



THE MCKELL INSTITUTE

# No Mind Left Behind

BUILDING AN EDUCATION SYSTEM  
FOR A MODERN AUSTRALIA

OCTOBER 2016

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# FOREWORD

There is good reason the word ‘innovation’ has become a ubiquitous buzzword in Australia during recent times. The end of the mining boom has left the Australian economy in a precarious position, without an industry or industries to drive the continual growth Australians have become so accustomed to. While our banking and professional services sectors are producing strong growth, the tyranny of our geographical distance prevents true competitive advantage in these industries, even in an increasingly globalised world.

Prime Minister Malcolm Turnbull’s National Science and Innovation Agenda was launched at the end of 2015 in order to map out the path to stronger science and innovation-driven industries. It is hoped that innovation in these industries will allow Australia to develop a strong competitive advantage and drive the economy for the next twenty-plus years of growth.

In order to achieve this, Australia must have a highly educated population to both instigate the innovation, and work within the new industries. However, while on average Australians are some of the most educated people in the world, there is a growing disparity in educational outcomes, and hence employment opportunities, within our population.

This report introduces the first of McKell’s opportunity indexes: *The McKell Institute Index for Educational Opportunity*, which maps Australia’s most advantaged and disadvantaged in terms of educational opportunity by federal electorate. It measures the factors that can make the largest difference in terms of educational outcomes, and includes variables from four different domains: the family, the community, the school, and the individual. It is not a measure of the efficacy of individual teachers, schools, or teaching methods; rather, it is designed to measure those electorates in Australia that have the highest barriers that children must overcome in order to achieve at school or beyond.

The Index provides us with a good starting point at which to focus our attentions and resources. As Part Three of this report shows, education and poverty are inextricably linked:

we cannot address one without also addressing the other. The Index is designed to consider a child holistically, and determine the factors that might be either enabling or hindering achievement at school and beyond. Part Four of the report then provides a framework of interventions and 10 recommendations that should be applied across a child’s lifetime. Research shows that early and regular educational interventions can close the gap between the most disadvantaged and the most advantaged in our society by up to 70 per cent.<sup>1</sup>

Piecemeal solutions to tackle the growing problem of inequality have been tried and tested, and have so far come up short. This report calls for coordinated action by all stakeholders to tackle one of the greatest moral challenges of our time, and to restore Australia’s education system to one where every child, regardless of background, is given the best possible start to life.



**The Hon John Watkins**  
CHAIR,  
MCKELL INSTITUTE



**Sam Crosby**  
EXECUTIVE DIRECTOR,  
MCKELL INSTITUTE

# EXECUTIVE SUMMARY

The nature of work is changing. While our parents and grandparents could once expect to get a job directly out of high school and keep it for life, today's workers cannot. Technology is partly to blame for this. Bill Gates has predicted that at least a dozen job types, like commercial pilots and real estate agents, will be automated or performed by robots within the next two decades.<sup>2</sup> Similarly, other predictions have stated that more than 2 billion jobs will disappear by 2030 due to technological improvements.<sup>3</sup>

However, it is not all doom and gloom. Technology has also brought with it products, processes, jobs and industries that our parent's generation never imagined. A US Department of Labor report in 2013 made the bold claim that 65 per cent of today's school children will eventually be employed in jobs that are yet to be invented.<sup>4</sup> Further, today's typical fifteen-year-old can expect to have upwards of 17 jobs in five different industries over the course of their lifetime.<sup>5</sup>

As the nature of work has changed, so too must the education curriculum. Skills and technical knowledge that were once a necessity for the work environment have now become redundant, and have been replaced by different capabilities. Workers must now have a good understanding of computers, and be able to use them efficiently. They must be able to work in teams, and have a good sense of intercultural differences; and they must be able to make sense of and solve complex, often ambiguous problems. These 'soft' skills are the new normal, and all future jobs will require them.

However, this does not mean that our education system needs a complete overhaul. Traditional knowledge, such as literacy, numeracy and scientific competence will also be in high

demand in the workplace of the future. As Australia shifts from a resource economy into an advanced manufacturing and knowledge-based economy; science, technology, engineering and mathematics (STEM) knowledge will be in high demand. The problem is, Australia's international scores on these subjects have been slipping in recent years. Additionally, fewer students are choosing to study STEM subjects in the upper high school years. Engagement with STEM subjects is at its lowest it has been in living memory, yet those skills have never been more necessary.

The other phenomenon affecting Australia is a growing disparity between high and low academic achievers. Young people from disadvantaged or Indigenous families, or who live in remote regions of Australia are far more likely to begin school developmentally behind their peers. Many will then record below-par results throughout primary school, become disengaged from education, and be locked into a lifetime of underachievement. Few will finish high school, and probably struggle to find meaningful employment as a result. Many of those young people will then be trapped in a cycle of poverty, and all the problems, including health, wellness and lack of opportunities that life brings.



This report introduces the first of McKell's opportunity indexes: *The McKell Institute Index for Educational Opportunity*, which maps the federal electorates most advantaged or disadvantaged in terms of educational opportunity. It has been designed with a holistic view of the child in mind: education, poverty and health are all inextricably linked and we cannot address one without also addressing the others. The Index of Educational Opportunity combines variables from the community, the school, the family and the individual to look at the level of advantage or disadvantage within each federal electorate in Australia.

Some of the results are surprising, some sadly are not. This index will allow policy makers to focus their attentions on those electorates that are most at risk of producing children with few educational opportunities and a high chance of disengagement from study and work, in order to implement measures to mitigate those risks.

The report concludes by proposing a series of interventions that can assist in restoring

Australia's education system to being the 'ultimate equaliser,' to reduce inequality in our nation, and to give Australia the skilled workforce it requires to drive our economy well into the second half of the century.

However, this is not just a challenge for Government, but a challenge for us all - policymakers, educational institutions, businesses, NGOs and individuals - we need to improve Australia's chances of competing in the international marketplace through a world-class education system, and a highly educated population. We need to reverse current trends of achievement, we need to help those most at risk of disengagement and underachievement, and we need to ensure the skills we teach our young people match the requirements of a modern economy. It will require work from all those involved. Governments can lay the path, educational institutions and NGOs can deliver the programs, businesses can provide the opportunities, and parents and students must accept responsibility for cultivating a commitment to lifelong learning.

# RECOMMENDATIONS

**RECOMMENDATION 1: We must extend early childhood education programs to all 3 and 4 year olds** prioritising those electorates in the lowest quintile of the Educational Opportunity Index.

**RECOMMENDATION 2: Government should implement parent training programs in areas with low educational opportunities as a matter of priority.**

**RECOMMENDATION 3: The selection criteria for entry into teaching courses at university must be reformed.** Teaching must become a high status profession, and controlling entry into teaching courses will assist in attracting the best and brightest students, and improving the image of teaching within society.

**RECOMMENDATION 4: Employment-based teaching pathways should be investigated on a broader scale.** Efforts to attract candidates from STEM fields should be prioritised.

**RECOMMENDATION 5: Curriculum updates must be a compulsory part of teacher professional development.**

**RECOMMENDATION 6: Gonski school funding must be continued in its intended form.**

**RECOMMENDATION 7: Local governments can become engaged by supporting volunteering programs at high schools, TAFEs and universities.** Schools must take a lead in promoting volunteering and encouraging young at-risk students to partake in volunteering opportunities.

**RECOMMENDATION 8: Career guidance services must be re-imagined within schools.** The nature of work is changing, and career guidance and work experience programs must adapt to those trends.

**RECOMMENDATION 9: Industry collaboration with universities must be encouraged.** Collaboration at the higher education level could be encouraged by extending the R&D Tax Incentive.

**RECOMMENDATION 10: Processes for reporting of programs designed to improve student outcomes must be standardised.**









# PART ONE: THE TIMES, THEY ARE A CHANGING

In 1999 author and science historian James Gleick wrote that change begets change, and the faster change occurs, the faster it will continue to occur as technological innovation builds upon itself. We are now at a point in time where our world is changing so quickly and in so many ways, systems and processes in place today will not make sense for much longer. Some estimates suggest that the current rate of change in technology will result in a global disruption 3000 times the impact of the Industrial Revolution.<sup>6</sup>



Medical innovation has led to longer lives, and longer working lives. More of us will be able to work for much longer as our work increasingly uses our brains more than our bodies. Some estimations claim that we will be working into our 70s from the 2030s onwards.<sup>7</sup> But although we will be working until later in life, we will not be starting as early as we once did. The proportion of people starting work at 15 has been steadily declining over the last few decades, and the opportunities for 15 year olds to start work and stay in a low-skilled job will continue to diminish as low skilled work is either automated or outsourced.<sup>8</sup>

The Committee for Economic Development of Australia (CEDA) estimates that 40 per cent of Australia's jobs will be automated within the next two decades, resulting in a loss of around 5 million jobs. Those jobs that are expected to be in demand will be highly-skilled positions that require creative thinking, problem solving and communication skills that are difficult for artificial intelligence to emulate

(at the moment). Of all the jobs created between 2005 and 2010, 70 per cent were in high skilled and professional occupations, whereas low skilled jobs (labourers and shop assistants) grew by just 2 per cent during the same period.<sup>9</sup>

These changes have resulted in a shift in what employers look for in young candidates. A KPMG executive notes that soft skills are the new hard skills: finding the answer to a technical question is often just one click away on the internet, but "how you collaborate, solve problems creatively, and authentically lead people will matter more" in the future to employers.<sup>10</sup>

We can expect that future employers will also want us to work with teams based all around the world, connected by technology that is becoming more of an extension of ourselves rather than just a tool for communication. In order to get a job, remain in it and excel at it we now need more than just a qualification: we need a mixture of soft skills and



technical skills, and we need to be willing to continually upskill and learn in order to remain competitive in a global job market that will be shifting and moving beneath our feet.

Our education system has struggled to keep up with these trends: a recent report found that 58 per cent of Australian students and 71 per cent of vocational training students are currently training for jobs that will either no longer exist or could change dramatically in the future.<sup>11</sup>

On top of all this, Australia's place in the world is now being questioned. China's move to a consumer-based economy has dampened demand for our resources, and the end of the mining boom has left our economy in a precarious position. As one commentator put it: "It's been a long time since Australia was a global leader in anything that doesn't involve a lot of digging."<sup>12</sup>

Thirty years of neoliberal reforms have also left us with a rising level of inequality: some of us

have become richer in the past few decades, but far too many of us have become poorer. Real wage growth has stagnated, and there is a real concern that our economy is going down the path of our largest trading partners whereby the middle class becomes almost non-existent.

Put simply, our world is changing, Australia is changing, and the very nature of work is changing. This report is about how our education system can account for and mitigate some of the pain in that change, and ensure more people are engaged in education and work for longer.

# PART TWO:

## WHAT A GOOD EDUCATION SYSTEM LOOKS LIKE

### Why education is so important

It is widely accepted that a good education system is important for a modern society. A good education system is one that gives every child the start in life to be whomever they want to be; to achieve whatever they dream of. It allows people to be curious, to develop an interest in a topic or idea or area, and to excel in that interest. High educational attainment is associated with nearly every positive life indicator: it allows improved employment opportunities and higher earnings; it increases health and longevity; it improves parenting skills and civic engagement; and leads to increased social cohesion.<sup>13</sup> Former university professor and current Member of Parliament Andrew Leigh has studied the rate of return for education and found that it is approximately 10 per cent per year of education.<sup>14</sup> For those who have completed a bachelor's degree at university, this translates into about \$1.2 million more in earnings over a working life than a person with a Year 11 or lower level of education.<sup>15</sup> In terms of employment, higher education is more likely to lead to full time employment and higher rates of participation in the workforce.<sup>16</sup>

But the benefits of a good education system do not just pertain to individuals: if every child in a society has access to a high-quality education, it provides that society with the

skills and capacities it needs to be productive, to be innovative, and to continue along a path of technological and economic growth. Studies have found that higher educational achievement leads to significantly larger economic returns at a nationwide level.<sup>17</sup> A highly-educated population allows a nation to be productive and competitive within an increasingly globalised world.

But the converse is also true. Nations with large numbers of people with low educational attainment and skills experience lower levels of productivity and higher costs associated with health, income support, crime and child welfare.<sup>18</sup> An individual with a low level of education will probably experience difficulty obtaining employment and will likely earn far less than a peer with a higher level of education. Lower levels of education are also associated with poorer health and wellbeing. Additionally, children who are disengaged from education are far more likely to land in trouble with the law than those who are not: 75 per cent of the children in the juvenile justice system in Australia dropped out of school before Year 10.<sup>19</sup>

This section recognises the meta trends identified in Part One and discusses how a modern education system should adapt to those trends. It begins by looking at the skills that will be required of modern workers, and assesses how Australia currently tracks on those domains.

## New work environments will require new skills

The idea that there is a range of skills - other than the content-based knowledge one learns in formal education - required for entry into and success in the workplace has been around for some time. In 2002, the Federal Government developed a framework outlining the soft skills a person needs to excel in a work environment. They included a set of fundamental skills such as literacy, numeracy and the ability to use technology; as well as a range of people-related skills; conceptual skills; business; community; and personal skills, such as the ability to organise one's own time and be responsible. In 2006, the framework was released and adopted by many vocational education and training (VET) providers and the TAFE network.<sup>20</sup>

More recently, and coinciding with greater shifts in technology around the world, reports have attempted to predict the skills required by future, not just current, workplaces. One such report<sup>21</sup> identified ten skills that will likely be required in future work environments. These include an array of higher-order thinking skills; better social intelligence and the ability to work with a diverse range of people in groups to solve complex issues; and the ability to manage and adapt to new technologies and systems of organisation.<sup>22</sup> Most of all, the workplaces of the future will require individuals who are committed to a lifetime of learning, adapting, and growing.

Research conducted in 2016 by The Foundation for Young Australians found that certain soft skills, named 'enterprise skills', are already commanding higher salaries from employers. On average, those candidates that can demonstrate strong presentation skills, digital literacy and problem solving ability can attract up to \$8,853 per year more than their peers.<sup>23</sup>

In addition, the demand for these skills is on the rise. The number of job advertisements asking for digital and critical thinking capabilities from candidates has grown by 212 and 158 per cent respectively over the past three years. Jobs

requiring creativity and presentation skills are also on the rise.<sup>24</sup>

Other research has shown that the jobs that have been growing the fastest over the past 25 years are either highly skilled or 'high touch', meaning roles that require a high level of personal interaction.<sup>25</sup> OECD research has found that occupations with the highest proportion of strong problem solvers were the only ones to increase their overall share of employment during the last decade.<sup>26</sup> The skills estimated to be least easily replaced by rising automation include problem solving, social skills and creative intelligence.<sup>27</sup>

Australia's National School Curriculum has shifted somewhat to account for these changes in skill requirements, expecting teachers to account for a range of general capabilities in each lesson. Those general capabilities include literacy, numeracy, information and communication (ICT) capability, critical and creative thinking, personal and social capability, ethical understanding, and intercultural understanding.<sup>28</sup> These capabilities were devised and published in the *Melbourne Declaration on Educational Goals for Young Australians* in 2008.

In order to maintain their licence to teach, teachers must participate in an average of twenty hours of professional development each year (as regulated by state teaching authorities). Some schools organise professional development for all of their staff, some schools allow teachers to organise their own professional development. However, while teachers must complete professional development, the curriculum update sessions are not made compulsory and it is generally unclear how teachers must adapt their teaching to account for updates in the curriculum. As it is difficult to test for soft skills or general capabilities, it is difficult to determine if the curriculum is achieving its aim. Indeed, employers are now suggesting that too many students are finishing their studies without the general capabilities required in order to excel in the workplace.<sup>29</sup>



## A large number of young people seem to be lacking in soft skills

A 2006 survey in the US of more than 400 employers found that collaboration, work ethic and communication were among the most important skills necessary to succeed in the workplace, yet only 24 per cent of employers felt that new employees with university degrees had 'excellent' applied skills in these areas.<sup>30</sup> The situation is no different in Australia. A 2015 Australian Industry Group report found that 44 per cent of Australian companies had positions that they could not fill because the applicants did not possess the requisite skills. And while 89 per cent of employees in Australia are confident they have the right skills to perform well in the future, only 55 per cent of hiring managers agree, meaning half of all employers doubt their team has the right mix of skills required for the future of the organisation.<sup>31</sup>

KPMG and PricewaterhouseCoopers state that they now value soft skills in their employees more than technical ability. PwC has recently initiated a professional framework of which only one is 'technical skills': the rest include leadership, relationships, business acumen and global acumen.<sup>32</sup> The Melbourne Business School has responded to this shift by including soft skills training in some of their more technical postgraduate courses, like for instance, the Master of Business Analytics.<sup>33</sup>

However, some researchers have argued that the skills gap identified by large employers is exaggerated in order to get government to take on more of the costs of training workers.<sup>34</sup> Peter Capelli from The Wharton School of Business argues that employers need to get more involved in training employees in order to give them the requisite skills to excel in their job.<sup>35</sup>

## Australia has average soft skills test results

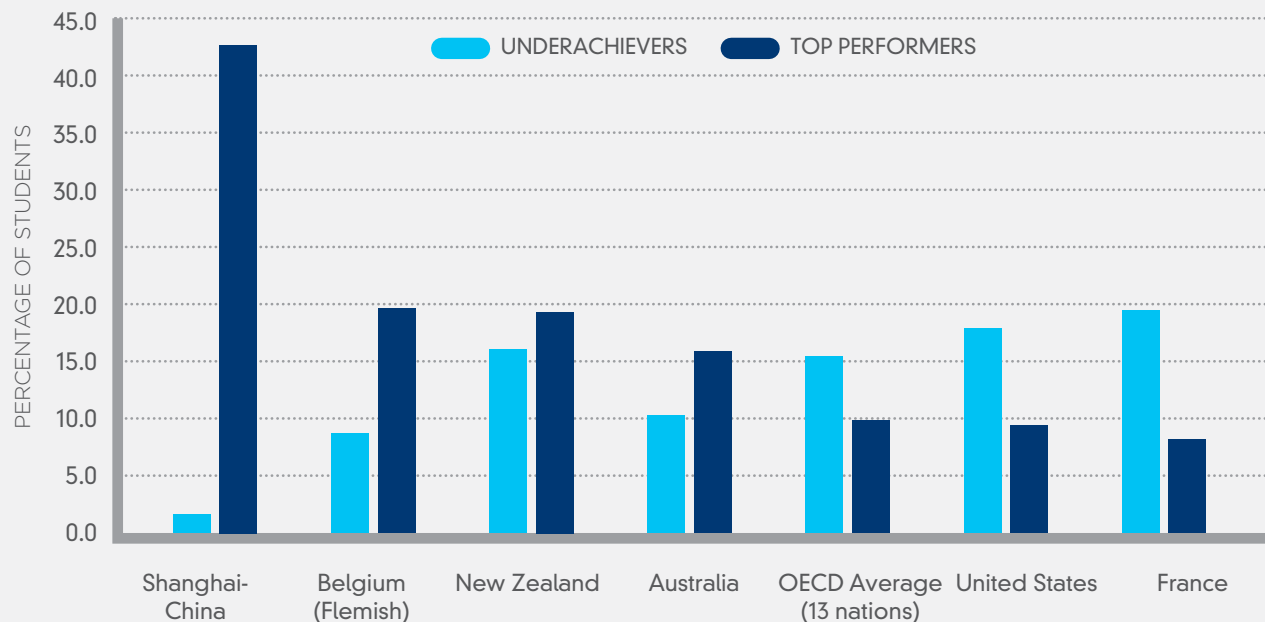
In general, it is difficult to measure the success that teachers have in instilling soft skills in students, although the OECD has been able to test for some of these skills. Financial literacy, problem solving and digital literacy are recent additions to the Programme for International Student Assessment (PISA) conducted by the OECD.<sup>36</sup> The latest results available are for the 2012 test, in which Australia can be compared against 64 other countries in literacy and mathematical and scientific literacy; and 17 other countries or economies in financial literacy, problem solving and digital literacy.

Australia performs well in measures of financial literacy, ranking fourth out of the jurisdictions that took part. This is particularly surprising given that Australia's mathematics scores, which are closely linked to financial literacy, dropped in the 2012 test compared to other nations.<sup>37</sup> About 10 per cent of students did not meet the minimum standard for financial literacy, but more than 15 per cent of students achieved in the highest quintile of the test.





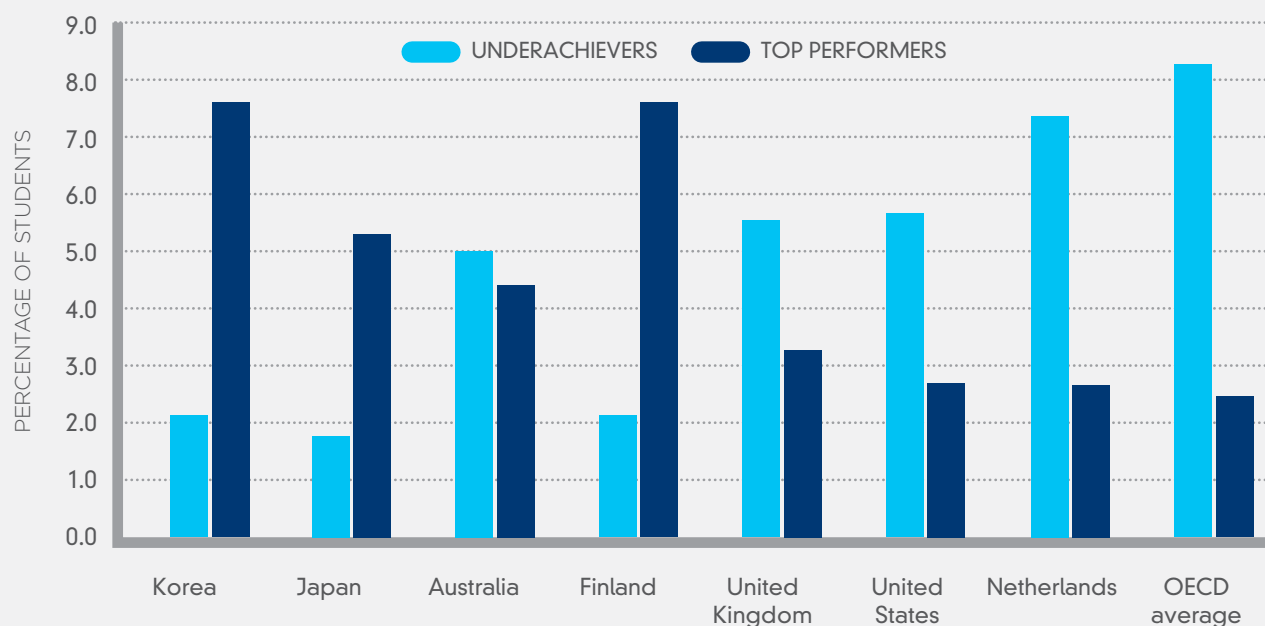
**FIGURE 2.1** Student performance in PISA financial literacy test 2012



Source: OECD 2012

Australia also performs well in terms of problem solving, ranking third out of OECD nations, and fifth out of all of the nations that took part, in terms of the number of students who achieved results in the highest category in the 2012 test. However, the proportion of students who scored in the lowest percentile outnumbered those highest achievers, as can be seen in figure 2.2 below.

**FIGURE 2.2** Student performance in PISA problem solving test 2012



Source: OECD 2012

Interestingly, Australia scores below the OECD average in terms of 'openness to problem solving,' which is a self-reported measurement of student drive and self-belief. This measurement is derived from a series of questions asked before the test regarding how a student feels like they resemble a person who can "handle a lot of information, is quick to understand things, seeks explanations for things, can easily link facts together and likes to solve complex problems."<sup>38</sup>

This finding has interesting implications for our education system. It seems to indicate that Australian students, while capable in problem solving, do not trust in their own ability to succeed in solving complex problems.

The OECD recently announced that it would be including a new assessment in the 2018 iteration of the PISA testing regime, that will measure a range of skills under the umbrella term 'global competence.'<sup>39</sup> The test will be designed to measure young people's understanding of global issues and attitudes toward cultural diversity and tolerance – skills that will be in higher demand in a globalised, complex world.



## Technical skills will also be in high demand

Soft skills are not the only skills that will be required in a modern Australian economy. Higher education qualifications will be increasingly in demand as many low skilled jobs become automated, and Australia's economy shifts towards a higher use of technology. It has been estimated that already 75 per cent of the fastest growing occupations require qualifications in the STEM subjects.<sup>40</sup>

Science, Technology, Engineering and Mathematics (STEM) knowledge is the cornerstone of a nation's competitiveness: workers with STEM capabilities drive innovation, jobs growth and productivity.<sup>41</sup> A 2016 survey of employers' hiring intentions in Australia found that the industry with the highest demand for new employees is the technology sector, with the fastest growing occupations in the technology and digital, and technical and engineering domains.<sup>42</sup>

The Australian Government has recognised the importance of STEM to the growth and competitiveness of Australia and has introduced an agenda aimed at increasing STEM knowledge within our economy.<sup>43</sup> The agenda recommends a range of interventions and policies that are designed to strengthen Australia's collective capacity in STEM fields and help us to get better at reaping the rewards of our world-class research.

It notes that "Australia now ranks 81st as a converter of raw innovation capability into the outputs business needs: new knowledge, better products, creative industries and growing wealth."<sup>44</sup> We already produce some of the world's best research, but we miss out on much of the economic benefit of that research because of our under-developed collaboration rates with businesses. As will be discussed in Part Four, we can address the problem of a diminishing pipeline of STEM-qualified workers by investing in collaboration efforts and more appropriately qualified teachers.

## Attainment levels have been rising; but achievement scores have been falling

Young people in Australia are now the most educated generation ever. The proportion of students completing Year 12 qualifications has risen steadily since 1980, to 78 per cent of all students in 2010.<sup>45</sup> While school retention and completion rates have been growing, so too have University enrolments and graduations. 3.5 million Australians now hold a bachelor degree or higher, a proportion that has grown from 17 per cent to 23.7 per cent in the decade to 2012.<sup>46</sup>

However, while attainment rates have been growing during the past decades, average achievement rates have been slipping.

The Australian Education Act 2013 sets out lofty goals for “Australia to be placed, by 2025, in the top five highest performing countries based on the performance of school students in reading, mathematics and science,” and for the “Australian schooling system to be considered a high-quality and highly equitable schooling system by international standards.”<sup>47</sup>

Figure 2.3 displays the average number of months of learning 15 year old students in Australia, the US and Europe are behind students in four top performing education systems in reading literacy, mathematics and science.

**FIGURE 2.3**

The number of months Australian, American and European 15 year olds are behind students in top performing education systems

	US			AUSTRALIA			EU21*		
	READ	MATH	SCI	READ	MATH	SCI	READ	MATH	SCI
Shanghai	22	39	26	18	32	19	22	34	24
Hong Kong	14	23	18	10	17	11	15	19	16
Singapore	14	27	17	9	20	9	14	22	14
British Columbia	11	12	15	7	5	7	12	7	12

< 1 YEAR BEHIND

1-2 YEARS BEHIND

> 2 YEARS BEHIND

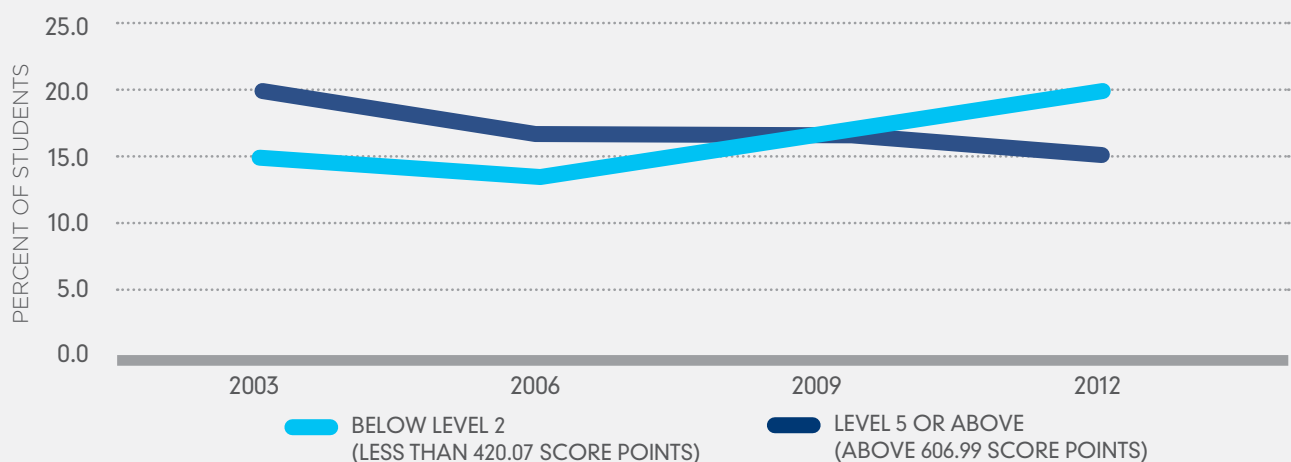
\* UNWEIGHTED AVERAGE

Source: OECD 2013.

Additionally, Australian student achievement scores have been falling in Australia since the turn of the century. While 40 to 50 per cent of students in Singapore, South Korea and Chinese Taipei record results in the highest achievement level in the mathematical literacy component of the OECD's PISA test, only about 10 per cent of Australian students achieve this score.

Australia's scores on the OECD's Programme for International Student Assessment (PISA) test in mathematics have been falling since 2003. The share of high achieving students has dropped nearly 25 per cent, or 5 percentage points; and the share of low achieving students has risen 37 per cent, or 5.3 percentage points over the course of the four tests. This correlates to about 57,000 fifteen-year-olds who scored below minimum standards in mathematics in the 2012 PISA test.<sup>48</sup>

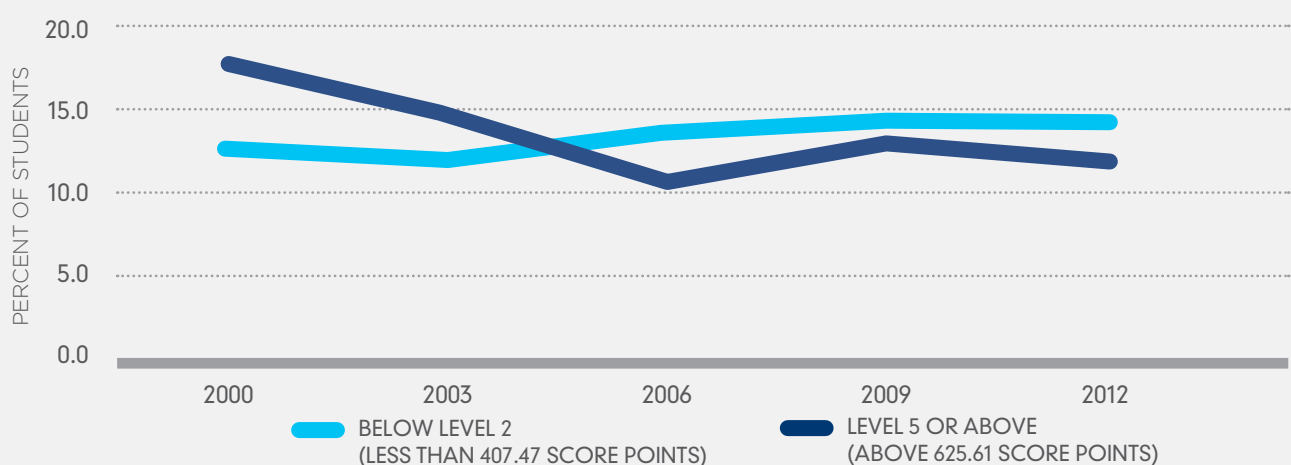
**FIGURE 2.4** Australian student achievement in PISA mathematics test 2003-2012



Source: Compiled from OECD PISA results

Similarly, Australian student achievement scores have dropped for the reading assessment since 2000. The proportion of students achieving below par for reading has increased 13 per cent since 2000; whereas the proportion of students achieving in the highest percentile has dropped 33 per cent since 2000. The OECD has estimated that around 40,000 Australian 15 year-olds lack the required reading skills to participate fully in the workplace and society.<sup>49</sup>

**FIGURE 2.5** Australian student achievement in PISA reading test 2000-2012

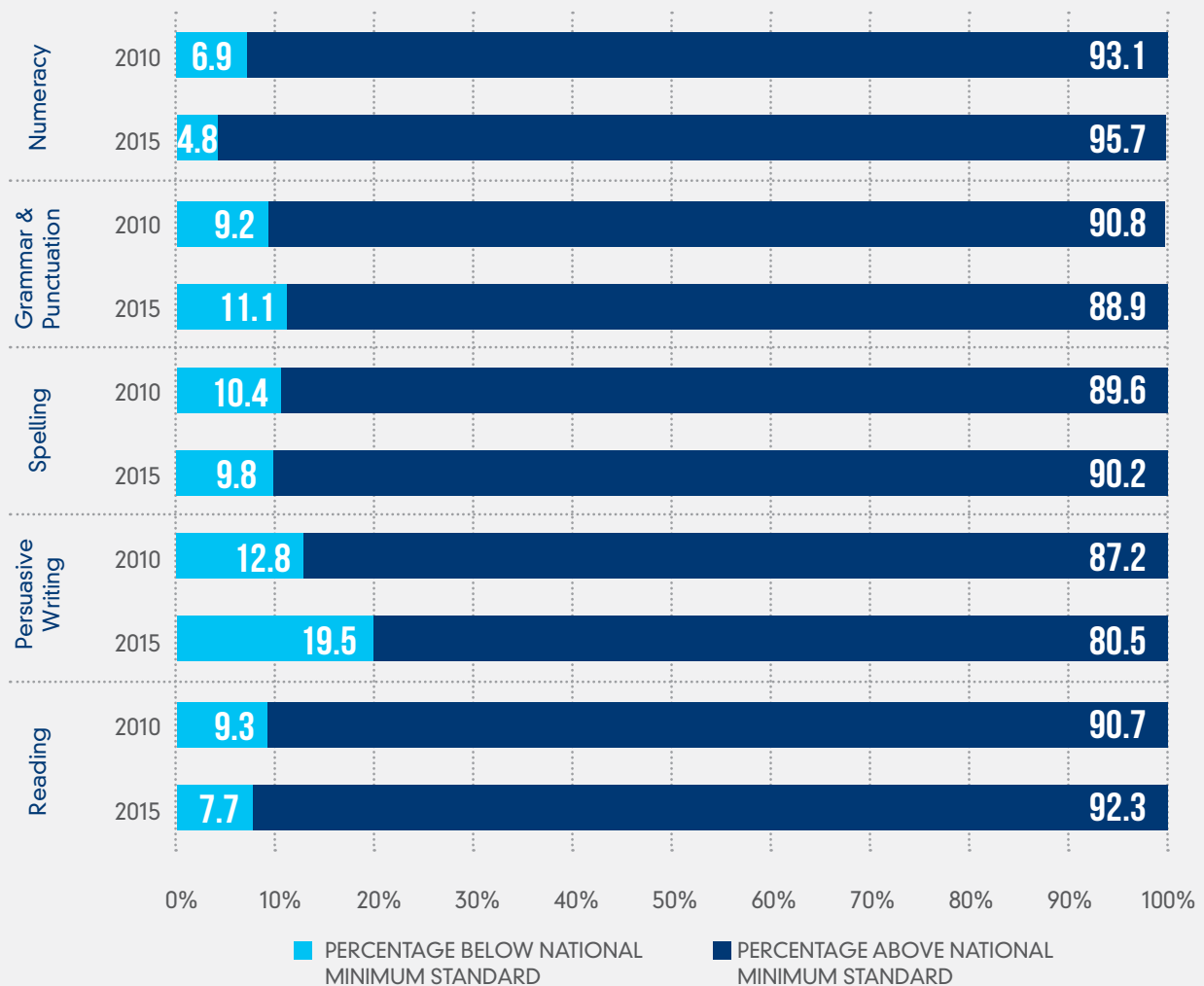


Source: Compiled from OECD PISA results

Further, more than 26,000 fifteen-year-old Australian students scored below par on all three subjects on the PISA test: reading, mathematics and science.<sup>50</sup> These results have prompted Andreas Schleicher, the education director of the OECD, to express concern for the falling number of high achieving Australian students. Schleicher claimed that Australia's system for choosing, training and developing teachers is negatively affecting our educational outcomes on the OECD's PISA tests: "(Australia) more or less defines teachers by the number of hours that (they) teach in front of students. That is part of the problem."<sup>51</sup>

However, NAPLAN (National Assessment Program – Literacy and Numeracy) results paint a slightly different picture. Year 9 NAPLAN results from 2015 indicate that the number of Australian students who meet the national minimum standard in metrics of numeracy, spelling and reading have grown since 2010; but the percentage of students meeting national minimum standards in grammar and punctuation and persuasive writing has reduced significantly in the same period.

**FIGURE 2.6** Year 9 NAPLAN results 2010 and 2015



**Source:** Compiled from NAPLAN results 2010 and 2015



Nearly 20 per cent of Australian Year 9 students did not meet the national minimum standard for persuasive writing in 2015, up from 12.8 per cent of students in 2010. Looking to the future of work, persuasive writing is a skill that can be applied to many different situations and jobs, across a wide range of industries. It is a skill that will be difficult to replace with automation, and will likely be in demand from employers. The large percentage of students who do not possess this skill is concerning.

However, ACARA (Australian Curriculum, Assessment and Reporting Authority – the organisation responsible for delivering NAPLAN) has come under fire from education experts recently for setting the national minimum standard too low. A recent Grattan Institute report found that the national minimum reading standard for Year 9 students was actually the median standard for Year 5 students, meaning that “when we say 90-something per cent of students are at or above national minimum standards, we are effectively saying that 90 per cent of our kids are less than four years behind.”<sup>52</sup> This helps us to better understand the disparity between PISA and NAPLAN results. ACARA have responded to the findings by stating that new proficiency standards will be introduced in 2017.<sup>53</sup>

## BOX 2.1

## A NOTE ON STANDARDISED TESTING

There has been a robust debate regarding the validity and usefulness of standardised testing amongst education experts for some years now. Critics of standardised testing argue that NAPLAN and PISA provide little information that teachers don’t already know about their students; and even if they did provide a unique insight, the results are released far too late in the school year for teachers to make any difference.<sup>54</sup> Additionally, there have been reported cases in both the US and Australia of some teachers ‘teaching to the test’ in order to inflate their students’ performance, while neglecting the curriculum. This has been particularly problematic in the US where school funding is tied to test results.<sup>55</sup>

Further, in recent years Finland’s PISA results have been slipping, even though Finland’s education system is widely regarded as one of the best in the world. This has led many critics of both NAPLAN and PISA to argue that neither test tells the whole story of a child’s ability.<sup>56</sup>

The scope of this report does not allow a full inquiry into the arguments for and against standardised testing, but the author recognises that they are not a perfect measure of a child’s educational achievement. This is especially so in a new world that requires capabilities in skills that cannot be tested for, just as much as (if not more than) content knowledge. However, the test results do provide a useful starting point for us to compare our results with other nations, as well as against ourselves over time, which is what has been done in this report.

### Fewer students are choosing to study STEM subjects and this is a serious problem

Australian schools are now recording the lowest rates of participation in science subjects in 20 years. Only about half of senior secondary school students study science, and science subjects are perceived by some as elitist and as important only in their ability to maximise a student's university entrance score.<sup>57</sup>

If fewer students are undertaking science in senior school, this has serious implications for the general level of science literacy in the wider community. Additionally, although science enrolments at the university level have increased by 30 per cent since 2007, numbers of students studying key fields related

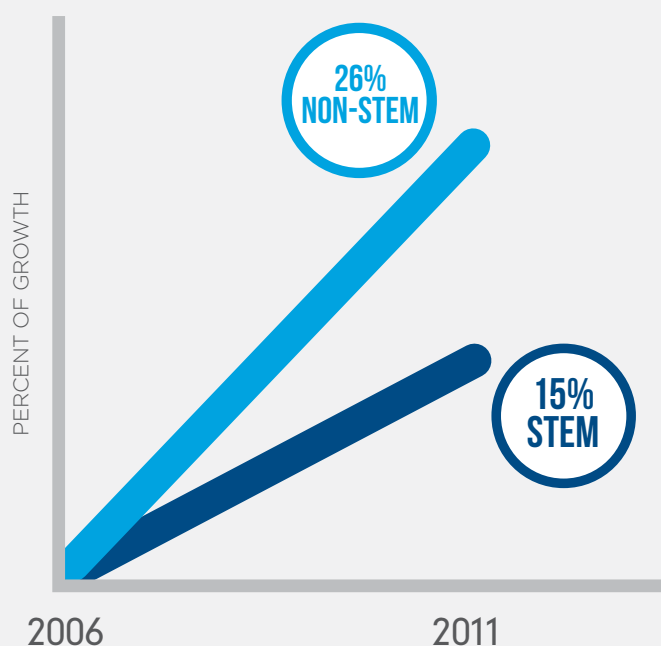
to innovation like chemistry, physics and mathematics drop off significantly after the first year.<sup>58</sup>

The Office of the Chief Scientist released an agenda in 2014 for strengthening Australia's competitiveness through increasing our collective capacity in STEM. It comprehensively explains how science, technology, engineering and mathematics knowledge in the community contribute towards research and development activity, resulting in innovation and an increased competitive position within the global economy.<sup>59</sup>

More recent reports have asserted that STEM graduates take longer to find full time work than graduates from other fields, asserting that there is currently a glut of STEM graduates in the marketplace.<sup>60</sup> While this might be the case, we argue that this is not necessarily a problem for either individuals or the Australian economy.

STEM knowledge includes both specific content in key subject areas, for instance, like learning the Periodic Table in chemistry; but it also includes skills such as problem solving, rigorous and sceptical analysis of evidence and theories, numeracy, and the development of logical arguments.<sup>61</sup> And while only about 2 in 5 STEM graduates work in STEM-related fields, a diverse range of employers look for the skills that STEM courses teach in job candidates.<sup>62</sup> This report further argues that Australia needs a population with a high degree of scientific literacy and a workforce with STEM capacity for an innovative and knowledge-based economy, and should continue on the path of encouraging more students to study in STEM fields.

**FIGURE 2.7** The growth of the STEM vs non-STEM qualified population 2006-2011



**Source:** Office of the Chief Scientist, 2016.

## A high quality education for the 21st century

A high-quality education for the 21st century will combine learning content with the development and enhancement of skills; it will combine technology with textbooks and require young people to learn to be collaborative and creative, to problem solve, and to think globally.

A 21st Century education system will need to be adaptable, to teach a more holistic curriculum, and will need to engage more children for longer. It will need to adapt to meet the needs of the economy and workplace, and help set young people up for a lifetime of learning.

More importantly, a high-quality education system for the 21st Century will do more to reduce the differences between students, and allow every student to succeed no matter where they were born or who their parents are.

OECD research shows that we could make dramatic economic gains by improving both the quality and equity of education across the nation. If Australia could ensure all students achieve minimum competencies, our GDP could be as much as 11 per cent higher by 2095.<sup>63</sup>

The next section details how Australia is faring on measures of equity, and introduces The McKell Institute's Index of Educational Opportunity.



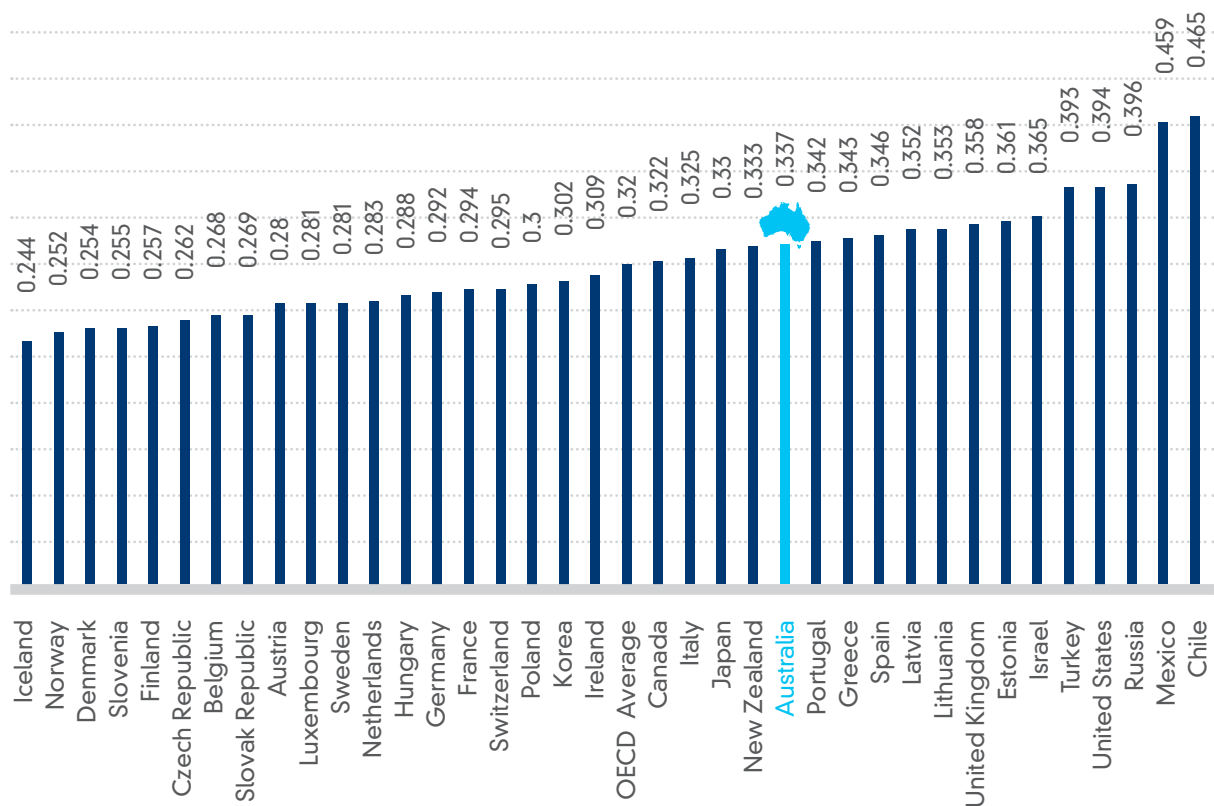


# PART THREE:

## INEQUALITY IN AUSTRALIA

Australia's inequality has been steadily rising since the turn of the century. The Gini Coefficient, which measures the level of income inequality in a nation on a scale of 0 (perfectly equal) to 1 (perfectly unequal), allows us to rank nations around the world. Australia's score rose from 0.303 in 1997-98, to 0.337 in 2014, which is above the OECD average of 0.320.

FIGURE 3.1 Income inequality in the OECD



Source: Compiled from OECD dataset – Income Distribution and Poverty; data is for 2014 or latest available year.

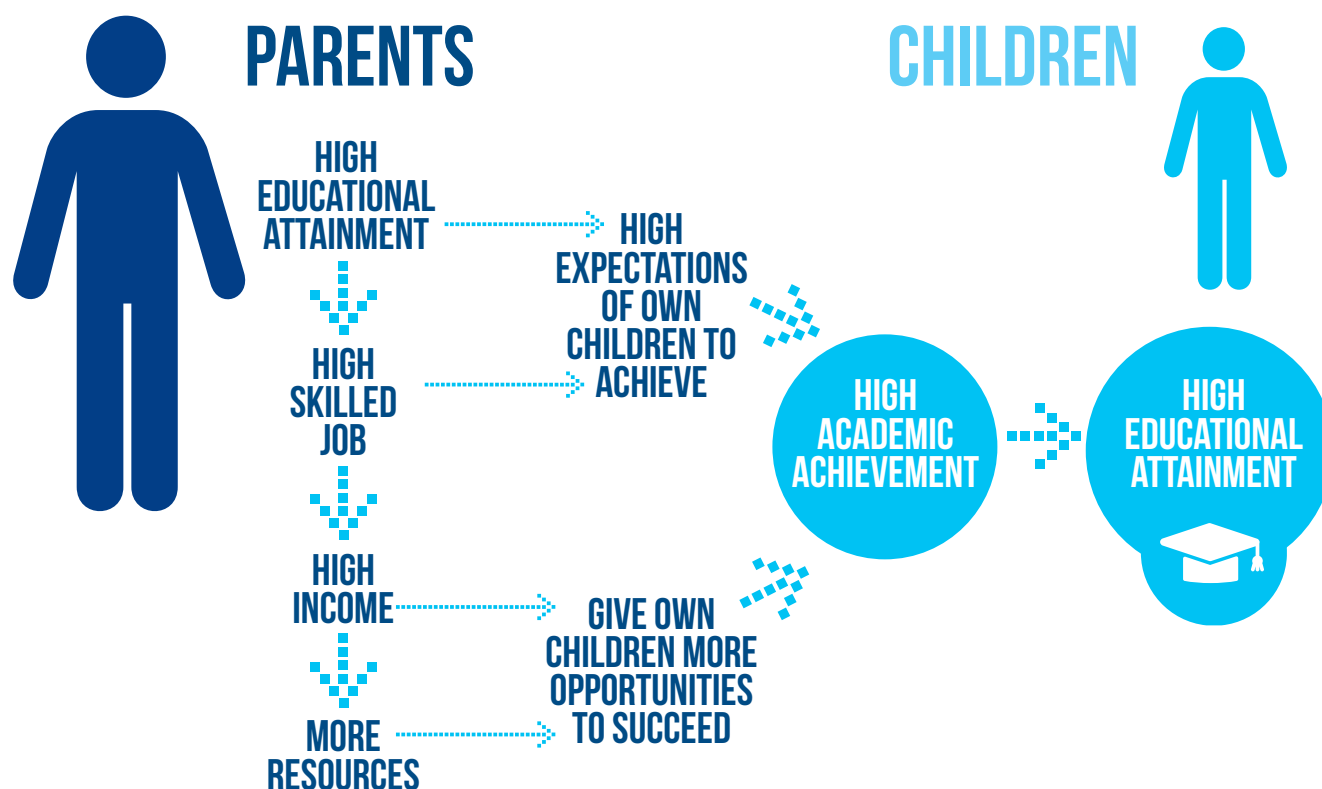


Inequality is a problem because it reduces growth and productivity and can lead to instability at the macroeconomic level, and at the micro level it can lead to poor health, lower educational performance and attainment, and crime.<sup>64</sup> Rising inequality has become a popular theme for politicians in 2016, with both parties discussing the problem leading up to the federal election in August. The McKell Institute recently launched a report entitled *Choosing Opportunity* which makes a series of 26 recommendations to strengthen equality within Australia. This report is the first in a series that takes a closer look at one aspect of inequality: education.

### Education and inequality are inextricably linked

Income inequality is inextricably linked to education through two pathways. Firstly, income is largely determined by the level of education one has: many high paying jobs in today's economy require a bachelor's degree or higher. But the level of education one might receive is also linked to a student's socioeconomic status. Those students who come from low-socioeconomic families, and attend school with other students from disadvantaged families, are far more likely to record lower educational scores, are far less likely to complete year 12, and are more likely to be locked into a lifetime of low educational achievement and poverty. Rising inequality in Australia is both caused by inequality in education, and causes it.

**FIGURE 3.2** The link between a parent's educational success and their child's success



**Source:** Derived from author's reading of the academic literature.

**Note:** Arrows indicate 'more likely to lead to' rather than an absolute causation.



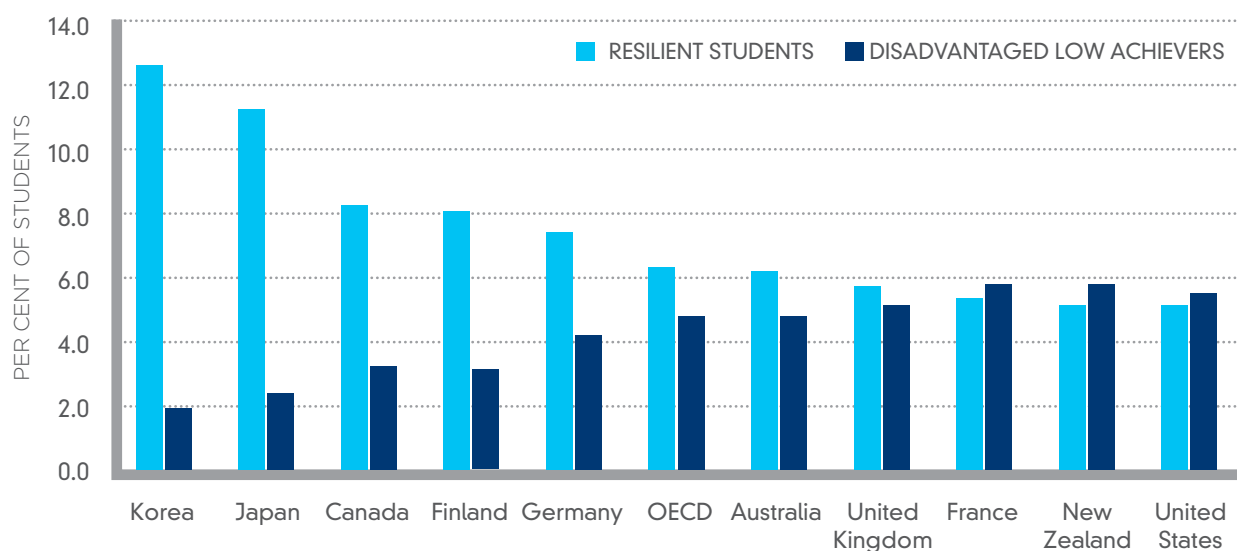
Education the world over is seen to be the 'ultimate equaliser' of economic opportunity and income: education leads to an increased likelihood of social mobility for the individual, and economic progress for the economy as a whole.<sup>65</sup> Australia's education system has been funded by Federal and State governments since the 1830s, when the idea first arose that crime was caused by ignorance, and ignorance is caused by a lack of education; therefore education would reduce crime in the colony.<sup>66</sup> While nearly 200 years of research has proven this relationship to be less than linear, education is still deemed to be of utmost importance for the functioning of a prosperous society. Today it is engrained in Australia's collective psyche that every child should receive a high quality education, no matter their personal circumstances.

However, while a public education remains free in Australia up until Year 12, the schooling system

is falling far short of equalising opportunity across the socioeconomic spectrum. According to the 2012 iteration of the OECD PISA test, a socioeconomically disadvantaged fifteen-year-old student is five times more likely to be a low performer in school than an advantaged student. Additionally, about one third of disadvantaged students in Australia were low performers in mathematics in 2012; whereas only 8 per cent of advantaged students were (OECD average: 37 per cent and 10 per cent, respectively).<sup>67</sup>

An education system is performing well if it can reduce the impact socio-economic status has on a student's educational outcomes. Australia scores close to the OECD average on this measure. Figure 3.3 displays the proportion of students who are both disadvantaged and either low achievers or high achievers (named resilient students).

**FIGURE 3.3** The performance of disadvantaged students on PISA 2012



Source: OECD 2012.

As can be witnessed, Australia's results are comparable to the OECD average. Korea and Japan's education systems do an excellent job of helping low socioeconomic students to perform well on the PISA test, and to a lesser extent, so does Canada, Finland and Germany. Conversely, France, New Zealand and the United States do a poor job for their disadvantaged students, with a higher proportion of disadvantaged students achieving poorly on PISA than are doing well.

## Inequality in education starts young and often persists

More than 1 in 5 Australian children start school at age 5 developmentally vulnerable in one or more of the following domains: physical health and wellbeing; social competence; emotional maturity; language and cognitive skills; communication skills; and general knowledge.<sup>68</sup>

While some of this can be attributed to the fact that boys sometimes take longer than girls to develop in areas of social competence and emotional maturity; many of these children enter school behind, and can never quite catch up. The gap is particularly wide for Indigenous children, of whom 42 per cent enter school developmentally vulnerable; and children from low socioeconomic groups, of whom 33 per cent begin their schooling years behind their peers on at least one metric of development.<sup>69</sup>

A study from the 1990s in the US explains why this might be. Social researchers from the University of Kansas found that by the age of three, children from high socioeconomic families had heard thirty million more words than their lower socioeconomic peers. This had a significant impact on the early development of children across a range of metrics, and impacted their abilities upon entrance to school. The researchers did a follow up study when the children were in year three and found this early educational gap had persisted into reading and comprehension scores.<sup>70</sup>

In terms of numeracy, children performed better in year four tests if their parents reported that:

- “They often engaged in early numeracy activities with their children;
- Their children had attended pre-primary education; and
- Their children started school able to do early numeracy tasks (eg. simple addition and subtraction).”<sup>71</sup>

Other studies have found that children who perform poorly in school at fifteen have performed poorly for most, if not all, of their

schooling. These students begin each year behind their peers, and are poorly equipped to learn the new material that will be taught. As a result, these students receive poor grades year after year, reinforcing the message that they are not succeeding at school and their perceptions of themselves as poor learners.<sup>72</sup> Many will become disengaged from education, and drop out of school before year 12, reducing their opportunities to secure work in the future.

A recent report found that about a quarter of young people perform below minimum achievement standards at each major milestone in their education. Researchers from The Mitchell Institute found that about 40 per cent of students who are developmentally vulnerable at age 5 will be underperforming by Year 7 on the NAPLAN tests; a slightly larger amount will then fail to finish Year 12, resulting in 26.5 per cent of 24 year olds failing to be fully engaged in employment, education or training.<sup>73</sup> In short, inequality in education starts young and will likely persist throughout a child’s life if sufficient interventions are not applied.

## Australia requires a new approach to education

It is for this reason that many educators have argued for the introduction of compulsory Pre-Kindergarten (Pre-K) education for every child over the age of three. The argument is that educators must work with children earlier in their lives in order to have a greater impact on educational outcomes than those predetermined by family and community factors.

However, most policy interventions aimed at reducing the inequality between students in educational outcomes have been directed at improving the quality of schooling. This is true around the world and also in Australia. In the US, the No Child Left Behind Act was designed to improve teaching and student outcomes by setting high achievement standards for schools based on standardised testing conducted annually. However, a recent study has revealed the failure of this program to reduce





achievement gaps, to increase average student performance, and the study also found that the policy actually severely damaged educational quality and equity.<sup>74</sup>

In Australia, David Gonski led a landmark government review in 2011 into funding schools. The *Review of Funding for Schooling* proposed needs-based funding, which was determined by understanding the socioeconomic status of children at each school, and providing extra funding to those schools with high proportions of children from low socioeconomic backgrounds. The goal for the review was to find a way to fund schools to promote “excellent educational outcomes for all Australian students.”<sup>75</sup> While Gonski school funding has received wide support from state governments (if not from all those in the media), the Federal Government has not promised to continue its funding of the program past 2017, and is now considering a different approach to the schools funding model.

While this report certainly advocates for the continuation of Gonski school funding, it is important to note that school finances are not the only factor that contributes to a child’s success at school. The next section introduces

the first Mckell Institute Index for Educational Opportunity, which assesses many of the variables that affect a child’s success at school and beyond, and maps which federal electorates are providing the best possible start for children.

### Introducing The Mckell Institute Index of Educational Opportunity

The Mckell Institute Index for Educational Opportunity measures the level of opportunity young people are likely to experience within an educational context in each federal electorate in Australia. The Index ranks electorates on a scale of 1 to 150, with 1 representing the most advantaged and 150 representing the most disadvantaged electorate.

The Index was constructed using seventeen variables that contribute as either inhibitors or enablers to success in school and beyond. The data was sourced from the Australian Bureau of Statistics, the Australian Curriculum and Assessment Reporting Authority, and the Australian Early Development Census, an initiative of the Australian Government. Table 3.1 displays the variables used in the Index.



TABLE 3.1 Variables used in The Index of Educational Opportunity

CATEGORY	SUB-CATEGORY	VARIABLE
<b>Individual Factors</b>	Language proficiency	Proportion of students who cannot speak English well or at all
	Early childhood education	Proportion of 3 and 4 year-old children attending an educational institution
	Development vulnerability	Proportion of 5 year-olds who are developmentally vulnerable in two or more domains
<b>Family Factors</b>	Income	Proportion families with children with high household income (<\$2500/wk)
	Income	Proportion families with children below poverty line (>\$800/wk - 2 parents; >\$600 - 1 parent)
	Education	Proportion of parents with bachelor or higher level qualification
	Education	Proportion of parents who did not finish Year 12
	Language proficiency	Proportion of parents who do not speak English well or at all
	Skills	Proportion of parents with high-skill jobs (managers, professionals)
	Skills	Proportion of parents with low-skill jobs (machinery operators and drivers, labourers)
	Labour Force Participation	Proportion of families where both parents are not working (either not in labour force or unemployed)
	Household Resources	Proportion of children living in overcrowded homes (Canadian National Occupancy Standard)
<b>Community Factors</b>	Labour Force Participation	Proportion of disengaged youth
	Remoteness	Proportion of population living in remote or very remote areas
<b>School Factors</b>	School results (NAPLAN)	Proportion of schools with average scores above national average NAPLAN scores on reading and numeracy (Year 3 and 9)
	School results (NAPLAN)	Proportion of schools recording scores below national average NAPLAN scores on reading and numeracy (Year 3 and 9)
	School attendance	Proportion of schools with less than a 90 per cent attendance rate

Source: OECD 2012.

This Index is by no means an exhaustive measure of the opportunity that students have to succeed. It does not, and cannot, account for every variable which may affect the likelihood of a student's success in school, university, training or the workplace. Student differences like IQ, interests, internal motivations and aspirations, learning style and personality type are encountered across every socioeconomic group, ethnicity, gender and geographical location, and have a great impact on the likelihood of a person's success in life.

Researchers have found that individual differences account for around 50 per cent of the variances in student outcomes: what a child brings to the classroom far outweighs any effect a teacher can have on a child. But teachers are important as well. 20 to 25 per cent of total learning variance depends on the type of teacher a student has. This information is nothing new: we all know how much difference a good teacher can make. The remaining sources of variance relate to pedagogical and structural factors, the quality of a student's peers, and leadership in the community.<sup>76</sup> Variables that influence all of these factors have been accounted for as much as possible in our Index of Educational Opportunity.

The Index was constructed with the knowledge that in order to make a real difference in children's lives, resources must be directed at the family level, the school level and the community level: and not in confined, separate programs, but in a coordinated manner. Piecemeal solutions to improving student outcomes have been tried and tested, and they have come up short. Take, for instance, the most recent NAPLAN test results, which indicate that Australian students' scores are plateauing, despite increased funding to many disadvantaged schools.<sup>77</sup> What is now required is a coordinated effort to reduce inequality: and inequality starts with educational achievement and attainment.

This Index is designed to give policymakers and education stakeholders a greater insight into where we, as a nation, should address

our attention. While David Gonski's report into school funding went some way towards this notion, this Index will give a better understanding of the barriers that face children in certain geographical areas: not just in terms of their socioeconomic status, but in terms of their household resources, their individual and family's proficiency in English, the proportion of disengaged youths in their community, and their school's average test scores. All of these factors play a part in either assisting or hindering a child's achievement in the schoolroom and beyond.

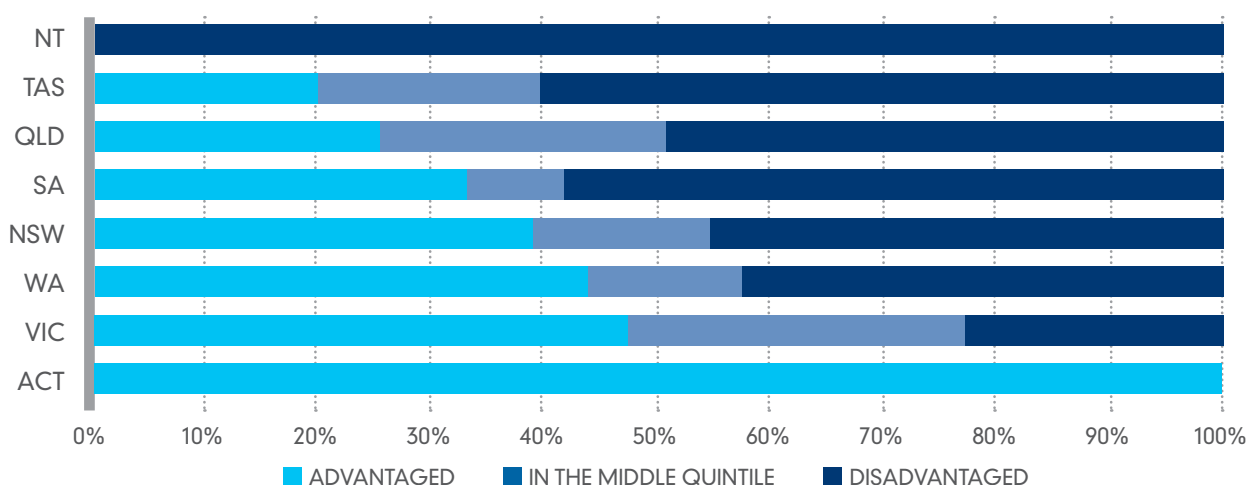
The following is a discussion of the results of the Index. For a full discussion of the methodology employed in creating this Index, please consult the methodology paper as Appendix One to this report.



## The Index of Educational Opportunity finds vast differences between states

Where you grow up can have a significant impact on your ability to achieve in the classroom and in the workplace. Some states and territories in Australia do a better job of giving every child a good start than others. Figure 3.4 displays the proportion of young people who are educationally advantaged or disadvantaged by state and territory in Australia.

**FIGURE 3.4** The proportion of young people who live in educationally advantaged or disadvantaged electorates by state and territory

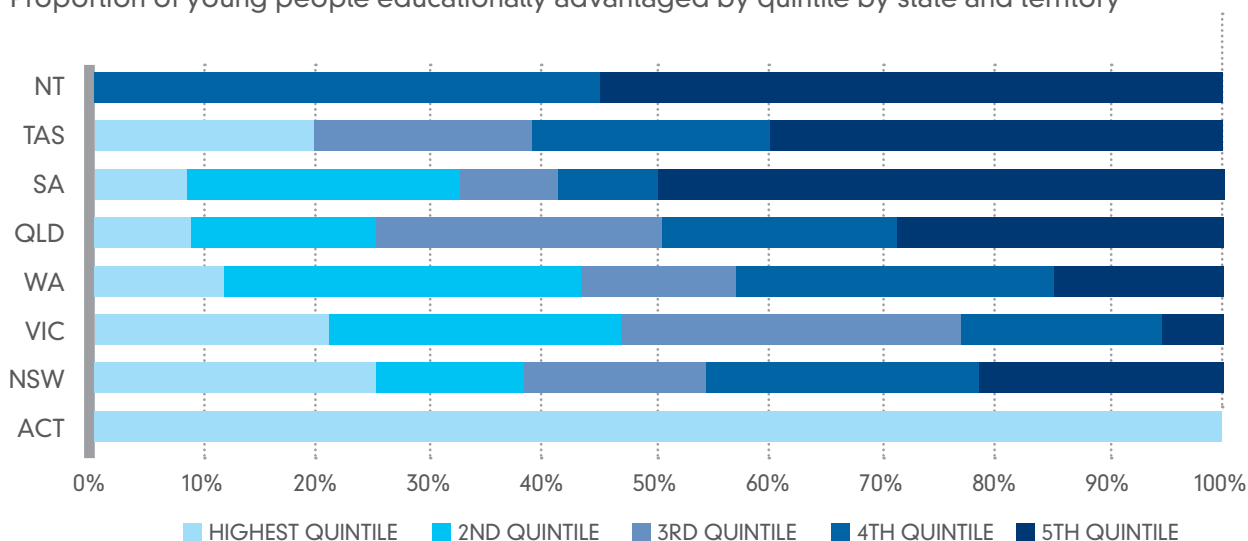


**Note:** 'Young people' is defined as those persons aged between 0 and 24 at the last census

As can be witnessed from Figure 3.4, a significant proportion of young people live in disadvantaged communities in Queensland, South Australia, the Northern Territory and Tasmania. Conversely, a large number of young people live in the most advantaged electorates in the ACT, Victoria and Western Australia.

**FIGURE 3.5**

Proportion of young people educationally advantaged by quintile by state and territory



**Note:** Quintiles have been calculated by the ranking of electorates on a scale from 1 to 150. The top 30 electorates form the highest quintile, the next 30 the second quintile, and so on. The population of young people (aged between 0 and 24) in each electorate was then attributed to each electorate in order to determine how many young people live in each quintile of opportunity.

Table 3.2 displays the number of young people in each state represented within each quintile of opportunity.

**TABLE 3.2** Variables used in The Index of Educational Opportunity

	HIGHEST QUINTILE (MOST ADVANTAGED)	2ND QUINTILE	3RD QUINTILE	4TH QUINTILE	LOWEST QUINTILE (MOST DISADVANTAGED)	TOTAL YOUNG PEOPLE BY STATE
<b>NSW</b>	573,052	293,030	344,440	538,148	473,681	2,222,351
<b>VIC</b>	374,424	441,851	506,557	306,770	87,062	1,716,664
<b>QLD</b>	142,439	231,566	369,741	301,121	415,951	1,460,818
<b>SA</b>	46,055	118,584	42,394	41,957	246,059	495,049
<b>WA</b>	93,011	233,116	102,574	207,629	109,480	745,810
<b>TAS</b>	0	31,482	30,329	32,614	61,401	155,826
<b>NT</b>	0	0	0	36,874	44,341	81,215
<b>ACT</b>	121,053	0	0	0	0	121,053
<b>Australia</b>	1,329,067	1,347,820	1,424,914	1,479,872	1,417,113	6,998,786

**Source:** Figures for the number of young people in each electorate were derived from the Australian Bureau of Statistics, 2011 Census of Population and Housing.

As can be seen, Victoria has a small proportion of people living in the most disadvantaged quintile, whereas nearly half of its population lives in the top two quintiles of opportunity. The Australian Capital Territory, as a small geographical region and the base of the nation's government operations scores the highest, with 100 per cent of the population living in the highest quintile of opportunity. This is no surprise given the level of education required in order to work for one of the federal departments, and the high wages often paid to government employees. Neither did the Northern Territory's results surprise. The population of the Northern Territory is small which means the federal electorates are geographically large, covering a wide stretch of land and people located in remote communities with few resources. As such, it is no surprise that the entire state scores poorly on this index.

Western Australia has a similar amount of young people living in both advantaged and disadvantaged communities, with the majority located in the second and fourth quintiles. Victoria arguably performs the best by its students for a large state, with only two electorates in the bottom quintile representing around 87,000 young people. Conversely, Victoria has nine electorates in the nation's top thirty electorates (the top quintile) out of its 37 electorates.

South Australia scores very poorly on the index, with roughly half of its young people living in Australia's most disadvantaged electorates, and the other half shared among the other quintiles. New South Wales is arguably one of the most unequal states, with a large proportion of young people very advantaged, and a large proportion also very disadvantaged, and a smaller share of young people living in the middle quintile.

**TABLE 3.3** Complete rankings for Index of Educational Opportunity

MOST ADVANTAGED QUINTILE		ADVANTAGED		MIDDLE QUINTILE		DISADVANTAGED		MOST DISADVANTAGED QUINTILE	
North Sydney, NSW	1	Batman, Vic	31	Cowan, WA	61	Calare, NSW	91	Wright, Qld	121
Bradfield, NSW	2	Boothby, SA	32	Maribyrnong, Vic	62	Riverina, NSW	92	Mcmillan, Vic	122
Curtin, WA	3	Aston, Vic	33	Dunkley, Vic	63	Forrest, WA	93	Paterson, NSW	123
Higgins, Vic	4	Bonner, Qld	34	Ballarat, Vic	64	Bass, Tas	94	Murray, Vic	124
Kooyong, Vic	5	Banks, NSW	35	Mcperson, Qld	65	Solomon, NT	95	Rankin, Qld	125
Goldstein, Vic	6	Barton, NSW	36	Corio, Vic	66	Wannon, Vic	96	Forde, Qld	126
Brisbane, Qld	7	Perth, WA	37	Newcastle, NSW	67	Indi, Vic	97	O'Connor, WA	127
Wentworth, NSW	8	Hotham, Vic	38	Gorton, Vic	68	Dawson, Qld	98	Page, NSW	128
Warringah, NSW	9	Sturt, SA	39	Eden-Monaro, NSW	69	Pearce, WA	99	Wide Bay, Qld	129
Ryan, Qld	10	Gellibrand, Vic	40	Fadden, Qld	70	Mallee, Vic	100	Kingston, SA	130
Bennelong, NSW	11	Corangamite, Vic	41	Oxley, Qld	71	Calwell, Vic	101	Leichhardt, Qld	131
Griffith, Qld	12	Greenway, NSW	42	Bowman, Qld	72	Lalor, Vic	102	McMahon, NSW	132
Chisholm, Vic	13	Parramatta, NSW	43	Watson, NSW	73	Lindsay, NSW	103	Barker, SA	133
Berowra, NSW	14	Dickson, Qld	44	Franklin, Tas	74	Shortland, NSW	104	Chifley, NSW	134
Sydney, NSW	15	Stirling, WA	45	Moncrieff, Qld	75	Dobell, NSW	105	Hunter, NSW	135
Melbourne, Vic	16	Isaacs, Vic	46	Flinders, Vic	76	Herbert, Qld	106	Cowper, NSW	136
Menzies, Vic	17	Moore, WA	47	Mayo, SA	77	Canning, WA	107	Braddon, Tas	137
Jagajaga, Vic	18	Bruce, Vic	48	Petrie, Qld	78	Makin, SA	108	Lyne, NSW	138
Tangney, WA	19	Wills, Vic	49	Fisher, Qld	79	Werriwa, NSW	109	Port Adelaide, SA	139
Deakin, Vic	20	La Trobe, Vic	50	Robertson, NSW	80	Hume, NSW	110	Kennedy, Qld	140
Mackellar, NSW	21	Lilley, Qld	51	Bendigo, Vic	81	Capricornia, Qld	111	New England, NSW	141
Fraser, ACT	22	Hindmarsh, SA	52	Holt, Vic	82	Flynn, Qld	112	Parkes, NSW	142
Grayndler, NSW	23	Swan, WA	53	Richmond, NSW	83	Blair, Qld	113	Fowler, NSW	143
Melbourne Ports, Vic	24	Denison, Tas	54	Hasluck, WA	84	Farrer, NSW	114	Maranoa, Qld	144
Mitchell, NSW	25	Moreton, Qld	55	Mcewen, Vic	85	Brand, WA	115	Wakefield, SA	145
Canberra, ACT	26	Cunningham, NSW	56	Macquarie, NSW	86	Macarthur, NSW	116	Longman, Qld	146
Adelaide, SA	27	Hughes, NSW	57	Groom, Qld	87	Blaxland, NSW	117	Grey, SA	147
Cook, NSW	28	Fairfax, Qld	58	Charlton, NSW	88	Throsby, NSW	118	Lyons, Tas	148
Kingsford Smith, NSW	29	Fremantle, WA	59	Gilmore, NSW	89	Hinkler, Qld	119	Durack, WA	149
Reid, NSW	30	Casey, Vic	60	Scullin, Vic	90	Gippsland, Vic	120	Lingiari, NT	150

**A note on the electorates:** As the majority of the variables were constructed using census data from 2011, 2011 federal electorate distributions have been used as the basis for this Index. When the 2016 census data becomes available, we will update the Index to reflect the new distributions and the new electorate of Burt in Western Australia.



## BOX 3.1

## THE INDEX OF OUTCOMES FOR YOUNG PEOPLE VALIDATES THE OPPORTUNITY INDEX

The Index of Educational Opportunity was validated against a mini-index of Educational Outcomes. Using four variables to determine the proportion of young people achieving desirable outcomes in each electorate, this Index presents a good check against the methodology of the Educational Opportunity Index. The variables included are: the proportion of 19 year olds who have completed Year 12 or equivalent; the proportion of 20-24 year olds engaged in either work and/or study; the proportion of 25-29 year olds with a certificate or above level of training or education; and the proportion of 25-34 year olds earning more than the average graduate starting salary of \$52,000 (as at the last census).

The Outcomes Index tells an interesting story. Firstly, more than 90 per cent of electorates fall within 30 ranking places in the Outcomes Index as compared to the Opportunity Index, meaning these electorates correlate closely across both indexes. Additionally, approximately 84 per cent of electorates fall within 20 ranking places in each index, meaning that 84 per cent of the electorates correlate very closely across both Indexes.

However, where there are disparities, they are mostly concentrated in the lower quintiles. The first two quintiles on the opportunity index are nearly exactly the same, indicating that both opportunity and good outcomes exist for young people in these electorates.

However, there were a few disparities between the Educational Opportunity Index and the Outcomes Index in the lower quintiles. Seats like Port Adelaide and McMahon are both in the lowest quintile for the opportunity index, yet there was a significant disparity in the Outcomes Index, with those two seats sitting in the fourth quintile on that Index.

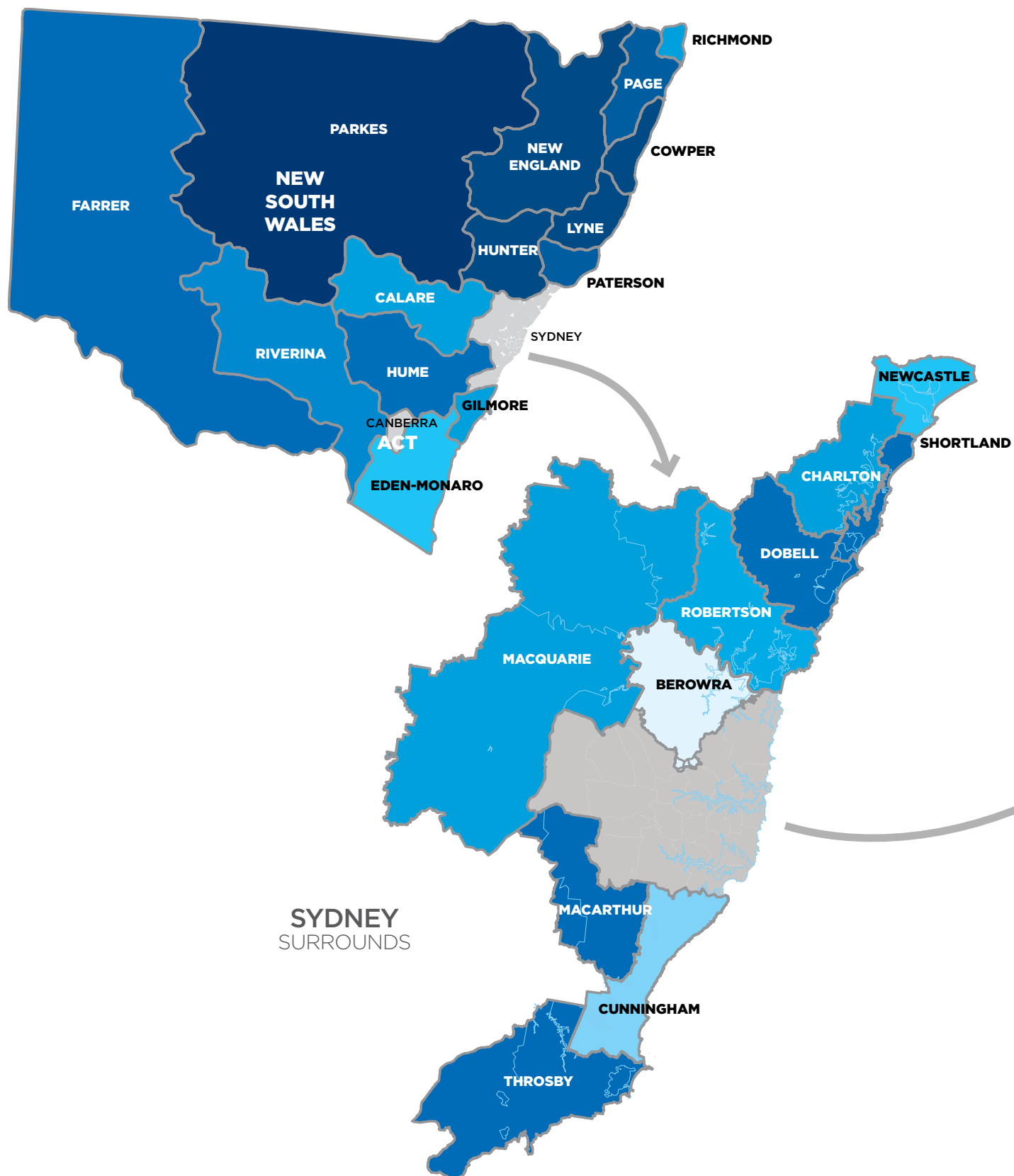
Upon closer inspection, the majority of electorates with large disparities between the outcomes and opportunity index perform better in the wages category than we might expect them to, accounting for much of the difference between the two indexes. This could be due to a variety of reasons, including; higher wages are paid in those electorates due to, for instance, mining operations; or because information for the Outcomes Index is older than all the information used for the Opportunity Index, a steady decline in opportunity has occurred in those electorates (considering the Outcomes Index measures an older group of people, the decline could be across a generation).

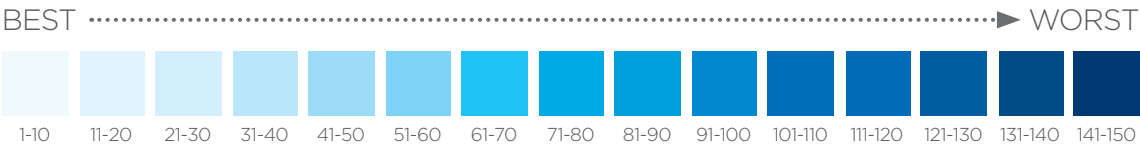
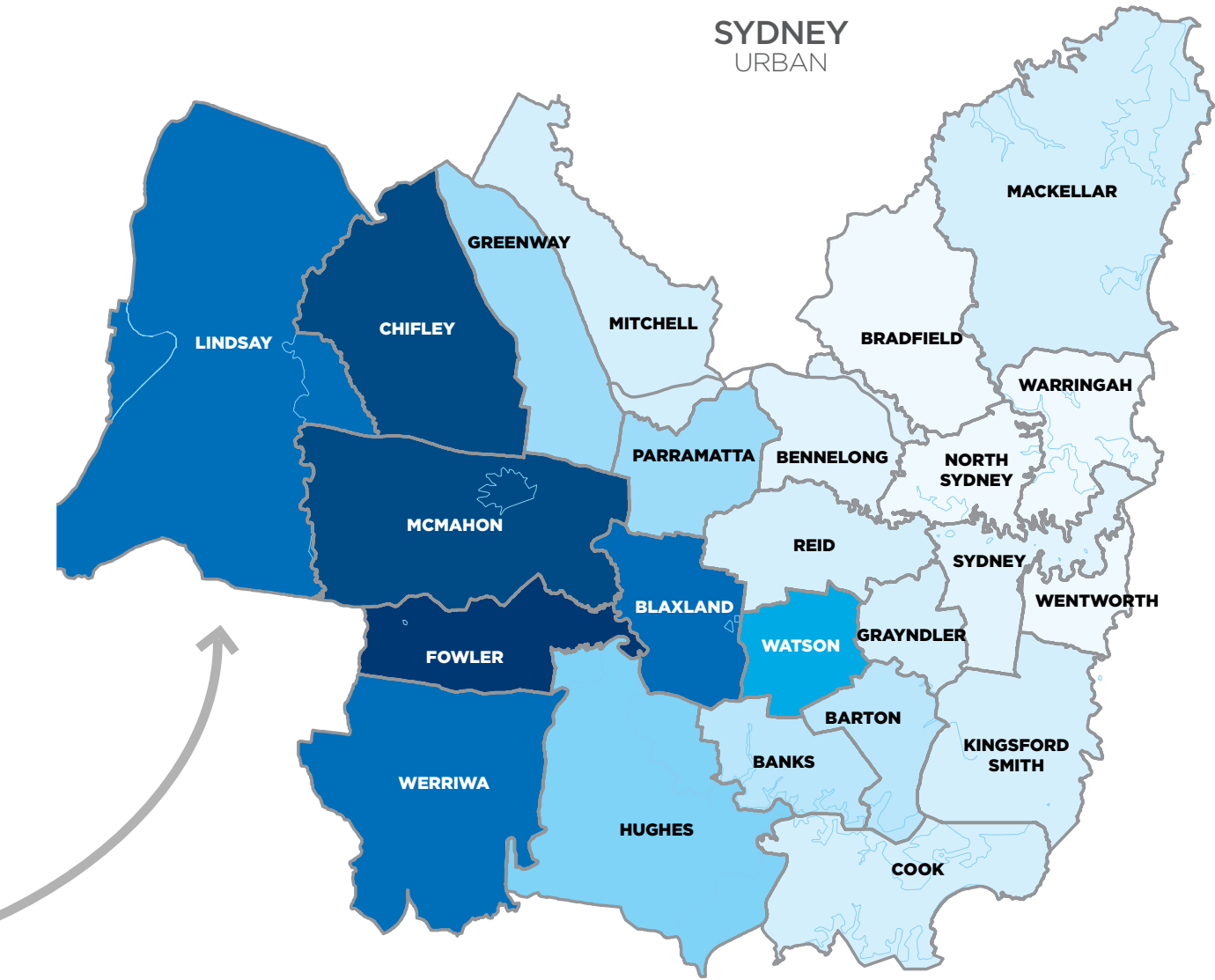
In general, though, the Outcomes Index closely correlates with the Opportunity Index and validates its findings.

### State-by-State analysis

The next section gives a more detailed analysis of the findings of the Educational Opportunity Index on a state-by-state basis. For a more detailed explanation of the different variables and their impact on student performance, please consult Appendix One.

## NEW SOUTH WALES





## NEW SOUTH WALES

Where the greatest difference is witnessed is in school NAPLAN results. Only 14 per cent of the schools located in the bottom quintile are likely to have an average NAPLAN score over the national average; whereas 82 per cent of schools in the top quintile do. This is compared to the national aggregate average of 52 per cent of schools with NAPLAN results over the national average. As is discussed in more depth in the Appendix One, “Where you go to school and who goes there with you are powerful determinants of performance.”<sup>78</sup> Children attending high performing schools will likely perform well themselves; children attending low performing schools will often be disadvantaged by the school’s average performance level.

Additionally, while only 3 per cent of New South Wales schools record attendance rates below 90 per cent in the top quintile; 15 per cent of schools in the bottom quintile record low attendance rates. Attendance rates affect all students at a school: both the student missing classes because they are missing lessons and key material, and the other students, as the teacher must direct resources and attention to the students who have missed classes.

The other interesting finding is that all New South Wales electorates record comparatively high proportions of families where no parent is in paid employment. For the bottom quintile, this figure is 23 per cent and the top quintile figure is 14 per cent; compared to the national aggregate average of 18 per cent for the bottom and 10 per cent for the top quintile.

Additionally, New South Wales electorates in the top quintile also outperform other electorates in the top quintile on many of the variables included in the Index. For instance, on the variables of high income, parents with a university degree and parents with high skilled jobs, NSW residents in the most advantaged quintile do better than other electorates in the top quintile nationally. While only 31 per cent of the national top quintile families earn more than \$2500/week; 45 per cent of New South Wales’ top quintile families earn that or more. Similarly, 55 per cent of parents have a university degree in the top quintile in New South Wales, nationally, just 39 per cent do. Interestingly, the proportion of parents with high skilled jobs (managers or professionals) is higher across all quintiles in New South Wales compared to the national aggregate average.

**TABLE 3.4** The proportion of parents with high skilled jobs in NSW and nationally

PROPORTION OF PARENTS WITH HIGH SKILL JOBS	NSW	NATIONAL AGGREGATE
Top Quintile	49%	35%
2nd	37%	26%
Middle	30%	21%
4th	28%	22%
Bottom Quintile	22%	19%

Other variables such as the proportion of disengaged youths, the incidence of overcrowding in family homes, and the proportion of students and parents who do not speak English well or at all were relatively similar across all quintiles and as compared to the national aggregate.

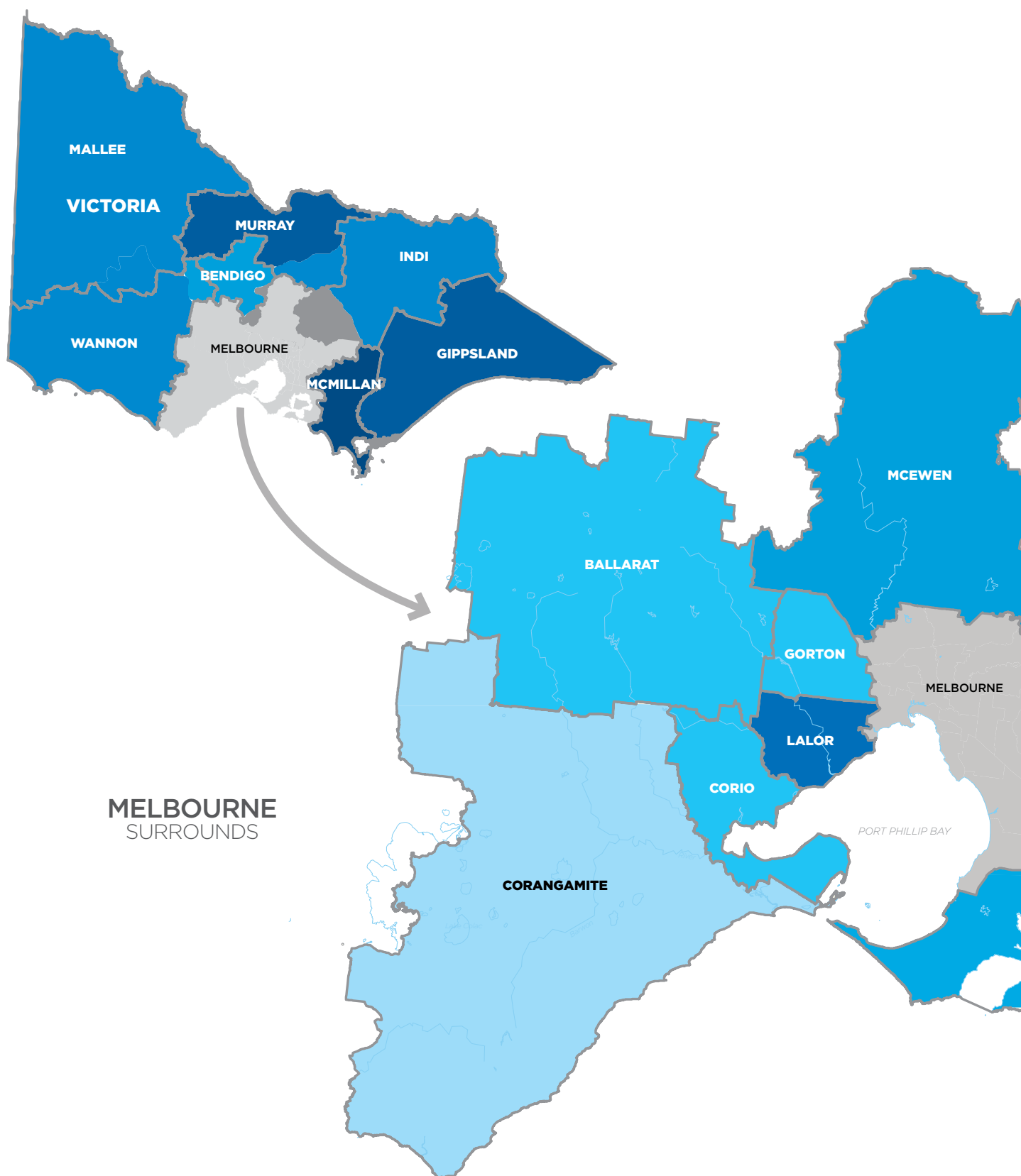






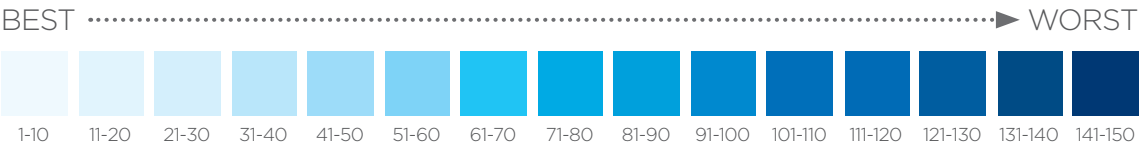
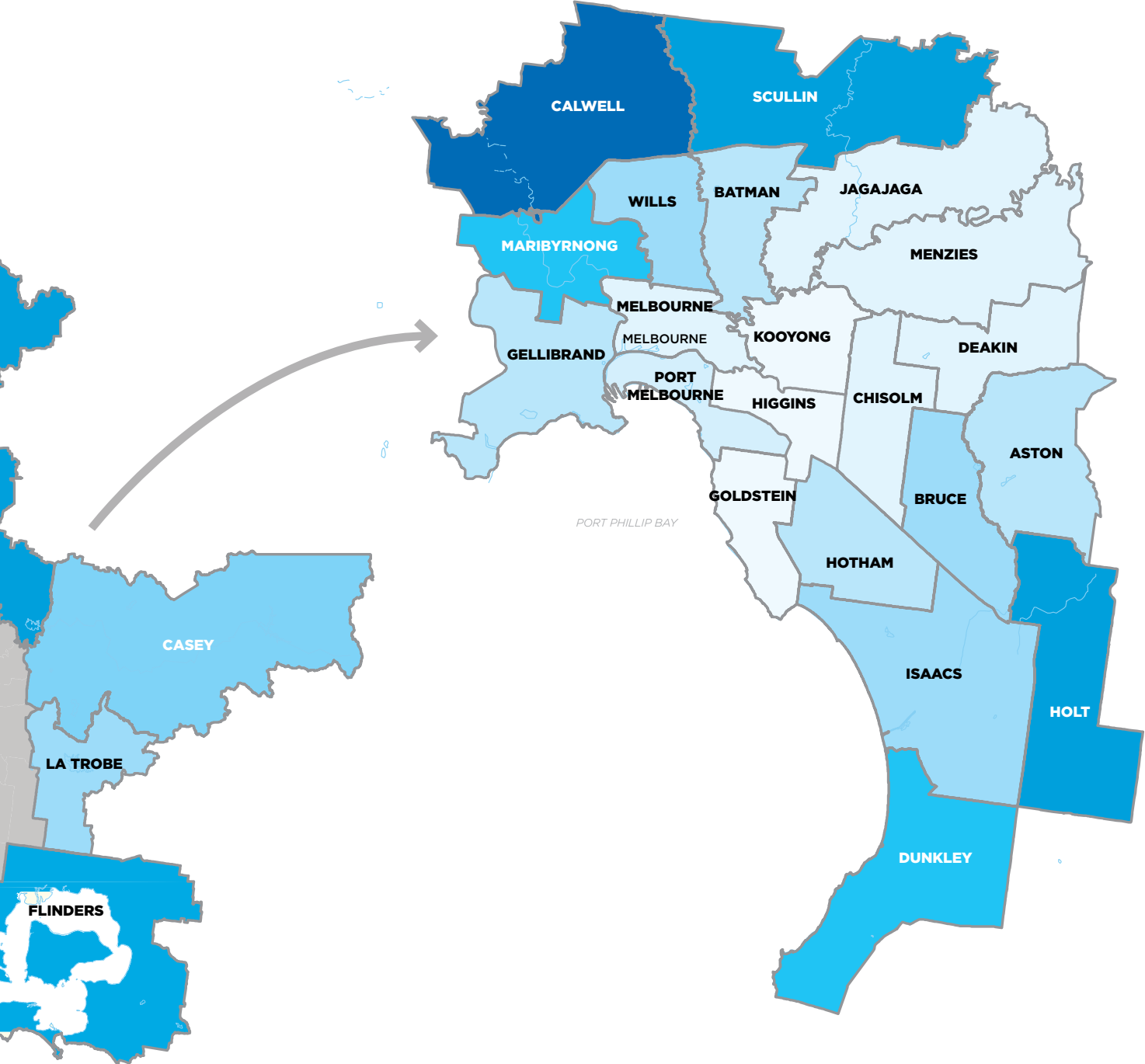


## VICTORIA



MELBOURNE  
SURROUNDS

MELBOURNE  
URBAN



## VICTORIA

Victoria scored relatively well on this Index with roughly similar proportions of young people distributed across the top three quintiles of opportunity and the remaining 23 per cent or so in the bottom two quintiles.

Where Victoria does particularly well is in having a higher than average incidence of parental education (university degree) and a higher proportion of parents working in highly skilled jobs than the national average. There is also a low incidence of overcrowding in Victorian households in general.

However, Victoria still displays a significant level of inequality in the results between the highest performing electorates and the lowest on the variables measuring NAPLAN results, school attendance and the proportion of 3 and 4 year olds attending an educational institution. There is a significant relationship between the top performing quintiles and good results on those variables. Victoria also has a relatively large proportion of families across all quintiles in which no parent is in paid employment.

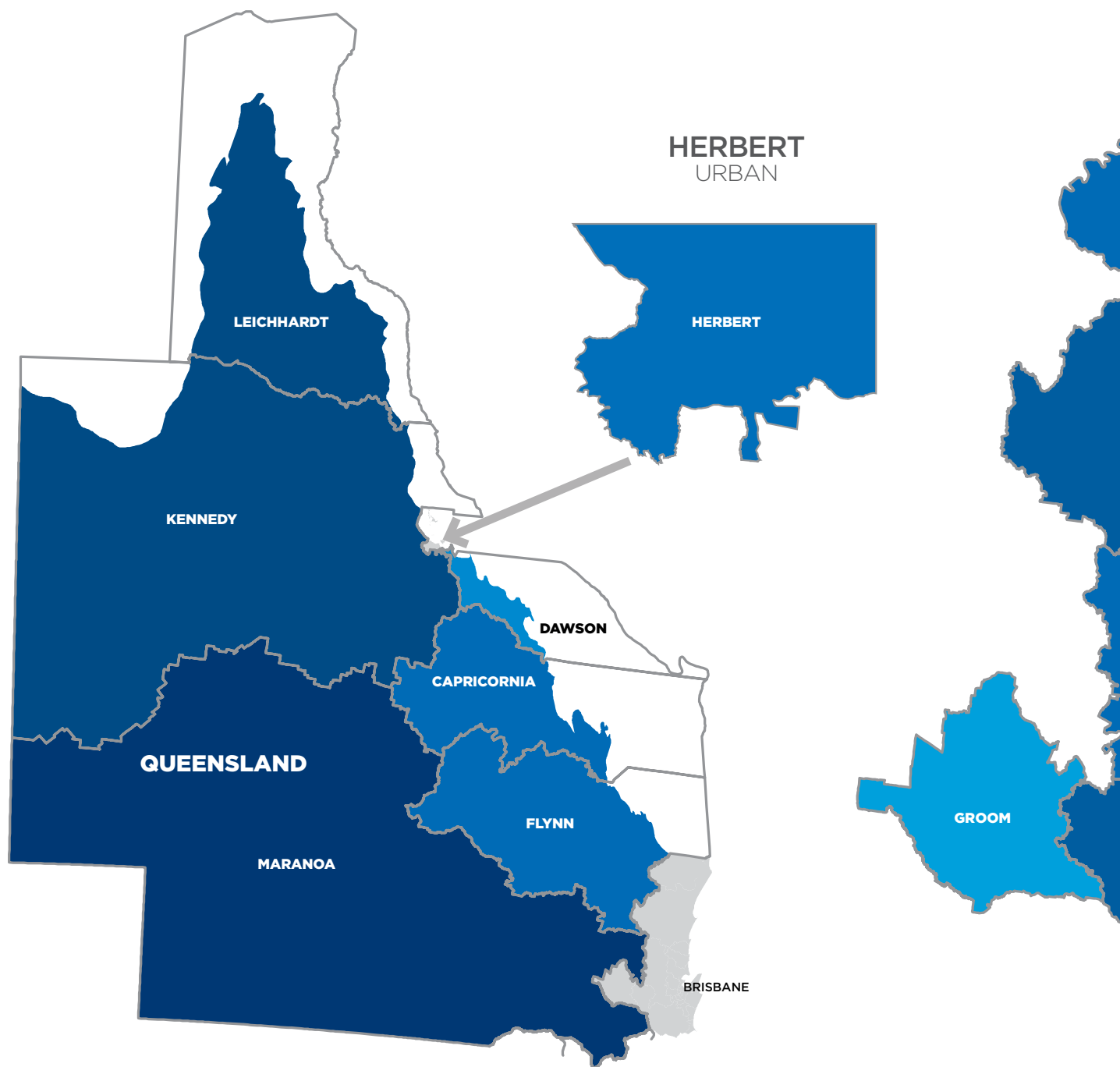
Income inequality in Victoria seems to be less stark than that witnessed in New South Wales.



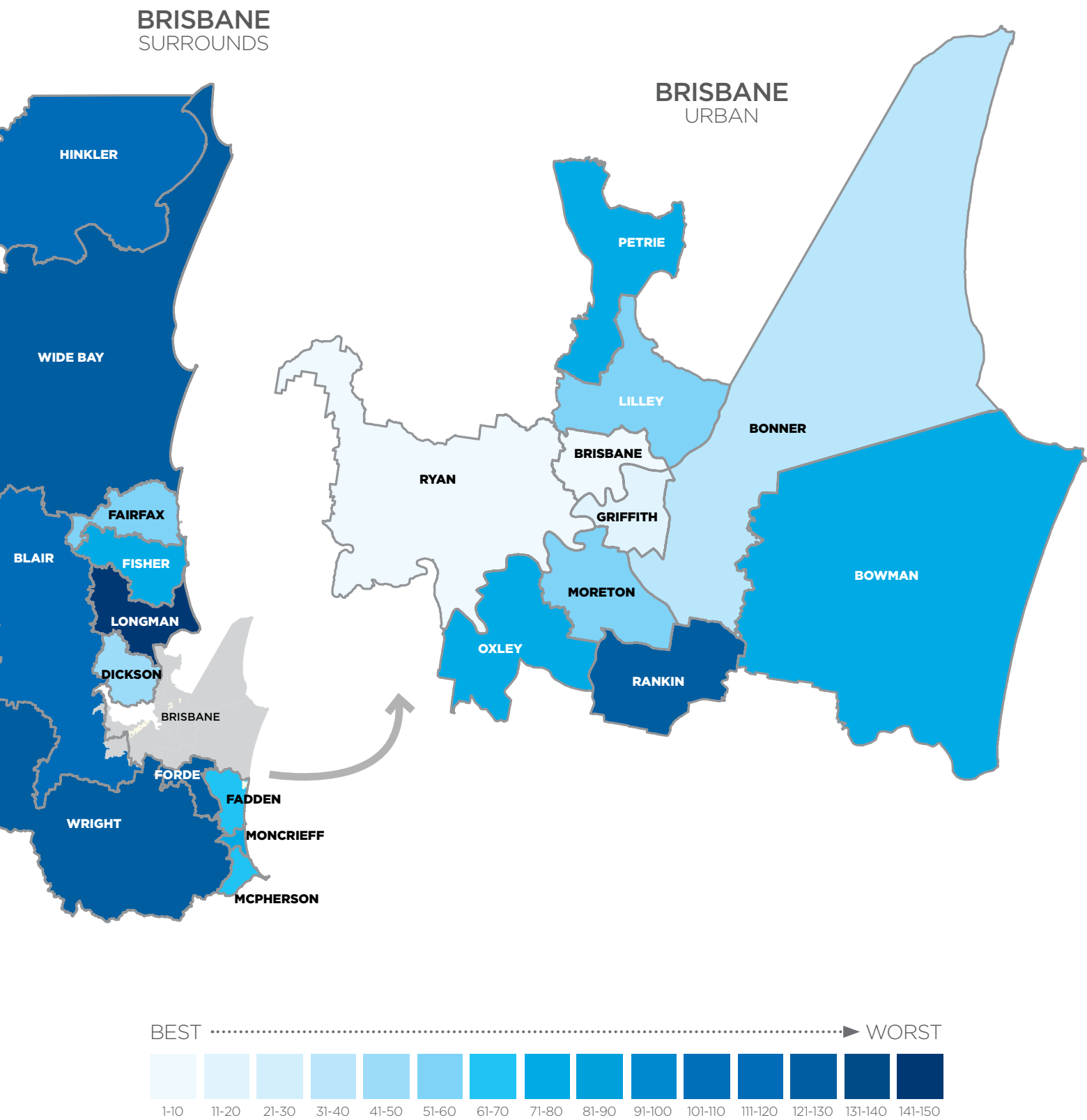




## QUEENSLAND









## QUEENSLAND

Queensland electorates in the top quintile score very well on the variables measuring NAPLAN success, parental education and high skilled jobs. However, all Queensland students are more likely to begin primary school developmentally vulnerable than other students around the nation, even though a higher proportion of Queensland 3 and 4 year olds across all quintiles attend an educational institution.

A relatively higher proportion of Queensland families also live below the poverty line, and a lower proportion on average earn more than \$2500 per week. This variable could be skewed slightly as the figures used to determine high and low income are national figures, and the cost of living in some Queensland communities

is far lower than the cost of living in major metropolitan regions.

Queensland parents in the top quintile are more likely to have a university degree than other parents in other quintiles or other parents in the top quintile nationally, although a relatively large proportion of parents living in the middle three quintile electorates have not completed year 12.

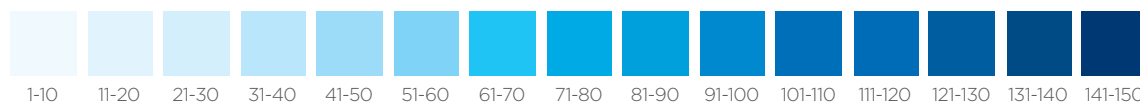
**TABLE 3.5** The education level of QLD parents compared to the national average

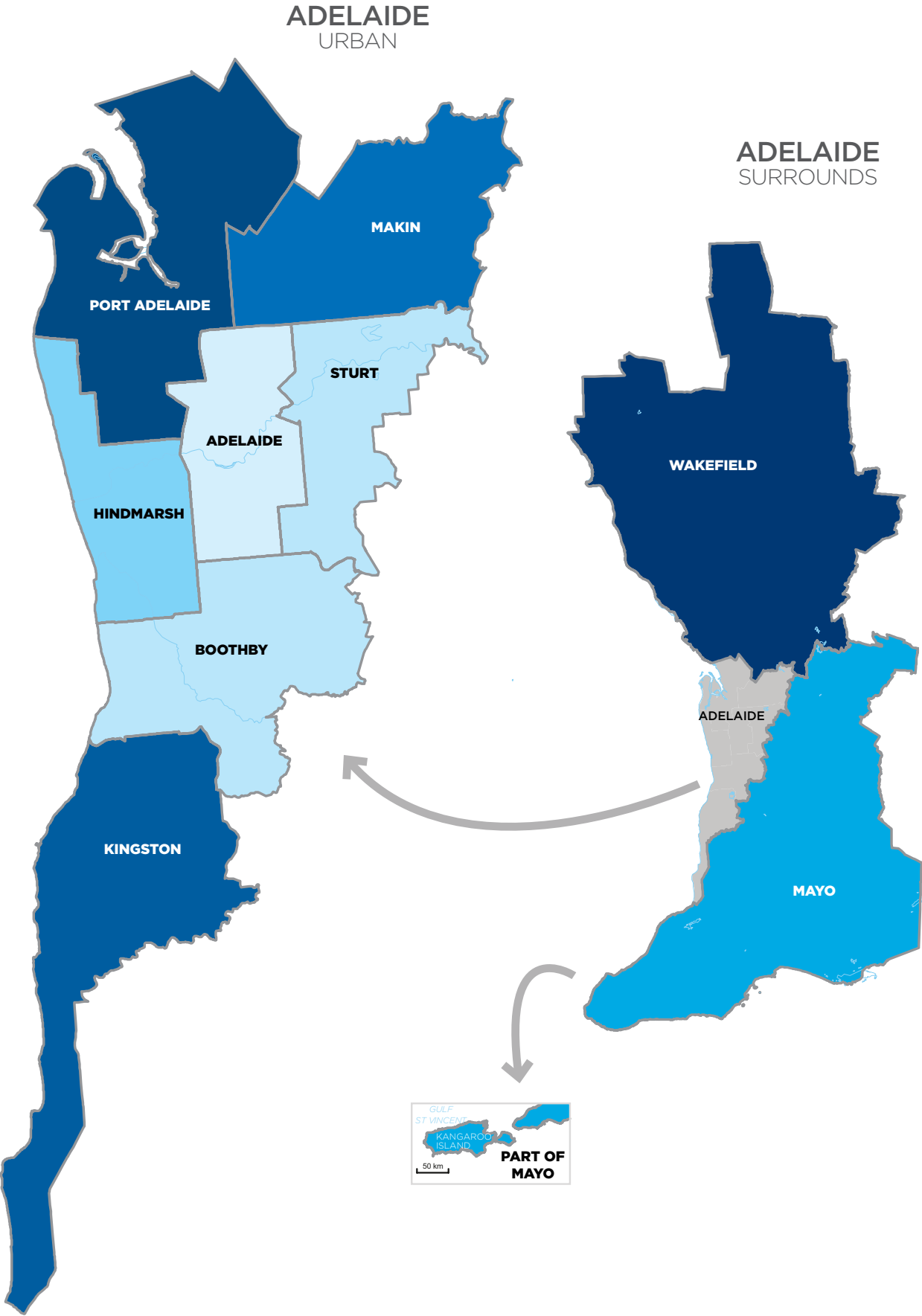
PROPORTION OF PARENTS WITHOUT YEAR 12 CERTIFICATE	QLD	NATIONAL AGGREGATE
<b>Top Quintile</b>	14%	13%
<b>2nd</b>	28%	22%
<b>Middle</b>	38%	29%
<b>4th</b>	45%	40%
<b>Bottom Quintile</b>	44%	46%
PROPORTION OF PARENTS WITH A UNIVERSITY DEGREE	QLD	NATIONAL AGGREGATE
<b>Top Quintile</b>	55%	39%
<b>2nd</b>	33%	27%
<b>Middle</b>	22%	19%
<b>4th</b>	16%	17%
<b>Bottom Quintile</b>	15%	13%

# SOUTH AUSTRALIA



BEST .....▶ WORST











## SOUTH AUSTRALIA

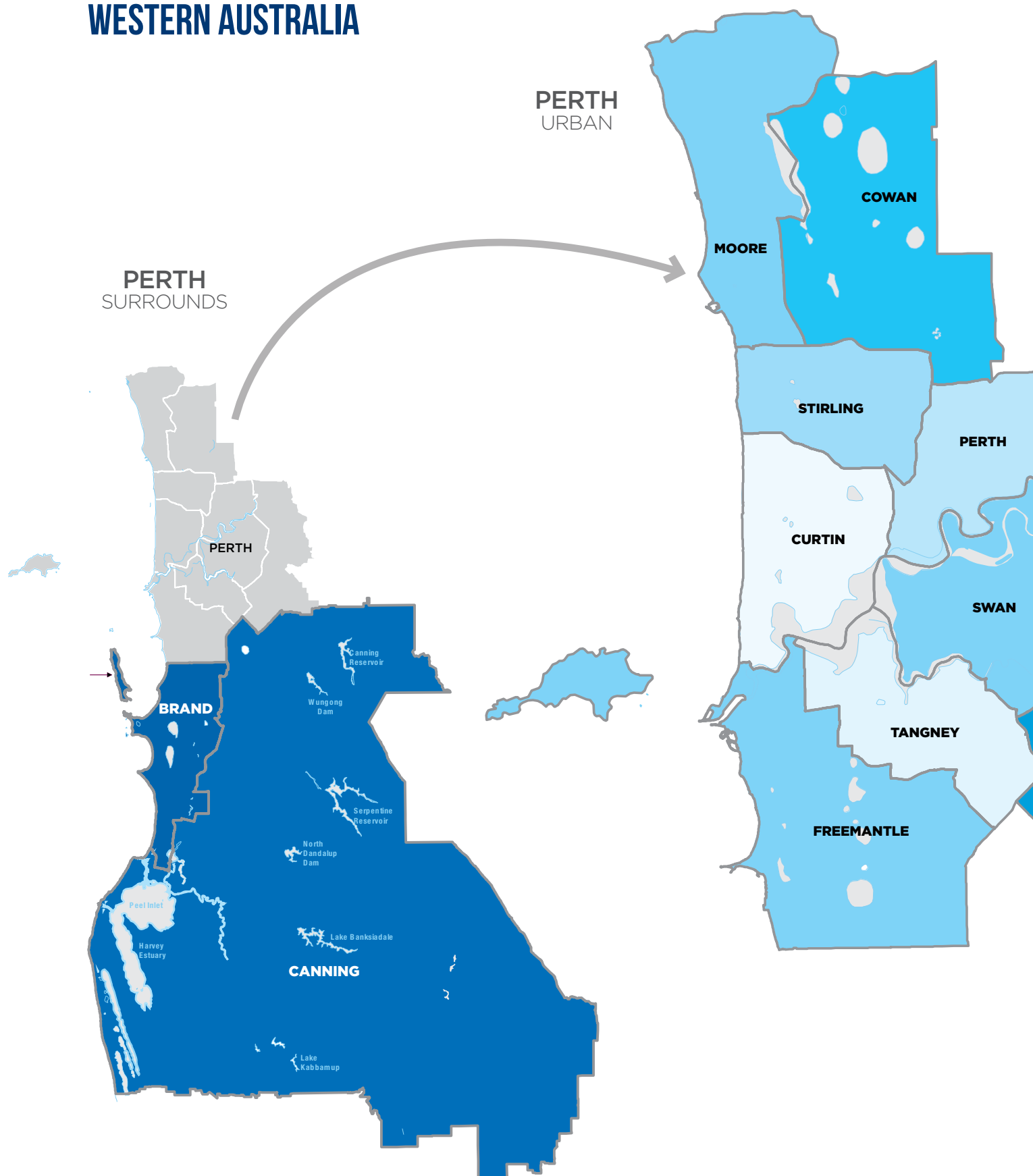
A high proportion of South Australian children live below the poverty line, have parents who have not completed year 12, are in situations where neither parent is in paid employment, and live in communities where the proportion of disengaged young people is high.

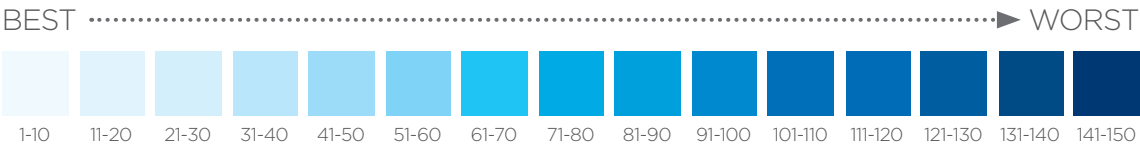
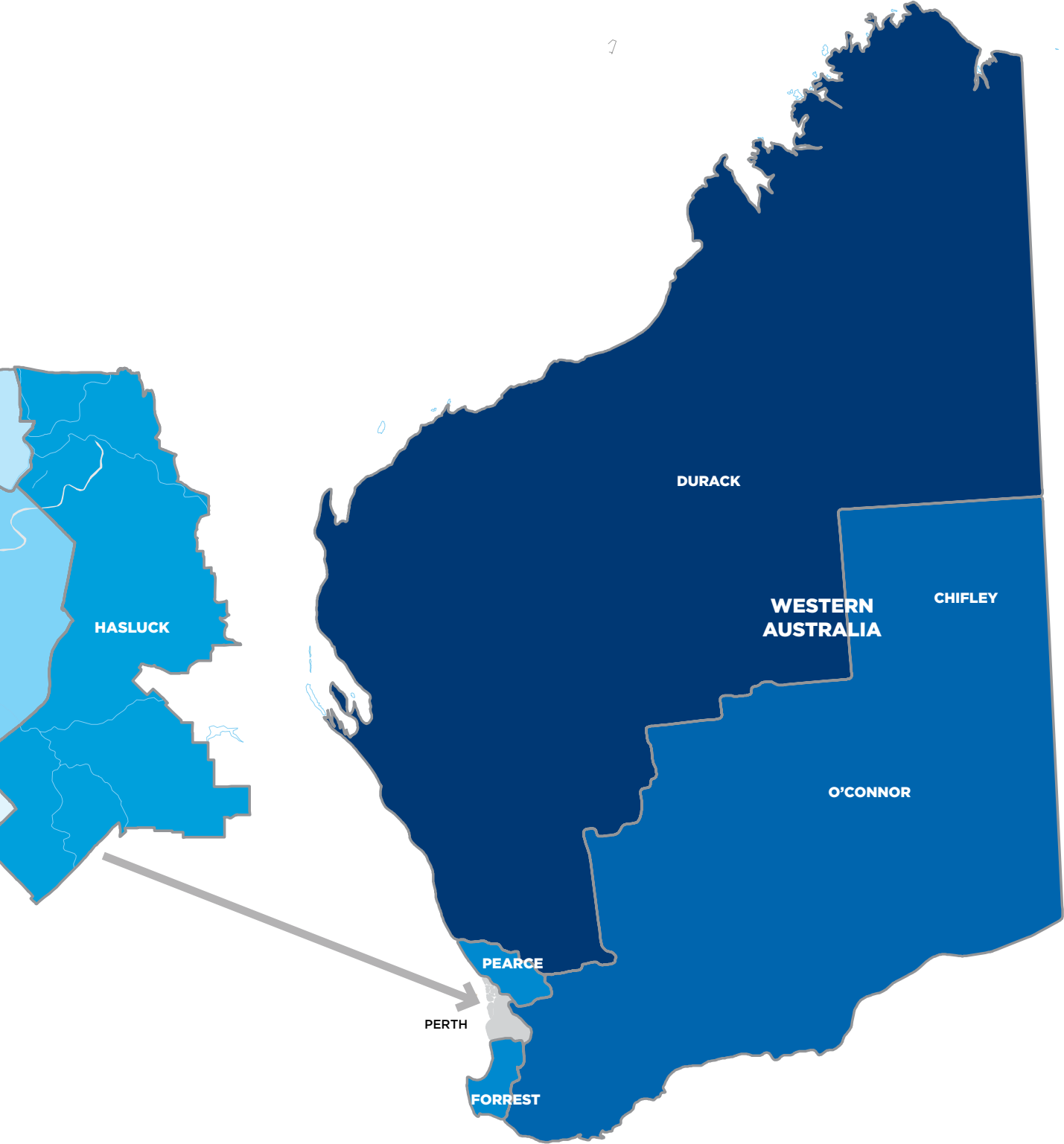
Additionally, far fewer schools in South Australia record NAPLAN scores above the national average and 3 and 4 year old children are less likely to attend an educational institution than other Australian children. These are just some of the reasons South Australia scores poorly on this Index.

Adelaide is the sole electorate that scores in the top quintile nationally, and children living in this electorate are far more likely than children in the rest of the state to live with parents who have a university degree, a high-skilled job, and a good income. They are also more likely to attend a school with other children who attend at least 90 per cent of the time, and achieve good test scores as a result.

A significant amount of attention should be directed toward those electorates performing poorly in South Australia, as nearly half of its population of young people are living in electorates with poor educational opportunities, representing 250,000 people and a significant proportion of a generation being left behind.

## WESTERN AUSTRALIA





## WESTERN AUSTRALIA

Western Australia has a similar proportion of young people living in electorates in the two top quintiles as compared to the two bottom quintiles, and this is partially due to good incomes across the board, and a relatively high proportion of parents with highly-skilled jobs. This of course is likely an outcome of the mining boom in Western Australia in recent years, and it will be interesting to see the outcomes of the second McKell Institute Index of Educational Opportunity which will take into account post-mining boom figures for income and jobs. Where Western Australia also does well is in the proportion of 3 and 4 year olds who are attending an educational institution: the attendance rates are higher than the national average.

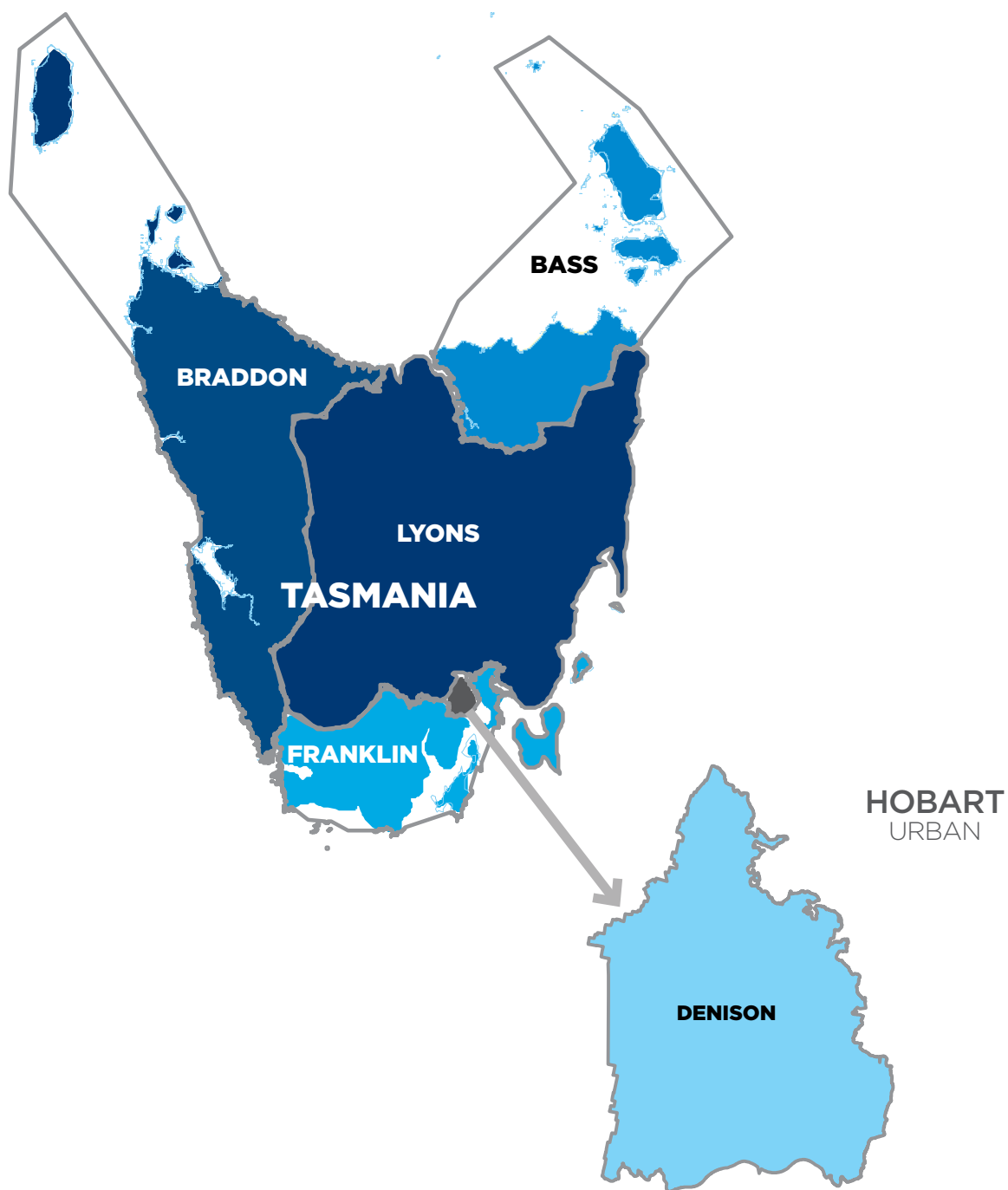
However, Western Australia must be wary of the level of disadvantage experienced by young people living in remote areas of the state. Those children are far more likely to attend a school with low attendance rates, with low NAPLAN scores, and in a community with high rates of youth disengagement. Nearly 50 per cent of parents in those electorates have not completed Year 12, and 16 per cent of families live below the poverty line.







# TASMANIA



Tasmanian children are more likely than other Australian children to live in households where neither parent is working (20 per cent); where the parents do not have a Year 12 certificate (53 per cent); and in a family living below the poverty line (17 per cent). Additionally, 52 per cent of Tasmanian school students attend a school with below average NAPLAN results, and 16 per cent go to schools with low attendance rates. However, Tasmania is doing a good job of getting 3 and 4 year olds into an educational institution, and overcrowding is not a big problem in the state.

### **We must do a better job for those electorates missing out**

The McKell Institute Index of Educational Opportunity shows those electorates that must do a better job of preparing children for success at school, training, and eventually the workplace if we as a nation are serious about reducing inequality, growing our economy and improving our productivity. We cannot continue to allow one quarter of young people to not fully engage with training or work; and we cannot continue to allow people to be trapped in a poverty cycle. As a nation that prides itself on egalitarianism and the idea of a 'fair go', we must concentrate our investments in education to those electorates that most need it: those electorates like Fowler, Wakefield, Lingiari, Lyons, Durack and Longman. The children in those communities need us.

The next section provides a series of ideas and recommendations that will assist policymakers and stakeholders to narrow the conversation regarding investment into education, training and young people. It has been designed with two ideas in mind: first, that policymakers should invest in those electorates with the greatest need as a priority; and second, that there should be a coordinated set of interventions designed to make an impact at different points in a person's life, in order to make a real difference in their life outcomes.



# PART FOUR:

## WHAT WE NEED TO DO

This report began by discussing how the world is changing, and how that will likely impact younger generations of workers. It then assessed the importance of education for a nation's wellbeing and economic prosperity, and outlined what a good education system of the future might look like. The third section of this report delved deeper into the rising problem of inequality, and how education and inequality are inextricably linked, before introducing the first McKell Institute Index of Educational Opportunity.

The Index maps the relative advantage and disadvantage experienced by young people around Australia by linking the various factors that either enable or hinder young people to succeed in an educational setting. It found that there are vast differences between Australia's states and territories, with the Northern Territory and South Australia providing the worst opportunities for young people, and Victoria and the ACT providing the best.

This next section aims to tie the report together by providing a series of recommendations that will help us to do better by all of our young people, no matter their personal circumstances. It has been divided into the potential interventions that can be implemented at different points within a young person's development. Table 4.1 displays the categories of interventions that will be discussed.

**TABLE 4.1** Interventions throughout a young person's development

INTERVENTION CATEGORIES	EARLY CHILDHOOD	PRIMARY SCHOOL	HIGH SCHOOL	TRAINING, UNIVERSITY OR APPRENTICESHIPS	TRANSITIONING TO WORK
<b>PREPARATION WITH TRANSITION</b>	Parent training programs		Career guidance and work experience programs	Industry engagement	Industry engagement
<b>ASSISTANCE IN ACHIEVEMENT</b>	Education for all 3 and 4 year olds	Teacher quality improvement and school leadership	Teacher quality improvement and school leadership		
<b>SKILLS DEVELOPMENT</b>			Volunteering programs	Volunteering programs; industry engagement	Volunteering programs; industry engagement
<b>STEM AND BASIC SKILLS DEVELOPMENT</b>		Attract more subject matter expert teachers	Attract more subject matter expert teachers	Industry engagement	Industry engagement
<b>REGULATION, ADMINISTRATION AND FUNDING</b>		Gonski school funding continuation	Gonski school funding continuation		Standardise funding requirements for reporting





Research has found that intervening early and often throughout a child's life can make a very large impact on their life outcomes. Well evaluated and targeted programs have the potential to close over 70 per cent of the gap between disadvantaged and advantaged children; and the return on investment is somewhere in the vicinity of ten to one.<sup>79</sup>

The previous section found those geographical regions that we should target as a priority for interventions, and this section provides a series of recommendations for the points in a person's life at which interventions should be available.

Currently, the Australian Government, state and territory governments and local charities and NGOs offer different programs to different groups of people. It appears that these programs are mostly piecemeal and not coordinated in any way. As has been shown in Part Three of this report, education cannot be extricated from health or poverty: all contribute to one another and are inseparable. Therefore, a coordinated plan by Governments must be concocted in order to deal with these issues, and most importantly, give all Australian children the best possible start to life.



## We need to have more children in an educational environment sooner

### RECOMMENDATION 1:

**We must extend early childhood education programs to all 3 and 4 year olds.** Those electorates within the lowest quintile in the Educational Opportunity Index should be targeted as a priority.

Trajectories of low achievement often begin well and truly before a child commences school. Children might begin school behind their peers for a variety of reasons: developmental lags or learning difficulties, language barriers, growing up in impoverished surrounds; or for some children, particularly Indigenous children, they are behind because they are exposed to multiple forms of disadvantage.<sup>80</sup> Once at school, some children can catch up, but far too many become locked into trajectories of low-achievement, falling further and further behind their peers as the years go on, and often resulting in dropping out of school early, disengaging from further training or the workforce, teenage pregnancy, and crime.<sup>81</sup>

There is a growing literature on the importance of early childhood education. Many studies have shown that children enrolled in 'head start' or Pre-Kindergarten programs experience a range of benefits compared to children who do not; including, the ability to learn more quickly upon entrance to school, higher IQs, and better behaviour patterns.<sup>82</sup> Other studies have found that the benefits obtained from early childhood education persist throughout a child's life, with a higher likelihood of that child finishing school, attending university and fully participating in the workforce.<sup>83</sup>

The TIMSS test, which tests children all around the world on mathematics and science, found

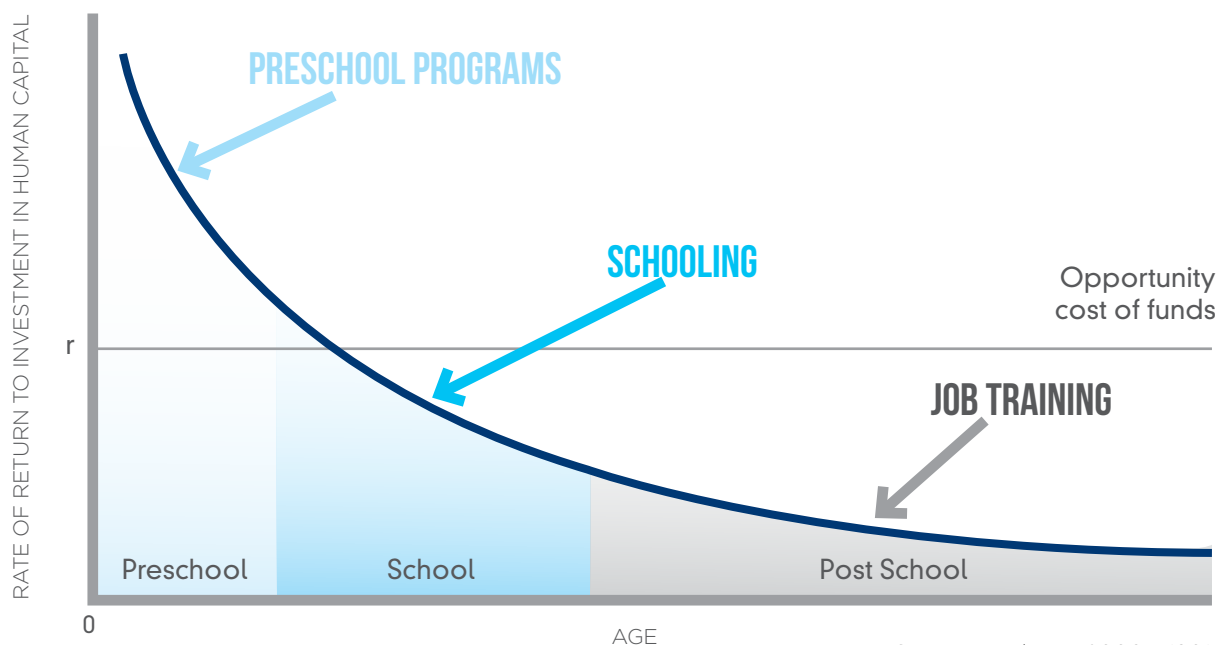
that children were far more likely to record higher achievement scores in maths if they had attended pre-primary education, and if they had started school able to do early numeracy tasks (ie. simple addition and subtraction).<sup>84</sup>

However, the recent McKell Institute report, *Baby Steps or Giant Strides*, found that although Australia is now spending more than we have in the past on early childhood education, we still spend significantly less than key OECD nations and the OECD average. As the authors noted,

"Many Australians would be shocked to know that their government spends less on childcare and preschool as a percentage of GDP than New Zealand did in 1998. Even today, New Zealand spends almost double what Australia does in these areas."<sup>85</sup>

This is doubly disappointing when we look at how much we spend on programs designed for older children, and the rate of return to both. Figure 4.1 demonstrates the diminishing rate of return for interventions over the course of a child's life. As can be witnessed, as a nation we are far better off investing heavily in early childhood education and other interventions for young children in order to make a big impact on disadvantage.



**FIGURE 4.1** The rate of return on investment in disadvantaged children

Source: Heckman 2006, p1901.

This report calls for the extension of early childhood education programs for all children, but believes that efforts should be first focussed in those areas of greatest need. While Australian governments have agreed to offer 15 hours of preschool to all children in the year before they start school, in disadvantaged communities this intervention is neither enough, nor early enough in order to make a real impact. Additionally, as one public servant told the author, the 15 hours of childcare is an arbitrary figure that does not account for the normal school day at many kindergartens and preschools. Fifteen hours equates to 2.5 days of kindy or preschool, which is particularly awkward for working parents and is not grounded in any empirical evidence about the minimum number of hours required to positively impact children.

Extending the child care subsidy is also not enough to ensure those children most at risk receive the educational support they require. While the report notes the positive steps that are being taken in this area, including the regulation of all child care centres and requirement for them to offer an educational program, still far too many children miss out on this opportunity. As such, we strongly urge the Federal Government to consider legislating for compulsory education for all 3 and 4 years-olds. Out of all the policy measures that could reduce the gap between the advantaged and disadvantaged, this is the policy that has the potential to make the largest impact.

## Parent training programs should be implemented as a priority

### **RECOMMENDATION 2: Government should implement parent training programs in areas with low educational opportunities as a matter of priority.**

Parent training programs are often centred around child protection. However, these programs could be extended both in scope and reach to include a program teaching parents to be their child's first teacher.

The level of education of parents is one of the greatest indicators of a child's outcomes in education and in life. Australian researchers found in 2002 that children with parents with a bachelor degree had a 4.5 times greater chance of achieving outstanding academic results than those whose parents did not have a degree.<sup>86</sup> A different study found that children with university-educated parents are five times more likely to complete Year 12 than those whose parents did not have any post-school qualifications.<sup>87</sup>

Other studies have found that a parent's level of education also influences their knowledge, beliefs, values and goals about childrearing, allowing more positive outcomes for children in school. For instance, "higher levels of education may enhance parents' facility at becoming involved in their children's education, and also to enable parents to acquire and model social skills and problem-solving strategies conducive to children's school success."<sup>88</sup> A parent with a high level of education will be more likely to read to their child from a young age, to invest in home learning toys and resources, to take children on visits to museums and zoos, and to invest in quality child care.<sup>89</sup>

Conversely, parents who do not engage with their children and stimulate their cognitive thinking skills do their child a great disservice. "Environments that do not stimulate young and fail to cultivate these skills at early ages place children at an early disadvantage."<sup>90</sup> Those effects are often felt for the remainder of a child's life.

However, this does not mean that parents with low levels of education or income cannot also be their child's first teacher. Programs designed to help parents, in a non-patronising and empowering manner, have the potential to make a great impact on a great many number of children. The Perry Preschool Program in the United States was an experimental program aimed at 3 and 4 year-old African American children from disadvantaged backgrounds. The program involved morning programs at school and afternoon visits by a teacher to the child's home. By the time the children turned 10, Perry participants had the same IQ as the control group of students, however their test scores were significantly higher because they were more motivated to learn. By the time the cohort turned 40 years old, the Perry group had higher salaries, higher rates of school graduation, higher percentages of home ownership, fewer out-of-wedlock births, fewer arrests and lower rates of welfare assistance than the control group.<sup>91</sup> This was obviously an intensive program, but one that paid great dividends to the children who were treated with the Perry program. Box 4.1 describes a different program that is currently operating across 12 nations and is in 100 communities around Australia, which evidence shows to be very successful.

## BOX 4.1

## THE HIPPY PROGRAM (HOME INTERACTION PROGRAM FOR PARENTS AND YOUNGSTERS)

The HIPPY (Home Interaction Program for Parents and Youngsters) program, which originated in Israel, was designed to assist parents in helping their child make a successful transition into school, especially for parents with low educational attainment and confidence. The program now operates all around the world, and in multiple sites around Australia. It is a two-year program that starts in the year before a child starts school, and is funded by the federal government for disadvantaged families.

Research completed in 2011 found that HIPPY gave a return on investment of between \$2.53 and \$4.00 for every dollar spent by government on the program, and it is applicable across various ethnic backgrounds and languages.<sup>92</sup> 2015 research from Australia's HIPPY program found that 97 per cent of parents who had participated in the program with their child believed the program helped to prepare their child for school, and 98 per cent thought that the program had benefitted them as a parent.<sup>93</sup>

The program is operated by the Brotherhood of St Laurence and is in 100 communities around Australia, targeting Aboriginal and Torres Strait Islander families. It was funded by the Federal Government in 2008 until 2017, benefitting 4000 children each year. This program has been found to be extremely successful by many different studies, and should undoubtedly be continued.<sup>94</sup> This report argues for the continuation and extension of the HIPPY program and for other programs like it to be targeted at the most high-risk communities as a matter of urgency.

The author acknowledges that the Australian Government committed \$4 million over four years in the 2014-15 budget to the Australian Research Alliance for Children and Youth to undertake research into how the Government can better assist parents to support their child's learning. We urge the Government to invest in the program(s) that are found to be most successful in improving parental engagement with children, and invest as a matter of urgency in those electorates most in need as per the Index of Educational Opportunity. This is an intervention that has the potential to make a great impact in the ability for at-risk children to transition into school smoothly, and be ready to learn when they do.

## The quality of Australia's teachers must be lifted

### RECOMMENDATION 3:

**The selection criteria for entry into teaching courses at university must be reformed.** Teaching must become a high status profession, and controlling entry into teaching courses will assist in attracting the best and brightest students, and improving the image of teaching within society.

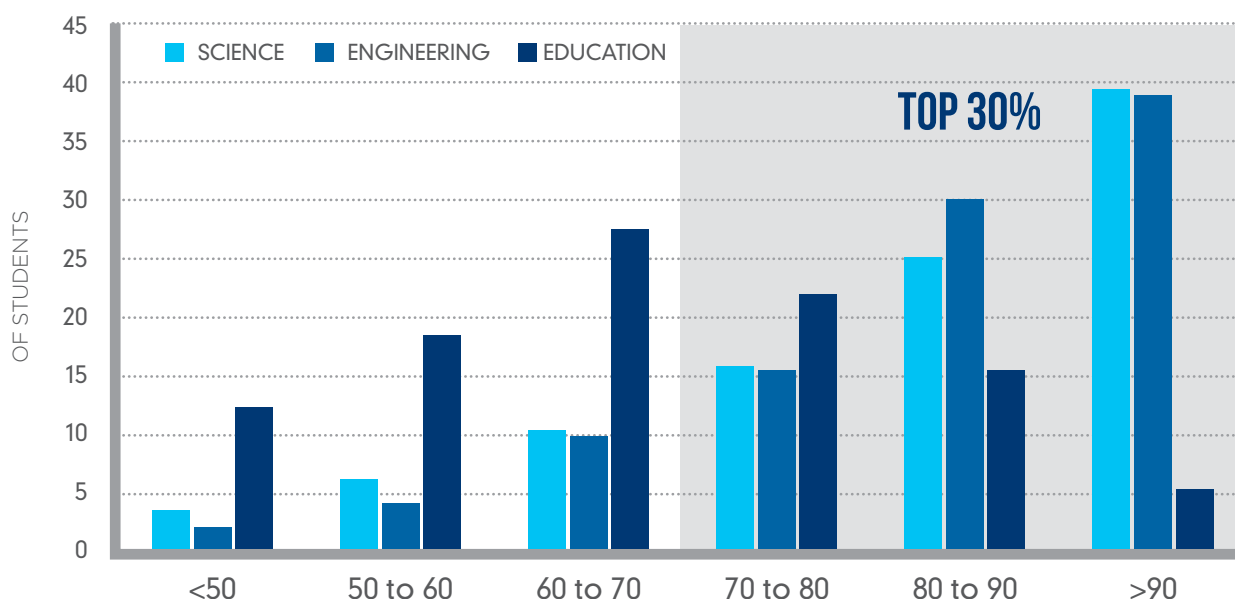
We simply could not write an education paper without mentioning the world's gold standard education system in Finland. Where Finland particularly excels is in the area of teacher attraction, training and retention. For example, in order to become a primary school teacher in Finland, a five-year Master of Education must be completed; into which only one in

ten applicants is accepted. The selection criteria requires a history of high academic achievement as well as a rigorous interview process. The profession is regarded very highly, and as a consequence, teachers are highly respected within their communities.<sup>95</sup>

Conversely, in Australia students can be accepted into teaching courses at universities based on an ATAR (Australian Tertiary Admission Rank, derived from high school results like the HSC or VCE), and do not require a master's degree to begin teaching. While the Accreditation of Initial Teacher Education Programs in Australia: Standards and Procedures specifies that entrants to teacher education courses should be broadly within the top 30 per cent of students, currently only about half of teaching course offers are made to students in the top 30 per cent.<sup>96</sup> Additionally, there are reports that universities in New South Wales made offers to students with ATARs below 50 for a Bachelor of Education in 2016.<sup>97</sup>

FIGURE 4.2

Percentage of Year 12 offers in each ATAR band in Science, Engineering and Education (2015)



Source: Australian Council of Education Research 2015.



Research has found that teachers can make a big impact on a student's outcomes. There are varying figures quoted in the literature for how much a teacher affects a child's results, but they range in impact between 20 to 30 per cent.<sup>98</sup> Research from Tennessee in the US in 1997 found that if two average 8 year olds were given different teachers – one a high performer and the other a low performer – the performance of the students will have diverged by more than 50 percentage points after three years.<sup>99</sup> Being placed with a low performing teacher in primary school is even worse for students: if a student has a poor teacher for a few years in a row, they will suffer an educational loss that is largely irreversible.<sup>100</sup>

An Australian study from 2010 found that students placed with a teacher in the top decile of achievement learned as much in half a year as students who were placed with teachers in the bottom decile did in an entire year of schooling.<sup>101</sup> The impact of a high performing teacher is even greater within disadvantaged and Indigenous communities: “the gap between Indigenous and non-Indigenous students could be closed in five years by giving all Indigenous pupils teachers from the top quartile.”<sup>102</sup>

A McKinsey & Company report from 2007 that looked at education systems all around the world found that the highest performing education systems did a few things differently from the rest:

1. They get the right people to become teachers;
2. They develop these people into effective instructors; and
3. They put in place systems and targeted support to ensure that every child is able to benefit from excellent instruction.<sup>103</sup>

They also found that the top systems had a different selection process for training teachers. The majority of systems in the world separate teacher training programs from teacher selection processes. In other words, they allow almost anyone to complete teacher

training and then select the best graduates to become teachers. However, the most successful education systems in the world combine the selection processes, by limited the number of places in training programs to those who are pre-selected as suitable for the training.<sup>104</sup> The report's authors found that the first model “tends to make teaching a low-status program, which in turn makes teaching a low-status profession.”

This report argues that the status of teaching must be improved through the control of the quality of people entering teacher training programs. While we recognise that the Australian Institute of Teaching and School Leadership (AITSL) has been tasked by Government to improve the quality of students undertaking initial teacher training courses, we argue that academic standards must be stringently tested and regulated by teacher accreditation authorities and the Government.

ATAR requirements to enter a teaching degree must be increased in order to recruit from only the top 30 per cent of students, as per the standards for initial teacher education programs mentioned above. As was recommended in the report by the Teacher Education Ministerial Advisory Group *Action Now: Classroom Ready Teachers*, personal qualities deemed important for good teachers should be assessed alongside academic merit in order to determine those candidates appropriate to undertake teacher training. One such approach to candidate selection is the Melbourne Graduate School of Education's Teacher Selector Tool, which uses a range of online tests to select appropriate individuals to take part in its Master of Teaching program.<sup>105</sup> A more holistic approach to selecting candidates to undertake initial teacher training coupled with more stringent academic standards will assist in improving the quality and status of teaching over time.

This is a job for both governments and universities. The Federal Government must better regulate for minimum standards for entry into teaching courses at universities (along

with continuing in its work in improving the transparency of the ATAR tertiary entrance system), and universities must work harder to select the right individuals for teaching courses. This report also echoes the call for greater collaboration between state departments of education and university teaching programs to control the pipeline of teaching graduates into the workforce. By controlling the quantity and quality of students entering teaching courses at university, the status of teaching as a profession will increase over time, leading to a higher quality of teachers and better outcomes for all Australian students.

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**RECOMMENDATION 4:**  
**Employment-based teaching pathways should be investigated on a broader scale.** Efforts to attract candidates from STEM fields should be prioritised.

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Following the introduction of the Teach for Australia program (see Box 4.2), the Melbourne Graduate School of Education introduced a course that provides student-teachers with the opportunity to learn on the job, in the Master of Teaching (Secondary) Internship. The program requires students to participate in 7 weeks of on-campus learning before completing a 3-year internship combining teaching secondary school students in a partner school with coursework. The selection criteria for the course involves the completion of an undergraduate degree, a record of high academic achievement, an online test component and an interview.

While some have argued against the introduction of such models for initial teacher education (ITE), we argue that these models have the potential to be highly effective in placing teachers passionate about teaching

and their area of expertise in disadvantaged schools. The model also helps to address the problem of staff shortages in specific locations or in subject areas, through its controlled access to the training.

The Teacher Education Ministerial Advisory Group report, *Action Now: Classroom ready teachers*, found that severe teacher shortages exist in subject areas like mathematics, science, and languages, and in hard-to-staff schools in regional, remote and low socioeconomic areas in Australia.<sup>106</sup> Additionally, many teachers are without any specific subject knowledge. The best education systems in the world require candidates who enter ITE to have an undergraduate or master degree in an area other than education.<sup>107</sup>

We do not seek to make any comment about existing ITE programs in Australia, but we do argue for state governments, universities and teaching regulatory authorities across all states to investigate alternative training pathways that can attract the best quality candidates to a career of teaching. We also urge these organisations to prioritise attracting STEM graduates to these programs.

Box 4.2 discusses the widely successful Teach for Australia program that provides ITE to high quality candidates in order to place them in disadvantaged schools. We argue that this program and others like it should be fully considered by the state governments of New South Wales, Queensland and South Australia.

## BOX 4.2

## THE TEACH FOR AUSTRALIA MODEL

Teach for Australia is a highly successful program designed to place student-teachers with an undergraduate degree in a field other than education into disadvantaged schools. Graduates are chosen to partake in the program from a highly-selective process and given a scholarship to complete an intensive teaching course. They are then placed with disadvantaged schools with a need for a teacher in their undergraduate field of training.

The program works for both schools and the student teachers. For schools it provides a high-performing person with a passion for science or maths or geography (or whatever field this person has training in) who can instil that passion in children. The program also trains teachers to be school leaders and help to collaborate with other school staff members to find the best outcomes for individual students, classes and schools as a whole. For the student teachers, the benefits are that the program pays them a wage while completing their training: at the end of the two-year program the student teacher graduates with a Master of Teaching.

The program currently boasts a high proportion of applicants with STEM backgrounds. In a time when STEM teachers are in demand, Teach for Australia specifically targets STEM talent for recruitment into their program. In 2016, 47 per cent of the cohort have STEM expertise.<sup>108</sup>

The Teach for Australia program was modelled on the highly successful Teach for America model, which works in much the same way. There has been a multitude of research studies showing how successful the program is at creating real change within communities. Currently, Teach for Australia operates in four states: Victoria, Western Australia, the Northern Territory and the Australian Capital Territory, with plans to roll out the program to Tasmania next year. In order to become a national program, the organisation requires both more funding and the authorisation from State Governments.

This report argues for the New South Wales, Queensland and South Australian State Governments to take steps to accredit Teach for Australia in those states.

The program is currently operating only at the high school level, however there is a significant opportunity to further extend the program to attract primary school and early childhood teachers. This report further urges governments at all levels to give more funding to this program to attract high performing individuals into the teaching profession.





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### **RECOMMENDATION 5: Curriculum updates must be a compulsory part of teacher professional development.**

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All Australian school teachers are required to complete a total of 100 hours of professional development over a five-year period in order to remain registered. However, the professional development can include up to 50 hours' worth of "reflecting on teaching practice; planning professional learning; observing a colleague's lesson; or attending an interesting talk or seminar, for example at a Museum or Art Gallery."<sup>109</sup> Additionally, when ACARA updates the curriculum, it conducts training for teachers, however, these sessions are not a compulsory part of professional development for teachers. This means that when ACARA updates the curriculum, it cannot be sure that all students are being taught to the new standards.

There is no system to adequately regulate the ongoing training that teachers partake in at a level higher than the school. Some schools get around this by organising the professional development their teachers take part in in-house; many other schools simply leave it to individual teachers to organise.

While the Australian Institute for Teaching and School Leadership is tasked with "providing national leadership for the Australian, State and Territory Governments in promoting excellence in the profession of teaching and school leadership,"<sup>110</sup> the framework for teaching and school leadership is more aspirational in nature, putting the onus back on schools to promote effective professional development practices.

This report urges each of the state teacher accreditation authorities (BOSTES in New South Wales; Victorian Institute of Teaching in Victoria, etc) to require all teachers to partake in curriculum update training as a part of the professional development program. A review of professional development for teachers should also be undertaken, with the aim to ensure professional development plays the role it is intended to play: helping teachers to provide the best learning environments for all students.



## Needs-based funding for schools is an imperative

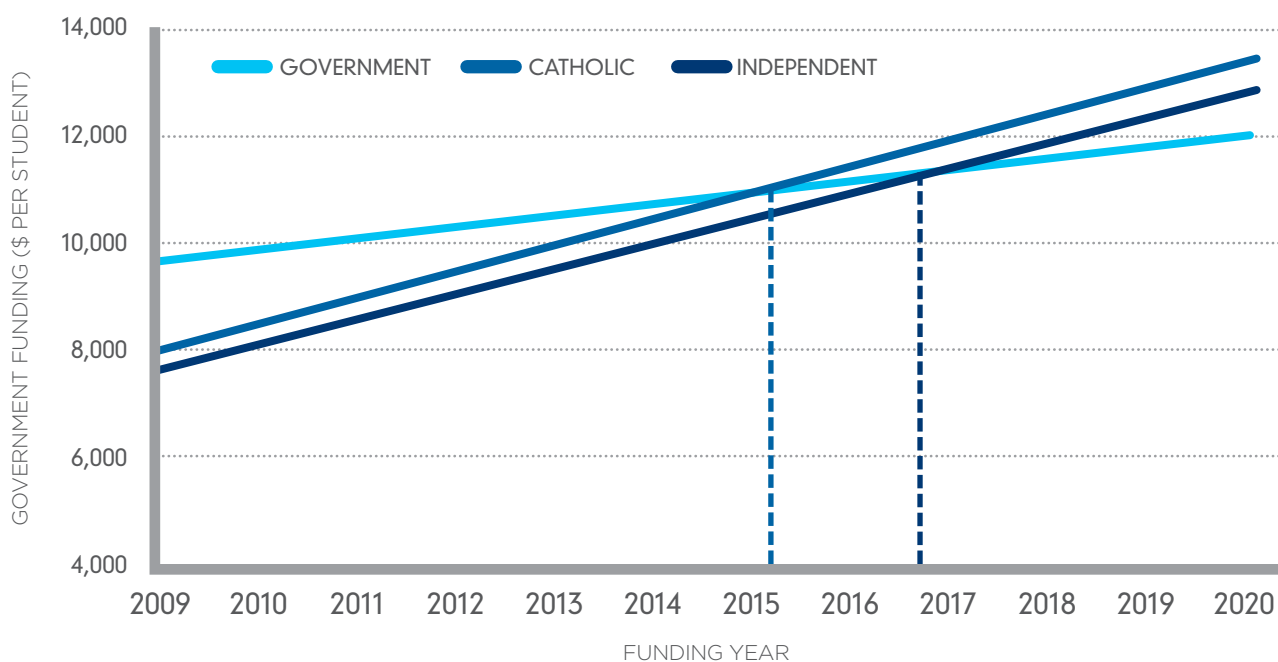
### RECOMMENDATION 6: Continue Gonski funding in its intended form.

The David Gonski-led Review into School Funding recommended the establishment of a National Schools Resourcing Body, owned by all of the State Education Ministers as well as the Commonwealth, and supported by an advisory group from all three sectors of the schooling system (government, Catholic and independent). That model was not implemented by the Gillard Government, but the existing model that allocates funding to non-government schools as a proportion of the average recurrent costs of government

schools was continued. This meant that funding has continued to increase to non-government schools along with rising costs in the government sector, regardless of whether those schools actually needed increased funding or not.

As a result, in New South Wales the top 20 most expensive independent schools receive in excess of \$111 million in public funding per year, and yet the gap between the top 20 per cent and bottom 20 per cent of fifteen year olds remains the equivalent of five years of schooling.<sup>111</sup> A recent report by the Centre for Policy Development on the equity in Australia's schools since the Gonski report in 2011 found that school equity has been declining, particularly in metropolitan areas and especially amongst secondary schools.<sup>112</sup> Most Catholic schools are presently on track to receive more government funding than equivalent public schools, as Figure 4.3 indicates.

**FIGURE 4.3** Government recurrent funding per student by sector 2009-2020



Source: Centre for Policy Development 2016

The report also found that there has been a steady shift of students from low ICSEA (Index of Community Socio-Educational Advantage) schools to high ICSEA schools since 2010, resulting in a compounding effect of disadvantage for those children left behind in low ICSEA schools.<sup>113</sup>

As Part Three of this report iterates, education resources must be targeted in order to have a real impact on reducing the gap between achievement and outcomes for the most advantaged and disadvantaged in our community.

This report recognises that Australia already spends a lot on school funding. As such, we argue not that funding is increased across the board, but that funding is better targeted to those areas and schools that most need it. Gonski should absolutely be continued, but it should be continued in the manner that it was originally intended. This is the responsibility of the Federal and COAG education ministers and the three school sectors.

## We must improve the holistic education of all young people

### RECOMMENDATION 7:

**Local governments can become engaged by supporting volunteering programs at high schools, TAFEs and universities.**

Schools must take a lead in promoting volunteering and encouraging young at-risk students to partake in volunteering opportunities.

Evidence suggests that volunteering programs, when implemented with the right supporting structures, can have a positive impact on communities and individuals. Volunteering programs can particularly help disadvantaged

students to learn how they can make a positive contribution to their communities and to help develop a more positive outlook on their ability to succeed in further study.<sup>114</sup>

Volunteering also has positive benefits for soft skills development as discussed in Part Two of this report. Depending on the nature of the activity, volunteers often get experience and develop skills that cannot be developed in the classroom.<sup>115</sup> In an age when employers are often looking for both academic achievement and examples of leadership and community engagement from candidates, giving students more opportunities to volunteer (especially those living in disadvantaged areas) will allow more students the chance to develop their soft skills and populate their *curriculum vitae*. Research conducted by LinkedIn in 2011 found that 41 per cent of hiring managers consider volunteer work equally as valuable as paid work experience when evaluating candidates, and one in every five hiring managers in Australia report hiring a candidate because of their volunteer work experience.<sup>116</sup>

This report urges local governments to become the conduit in connecting volunteering opportunities with young people at schools, TAFEs and universities within their communities. The benefit to local governments in doing so will be an increase in social cohesion and civic participation within their community, and a greater level of connection between the council and various community groups, charities and sporting clubs in their jurisdiction.

Research has found that young people from socioeconomically disadvantaged backgrounds are far less likely to become involved in volunteering. This is due to a range of reasons, from feeling like their contribution would not be valued, to not knowing how to get involved, to the structural barriers like a lack of time, money or suitable transport to volunteering activities.<sup>117</sup> These are all issues that can be addressed by a well-supported volunteering program run by local governments in conjunction with local educational institutions.

A number of volunteering programs already exist within local councils around Australia. The Hume City Council in north-western Melbourne offers a service to connect volunteers with community organisations and charities; and Blacktown City Council has extensive volunteering opportunities within council programs. Where these services could be improved is through the engagement with local state high schools with large proportions of at-risk students. This would be the responsibility of both school principals and career counsellors, as well as the local councils to investigate.

### RECOMMENDATION 8:

#### **Career guidance services must be re-imagined within schools.**

The nature of work is changing, and career guidance and work experience programs must adapt to those trends.

There has been a strong decline in the ability of schools to engage with businesses and develop support for work experience programs in recent years. This is despite the fact that students from all backgrounds highly value such programs and others designed to increase knowledge and awareness of the job market.<sup>118</sup>

The Smith Family states that all young people need at least one adult in their life on whom they can depend for advice on life and career or training options. Those young people at the greatest risk of disengagement overwhelmingly have no adult in their life on whom they can depend in this way. If there is just one adult who cares about a child and their outcomes, research has found that this can provide the necessary support to keep that young person engaged in study or make a successful transition into work.<sup>119</sup> This is where the role of counsellors in disadvantaged schools becomes even more important.

Research suggests that “schools offer the ideal site to identify and initiate early interventions for young people likely to be at risk of a poor school-to-work transition.”<sup>120</sup> However, the Federal Department of Education and Training found in 2011 that career development services in secondary schools is both patchy and inconsistent, across and within the states and territories and across the three education sectors.<sup>121</sup> Various studies have found that low socioeconomic status schools and schools in regional and rural locations are less likely to have good career guidance and work experience programs, and students are less likely to be able to access advice regarding pathways.<sup>122</sup>

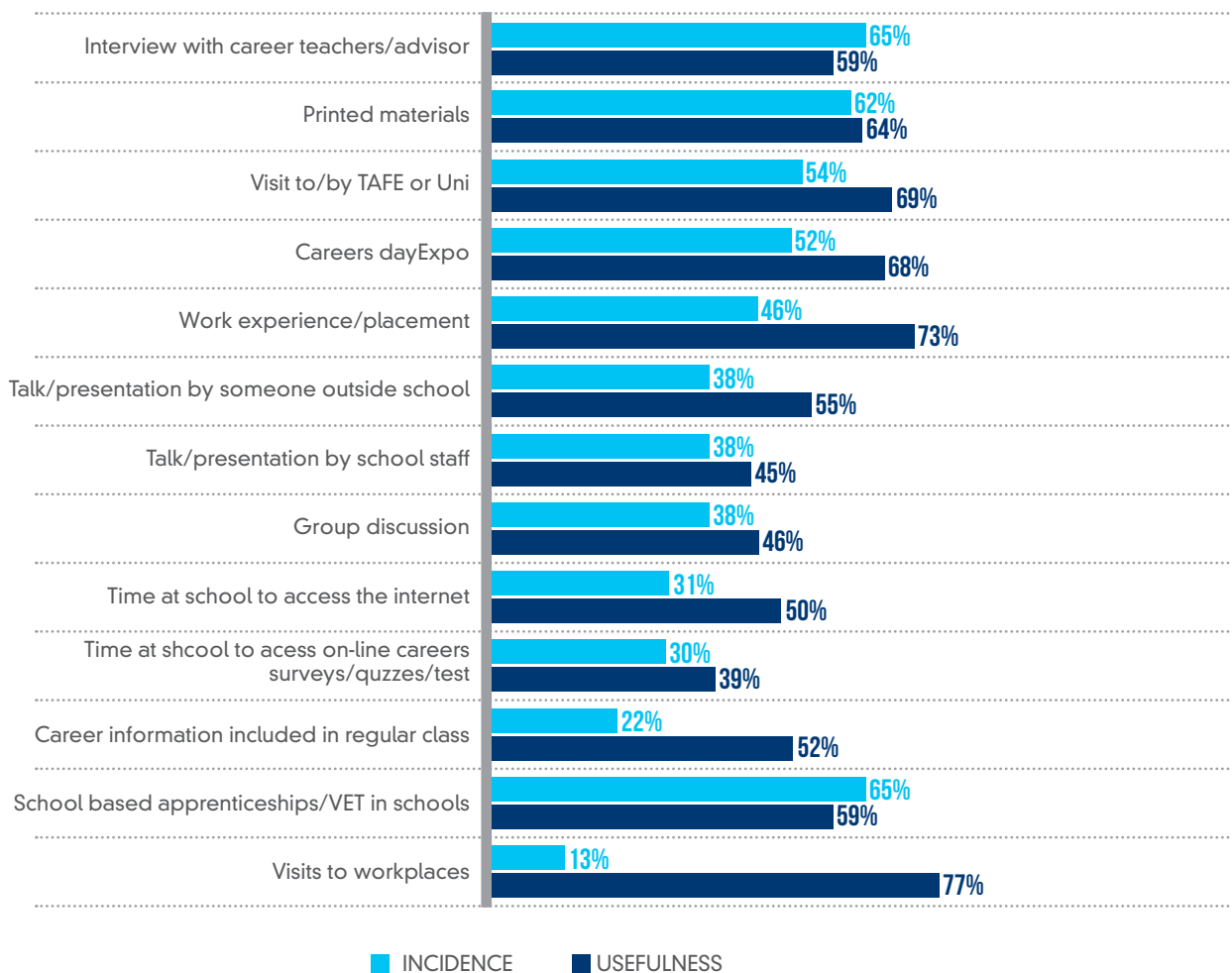
A survey conducted in 2011 found that more than a quarter of teachers working in small schools (schools with less than 500 students) say that less than half (or none) of their students receive career information, education or guidance at school.<sup>123</sup> But those that do are generally critical of career guidance practitioners, for failing to provide personalised advice that takes into account a young person’s values, interests, strengths and weaknesses.<sup>124</sup>

Figure 4.4 displays the availability and perceived usefulness of various career guidance services offered within secondary schools in Australia. As can be witnessed, those services perceived as most useful for young people making the transition from school to further study or work are least available.



**FIGURE 4.4**

The incidence and perceived usefulness of career guidance services at secondary schools



Source: Urbis 2011







Work experience placements and visits to workplaces are perceived by students and teachers as some of the most beneficial activities to prepare a student for a transition into work. However, one of the criticisms of work experience programs is that the onus is on the student to find and secure their own work experience placements when at school, which is significantly affected by the social capital of the student's family and community. Indigenous, rural and disadvantaged students have a harder time finding work experience than other Australian students.<sup>125</sup>

Parts One and Two of this report outlined the major shifts taking place in our society and in the world of work that will greatly affect the types of jobs and careers available to young people. Some estimates assert sixty per cent of students are currently training for jobs that won't exist within two decades; and the average Australian 15 year old will have 17 different jobs in five industries throughout their working life.<sup>126</sup> These projections have serious implications for the way career guidance services are conducted within schools,

particularly for those students not suitable for or not choosing to go down the path of university.

The problem with the area of career guidance services and work experience in Australian schools is that there is a lack of adequate research to draw upon. The Federal Government released a *National Career Development Strategy* in 2012 and has a range of online resources but there is limited information available as to how these resources are having an impact.

While the *National Career Development Strategy* is a good start, this report argues for better coordination amongst federal and state governments and the school sectors to deliver programs with impact that adequately prepare and give students the opportunity to experience work. At the local level, individual schools and communities need to come together, particularly in low socioeconomic or regional and rural areas, to provide the opportunities young people need to access information about work options and experience work in action.





The 2012 green paper that informed the *National Career Development Strategy* stated that the industry had been without significant leadership for far too long. This report calls for that to end now.

### **We need to strengthen the pipeline of STEM graduates**

Parts One and Two of this report laid out the argument for investing in STEM knowledge amongst the population, and STEM subjects' relationship to innovation within the economy. However, recent estimates suggest that 40 per cent of Year 7 to 10 and 25 per cent of Year 11 and 12 mathematics classes are taught without a qualified maths teacher.<sup>127</sup> Additionally, only half of Year 12 students now study science, compared to 90 per cent of students in the early 1990s.<sup>128</sup>

*The STEM: Australia's Future* report by the Office of the Chief Scientist in 2014 laid out a set of recommendations to secure the pipeline of capable STEM graduates and science and

maths literacy for the wider population. It recommended implementing mechanisms to encourage more high-achieving STEM students into teacher training courses; to mandate the study of "the scientific method, the philosophy of science and the history of scientific discovery"; and to foster partnerships between schools, higher education institutions and employers.<sup>129</sup> This report reiterates those calls for reform.

The recommendations related to attracting better quality candidates into teacher training has already been covered in this Part. A focus on STEM-qualified candidates is already being targeted by programs like Teach for Australia, and it would be a simple measure to provide teaching scholarships to outstanding STEM students to undertake traditional teacher training. That addresses the problem from the bottom up. The recommendation in this section addresses the problem from the top-down, by encouraging more organisations to become involved in the STEM training process.

## RECOMMENDATION 9: Industry collaboration with universities must be encouraged.

Collaboration at the higher education level could be encouraged by extending the R&D Tax Incentive.

There has been quite a lot of attention regarding Australia's poor collaboration statistics between industry and education institutions in the past two years. Australia ranks 32nd and 33rd out of 33 OECD nations for research institution collaboration with small/medium and large organisations respectively;<sup>130</sup> and this negatively affects our ability to innovate, to commercialise our research, and to provide job mobility between universities, government and industry for our best researchers. Quite simply, our lack of collaboration is holding our nation back.

The Australian Industry Group recently set out a plan to encourage greater levels of collaboration between higher education and industry, recognising that collaboration must be encouraged by government but enacted by organisations and education institutions.<sup>131</sup>

A recent McKell Institute report into the biotechnology industry in Australia calls for greater industry-university collaboration in order to drive commercialisation of research conducted in Australia.<sup>132</sup> But increased collaboration also has the potential to benefit students, through an increase in opportunities for internships and jobs with industry organisations collaborating on university projects.

Higher levels of collaboration will also likely affect the pipeline of students continuing studies in STEM fields. There is currently a high drop off in STEM subjects like chemistry, physics and mathematics after the first year in university. While this may be due to a variety of reasons, if students could see direct pathways to employment after graduation from a science

degree, they might be more likely to continue with their studies in STEM.

The AI Group report also identified other direct benefits to industry collaboration within universities. Those are:

1. Student engagement with industry and presence in the workplace can lead to work integrated learning opportunities to improve the work readiness and employability of our graduates;
2. Companies can create partnerships to help develop curriculum that is tailored to their future strategy;
3. Companies gain early access to the best and brightest students; and
4. Teachers can gain exposure to industry environments that improve the real life application of their work and therefore the quality and relevance of their teaching.<sup>133</sup>

Greater collaboration between industry and education institutions can be encouraged through a range of policy mechanisms. One such mechanism is the R&D Tax Incentive, which was recently cut in the Government's Omnibus Budget Savings Bill that passed the Senate in September. However, recent reviews into the R&D Tax Incentive have continually found the policy to be successful in generating greater levels of research and experimental development in Australia. Additionally, Bill Ferris, chair of the most recent R&D Tax Incentive Review, has argued that it can be extended in order to encourage collaboration by allowing a higher rebate for R&D projects that collaborate with education institution researchers.<sup>134</sup>

The R&D Tax Incentive is not the only policy mechanism that can be employed in order to stimulate higher levels of collaboration, but as it already exists and has wide industry recognition and support, it will be one of the simpler reforms to make in order to kick-start change in our economy regarding STEM. This report urges the government to reconsider

its recent cut of the R&D Tax Incentive and to extend its incentives for those organisations who collaborate with our research and education institutions. This simple reform has the potential to strengthen our pipeline of STEM-capable workers from the top-down, and generate the innovation our government and nation so strongly desire.

**Processes and reporting of interventions must be standardised in order to better understand what works and what doesn't**

**RECOMMENDATION 10:**  
**Processes for reporting of programs designed to improve student outcomes must be standardised.**

In the process of researching this report, it became clear how fragmented the 'education system' truly is. There is a myriad of stakeholders involved in education and work-ready training. The existing interventions are even more numerous and disparate, which is a problem regarding the reporting and evaluation of programs by government or third parties.

The 2014 report into Australia's STEM Future by the Office of the Chief Scientist made this point succinctly: "Our datasets are incomplete in coverage and fragmented in their approach. We do not have the tools we require to track our progress, act swiftly on gaps or help stakeholders see their place in the whole."<sup>135</sup>

Table 4.2 displays the data available online for reporting of various programs and interventions designed to mitigate some of the issues discussed in this report. As can be seen, there is an array of programs that already exist in operation; however, while the data available regarding the cost and relative success for some is complete, for others, it is very limited.



TABLE 4.2 The data available for various program interventions

PROGRAM NAME/ OPERATOR	GOALS/PURPOSE	METHOD	FUNDING SOURCE
<b>Clontarf Foundation</b>	Uses AFL and Rugby League to encourage Indigenous boys to stay in school	Boys are not allowed to play AFL or Rugby League on Saturday if they don't meet requirements of school attendance and minimum achievement standards	Federal: 31%; State 35%; Private sector remainder
<b>Australian Indigenous Mentoring Experience</b>	To help students finish school and transition into university/employment/training	Personal support, coaching and career advice offered to students	Government, universities, businesses, fundraising and individuals
<b>National Accelerated Literacy Program</b>	Deal with low literacy rates in remote communities, particularly Indigenous communities, in the Northern Territory	Increasing literacy rates through 4 teaching stages; Literate Orientation (interpreting texts), Transformations (creating contexts), Spelling and Writing. Provides students with routine, also increasing attendance rates	Federal government and NT government, and Charles Darwin University. Funding ceased in 2009
<b>CSIRO Indigenous STEM Education Program</b>	Increasing the participation of Aboriginal and Torres Strait Islander students in STEM	Different programs for children of different ages. Encourage pathway to Bachelor of Science	Government and sponsor (BHP Billiton Foundation)
<b>Australian Business Week Enterprise Education Program</b>	To simulate business concepts, to build problem-solving and communication skills, and to encourage students to develop interest in business	Primary, middle and high school programs where simulations are run with students participating in a small business	Mixture of funding from Federal Government and corporate partners. Each school pays to be involved and self-funds program
<b>\$20 Boss Program, run by Foundation for Young Australians</b>	Aims to develop enterprise skills and expose students to entrepreneurship	Loans of \$20 to student to start-up a business. Students then are encouraged to pay the loan back with a \$1 legacy payment	Private sponsor (NAB); previously also supported by Victorian Government
<b>Little Scientists</b>	Aims to spark interest in pre-school age children in STEM, and encourage educators to engage more with STEM fields	Fun, age-appropriate experiments	Federal govt \$4m grant for 2016-17 period; corporate support (PwC)



COST	RESULTS	SUCCESSFUL?
\$6840/student; one full time staff member per 25 boys	89.6% retention rate; 85% Year 12 graduates remained engaged in employment or further education 12 months after end of program	Yes
Under \$3000 per student annually	2015 Year 12 attainment 93.7% (compared to 58.5% for wider Indigenous population)	Yes
Unpublished	Results were reported in relation to remoteness level. Indigenous students on a whole did not improve their literacy except for those living in regional areas (who improved between 0-1 years' worth of schooling)	No
Unpublished	Unpublished	Unsure
Unpublished	Unpublished	Unsure
\$20 per student initially, final figure varies per students involved. \$20 is paid back at the end of the program.	61% teachers reported students improved communication skills; 77% thought students improved business literacy skills; 58% students thought they had improved their budgeting and problem-solving skills	Yes
\$135 fee per institution, no program cost data available	Unpublished	Unsure





The Federal Government has recently taken steps to improve the reporting process for social services providers through its Department of Social Services Data Exchange program. However, the program is still in its infancy and it is difficult to tell its success or whether data will be made available to the public. This report argues for a similar service to be rolled out for the education and training sectors in order to help improve the reporting processes for government-funded programs. This will allow government to better judge the efficacy of interventions for young people and to make better decisions for all Australians. This job is firmly in the Government's hands.

### **We must be smarter with our funding**

This section has provided a series of ten recommendations designed to set Australia's education system back on the right path: to one where every child has the opportunity to strive for the career they want, and to ensure Australia has the skills and capabilities required to drive our economy for many more years of uninterrupted growth. But in a time of limited government funding, we must be smarter about the way we use the funding we do have. Research tells us that we are far better off investing in our very young children and families than investing more heavily in young people as they get towards the end of their schooling. However, this does not mean we should give up on those older young people. We can be more pointed in our interventions; but we must do this in a transparent manner that is evidence-based. While some of the recommendations made in this section do require additional funding, most call for better allocation of existing funding towards those most in need. If we are not more targeted in our approach, the gap between rich and poor, between the haves and have-nots, will only continue. And as has been discussed previously, this is bad for our society, disastrous for our economy, and obviously very unfair for the vast majority of Australians caught without opportunities.

# CONCLUSION

During the process of this research it became clear that there are some very positive changes occurring in Australia regarding the education system. It is sometimes easy to forget that Australia's education system is in fact world class. But this does not mean that we should not be trying to make it better. Still too many young people miss out on essential opportunities which then have flow on effects for the rest of their lives. There are also a declining number of young people choosing to undertake study in STEM fields; and as a whole our children's academic results are slipping on key international measures.

Australia has a history of being complacent with our lot in life. We call ourselves the lucky country, often without the knowledge that the very term that was meant to be a criticism of our society has turned into an explanation for our success. We also like to think of ourselves as the land of the fair go, patting ourselves on the back for reforms enacted by our parents' and grandparents' generation, but without serious consideration to our own children.

This report has aimed to provide a sweeping view of the major trends that have already started to shape our world, and provide recommendations on how we might band together to provide every young person with the opportunity to make something of themselves. It has introduced the very first of the McKell Institute's Opportunity Indexes: The Index of Educational Opportunity, that has mapped the level of advantage and disadvantage around the nation. While it may not provide many surprising results for those working in the education or social services system, it aims to shift the public rhetoric that views education as a silo, unconnected from issues that plague families such as overcrowding in homes and living below the poverty line – issues that get in the way of children being able to perform to their best ability. It provides a starting point for policymakers to direct resources, and argues that this must be done as a matter of urgency.

It also provides a series of recommendations that will affect young people more broadly. We argue that in order for our nation to innovate and remain competitive in a global economy, we must get more students studying in the STEM fields: both at school and beyond. We also need to start thinking about giving students a more holistic education: in an environment where most content-related questions can be answered with just a few clicks of the mouse, high-level skills such as problem solving, communication and creative thinking skills will be more important than ever.

The problems and recommendations identified in this report speak not just to government. Government's role is certainly important, and should be strategic in providing the right policy instruments to lead our nation boldly into the 21st century and beyond; but it is also the responsibility of education institutions and regulators; of NGOs and other service providers; of industry; of families; communities; and individuals. Australia's education system is the backbone of our society; it has the potential to be nation-building and set the pace for our new economy; or it could hold us back. This, in the end, is our choice.

# APPENDIX

# METHODOLOGY FOR THE INDEX OF EDUCATIONAL OPPORTUNITY

The McKell Institute Index for Educational Opportunity measures the relative barriers each student likely faces in order to achieve in an educational context. As barriers are generally concentrated geographically, this index maps those federal electorates that contain the highest and lowest barriers to achievement for young people.

The Index consists of seventeen variables that contribute in some way towards educational success. It uses a variety of data from three different datasets that provide national information. The majority of the variables are sourced from the 2011 Australian Census of Population and Housing, conducted and administered by the Australian Bureau of Statistics. One variable was constructed from the 2015 Australian Early Development Census; and three variables were constructed using 2015 NAPLAN (National Assessment Program

– Literacy and Numeracy) data, obtained from the Australian Curriculum and Assessment Reporting Authority (ACARA).

Table 1 displays the variables used and weightings assigned each variable.



TABLE 1: Variables and weightings used for the Index of Educational Opportunity

CATEGORY	SUB-CATEGORY	VARIABLE	WEIGHTING
<b>Individual Factors</b>	Language proficiency	Proportion of students who cannot speak English well or at all	-0.50
	Early childhood education	Proportion of 3 and 4 year-old children attending an educational institution	0.80
	Development vulnerability	Proportion of 5 year-olds who are developmentally vulnerable in two or more domains	-0.80
<b>Family Factors</b>	Income	Proportion families with children with high household income (<\$2500/wk)	0.50
	Income	Proportion families with children below poverty line (>\$800/wk - 2 parents; >\$600 - 1 parent)	-0.50
	Education	Proportion of parents with bachelor or higher level qualification	0.80
	Education	Proportion of parents who did not finish Year 12	-0.50
	Language proficiency	Proportion of parents who do not speak English well or at all	-0.20
	Skills	Proportion of parents with high-skill jobs (managers, professionals)	0.50
	Skills	Proportion of parents with low-skill jobs (machinery operators and drivers, labourers)	-0.20
	Labour Force Participation	Proportion of families where both parents are not working (either not in labour force or unemployed)	-0.20
	Household Resources	Proportion of children living in overcrowded homes (Canadian National Occupancy Standard)	-0.50
<b>Community Factors</b>	Labour Force Participation	Proportion of disengaged youth	-0.50
	Remoteness	Proportion of people living in remote or very remote areas	-0.50
<b>School Factors</b>	School results (NAPLAN)	Proportion of schools with average scores above national average NAPLAN scores on reading and numeracy (Year 3 and 9)	0.50
		Proportion of schools recording scores below national average NAPLAN scores on reading and numeracy (Year 3 and 9)	-0.50
	School attendance	Proportion of schools with less than 60 per cent of students attending school at least 90 per cent of the time	-0.50



There is a plethora of academic literature on the effect different factors have on student outcomes, with each study discovering slightly different findings regarding the most important factors that affect a child's likely success in an educational environment. Of course, the reality is that each student is different, and each factor or barrier to success will have differing impacts on different students.

John Hattie from the University of Melbourne has conducted perhaps the most definitive study on influences of student achievement, by conducting a meta-analysis of the academic literature and finding the effect sizes of 195 different variables that might affect a student's academic achievement.<sup>136</sup>

The majority of Hattie's research focuses on the effect size of school and teacher factors, particularly related to pedagogy, but his work provides us with a good starting point on which to premise weightings for the variables in this index.

Hattie finds that the factors with the largest effect size regarding the variables in this index are: prior achievement (0.63 effect size); pre-school with at-risk students (0.56 effect size); socio-economic status (0.54 effect size); home environment (0.52 effect size); and early intervention (0.44 effect size). Hattie's meta-analysis of around 1200 studies found that family structure and parental employment had a low effect size on student achievement.

However, there is a large amount of academic research regarding the effect other factors, such as community and individual factors, have on a student's educational outcomes, which Hattie's study does not address. As such, variables have been given weightings according to groupings of large impact (0.8 weighting), medium impact (0.5 weighting) and small impact (0.2 weighting) on student achievement, as determined from the academic literature. Each group has been assigned a weighting for both positive and negative influences on a student's ability to achieve.

As was mentioned above, this index is designed to measure the potential barriers to success a child will face when living in a particular geographical area. Of course, not every child will face every barrier accounted for in this index, nor will every child struggle with each potential barrier in the same way. There are resilient, high achievers among every group, and conversely, low achievers among every group. This index is an indicator of which electorates may face the greatest barriers, and will be useful to policymakers and education stakeholders so that resources may be assigned appropriately.

With this in mind, each variable and the justification for the weightings are discussed below.

## Individual factors

### LANGUAGE PROFICIENCY

There are conflicting findings regarding English-language proficiency in the literature. Some studies have found that children who come from families where the language spoken at home is one other than English are more likely to do well at school than those children whose first language is English.<sup>137</sup> However, this fact is dependent on ethnicity and place of birth. Considine and Zappala found that children whose families are from Africa or the Middle East were more likely to be low achievers than those who were born in Australia; as were children from Indigenous families.<sup>138</sup>

Anecdotally, middle-school teachers from outer-suburban areas in Melbourne have explained to the author that children who were born in nations where the education system is of lower quality than in Australia will enter school in Australia with fewer skills and less knowledge than other children their age. The language barrier will then act to exacerbate the difference in achievement levels, as will prolonged holidays back to their country of origin, as well as the lack of English being

spoken in the home. Anecdotally, families who immigrated to Australia from certain nations will have satellite television play stations in their mother-tongue at home, further reducing opportunities for the children to learn English quickly.

Conversely, there are other families who speak a language other than English at home who will take a very active role in their child's education, and value educational achievement above all else. Familial differences like this are inherently difficult to measure, and it is both ethically and conceptually wrong to attempt to account for differences in opportunity along ethnic lines.

As such, this index does not account for ethnicity or Indigenous status, as neither of those factors are in themselves indicators of or barriers to educational achievement. Rather, it is the factors that come with being Indigenous or from certain ethnic backgrounds that often act as barriers to success in school and in the workforce. Factors such as socioeconomic status, parental education, and home resources are better indicators of opportunity than ethnicity.

As such, we have included a variable that measures English language proficiency, as was self-reported on the 2011 Census. This variable assesses the proportion of students (full or part time) that reported (or their parents reported for them) that they either did not speak English well, or did not speak it at all during the last census collection period.

While this indicator is not by itself a measure of whether a student can achieve at school, not being able to speak English well is a significant barrier in Australia, where the majority of education is performed in English-speaking environments. As such, this variable has been given a medium weighting (-0.50).

## EARLY CHILDHOOD EDUCATION

There is a growing literature on the importance of early childhood education. Many studies have shown that children enrolled in 'head start' or Pre-Kindergarten (Pre-K) programs

experience a range of benefits compared to children who do not; including, the ability to learn more quickly upon entrance to school, higher IQs, and better behaviour patterns.<sup>139</sup> Other studies have found that the benefits obtained from early childhood education persist throughout a child's life, with a higher likelihood of that child finishing school, attending university and having a lower likelihood of becoming involved in crime later on.<sup>140</sup>

The TIMSS test, which tests children all around the world on mathematics and science, found that children were far more likely to record higher achievement scores in maths if they had attended pre-primary education, and if they had started school able to do early numeracy tasks (ie. simple addition and subtraction).<sup>141</sup>

Further, John Hattie's research indicates that attendance in early-childhood formal education and early intervention for disadvantaged children can have a great impact on a child's educational outcomes. For these reasons, we have assigned a high weighting to this variable (0.80).

This variable has been derived from ABS 2011 census data for all children aged 3 and 4 who were enrolled in an educational institution, either part time or full time.

## DEVELOPMENTAL VULNERABILITY

The Australian Early Development Census (AEDC) is a questionnaire run every three years by the Australian Government that requires teachers of Year 1 students to answer questions regarding the development of each of their students. The AEDC identifies five domains of development on which teachers assess each of their students: physical health and wellbeing; social competence; emotional maturity; language and cognitive skills; and communication skills and general knowledge. These domains have been deemed important indicators of a child's key development areas and indicators of a successful transition into school, as well as success throughout a child's schooling years.

Research has found that investment into a child's early development has significant positive impacts on that child's life: particularly in the areas of behaviour, learning, health and wellbeing. Children who are developmentally on track at the point of entry into school have a higher likelihood of success throughout their life than those who are not.<sup>142</sup> Conversely, children who enter school developmentally behind their peers will likely remain behind for the rest of their schooling, before likely dropping out when compulsory schooling ends in Year 10. A recent estimate of the number of young Australians that this affects is about 10 per cent.<sup>143</sup>

As such, a high weighting has been assigned to this variable. The variable measures the proportion of students who are developmentally vulnerable on two or more domains in each electorate and is given a weighting of negative 0.80.

## Family factors

### INCOME

Income is an important determinant of educational opportunity. Families with a high income can give their children the resources required to perform well in school. Parents can pay for tutors if their children require extra help; they can send their children to private schools that normally have better teaching resources, such as fully-equipped science labs; and they can afford to purchase and maintain computers, books and other educational resources.

Conversely, poverty inhibits a child's development and school readiness, as well as the ability to perform whilst at school. Poverty can affect a child's educational outcomes through aspects of health, home life, schooling and neighbourhoods.<sup>144</sup>

Various studies have demonstrated the negative impact poverty has on school readiness for children, as well as general educational attainment. Studies conducted all

over the world have consistently shown the link between low socioeconomic status and academic outcomes. Children living in poverty are more likely to start school behind their peers, and stay there for the entirety of their schooling. This is due to a variety of factors that are associated with poverty: for instance, lower parental education and high family stress.<sup>145</sup>

Income for this index has been split into two categories: high income families, measured at earning more than \$2500 per week, which indicates that they are earning in the top two quintiles as per the ABS for 2011-12; and families living below the poverty line, which is designated at \$800 gross income per week per two-parent family; and \$600 per week for a one-parent family. The poverty line designated was devised by the Australian Council of Social Services in 2014 and is based on 2011-12 figures.<sup>146</sup>

As family income is a strong determinant of educational opportunity for children, we have designated a weighting of 0.50 for these variables.

### EDUCATION

*"Children do some of their most powerful learning from copying what people around them do, so it is important that they are with adults who are learners themselves."<sup>147</sup>*

Education of parents is estimated by various studies to have a very large impact on the educational outcomes of children. One study found that the level of parents' education when their child is 8 years old has significant indirect effects on their child's outcomes forty years later: children with educated parents tended to become more educated themselves, and able to secure high-paid jobs as a result. In this study, the expectations of success a parent places on their child and the transferral of high aspirations to their child was found to be the largest determinants of success attributable to a parent's level of education.<sup>148</sup>

Australian researchers found in 2002 that children with parents who had a bachelor or higher level degree from university had a 4.5 times greater chance of achieving outstanding results at school.<sup>149</sup> This was the highest ratio for any variable that these researchers tested, and a much higher determinant than family income level. A different study found that males with university educated parents were three times more likely and females with university educated parents were four times more likely to graduate from university than their peers with lower educated parents.<sup>150</sup> Children with university educated parents were also five times more likely to complete secondary school compared to students with parents who did not have any post-school qualifications.<sup>151</sup>

Other studies have found that a parent's level of education also influences their knowledge, beliefs, values and goals about childrearing, allowing more positive outcomes for children in school. For instance, "higher levels of education may enhance parents' facility at becoming involved in their children's education, and also to enable parents to acquire and model social skills and problem-solving strategies conducive to children's school success."<sup>152</sup> A parent with a high level of education will be more likely to read to their child from a young age, to invest in home learning toys and resources, to take children on visits to museums and zoos, and to invest in quality child care.<sup>153</sup>

Conversely, an expert working in the field of education in disadvantaged communities told the author that many mothers in lower socioeconomic areas do not engage with the education process with their children, because they themselves had been low achievers in school, and felt intimidated by schools and teachers. There is also a sense of embarrassment among some parents in disadvantaged areas in not being able to help their children with homework, leading to lower outcomes for their children.

There are two variables associated with parent education in this index: the proportion of parents with a bachelor or higher level degree;

and the proportion of parents who did not finish Year 12.

Both variables were derived from 2011 ABS census data. Both variables were assigned high weightings (0.80) in recognition of the impact the education level of parents has on children's outcomes. The variable that measures the proportion of parents with a bachelor or higher level degree was assigned a positive weighting; and the variable that measures the proportion of parents without a Year 12 certificate was assigned a negative weighting.

## LANGUAGE PROFICIENCY

As mentioned above in individual factors, there are conflicting arguments in the academic literature regarding the impact the language spoken at home has on a student's outcomes. For this variable, we used 2011 Australian Census data to determine which parents self-reported that they either did not speak English well, or at all. While of course this is no indicator of the child's English proficiency, this variable was included as the language of a child's parents does present as somewhat of a barrier to educational achievement if the parents speak very little or no English. This would indicate that a child's first language was a language other than English, and would also suggest that English was learned later than their peers.

Of course, like the other variables in this index, this variable alone does not indicate whether a child will obtain success or not in school and beyond. Other factors play a larger role in determining success, however, the language barrier is a barrier nonetheless. For this reason, we have allocated this variable a low weighting of 0.20, indicating that it has a weaker correlation as a barrier to success than other variables in this index.

## SKILLS

The occupation and skills of a parent has an impact on a child's outcomes through various channels. One channel is through the ability

of more educated and skilled parents to be their child's first teacher. Another is through the ability of parents with high-skilled jobs to provide the resources and home environment conducive to learning. The third is through providing their child with a positive role model for education and work, and by the likelihood that the parent will have higher expectations of their child if they themselves have excelled in an educational and work environment. The final channel relates to the later years of a child's education, when parents with highly-skilled jobs can tap into their job network to open doors for their children to more easily enter the workforce.

The OECD through the PISA program found that children whose parents work as managers or professionals outperformed all other children in mathematics tests. The gap tends to be smaller for reading, but there is still a clear divide between children of parents with high-skilled jobs and those with low-skilled jobs.<sup>154</sup>

For this variable, we have used ABS 2011 Census data to determine the proportion of parents with high-skilled jobs, and the proportion of parents with low-skilled jobs in each electorate. Children of parents with high-skilled jobs are considered advantaged, and hence this variable was given a strong positive weighting in our index of 0.80. Indeed, children of managers and professionals are far more likely to succeed and to themselves enter a professional career, because of all of the reasons mentioned above, and because those parents are far more likely to make introductions and help their children gain valuable networks and work experience opportunities within their own professional networks. This is a very valuable asset to a young person entering the workforce, and gives a young person another reason to strive for academic achievement.

Conversely, children of parents with low-skilled jobs such as machinery operators or labourers are less likely to be able to capitalise on their parents' networks. They may be given less of an incentive to achieve at school because the

link between education and career outcomes is not as easily recognisable to them. Parents may themselves not have succeeded at school, and may have lower expectations of their children than higher-skilled parents.<sup>155</sup>

The variable for the proportion of parents with low-skilled jobs in each electorate has been given a medium negative weighting of 0.50. It is not considered as strong an indicator as the high-skilled job variable, due to the fact that the nature of work is changing, and many modern jobs require more highly-educated workers. Just because a parent has a low-skilled job themselves, does not mean that they do not recognise the importance of education and skills for their children.

## LABOUR FORCE PARTICIPATION

Of all of the variables that we have used in this index, the impact parental unemployment has on a child's educational success is the most difficult to judge. If both parents are at home, they might have more time to spend with their children; reading to them, and engaging with them on a more regular basis than working parents, leading to that child performing well in school.<sup>156</sup> However, the stress involved with being unemployed and living on welfare payments could also have a negative impact on a child's success in the classroom. In fact, there is a lot of research that suggests that those families in which neither parent is working or in the labour force are more likely to live in poverty, to have health problems, and to suffer stress.<sup>157</sup>

The differences between families also play a factor in whether parental unemployment plays a large part in the relative success of children at school. If a family is cohesive, and the parents try to protect their children from the stress that can be associated with being unemployed, children will be less affected. There is also a difference between short-term unemployment and long-term unemployment and the effect it has on children. The stress of short term unemployment might be more acute, but long term, chronic stress caused potentially by long



term unemployment has larger and longer-lasting effects on children and their ability to learn.<sup>158</sup> Conversely, parents and families might not be stressed about being unemployed: in which case the lack of a positive role model might negatively affect the child.

Various studies have found that having a father who is unemployed is more detrimental to a child's outcomes than having a mother who is unemployed, even if the mother is the main breadwinner in the family,<sup>159</sup> and academics have theorised that this is because of the differences in the ways each gender spends the extra time they have. Mothers are more likely to spend time not in paid work with their children; whereas fathers are less likely.<sup>160</sup>

This variable was derived from ABS 2011 census data for all parents of children who were either not working or not in the workforce. For two parent families, both parents had to be not working to be included in this variable. For all electorates, the proportion of families with no working parents was relatively high. It was as high as 34 per cent in Fowler, NSW; and no lower than 9 per cent in Berowra, NSW, for an average of 17.9 per cent across all electorates. For all of these reasons, this variable has been assigned a low negative weighting of 0.20.

## HOUSEHOLD RESOURCES: OVERCROWDING

Overcrowding in housing is a serious issue for children and parents alike. In Australia it is more prevalent in Indigenous and immigrant families,<sup>161</sup> and affects the social, educational and emotional development of children. It is also closely associated with low mental and physical health outcomes.<sup>162</sup>

Overcrowding affects children's educational, social and emotional development through interrupted sleep, household tensions, and by a lack of quiet space for a child to study. Studies have found that children living in overcrowded homes (with at least 2 children per bedroom) perform worse than their peers, are held back a grade more often, and drop out of school

earlier than other children.<sup>163</sup> They also miss school more often, due to health complications that arise with unfit and overcrowded homes.<sup>164</sup>

The standard for overcrowding is adopted from the Canadian National Occupancy Standard, which has also been adopted by the Australian Government's Australian Institute of Health and Welfare (AIHW). The standard dictates that there should be no more than two people per bedroom, that children of more than 5 years of age of different sexes should not share a room, and that people over the age of 18 should have their own room.<sup>165</sup>

This variable has been derived from ABS 2011 census data for families with children that have more than 2 people per bedroom, and has been assigned a medium negative rating of 0.50.

## Community factors

### DISENGAGED YOUTH

The community in which a young person lives can have a significant impact on the likely educational outcomes of a child. Peers and role models can help to shape the goals and aspirations of a young person: when the majority of people in a community are unemployed and disengaged from education, this presents a significant barrier over which a person must climb in order to do well at school and obtain meaningful work.<sup>166</sup> Conversely, when a community has many high achievers, the likelihood that any individual child will grow into a high achiever is increased.

The link between education and employment is important to foster in young people, however in some communities of severe disadvantage, that link is perhaps not as prevalent in the mindsets of many young people.<sup>167</sup> One study has found that there is a significant link between the knowledge of post-secondary courses and students' plans for partaking in post-secondary courses.<sup>168</sup> The school can act as an important tool in disseminating information about course types and financing options, but learning by example from an older friend or relative has



a much more powerful impact on students' aspirations and plans for their lives.<sup>169</sup>

John Hattie (2015) found a significant effect size for the variable 'peer effects' on students' outcomes in his meta-analysis of 1200 studies. Much research has been conducted into the impact peers have on one's likely success in life, and found that the impact is significant. Other researchers have found that disadvantaged youths are more resilient when positive role models are in their lives.<sup>170</sup>

This variable was derived from 2011 ABS census data. Disengaged youths are those young people between 15 and 24 that are not in full or part time education, training or work, and was assigned a medium negative weighting of 0.50, in recognition of the impact peers have on individual outcomes and aspirations.

## REMOTENESS

Remote communities suffer from a variety of disadvantages associated with their location. In general, people and businesses that are located a long distance from goods and services tend to be both socially and economically disadvantaged in terms of their access to

goods and services. Larger towns and cities have a greater range of goods and services (and jobs) available.<sup>171</sup>

Remoteness also specifically affects educational opportunity through a variety of avenues: from high teacher turn over and a higher proportion of young inexperienced teachers, to a lack of specialist services and a restricted curriculum and school resources, students attending remote schools are not as advantaged as urban children.<sup>172</sup>

The OECD PISA test results show that the urban-rural gap for student achievement is equivalent to about half a year of schooling across all OECD nations.<sup>173</sup> NAPLAN results too show that there is already a gap evident between urban and rural children by Year 3, even after population differences like socioeconomic status are taken into account.<sup>174</sup> Part of this achievement gap is related to school size, part is related to the program breadth and part is due to the tendency for smaller and remote schools to find it difficult to attract and retain good teachers.<sup>175</sup>

This variable has been constructed using data from the ABS that estimates the proportion

of the population of each electorate that lives in either remote or very remote locations. As location has a significant impact on student outcomes, it has been given a medium negative weighting of 0.50, in recognition that remoteness is a disadvantage, but does not necessarily dictate the quality of the school and teachers: there are examples of effective and ineffective schools and teachers in every area.

### School factors

“Where you go to school and who goes there with you are powerful determinants of performance.”<sup>176</sup>

### SCHOOL ATTENDANCE

If children miss school regularly, they are more likely to miss out on learning key skills and content that are important building blocks for further learning. Absenteeism at a young age has compounding effects as a student progresses through school: studies have found that prior knowledge has a greater impact on further knowledge acquisition than IQ or the ‘learning style’ of the student.<sup>177</sup>

As well as inducing lower achievement in both literacy and numeracy, absenteeism is associated with patterns of early school leaving.<sup>178</sup> Research has found that chronic absenteeism reduces educational and social engagement within young people,<sup>179</sup> and leads to a higher likelihood of children leaving school early, becoming unemployed, dependent on welfare and being involved in the justice system.<sup>180</sup>

When a school has a high truancy (absentee) rate, teachers must adapt their teaching to a wide range of abilities and knowledge, as students will be even more likely than in schools with good attendance rates to be at different levels of competence. A study on New York primary school students found that students with good attendance rates are impacted negatively in their test results by attending a school with high truancy rates.<sup>181</sup>

This indicator has been given a medium negative weighting (0.5). The variable is derived from ACARA data from the NAPLAN test that asked schools how many of their students had been absent from school and for how many days during Semester 1, 2015. The attendance rate is measured by determining how many students were at school for at least 90 per cent of school days during the reporting period. The variable measures how many schools in each electorate recorded average attendance rates of less than 90 per cent for the entire student population.

### SCHOOL RESULTS

What school a student attends has a significant impact on the educational outcomes for that student. In a similar vein to the variables under community factors, peer effects make a large impact on aspirations, motivations and achievement levels for all people, but particularly young people.

The OECD has found that socioeconomic status is largely negated for students if they attend schools where the average student is socioeconomically advantaged.<sup>182</sup> Disadvantaged students will tend to perform better on tests if they go to advantaged schools. This fact is well recognised by education experts and policymakers: the scholarship programs that many schools and universities offer are designed to give young people from disadvantaged backgrounds an opportunity to excel in an advantaged educational environment.

The Australian Curriculum, Assessment and Reporting Authority recognises the impact socioeconomic background has on student outcomes and attempts to account for those differences in the Index of Community Socio-Educational Advantage, which rates each school on a sliding scale, with an average of 1000. It then uses this score to compare individual schools against ‘comparable’ schools on the MySchool website, so parents and interested parties can see how individual schools’ results compare against schools with a

similar socioeconomic distribution. This is done with the knowledge that not all schools are the same, and individuals within schools are grossly affected by the achievement level of those around them.

There are two variables used for school results: Proportion of schools with low average NAPLAN results, and proportion of schools with high average NAPLAN results. These variables were derived from data procured from ACARA at the school level. Each school was divided into those schools that perform above the national average for NAPLAN reading and numeracy tests, at both the Year 3 and Year 9 levels, or below the national average for those tests. The school data was then aggregated to the federal electorate level in order to determine the proportion of schools in each electorate that sat above the national average score, or below the national average NAPLAN score for both reading and numeracy. Both variables were assigned a medium weighting (0.50), with the variable for schools with average grades above the national average receiving a positive weight, and the other variable a negative weighting.

### Other factors unaccounted for in this index

There are of course other factors that affect the outcomes of students that have not been accounted for in this index. A parent who reads to their child, has conversations with their child about their learning, challenges their child intellectually, and helps their child learn important skills like problem solving and self-reliance is more likely to raise a child who will excel at school and beyond. These factors play a larger part in determining the outcomes of a child than whether the child's parents speak English; or goes to a school with a high attendance rate. Research has shown that parents who are engaged with and interested in their children from a young age will help their offspring to succeed in the classroom and beyond; and build a better relationship with them along the way.

The OECD asked parents of students who took the 2009 iteration of the PISA (Programme for International Student Assessment) test questions about their engagement with their children. Parents who reported that they had read regularly (more than once a week) to their children during their child's first year of school had children who performed better across all domains than those parents who rarely read to their children ('once or twice a month' or 'never or almost never').<sup>183</sup> Additionally, parental engagement continues to have a positive effect throughout a child's life. A student with parents who actively engaged them in discussions of political or social issues scored, on average, 28 percentage points higher on PISA than students whose parents did not discuss such issues.<sup>184</sup>

While there is no data that measures parental involvement existing at a population level in Australia, education of parents is a strong determinant of parental involvement, and has been accordingly allocated a high weighting in this index.

### Factors that have been deliberately left out

Many people might look at this Index and comment that Indigenous people in Australia are significantly disadvantaged in many areas, including education. While they will be absolutely correct, we have deliberately left out a variable that indicates Indigeneity because being Indigenous is not by itself an indicator of advantage or disadvantage. Being Indigenous is associated with higher rates of disadvantage: through avenues of health, wealth, and opportunities – all factors that influence a person's relative success at school and work – but being Indigenous is not a disadvantage by itself. For instance, for an Indigenous child living in Wentworth, NSW (Prime Minister Malcolm Turnbull's seat), with both parents working and whose parents have a bachelor's degree or higher, disadvantage is minimal. In fact, being Indigenous is unlikely to have any impact on their relative success at school or afterwards at

all. It would be unfair and incorrect to include Indigeneity as an indicator of disadvantage in this Index, especially when other factors that have a real impact on educational success are already accounted for.

For the same reasons, we have not accounted for ethnicity in this Index.

Finally, a variable for sole parent families was originally included in the first phase of this research. However, upon closer inspection, this variable was removed for the same reason cited for not including Indigenous status. While sole parent families are associated with a higher likelihood of poverty, instability and mobility, as well as lower levels of physical and mental health, having a single parent is not by itself an indicator of disadvantage for children. There are of course many great single parents, who work very hard to bring in a payslip and give their children the best start in life, and conversely some single parents who don't or can't for various reasons. However, in the absence of other variables, being a sole parent does not improve or reduce the likelihood of success for a child in the classroom.

There are a variety of other factors that have been tested in the academic literature regarding their relative effects on student outcomes. Of course, not every variable that can potentially affect a child can be included in this index: both because it is not necessary to include every single factor in an index of this nature, and because a lot of this data simply does not exist on a national scale. The data that has been included has been derived from studies such as the census and NAPLAN, which deliberately measures data on a national scale, and this data could then be adapted on a federal electorate scale.







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