of NSW students achieved the National Proficiency Standard in 2018, lower than any state except Tasmania and the Northern Territory.

FIGURE 5 PERCENTAGE OF STUDENTS ACROSS AUSTRALIA ACHIEVING NPS IN 2018



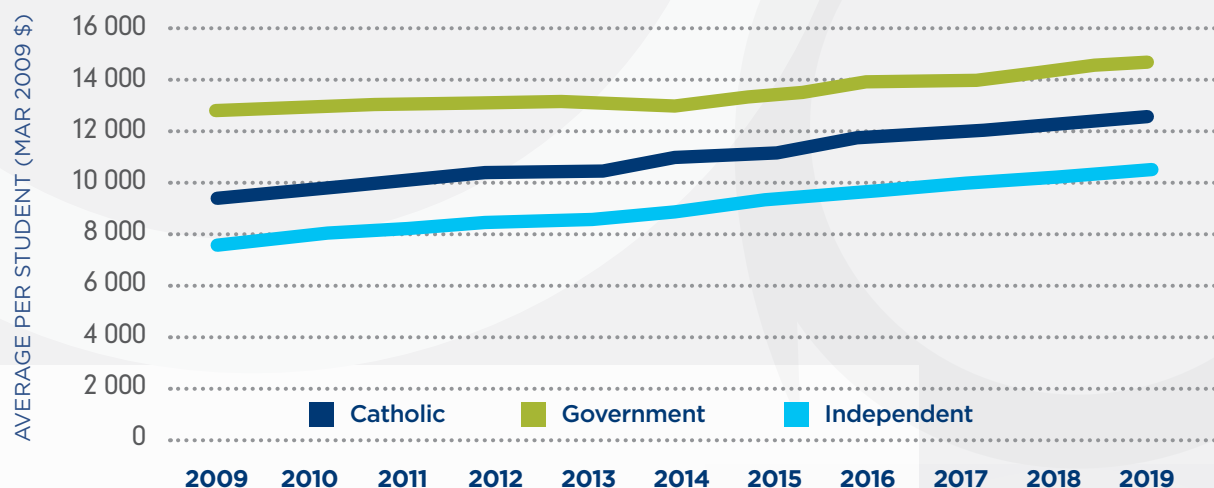
Source: NSW Parliamentary Research Service¹

The current bilateral school funding agreements leave every state (except the ACT) public school funded to less than the Schooling Resource Standard.

Only the ACT has fully funded the Schooling Resource Standard as set out in the Gonski Reforms. The ACT has the highest mean PISA scores of any Australian jurisdiction.

Between 2009 and 2014, government expenditure on education in real terms was steady. Since then, funding has increased slightly (see Figure 6) but only in line with growth in GDP per capita.

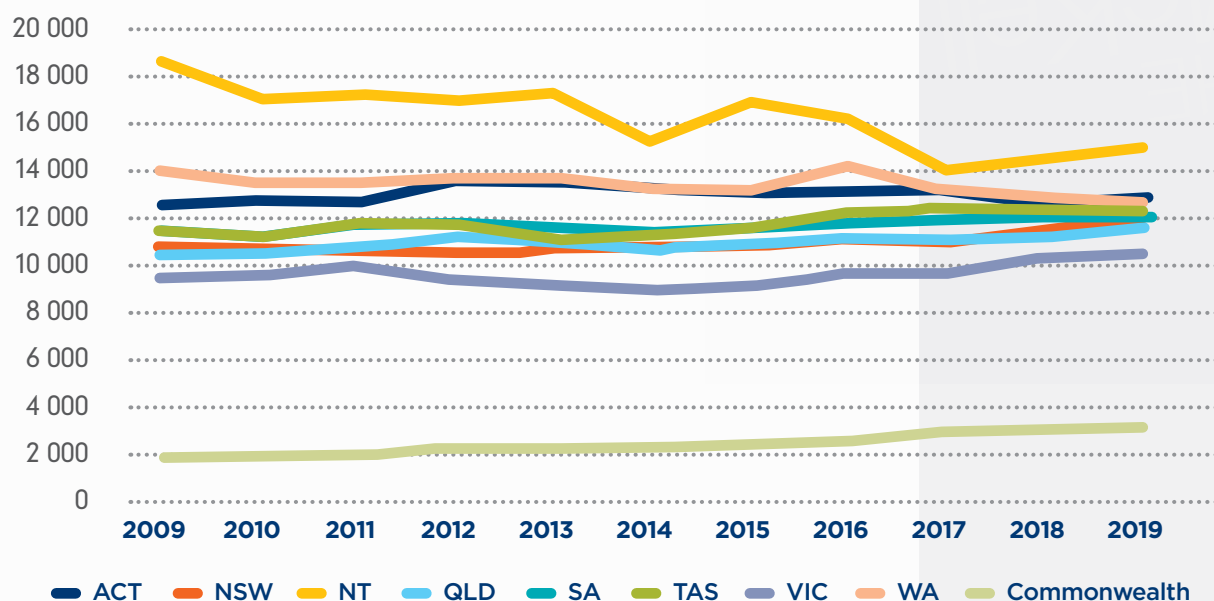
FIGURE 6 TOTAL GOVERNMENT RECURRENT FUNDING (2020 DOLLARS)



Source: NAPLAN data from ACARA

The commonwealth is accounting for almost all of the modest increase in education expenditure. States spending has been mostly steady for a decade.

FIGURE 15
REAL TOTAL GOVERNMENT RECURRENT FUNDING TO PUBLIC SCHOOLS PER STUDENT BY STATE



Source: ACARA Data, Consumer Price Index ABS 6401.0

NSW is the only major state with a mean PISA score below the national average.

TABLE 4 MEAN PISA SCORES BY STATE/TERRITORY

State/Territory	Mean PISA Score (2018)
ACT	535
WA	512
VIC	511
QLD (& the Australian Average)	503
SA	496
NSW	493
NT	481
TAS	479

Source: Reporting Australia's Results Vol 1

The average NSW Public school student is underfunded by \$1,550 to \$1,629 every year.

To regain leading status in PISA, mean scores must improve by:

- 46 in reading
- 78 in mathematics
- 48 in science

To change mean scores will require a mix of broad-based programs and targeted student support which can only be achieved by sustained investment in education.

PART ONE:

EDUCATION OUTCOMES ARE STAGNATING AND DECLINING RELATIVE TO OTHER COUNTRIES

The Australian education system is unique

Australia has a unique education system with a mixture of public and independent school systems, and a complex funding environment covering multiple government jurisdictions.

The constitution stipulates that school education is the responsibility of each state and territory and that they (each state and territory) should provide most of the funding for government schools (or public schools). In this context, public schools are those which are owned and operated by state or territory governments.² These schools are almost entirely funded by taxes and are nominally free for students to attend.

Catholic schools are owned by the Catholic Church in Australia, and the state Catholic education offices distribute funding and provide support to the Catholic dioceses in their state, which own and operate the schools. They also receive funding from federal and state governments, and they charge fees.³

Independent schools are non-government schools that are run by a variety of private non-profit organisations, however, most of them are governed by religious bodies. Like Catholic schools, they also receive funding from federal and state governments, and they also charge fees.⁴

In 2021, across Australia, government schools held the greatest share of enrolments with 65.1 per cent, followed by Catholic schools at 19.5 per cent, and lastly, independent schools at 15.4 per cent.⁵

Not only do Australian schools suffer from unequal funding distributions, but there is also a skills shortage that is impacting educational standards. Insecure employment is more prevalent in public schools where just 62 per cent of teachers are permanent/ongoing (Catholic 71 per cent and Independent 81 per cent). Additionally, 23 per cent of teachers in public schools are on a contract of one year or less, and only 37 per cent of teachers in their first three years are permanent or ongoing.⁶





Pressures on teachers are increasing

Teachers are the most vital in-school influence on the shaping of young minds. However, with teacher shortages, increased workloads, low pay, and an increasing amount of out of field teaching, how are students meant to maximally benefit from their passion, training, and experience?

Teacher shortages mean that more than one in four secondary teachers are teaching subjects they did not study at university. In special education, it's one in three teachers. Additionally, 30 per cent of public school teachers are temporary, which heavily impacts the continuity of learning in the classroom.

A 2018 study found that Australian teachers reported working an average of 140 to 150 per cent of their paid hours, with the largest proportion of non-face-to-face teaching time being spent on planning lessons, marking work, and the completion of general administrative tasks.⁷

According to the OECD Teaching and Learning International Survey, Australian teachers spend the 3rd highest number of hours on management and administration in the OECD. Worryingly, this focus on administration has been increasing.

A quarter of teachers surveyed by the Australian Institute for Teaching and School Leadership reported that they intended to leave the profession before they retired, with 87 per cent of those intending to leave citing reasons related to increased workload and coping.⁸ Further, insufficient pay was cited by 29 per cent of the workforce.⁹

The increasing challenges facing teachers have coincided with a decline in education outcomes.

The Program for International Student Assessment (PISA)

The Program for International Student Assessment (PISA) is an international study launched by the OECD in 1997, and first administered in 2000. It is a triennial assessment that is now administered in over 80 countries and compares data on 15-year-olds' performance in reading, mathematics, and science.¹⁰ The tests are designed to assess the extent to which participating 15-year-olds' have acquired and apply the key knowledge and skills essential for full participation in society.¹¹

While this report draws and on uses PISA scores to measure Australian education standards over time (as it provides for international comparison), that's not to say that the internationally administered test is without drawbacks or criticism. For example, in the most recent PISA examination, three in four Australian students reported that they did not try their hardest when it came to the test and that they would have invested more effort if the results counted toward their overall marks.¹²

When it comes to measuring our education standards and achievements quantitatively, there are several sources that we can draw from, be it PISA, National Assessment Program–Literacy and Numeracy (NAPLAN), or HSC. Depending on how these assessments are approached and the results are interpreted, each can tell a different story as to whether progress in education is being made.¹³ Each test has its own assumptions and objectives.

Thus, while PISA scores can serve as a useful benchmarking and evaluation tool, the impact and utilisation of PISA can also be linked to the dominant contemporary framing of educational policy, namely, a certain articulation and theorisation of human capital.¹⁴ With the advent of the global economy, countries across the world have seen the production of high-quality human capital through schooling systems as the best economic policy and insurance for a competitive advantage in the future.¹⁵ Policymakers and politicians use comparative performance on PISA

(nationally, over time, and internationally) as a substitute or proxy measure of that future.¹⁶

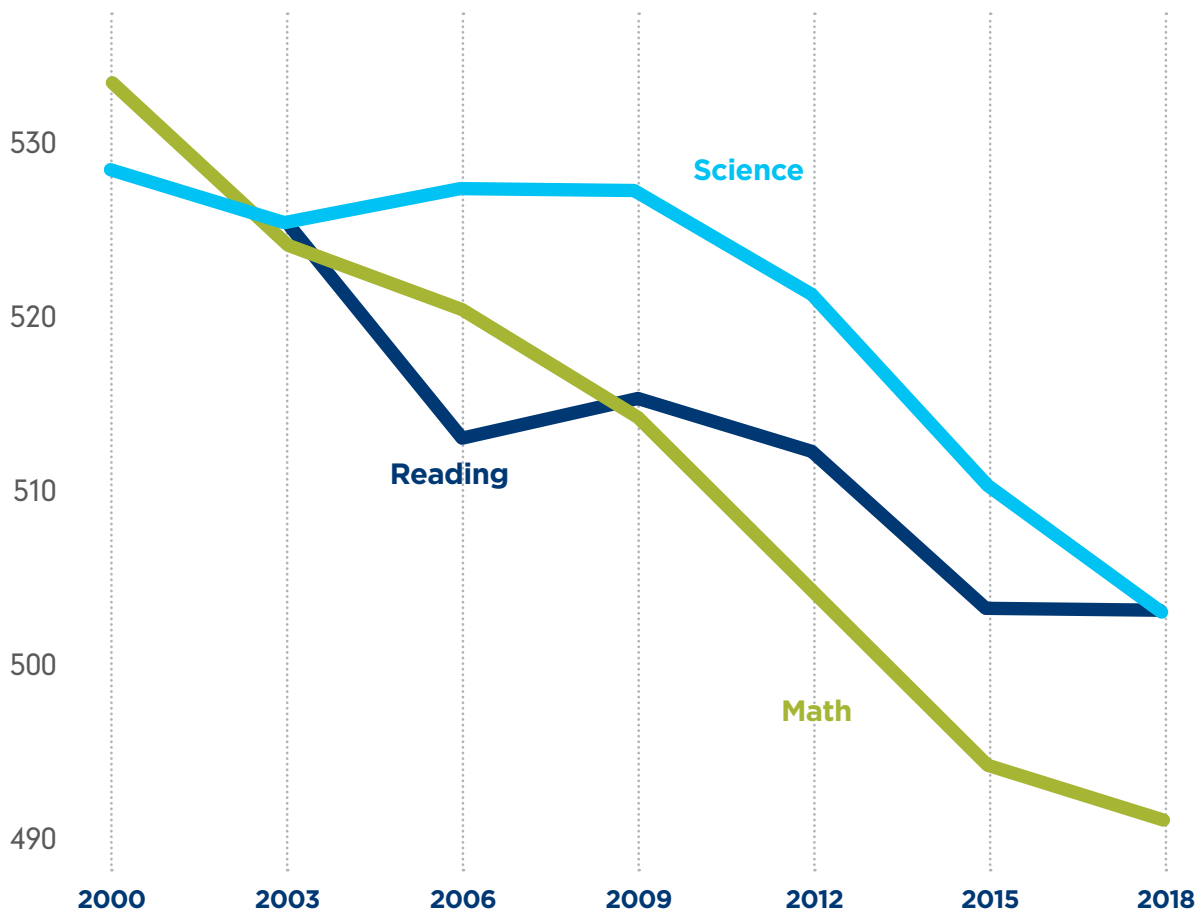
While quantifiable achievement does not represent the entire purpose of schooling, and while PISA has some major flaws, both international (PISA) and domestic (NAPLAN) reports tell similar stories of stagnation, if not decline.¹⁷

Yet, we must be careful of an overreliance on comparative analyses and make sure that we view such comparisons in context, as top-ranking PISA countries are often socially, culturally, demographically, geographically, and linguistically different to Australia.¹⁸ All these features impact educational policy and performance.

Australia's PISA performance is declining

Since Australia first participated in PISA in 2000, the long-term trends in all three categories show that Australia's scores have been steadily declining (see Figure 1). Of particular concern is that the most rapid declines have been observed amongst the country's lowest-achieving students. Performance in mathematics has been declining since 2000, and in science since 2012. In the latter two categories, performance declined to a similar extent at the top and the bottom of the performance distribution, as well as on average.¹⁹

FIGURE 1 AUSTRALIAN AVERAGE PISA SCORES OVER TIME

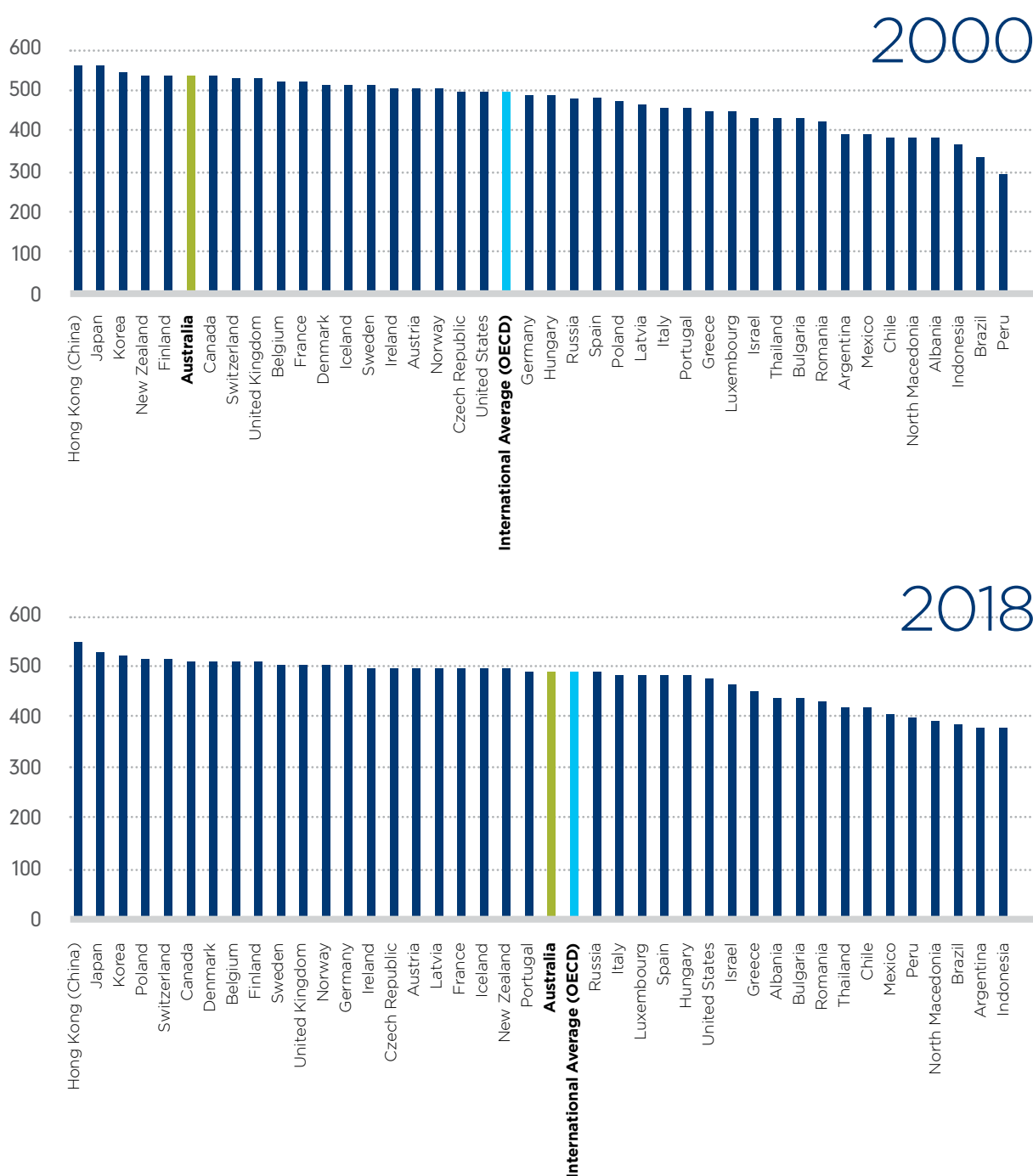


Source: Author calculations and PISA scores provided by ACARA

After years of decline, the latest PISA scores (2018) show that Australian students only barely managed to exceed the OECD average in mathematics. When considering these results in the context of Australia's relative performance over time, of the 35 countries whose maths results were lower than Australia's in their first PISA assessment (2000), sixteen of them now outperform Australia (see Figures 2 and 3).

FIGURES 2 AND 3

AVERAGE PISA MATHEMATICS SCORES (USING AVAILABLE DATA) IN 2000 AND 2018



Source: Author calculation using data from PISA data explorer

Canada, Switzerland, United Kingdom, Belgium, France, Denmark, Iceland, Sweden, Ireland, Austria, Norway, Czech Republic, Germany, Poland, Latvia, and Portugal have all overtaken Australia in PISA mathematics scores since 2000.

Over the nearly two decades of Australia's participation in PISA, the proportion of low performers has increased, while the proportion of high performers has decreased in each domain.²⁰ Additionally, the proportion of students who attained the National Proficient Standard (a demonstration of more than the minimal skills expected) has also declined in each category (see Table 1).²¹

TABLE 1 CHANGES IN AUSTRALIA'S PERFORMANCE OVER TIME

Changes in...	Reading Literacy (2000-2018)	Mathematical Literacy (2000-2018)	Scientific Literacy (2000-2018)
Average performance	▼ 26 points	▼ 33 points	▼ 24 points
Proportion of low performers	▲ 7 per centage points	▲ 8 per centage points	▲ 6 per centage points
Proportion of high performers	▼ 4 per centage points	▼ 9 per centage points	▼ 5 per centage points
Proportion of students who attained the National Proficient Standard	▼ 10 per centage points	▼ 13 per centage points	▼ 9 per centage points

Source: PISA in Brief I – Student Performance²²

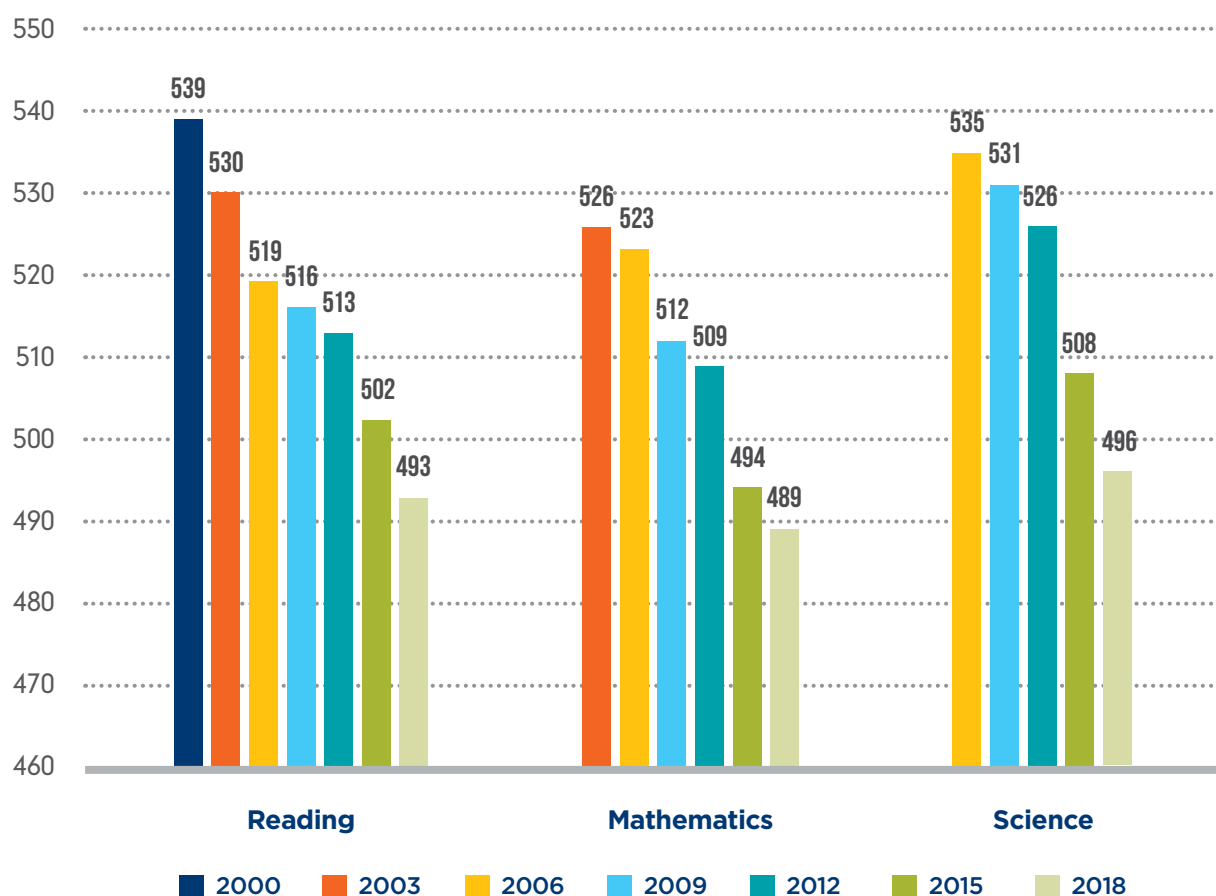
NSW is the largest Australian jurisdiction and has experienced the largest decline in reading literacy since 2000. Since 2000, the mean score has declined by 9 per cent, from 538.8 and to 493.

Note that the 2021 PISA test was rescheduled for 2022 and the 2024 test was moved to 2025, both changes being due to post-COVID difficulties.²³

NSW's PISA trends are worrying

Over time, NSW's PISA scores have declined by 46 points in reading, 37 points in mathematics, and 39 points in science (see Figure 4). This is a worrying finding in an increasingly bleak report card.

FIGURE 4 NSW PISA MEAN SCORES OVER TIME

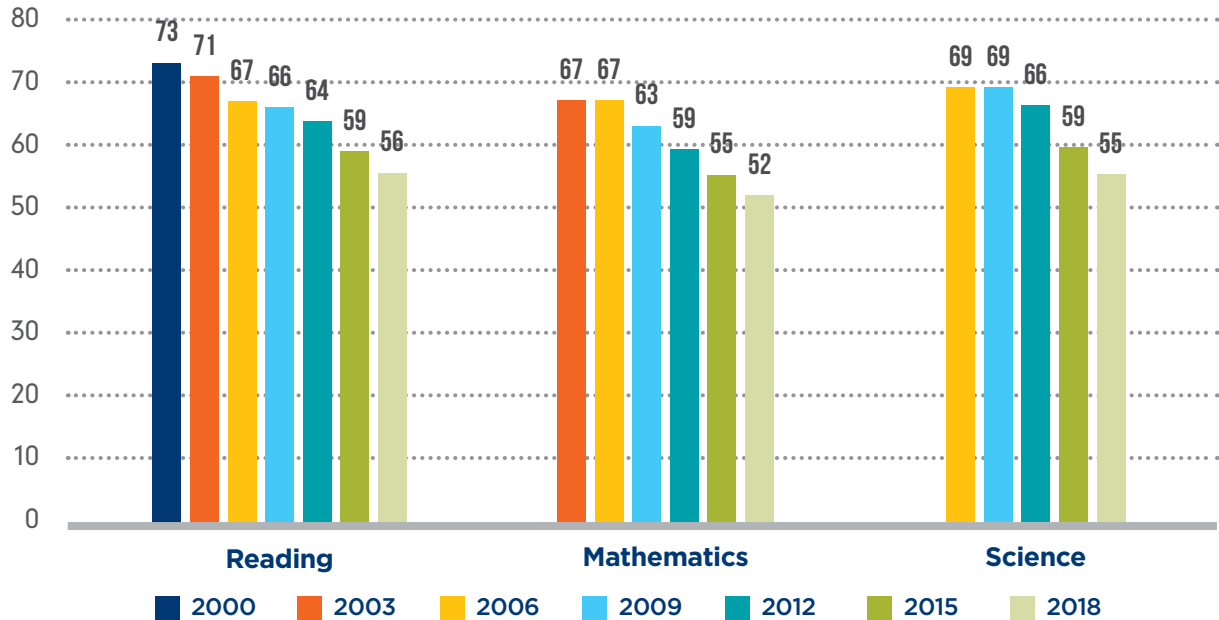


Source: NSW Parliamentary Research Service²⁴

To aid the comprehension of PISA scores, PISA provides a profile of student reading, mathematical, and scientific literacy performance using proficiency levels—categories that summarise the knowledge and skills that students are consistently able to display.²⁵ In Australia, the National Proficiency Standard for PISA has been set at a level where most students should be able to complete “challenging but reasonable” tasks most of the time.²⁶

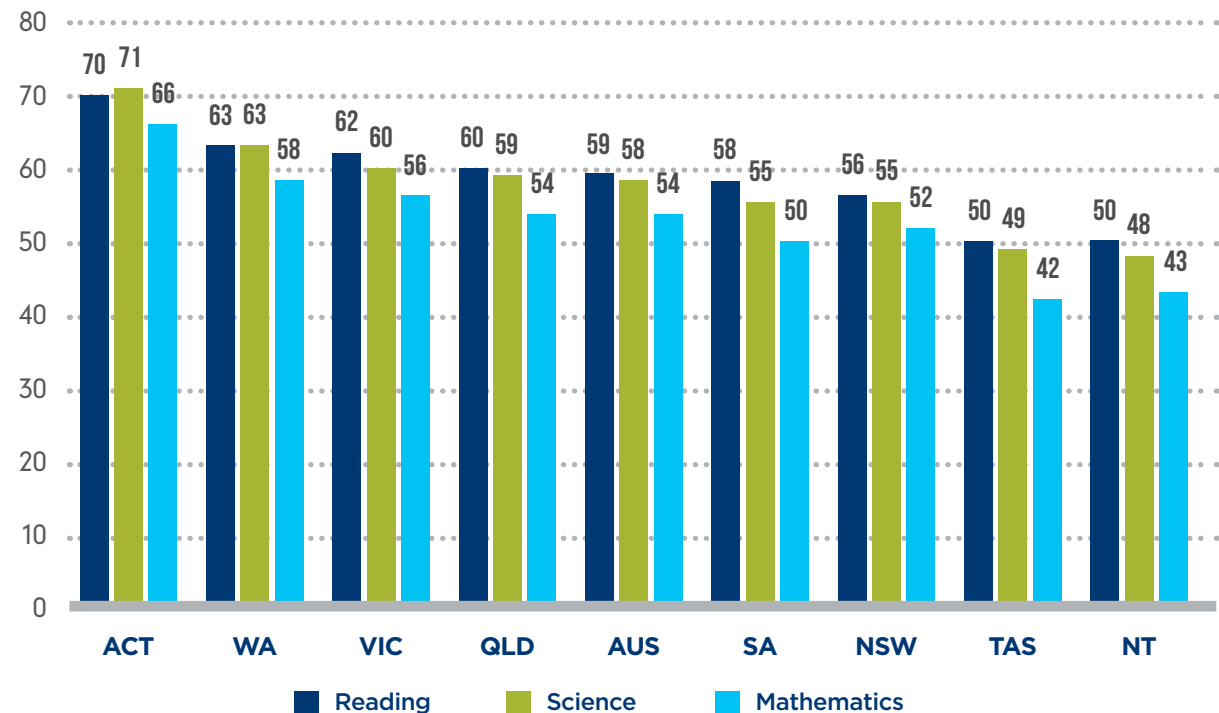
The proportion of NSW students attaining the National Proficient Standard (NPS) has declined by 17 per cent for reading, 15 per cent for mathematics, and 14 per cent for science (see Figure 5). In 2018, in each of the three areas, almost half of NSW students did not meet the NPS. Further, the proportion of students who attained the NPS was lower than the national average (see Figure 6).²⁷

FIGURE 5 PERCENTAGE OF NSW STUDENTS ACHIEVING THE NPS (2000-2018)

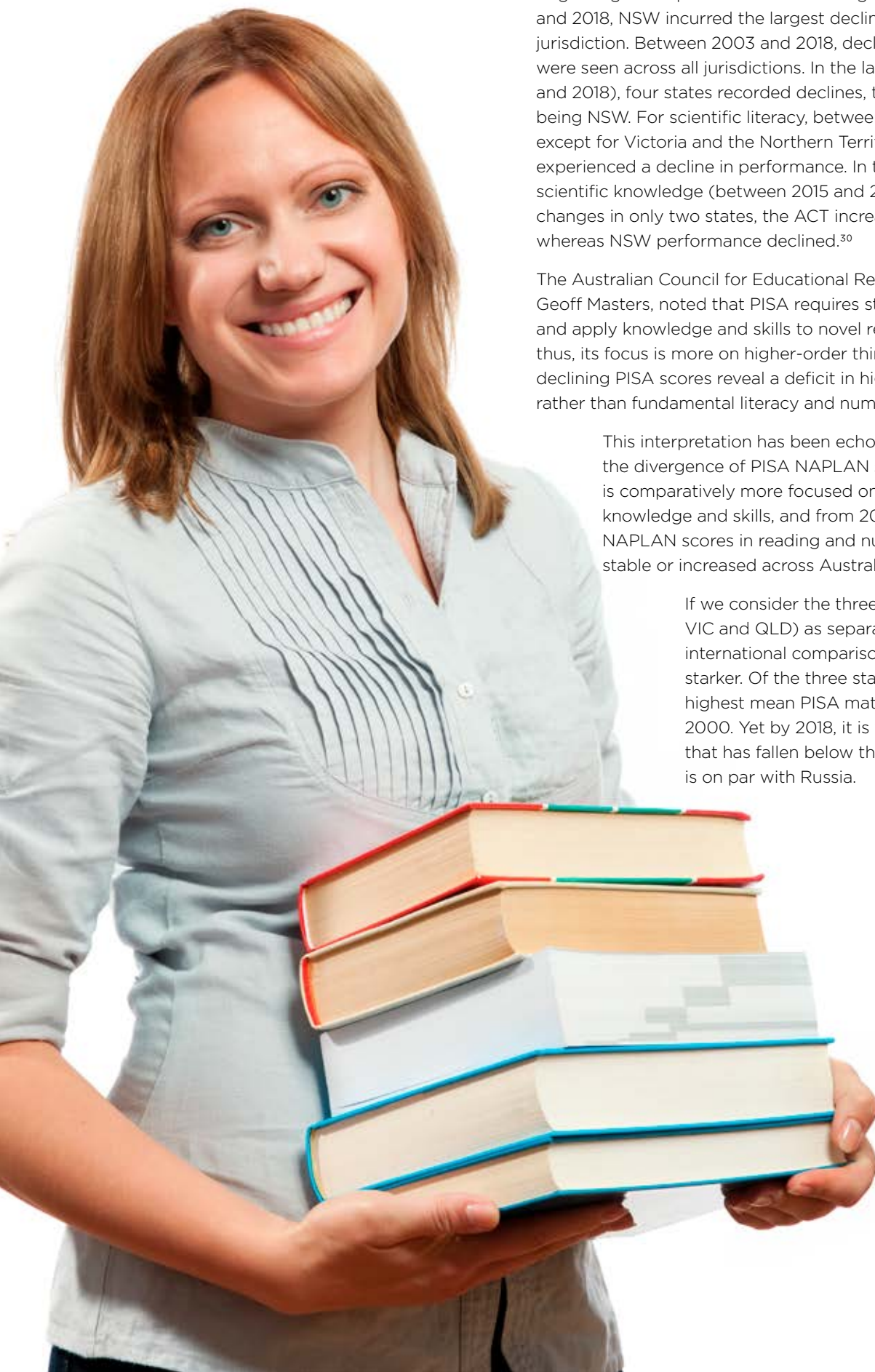


Source: NSW Parliamentary Research Service²⁸

FIGURE 6 PERCENTAGE OF STUDENTS ACROSS AUSTRALIA ACHIEVING NPS IN 2018



Source: NSW Parliamentary Research Service²⁹



Regarding mean performance in reading literacy between 2000 and 2018, NSW incurred the largest decline of any Australian jurisdiction. Between 2003 and 2018, declines in mathematics were seen across all jurisdictions. In the last two cycles (2012 and 2018), four states recorded declines, the largest of these being NSW. For scientific literacy, between 2006 and 2018 except for Victoria and the Northern Territory, all jurisdictions experienced a decline in performance. In the last cycle for scientific knowledge (between 2015 and 2018), there were changes in only two states, the ACT increased its literacy, whereas NSW performance declined.³⁰

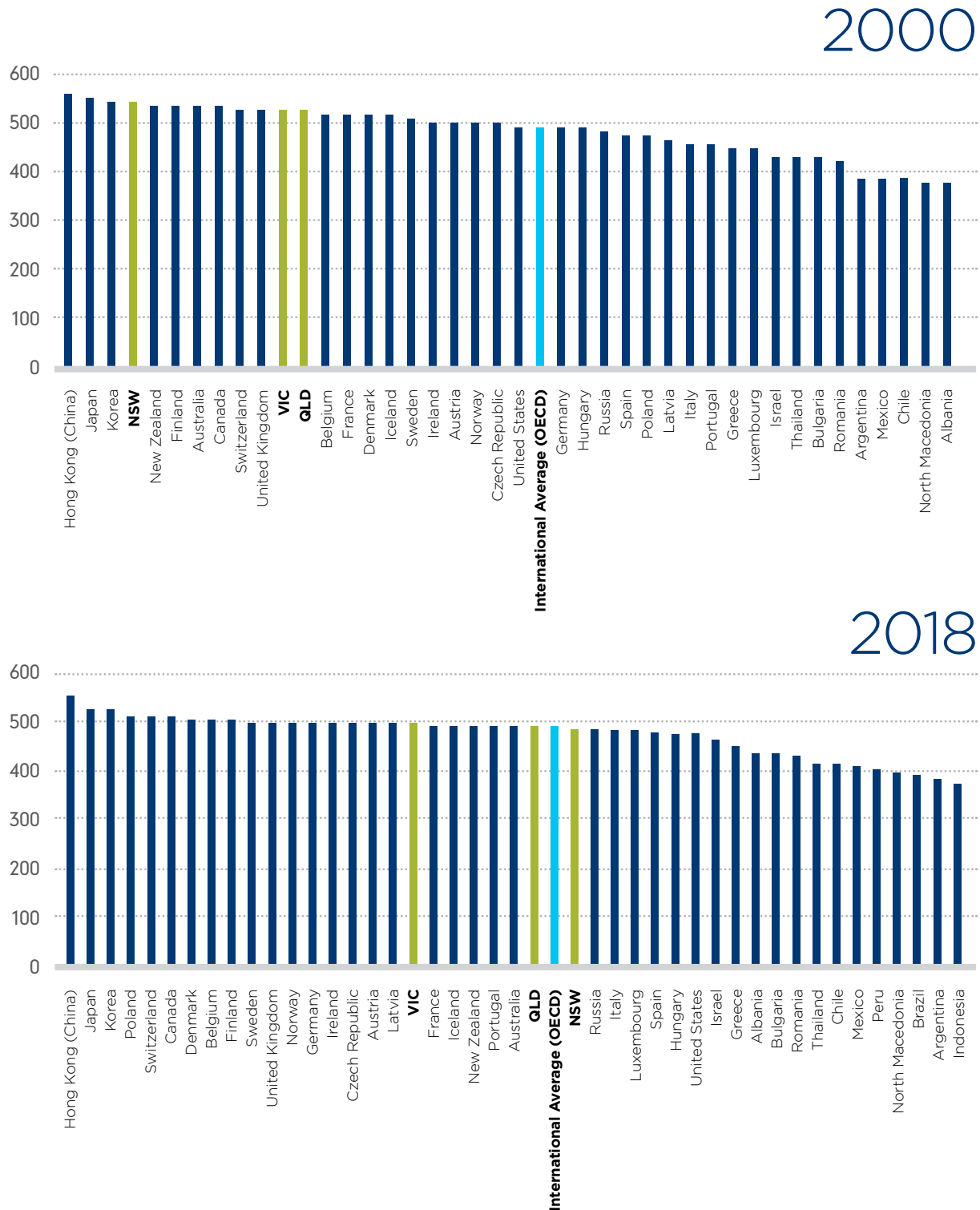
The Australian Council for Educational Research (ACER) CEO, Geoff Masters, noted that PISA requires students to absorb and apply knowledge and skills to novel real-world situations, thus, its focus is more on higher-order thinking. This means that declining PISA scores reveal a deficit in higher-order thinking, rather than fundamental literacy and numeracy skills.³¹

This interpretation has been echoed by those watching the divergence of PISA NAPLAN scores. NAPLAN is comparatively more focused on fundamental knowledge and skills, and from 2008 to 2019 mean NAPLAN scores in reading and numeracy remained stable or increased across Australia and in NSW.³²

If we consider the three largest states (NSW, VIC and QLD) as separate jurisdictions in international comparisons, the decline is starker. Of the three states, NSW had the highest mean PISA mathematics score in 2000. Yet by 2018, it is the only major state that has fallen below the OECD average and is on par with Russia.

FIGURES 7 AND 8

MEAN PISA MATHEMATICS SCORES FOR NSW, QLD, AND VIC IN AN INTERNATIONAL CONTEXT (2000 AND 2018)



Source: Author calculation using data from PISA data explorer



NAPLAN vs PISA

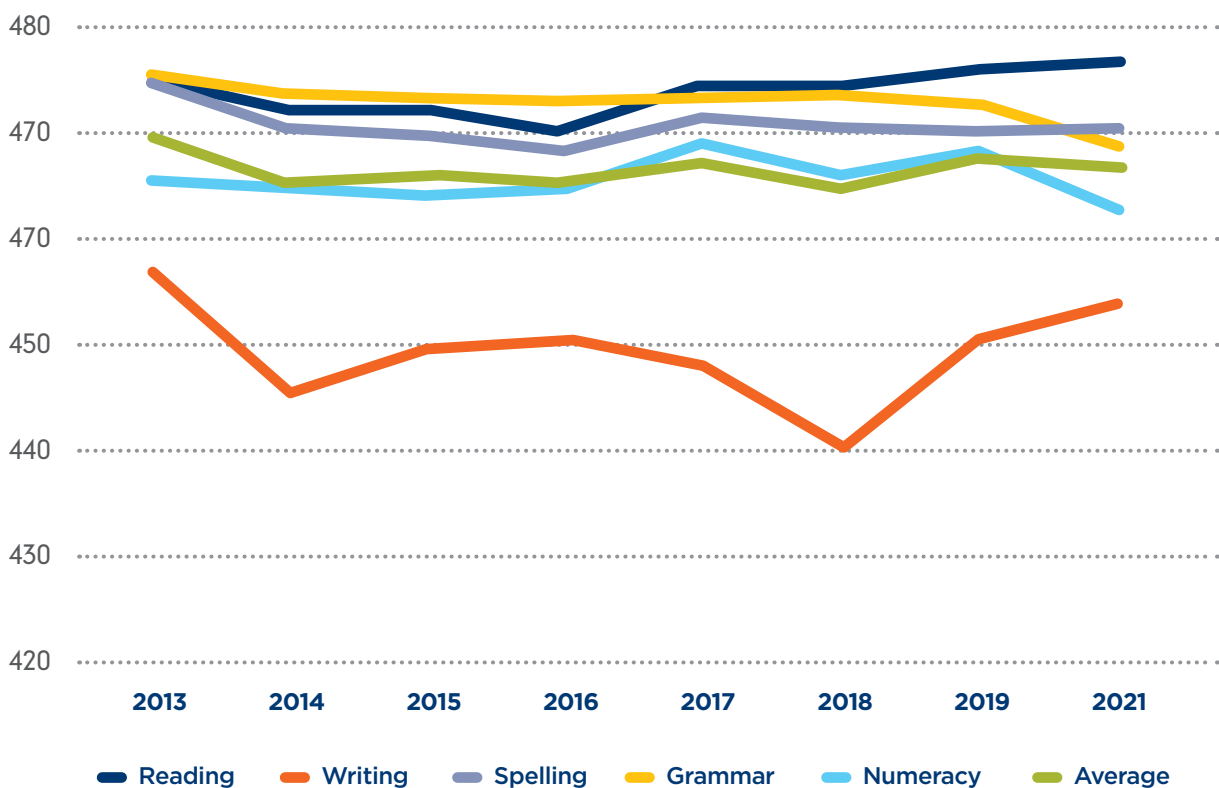
As has been firmly established in the previous sections, PISA scores have been declining for decades. However, the NAPLAN scores for year nine students (who are of comparable age) have stayed stable or even shown slight improvement in equivalent subjects since testing began in 2008.³³ While both tests claim to assess similar skills, the difference is in the application of information and the way that questions are asked.

PISA requires comparatively greater higher-order thinking and application skills, as the questions are designed to ascertain how well students can extrapolate information or formulae from what they have learned and apply that knowledge in unfamiliar settings.

For example, in the 2018 PISA reading example 'Rapa Nui', students are asked to read and assess sources of information in terms of their veracity, accuracy, and relevance. They are then directed to support which theory they subscribe to, providing evidence (as cited in the sources) for their choice. By contrast, in the 2016 Year nine NAPLAN reading test, students were provided with a 'magazine' of one-page articles and simply directed to answer a series of multiple-choice comprehension questions.³⁴

NAPLAN scores have been relatively stable over time, showing some slight improvements in recent years.

FIGURE 9 AVERAGE NAPLAN SCORES - TOTAL STUDENTS



Source: NAPLAN data from ACARA

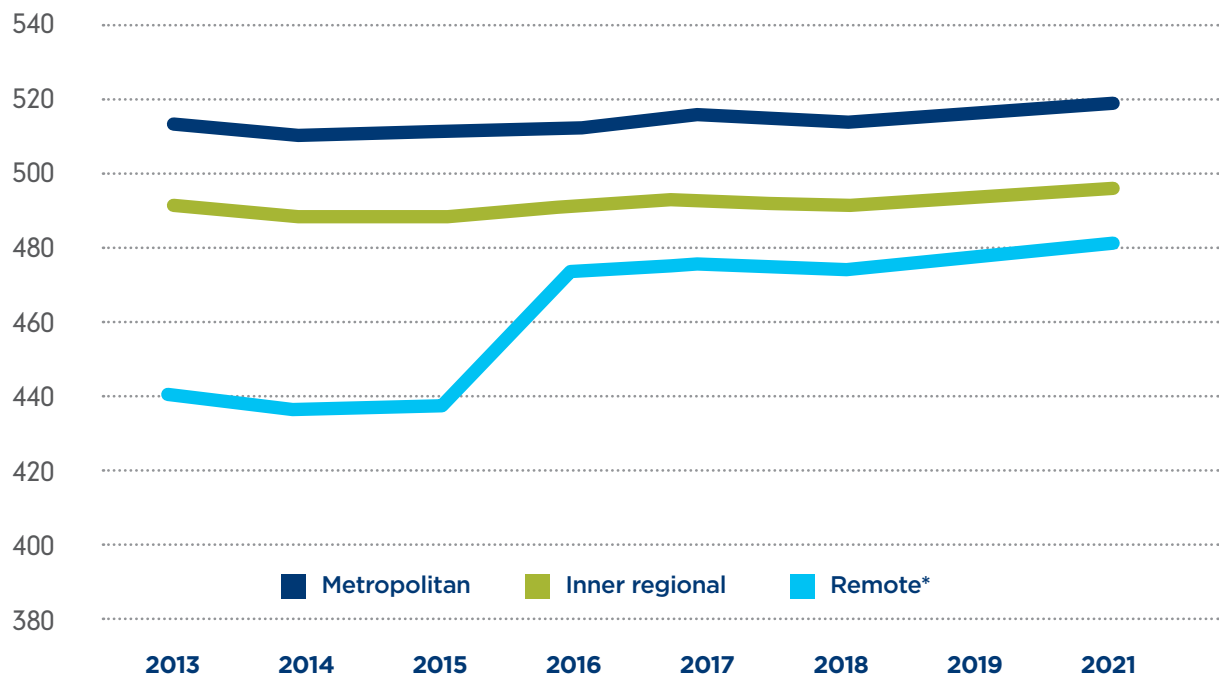
The relative stability of the NAPLAN scores and the decline of PISA scores sheds light on the difference between focusing on basic literacy and numeracy comprehension skills and fostering the ability to engage in deep thinking.³⁵ According to Geoff Masters:

This matters because PISA assesses skills that will be increasingly important in the future. Unlike many tests and examinations, PISA does not assess students' abilities to recall facts or basic literacy and numeracy skills. Instead, it assesses the ability to transfer and apply learning to new situations and unseen problems. This requires an understanding of fundamental concepts and principles, as well as the ability to think. It is in these areas that Australian 15-year-olds' performances are declining.³⁶

The back-to-basics focus of the NAPLAN tests risks making the decline of Australia's PISA scores even starker in the future.³⁷ Yet there are positive signs that policymakers' decisions can impact student outcomes.

Ten years ago, the Gillard Government began the shift to needs-based education funding as part of the 'Gonski' reforms. Since then, average NAPLAN scores among many of these cohorts have improved. Our experience to date, suggests that funding has an impact on student outcomes.

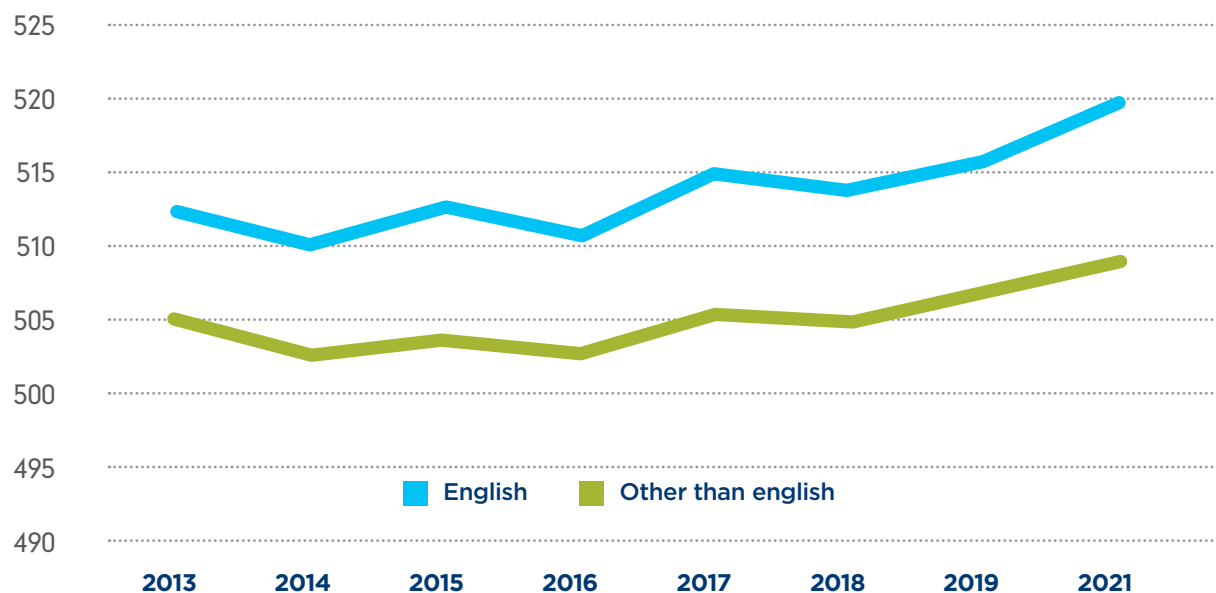
FIGURE 10 AVERAGE NAPLAN SCORES BY SCHOOL REMOTENESS



Source: NAPLAN data from ACARA

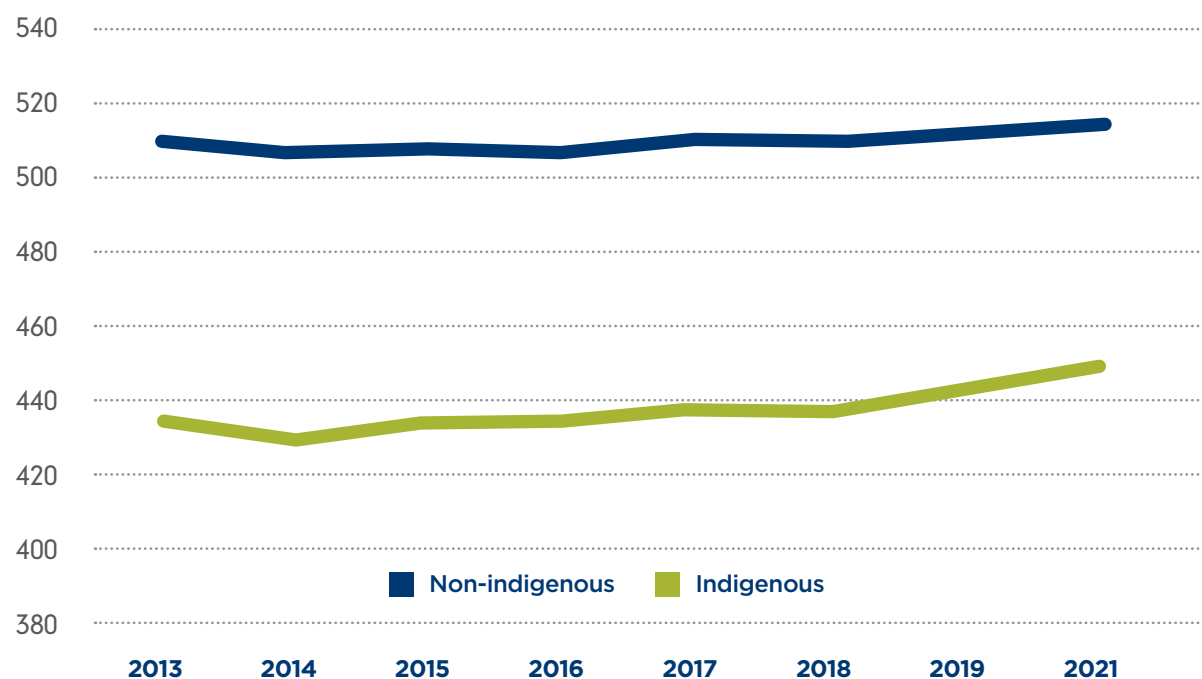
*An accounting change for remoteness classification took place in 2016.

FIGURE 11 AVERAGE NAPLAN SCORES BY LANGUAGE BACKGROUND



Source: NAPLAN data from ACARA

FIGURE 12
AVERAGE NAPLAN SCORES FOR ABORIGINAL AND TORRES STRAIT ISLANDER STUDENTS



Source: NAPLAN data from ACARA



PART TWO: MOST AUSTRALIAN SCHOOLS ARE UNDERFUNDED

The Gonski reforms and Schooling Resource Standards

State and territory governments are responsible for the delivery of school education in each of their respective jurisdictions. And while the federal government does not own or operate any schools *per se*, it provides the balance of funding to government schools. It also provides the majority of funding to non-government schools.³⁸

Using data from the Department of Education, Skills, and Employment, we can see that approximately three-quarters of Catholic school funding and less than one-half of funding for independent schools comes from the public purse, compared to the 95 per cent of funding for government schools.³⁹ Federal government funding is allocated based on an estimate of how much government funding each school requires to meet the educational needs of its students. This estimate is calculated by reference to the Schooling Resource Standard (SRS), which provides a base amount for every primary and secondary student.⁴⁰ The SRS approximates how much total public funding a school needs so that it can meet the educational needs of its students.⁴¹

For many non-government schools, the base amount is discounted or reduced by the anticipated capacity of the school community to financially contribute towards the school's operating costs.⁴² This is called the 'capacity to contribute' assessment and it is based on a direct measure of the median income of parents and guardians of the students and at the school. This money is then provided to the state and territory governments and to organisations such as the Catholic education system—which then distribute the money to individual schools according to their own formulas.⁴³

Due to far-reaching dissatisfaction among educational stakeholders in terms of the overall equity of the funding system, 2011 saw a major review led by David Gonski.⁴⁴ The primary goal of the review was to “develop a funding system for Australian schooling which is transparent, fair, financially sustainable, and effective in promoting excellent outcomes for all Australian students”.⁴⁵ In general, the review argued that funding should aim to ensure that differences in educational outcomes were not the result of non-school factors such as a student’s socioeconomic background.⁴⁶

The review recommended a national approach to needs-based funding with both the Federal, state, and territory governments contributing additional funding to ensure schools are adequately resourced, as measured by the SRS.⁴⁷ Further, it recommended that “a significant increase in funding is required across all schooling sectors, with the largest part of this increase flowing to the government sector due to the significant numbers and greater concentration of disadvantaged students attending government schools. Funding arrangements for government and non-government schools must be better balanced to reflect the joint contribution of both levels of government in funding all schooling sectors”.⁴⁸

In other words, the report recommended that governments reduce excessive payments to schools that didn’t need them and redirect funds to those that did. However, government funding boosts to private schools outpaced increases

to public schools in the decade to 2017.⁴⁹ This disparity is blamed on states’ reluctance to contribute enough funding as well as a significant increase in Commonwealth spending. As the federal government predominantly funds private schools and only contributes approximately less than a quarter of public school funding, more of that money goes to Catholic and independent schools.⁵⁰

So, while the Gonski report advocated for a needs-based funding system, a decade on, many schools are still not receiving all the needs-based, per-student funding that was intended by the review recommendations.

Students’ education is not funded to the minimum Schooling Resource Standard

The SRS is the minimum funding required for schools based on ensuring at least 80 per cent of their students achieve learning outcomes above the national minimum standard in NAPLAN for reading and numeracy.⁵¹

As part of the Gonski reforms, the Commonwealth has set out a plan to fund 80 per cent of non-government schools and 20 per cent of government schools, while the states would cover the remaining 80 per cent. This way every school would receive at least 100 per cent of the SRS.

TABLE 2 COMMONWEALTH POLICY TOWARDS THE FUNDING OF THE SRS

Level of Government	Government schools	Non-government schools
Commonwealth	20%	80%
State	80%	20%

Source: Department of Education⁵²

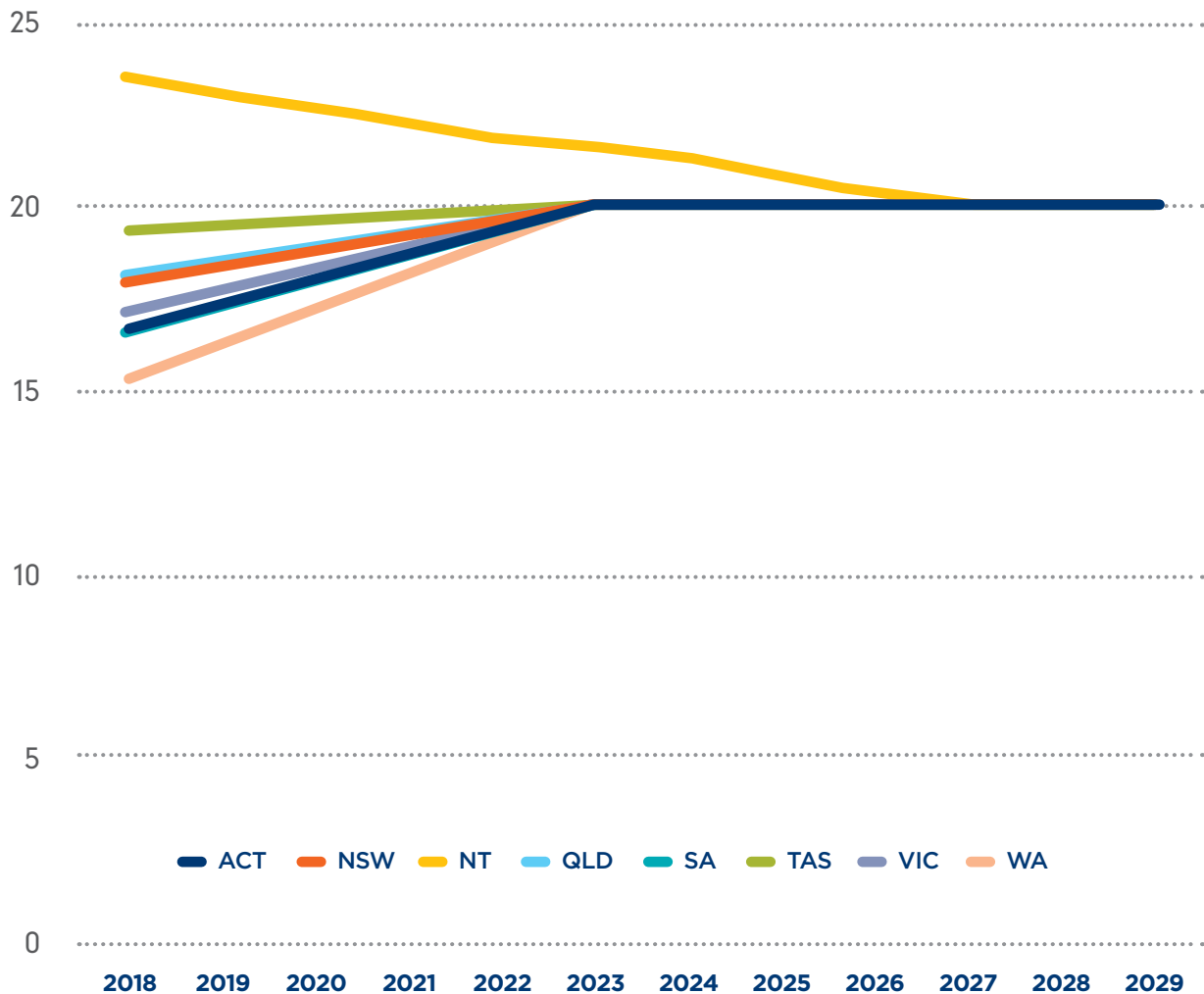
However, not all schools are on a path to be funded to the SRS, which may affect student education outcomes. As a sector, independent schools across Australia are funded to the amount of the SRS (some in excess).⁵³ From 2022, independent schools are funded to 100 per cent of the SRS in every state and territory except the Northern Territory.⁵⁴

However, public schools are not funded to the SRS in any state or territory, except the ACT.⁵⁵ In his 2021 report, Economist Trevor Cobbold

calculated that, "the total underfunding from 2021 to 2029 will amount to \$57.9 billion. They will be underfunded by \$6-7 billion annually over the period."⁵⁶

From 2023, the Commonwealth's contribution to public schools will have reached the 20 per cent target. Therefore, the underfunding of Government schools is due to the failure of States to outline a pathway to reach their 80 per cent contribution towards the SRS.

FIGURE 13 COMMONWEALTH SHARE OF THE SRS (GOVERNMENT SCHOOLS)



Source: NAPLAN data from ACARA

Despite the Commonwealth policy, only one jurisdiction (ACT) has agreed to fund the full 80 per cent of Government Schools SRS. The other jurisdictions, except the NT, have agreed to fund at least 75 per cent, but only from 2027-2032.⁵⁷

TABLE 3 STATE SRS FUNDING RATES AND TARGET FUNDING RATES

State/ Territory	2022 Funding	2023 Funding	The year in which the 75% funding target is to be reached
ACT	80	80	Already reached
WA	75	75	Already reached
SA	75	75	Already reached
TAS	73.85	74.08	2027
NSW	71.80	72.22	2027
VIC	69.68	70.43	2028
QLD	69.26	69.26	2032
NT	58.5	59	Not specified

Source: National Schools Agreement, Bilateral Agreements⁵⁹

Under these agreements, public school students receive less than the agreed standard level of funding for their education. Even at the completion of the bilateral agreements from 2027-2032, with states funding 75 per cent and the Commonwealth 20 per cent, Government schools will still be underfunded by five per cent of the SRS.

This may be an underestimate of public school underfunding. The 2011 Review of Funding for Schooling (Gonski Review) specified that the Schooling Resource Standard represented the annual recurrent funding and not capital costs.

“The resource standard proposed by the panel is a recurrent resource standard, which includes a provision for general maintenance and minor acquisitions (such as computers and general equipment below established capitalisation thresholds) but does not include capital costs associated with debt servicing or the acquisition of fixed assets such as land and buildings.”⁶⁰

However, provisions in the bilateral agreements with each state allow up to four per cent of the SRS in the Government sector to be deducted to account for capital depreciation and some other expenses such as the NSW Education Standards Authority or school transport in Queensland. The underfunding of the SRS may therefore be much larger than they appear.

TABLE 4 SCHOOLING RESOURCE STANDARD FUNDINGS GAP (GOVERNMENT SCHOOLS)

State/ Territory	2023 Funding Gap (inc. capital expenditure allowance)	2023 Funding Gap (exc. Capital expenditure allowance)
ACT	0	0
WA	5	9
SA	5	9
TAS	6	10
NSW	8	12
VIC	9	13
QLD	11	15
NT	21	25

Source: Authors calculations using National Schools Agreement, Bilateral Agreements⁶²

More than a decade after the Schooling Resource Standard was first proposed, most public school students are underfunded by more than ten per cent. Further, there is currently no pathway agreed upon by any state (except the ACT) to reach the full 100 per cent funding of the SRS.

For each state to fully fund the SRS, they must contribute 80 per cent of funding for Government Schools. Only the ACT has committed to achieving this while the others are seeking to reach 75 per cent by the late 2020s.

While SRS funding and PISA scores are not necessarily causally linked, the ACT has the highest mean PISA scores and is the only state to fully fund the SRS. They are followed by WA, which has reached its 75 per cent target. NSW is the only large state to score below the Australian average.

TABLE 5 MEAN PISA SCORES BY STATE/TERRITORY

State/Territory	Mean PISA Score (2018)
ACT	535
WA	512
VIC	511
QLD (& the Australian Average)	503
SA	496
NSW	493
NT	481
TAS	479

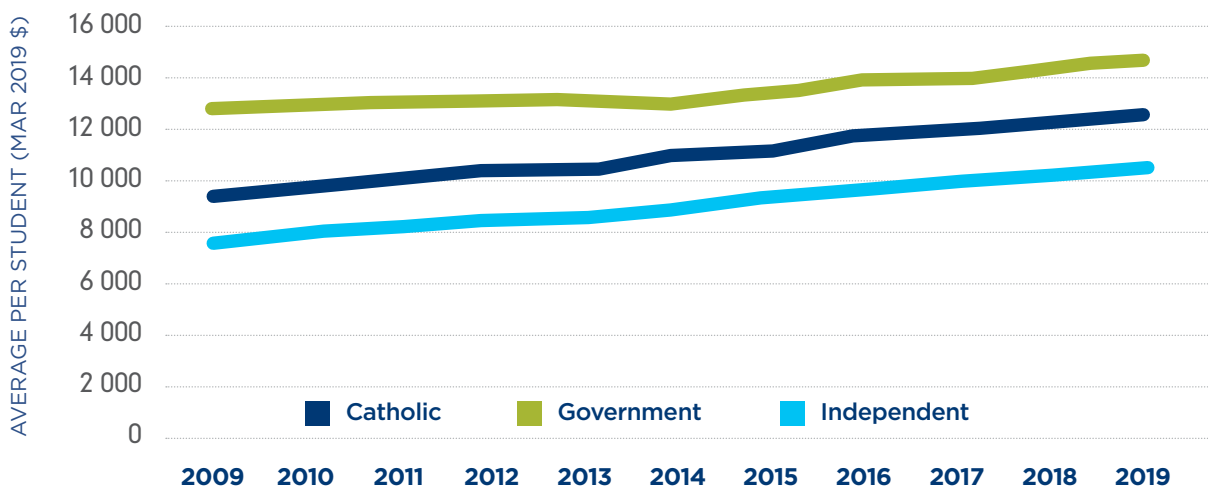
Source: Reporting Australia's Results Vol 1⁶³

Addressing the underfunding of public education should be a priority for states that are underachieving or declining in education outcomes. This includes South Australia, Tasmania, the Northern Territory, and New South Wales.

Education expenditure has not risen as expected

Contrary to popular belief, government funding per public school student has not increased substantially since the Gonski reforms, education expenditure on public schools in the ten years before the pandemic has been steady, with only slight increases in real terms since 2015.

FIGURE 14 REAL TOTAL GOVERNMENT RECURRENT FUNDING PER STUDENT

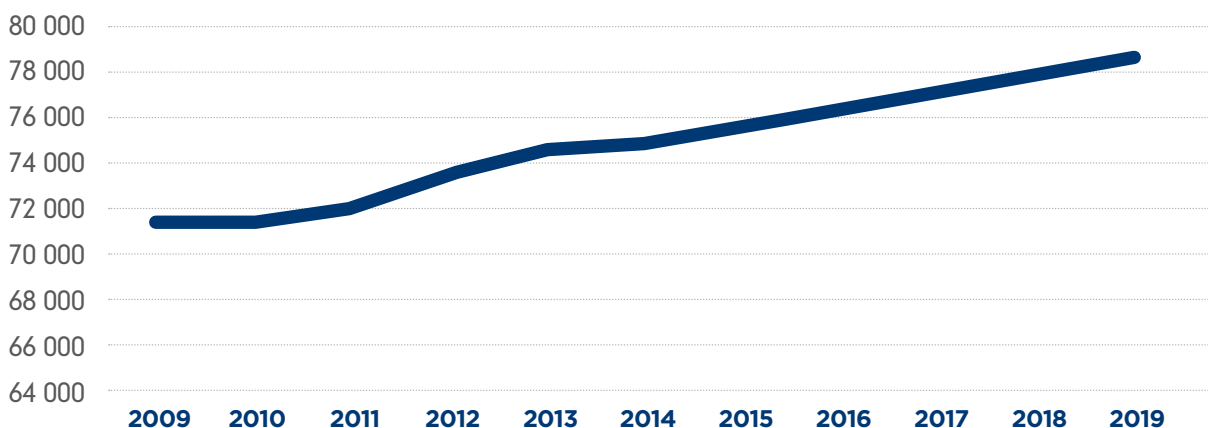


Source: ACARA Data, Consumer Price Index ABS 6401.0

Where increases are observable is among Catholic and Independent Schools. In the ten years to 2019, Government funding increased by an average of 1.45 per cent per year while Catholic and Independent school funding grew by 3.08 and 3.30 respectively.

The international standard for measuring education expenditure is for it to be scaled to GDP.⁶⁴ This reflects a nations commitment to education as a share of the economy, rather than the basket of goods represented by the Consumer Price Index. When the 1 per cent average annual increase in GDP per capita (Figure 16 below) is considered, any additional investment in public education can be viewed as marginal.

FIGURE 15 REAL GDP PER CAPITA



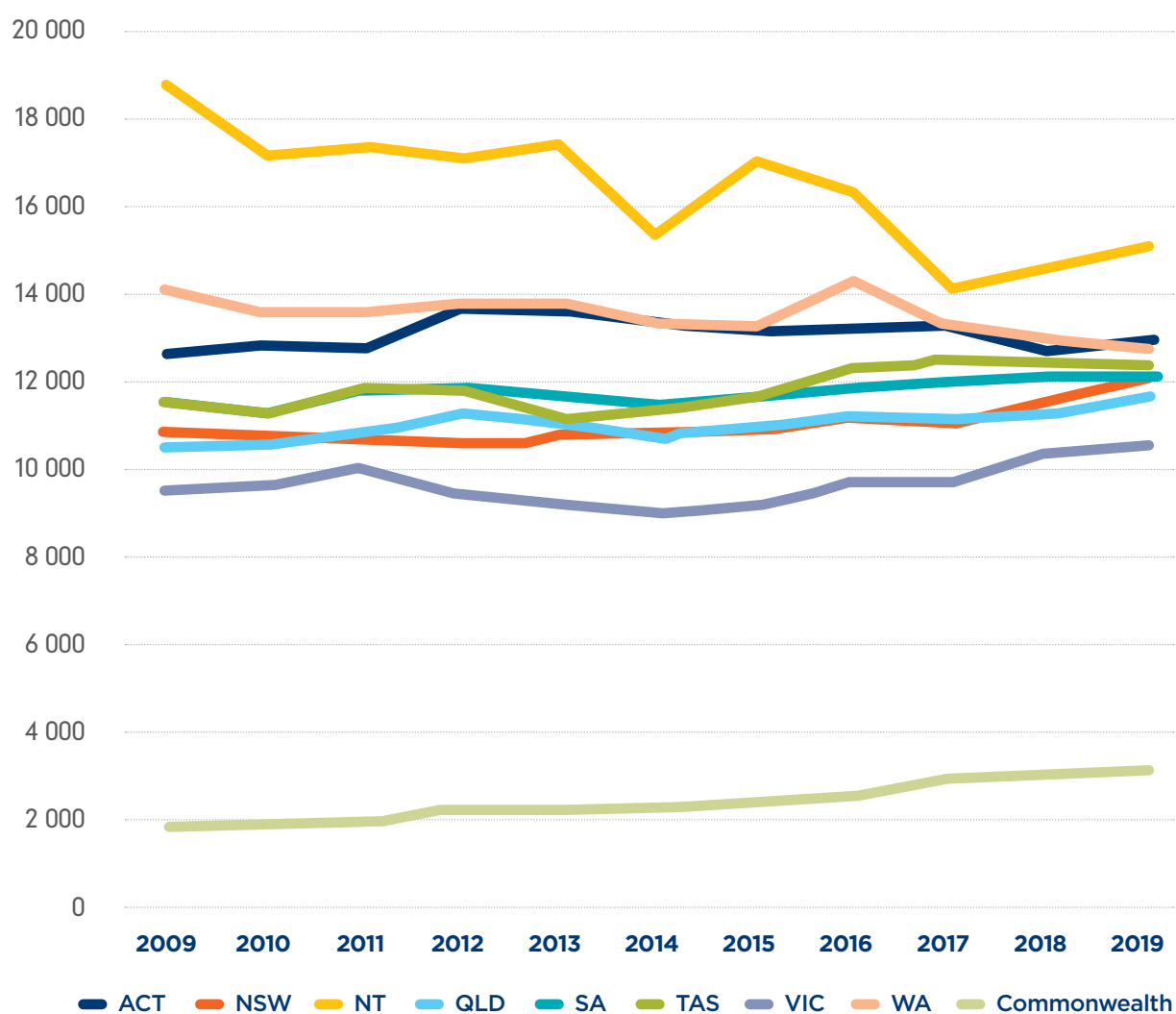
Source: ACARA Data, Consumer Price Index ABS 6401.0, National Accounts ABS 5206.0



Considering education expenditure aggregated nationally, masks differences in state and federal funding. We therefore examine the funding of public schools by each level of Government.

FIGURE 16

REAL TOTAL GOVERNMENT RECURRENT FUNDING TO PUBLIC SCHOOLS PER STUDENT BY STATE



Source: ACARA Data, Consumer Price Index ABS 6401.0

We can see that Commonwealth expenditure has risen consistently, by 58 per cent in the ten years to 2019, albeit off a lower base. Victoria has increased expenditure strongly (16 per cent) from 2014. NSW has shown no increase in expenditure until a recent increase from 2018.

CASE STUDY

NSW PUBLIC SCHOOL STUDENTS MISS OUT ON THOUSANDS OF DOLLARS EACH YEAR

The SRS is complex but includes a base level of funding and then additional loadings provided based on four categories of student need. Schools themselves have two further loadings based on need.

The key components are:

- Base Funding
- 4 student loadings
 - Disability
 - Low-English proficiency
 - Aboriginal and Torres Strait Islander student loading
 - Socio-educational disadvantage loading
- 2 school-based loading
 - School size
 - School location⁶⁵

According to 2019 estimates from the NSW Parliamentary Budget Office, we expect that the average student is missing out on \$1,629 per year, with students receiving higher loadings, or those attending schools with higher loadings, missing out by more.

In his review of the Schooling Resource Standard, Adam Rorris forecast that NSW

public schools would be underfunded by \$1,275,297,677 in 2023.

This equates to an average of \$1,550 taken from each NSW public school student and is consistent with other estimates.⁶⁶

The average level of student underfunding masks the fact that the underfunding is more severe for students and schools with the highest needs. Assuming the 8 per cent NSW funding gap in 2023 is replicated among each component of the SRS, a smaller, regional secondary school is missing out on approximately \$26,086 in school size loadings alone.

While many students will be more adversely affected than others, each student relies on the base SRS funding rate, which is \$12,522 for primary students and \$15,736 for secondary students in 2012.

These figures represent the minimum level of underfunding per student only, with the average being 26-59 per cent higher.

PART THREE:

MANY EDUCATIONAL INTERVENTIONS ARE PROVEN TO WORK

The most effective policy options

The academic literature on education policy evaluation allows us to identify and rank the most effective policy reforms ever studied. We provide a full list of the 15 most effective policies (*henceforth* 'top 15') in Appendix 1, which we divide into five groups.

- **Broad student programs.** These policies affect the whole student population, without discriminating between the least and most struggling students. They include interventions such as a reduction in class size and group counselling.
- **Targeted student programs.** These policies target lower-performing students. They include policies such as tutoring and other programs designed to improve their outcomes.
- **Teacher programs.** These programs aim at improving student outcomes through teacher interventions. They include professional training in teaching and day-to-day support.
- **Charter schools.** These, rather than commonly used policies, are new initiatives. They are US schools that receive public funding but operate independently from the US public school system. They are a hot topic in the US education literature. However, this intervention is less relevant in the Australian context.
- **New curriculum.** These are policies that propose a curriculum change. They are sometimes thought to be attractive since they can be relatively cheap to implement.





Methodology

PISA SCORES AS EFFECT SIZES

Before being published, the OECD staff rescales the PISA scores. In particular, they rescale them to fit a Normal distribution with a mean of 500 and a standard deviation of 100 score points.⁶⁷ This procedure has several benefits, among which is the fact that a 10-point difference on the PISA scale is interpretable as an effect size of 0.1. This means that, for instance, if Australia wanted to improve its Reading score by 10 points, it would have to pass a policy capable of shifting the Reading score distribution by 0.1 standard deviations.

While this might sound rather abstract, it turns out to be useful in the context of the academic literature on education. Here, the effect of education policies is most often measured in terms of standard deviations. Therefore, for instance, Australia would have to pass policies shifting its Mathematics score by 0.2 standard deviations to catch up with a country 20 points ahead in Mathematics.

WHAT ARE STANDARD DEVIATIONS?

The standard deviation (s.d.) of a set of values (such as the PISA score of a country in a given topic) is a measure of how far they are from their mean value. In statistics, it is said to be a measure of the spread of a random variable. Together with the mean, the s.d. tells us some key information about how the distribution of a variable looks like.

In practice, one s.d. in a variable whose values are all close to the mean will be different—smaller—than one s.d. in a variable whose values are spread out, far from the mean.

FROM US IMPACTS TO AUSTRALIAN IMPACTS

Most of the academic literature measuring the effect size of education policies is focused on the United States. Hence, to say something about how those policies would affect the test scores of Australian students, we need a way to convert US estimates into Australian ones.

To achieve this, we rely on some simplifying assumptions:

1. The effect size of a policy on a standardised test on Mathematics or Reading is the same as the effect size of that same policy on the PISA test. Thanks to this assumption we can treat the US effect sizes found in the literature as effects on US PISA scores.
2. The policy effects are persistent over time. This implies, for instance, that a policy that improves the mathematics score of an eighth-grade student by 0.4 s.d., will also improve the same student's mathematics score in the following grades by the same amount.

As mentioned, policy effects are measured in s.d. terms. In general, a standard deviation effect will translate into a different number of points gained/lost if applied to the Australian or US PISA score distributions. However, in practice, the two distributions happen to be very similar, so that a 0.5 s.d. effect would shift the US 2018 PISA Reading distribution by 53.94 points and the equivalent Australian distribution by 54.33 points.

To convert the impact of a US policy on the PISA Reading or Mathematics score into an Australian impact, we simply multiply the US policy impact (in s.d. units) by the standard deviation of the Australian Reading or Mathematics scores. Formally, for a policy impacting a given field (Reading or Mathematics),

$$\text{AUS policy impact} = \text{US policy impact} \times \text{AUS PISA s.d.}$$

The resulting value tells us how much a US policy would shift the Australian score distribution of the relevant field.

- a. Effect size can be defined as $\delta = (\mu_1 - \mu_2)/(\sigma)$, where subscript 1 indicates the group affected by the policy (treatment group); subscript 2 the group not affected (control group); μ_g indicates the mean of group g, and $\sigma_1 = \sigma_2 = \sigma$ is the standard deviation of the population of groups 1 and 2.
- b. In other words, this assumes that interventions in the U.S. are "externally valid" in applying to Australia. In many instances, there are good reasons to believe this is true. In others, differences between Australia and the U.S. suggest that randomised controlled trials (RCTs) in Australia would be valuable.
- c. The US 2018 PISA Reading score s.d. is 107.89 and the equivalent s.d. for Australia is 108.66

Interesting interventions and their policy costs are worth exploring

In this section, we outline some interesting interventions that have worked overseas. A full list of the 15 most effective interventions based on our literature review encompassing international studies can be found in the Appendix.

That said, as with most empirical research, these studies aren't without their limitations. For some interventions, later evaluation in an Australian context has cast new light on the program. For example, the Reading Recovery program has been assessed positively overseas, but a recent examination in Australia cast doubt on its effectiveness and found no evidence of long-term success.⁶⁸ Chapman and Tunmer⁶⁹ and May et al.⁷⁰ both found that first-grade students do not always have long-term retainable literacy skills two or three years after completing the Reading Recovery program.

We also provide estimates for the per-student cost of implementing those policies. All the estimates are expressed in inflation-adjusted 2021 Australian Dollars. These costs are not fixed, they are indicative and although they've been adjusted for inflation, they're still based on the US studies and the years they were conducted. If these programs were implemented in Australia, the costs may vary.

BROAD STUDENT PROGRAMS

Class size. Class size is one of the most studied topics in the economics of education literature. Krueger (1999) is a fundamental part of this literature, and it studies the effects on student performance of a class size reduction from 22 to 15 students — in the context of the Tennessee STAR experiment.⁷¹ IT found substantial success, though also high costs of implementation. Such a policy is capable of improving the Australian PISA score by 10 points in mathematics and 14.5 in reading.

TARGETED STUDENT PROGRAMS

Targeted student programs have the advantage of directing funds and efforts to those that benefit the most from them. Their per-student cost often is high relative to programs with a broader base, but they have the potential to have stronger impacts while also addressing disadvantage.

Group counselling. The Student Success Skills (SSS) model takes a different approach to helping students in school. It uses group counselling (45 minutes a week for 8 weeks) to aid students in developing academic, social, and self-management skills, which are vital to succeed both in and out of school. Campbell and Brigrman find that this program led to an improvement in Reading equivalent to 25.9 PISA Reading points.⁷² The cost of implementation is modest too, around \$215 per student. The reason for this is that it takes advantage of existing school counsellors, to which only an additional 3-day training is provided.

Targeted tutoring. Several studies have provided good evidence that tutoring is effective in reducing the reading gap between low-performing students and their peers. While the effects are mostly similar, the costs vary significantly across programs. Blachman et al. study a program assigning 50 minutes of individual daily tutoring 5 days per week for 10 months.⁷³ This proves very effective (79 PISA points gained). The two programs studied by Jenkins et al. trade off little gains (73 and 70 PISA points, respectively).⁷⁴

Bringing this logic to the extreme is the program analysed by Pullen et al., which uses volunteer tutors to implement a range of instructional strategies.⁷⁵ The costs are not reported and hard to estimate, but they would be by far the lowest among similar interventions. The effect on reading skills is virtually unchanged though, with an estimated effect of 68 PISA points.

Home visits. Some interventions can get quite personal, as they use home visits to boost learning. Peebles trials a simple but effective idea.

Parents of students struggling with learning how to read in first grade receive a 1-hour visit by a researcher. During this visit, they are taught how to help their child with their reading. This has a remarkable effect of 103 PISA-equivalent Reading points and, while the costs are not reported, they would be in the lower range — our guess being at \$200 per student.⁷⁶

In addition to home visits, the Perry Preschool program assigned highly disadvantaged preschool pupils to 2.5 hours per week of preschool — as opposed to no preschool (Weikart et al., 1970). The impact on reading skills is high but lower than Peeples, while the costs are much greater (around \$15,883 per pupil).⁷⁷

Small groups. Torgesen et al. and Zvoch and Stevens study programs targeting low-performing students using additional instruction in small groups. In the former, students at risk of reading disabilities are supported by both teachers and computers. In the latter, students participate in an intensive summer program. Costs and impacts are similar, with the program in Torgesen et al. delivering a 76 PISA points increase at 1368 per student and the program in Zvoch and Stevens 75 points at \$1860.⁷⁸

NEW CURRICULUM

Curricula are appealing and powerful policy instruments. They are easy to scale up and cost-effective—although per-student costs are often not provided in the literature and are hard to compute. They require careful design and some teacher training, but if found impactful they can be quickly implemented countrywide. In the empirical literature, this approach has been found to be strong in improving both the math and reading skills of students.

On the mathematics front, the Spatial-Temporal Math curriculum has proven very effective in the US. It is an interactive software which provides personalised instructions. It presents mathematical concepts to 2-5 Grade students via pictures and games, taking a spatial-temporal approach. Rutherford et al. find that this curriculum increased PISA-equivalent math

scores by 26.7 points.⁷⁹ Based on the current official pricing of ST Math, purchasing the licenses for a whole school would cost \$43.6 per student to the average-sized Australian primary school.

It should be noted that many of the most successful curriculums are implemented very early on, as early as childcare. Layzer et al. analyse several curricula and finds that two of them had an effect comparable to 59 and 55 PISA Reading points, respectively, on the performance of children in childcare.⁸⁰ The preschool curriculum “Literacy Express” increased the math scores by 25.3 PISA-equivalent points and the Reading score by 50. Finally, a curriculum that adds phonetic segmentation and spelling techniques on top of standard instruction increased the PISA-equivalent Reading scores of first graders by as much as 153.5 points.⁸¹





PART FOUR: INTERVENTIONS WORK BUT THEY MUST BE IMPLEMENTED JUDICIOUSLY

Educational outcomes levels are slipping in Australia compared to other countries. It has been happening for decades.

This paper has examined educational interventions that have worked overseas, however, for the programs to be successfully implemented nationally, they would need to be adapted for the Australian school system.

While it's true that studies conducted in the US or elsewhere abroad must be seen and understood in context, what this report shows is that in the right setting, interventions do work. And funding those interventions matters.

In a statement released by The Royal Swedish Academy of Sciences for the Nobel Prize in Economic Sciences 2021, the Prize Committee stated that "resources in schools are far more important for students' future labour market success than was previously thought".⁸² In jointly awarding the Nobel Prize to David Card, Professor of Economics at the University of California, Berkeley, the Committee's detailed analysis of his work further stated that:

The impact of resources on school achievement tends to be greater for non-advantaged students, suggesting that their schooling choices are constrained to a greater extent than for students from advantaged backgrounds. Whether an increase in school spending reduces wage and earnings inequality is a more complicated matter. Nevertheless, the quasi-experimental literature is consistent with the view that the earnings effects of investments in education are higher for individuals from disadvantaged backgrounds.⁸³ — Committee for the Prize in Economic Sciences

Public school students are funded at a lower rate than the SRS, equalling hundreds of millions of dollars every year. This funding has the capacity to support the implementation of many different education interventions.

These new policies should learn from international experiences and apply them in the uniquely Australian context. Some of these programs could target the whole school population, while others specifically focused on disadvantaged students.

Based on our research, we know that smaller class sizes improve learning environments and that providing teachers with more time for one-on-one or small group sessions works. Additionally, we also know that targeted programs such as counselling and home visits for highly disadvantaged and low-performing students have proved effective.

While these programs cannot be merely transplanted from the US based on location-specific studies, what is clear is that these interventions and programs all require adequate funding. And although there is much complexity surrounding the drivers of school outcomes, the interventions and their corresponding costings described above begin to allow us to look at practical policy.

Australia's mean PISA scores are 46 points behind the leading nations in reading, 78 points in mathematics, and 48 points in science.

TABLE 6 PISA-SCORE GAP BETWEEN AUSTRALIA AND LEADING COUNTRIES BY FIELD

	Leading nation	Australia	Gap
Reading	549	503	46
Mathematics	569	491	78
Science	551	503	78

Source: PISA 2018. Insights and Interpretations⁸⁴

To begin closing this gap, Australian Governments should commit to fully funding the Schooling Resource Standard. The new funding should be committed to trials of new policy interventions which, once successfully assessed with randomised control trials, should be rolled out across the school system.

Australian children are increasingly competing on a global stage. Australian prosperity relies on the investment we make in our people. Improving education outcomes won't just support students, it supports Australia.





APPENDIX

Top 15 most effective education policies according to the academic literature.

Study name	Treatment	US effect size	US s.e.	Effect on AUS PISA scores	Ranking	Grade
FIELD: MATHEMATICS						
Bailey, 1991	only	0.728	0.304	67.1216	1	9
Cook et al., 2014	one	0.611	0.227	56.3342	2	9-10
Campbell and Brigman, 2005	only	0.49	0.116	45.178	3	5-6
Abdulkadiroglu et al., 2011	charter	0.337	0.071	31.0714	4	K-12
Rutherford et al., 2010	only	0.29	0.14	26.738	5	2-5
Preschool Curriculum Evaluation Research Consortium, 2008	le	0.274	0.136	25.2628	6	preschool, ages 4-5
Curto and Fryer, 2014	only	0.218	0.082	20.0996	7	middle and high school
Angrist et al., 2011	only	0.201	0.042	18.5322	8	4-10, 10
Fryer et al., 2015b	loss	0.197	0.071	18.1634	9	K-8
Glazerman et al., 2006	only	0.15	0.04	13.83	10	1-5
Bettinger, 2012	only	0.1328	0.0485	12.24416	11	3-6
Dobbie and Fryer, 2011	only	0.121	0.049	11.1562	12	K-8
Tuttle et al., 2013	only	0.11	0.04	10.142	13	5-8
Krueger, 1999	only	0.107	0.033	9.8654	14	K-3
Hoxby and Murarka, 2009	only	0.092	0.016	8.4824	15	3-8

	Policy	Type	Per-student estimated cost (2021 AUD)
	Computer-assisted personalised instructions for low-performing students in math	targeted student program	\$132.8
	Cognitive behavioural therapy for male students at high academic risk.	targeted student program	\$5855.3
	Group counselling	broad student program	\$62.3
	Going to a charter school	charter	see report
	Spatial-Temporal Math curriculum	curriculum	43.6
	New curriculum (Literacy Express)	curriculum	low, not clear
	Going to an urban boarding school	charter	\$56,358.4
	Going to a charter school	charter	see report
	Monetary incentives for teachers, exploiting loss aversion	broad student program	\$2222.2
	Having Teach For America teacher	teacher program	see report
	Monetary incentives for students	broad student program	
	Going to a charter school	charter	see report
	Attending a "knowledge is power program" (KIPP) charter schools	charter	see report
	Reducing class size from 24 to 16	broad student program	\$2,630
	Going to a charter school	charter	see report

Study name	Treatment	US effect size	US s.e.	Effect on AUS PISA scores	Ranking	Grade
FIELD: READING						
Center et al., 1995	only	1.582	0.321	171.90012	1	K-1
Uhry and Shepherd, 1993	only	1.413	0.594	153.53658	2	1
Peeples, 1996	only	0.949	0.298	103.11834	3	1
Schwartz, 2005	only	0.934	0.245	101.48844	4	1
Blachman et al., 2004	only	0.728	0.249	79.10448	5	2-3
Torgesen et al., 2010	LPIS	0.702	0.24	76.27932	6	1
Zvoch and Stevens, 2012	only	0.691	0.28	75.08406	7	K-1
Jenkins et al., 2004	less decodable	0.673	0.279	73.12818	8	1
Weikart et al., 1970	only	0.655	0.162	71.1723	9	preschool, age
Jenkins et al., 2004	more decodable	0.646	0.282	70.19436	10	1
Pullen et al., 2004	only	0.626	0.3	68.02116	11	1
Layzer et al., 2007	BTL	0.544	0.119	59.11104	12	child care, age
Layzer et al., 2007	RSL	0.507	0.118	55.09062	13	child care, age
Pinnell et al., 1994	RR	0.484	0.218	52.59144	14	1
May et al., 2015	only	0.47	0.05	51.0702	15	1
Preschool Curriculum Evaluation Research Consortium, 2008	LE	0.458	0.154	49.76628	16	preschool, age

	Policy	Type	Per-student estimated cost (2021 AUD)
	Reading Recovery. 30-min daily lessons for high academic risk students and extensive professional development for teachers	targeted student program	\$3,362.3
	New curriculum (old + phonetic segmentation and spelling techniques)	curriculum	low, not clear
	1-h home visit where researchers trained parents to assist with beginning reading	targeted student program	200
	Reading Recovery (see above)	targeted student program	\$3,362.3
	50 min of individual daily tutoring 5 days per week for 10 months	targeted student program	\$5962
	Small-group instruction for students at risk for reading disabilities, half delivered by teachers, half by computer programs.	targeted student program	\$1368.4
	Intensive summer reading program	targeted student program	\$1680
	30-min tutoring sessions four days per week, for 25 weeks.	targeted student program	\$1162.8
s 3-5	Disadvantaged children attending 2.5 hours five days a week plus weekly home visits	targeted student program	\$15883.2
	30-min tutoring sessions four days per week, for 25 weeks.	targeted student program	\$1162.8
	Tutoring model that included a repeated reading of familiar texts, explicit coaching in decoding and word strategy, and reading new books for forty 15min sessions throughout the term.	targeted student program	low, not clear
4	Breakthrough to Literacy curriculum	curriculum	unclear
4	Ready, Set, Leap! Curriculum	curriculum	unclear
	Reading Recovery curriculum	curriculum	\$3,362.3
	Scale-up of Reading Recovery. During the school year, teachers are experts in helping struggling students spending half of their workday working with the same eight low-performing students.	curriculum	\$8,582.3
s 4-5	New curriculum (Literacy Express)	curriculum	low, unclear

FOOTNOTES

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