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Attracting high achievers to teaching

Peter Goss and Julie Sonnemann

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This report was written by Peter Goss, Julie Sonnemann, and Jonathan Nolan.

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Overview

Australia needs more high achievers in teaching. People who are good learners themselves are far better placed to teach. And as we expect more from schools, we need the best and brightest teachers, so that our students have the skills for work and life.

Today in Australia, bright young people rarely see teaching as an attractive option. Only 3 per cent of high achievers choose teaching for their undergraduate studies, while 19 per cent choose science, 14 per cent health, and 9 per cent engineering.

It wasn't always this way. Demand from high achievers for teaching has steadily declined over the past 30 years. Over the past decade, demand fell by a third – more than for any other undergraduate field of study.

The low status of teaching has become self-reinforcing, putting off high achievers who might otherwise want to teach. By contrast, high-performing countries get many high-achieving students to apply, and then select the most promising candidates.

Australia must do better. This report shows what it will take. The report includes details of a Grattan Institute survey of almost 950 young high achievers – a first in Australia. It shows that more bright young people would choose teaching if there was financial support while studying, better pay for top teachers, and better progression opportunities beyond traditional principal career paths.

We recommend a bold reform package with three parts.

First, offer \$10,000 cash-in-hand scholarships to high achievers to study teaching. This would not cost much, but it would work fast. People who get government-funded scholarships should be required to work at government schools.

Second, provide better career pathways. High achievers worry about getting stuck in the one classroom. They want opportunities to progress, and they want much higher pay that recognises teaching expertise rather than years of service. New 'Instructional Specialist' and 'Master Teacher' roles would give the best teachers extra time and extra responsibility to improve teaching within and across schools. The roles would be paid a lot more – \$40,000 and \$80,000 above standard classroom teachers respectively. All teachers could apply and compete for the new roles, provided they are first certified at the highest national teaching standards.

Third, promote the new package through a marketing campaign. Governments should raise awareness of the new opportunities and re-position teaching as a career of choice for high achievers.

These reforms would also help current teachers. All teachers benefit if the teaching profession offers better support, career progression, and top-end pay.

Our reform package would double the number of high achievers choosing teaching within a decade. Over time, this would transform Australia's teaching workforce, and the typical Australian student would gain an extra six to 12 months of learning by Year 9, possibly much more. Improvement at this scale represents economic reform, as well as educational improvement.

The package would cost \$620 per government school student per year to implement, or \$1.6 billion across the country for government schools. This is about one third of the extra funding that government schools would get if they were to reach their full Gonski target. It is not cheap, but it must be a priority. Great teachers are the key to better student performance.

Recommendations

1. The Education Council should set a national goal to double the proportion of high achievers who choose teaching within 10 years.
2. Policies designed to attract high achievers should also focus on supporting them in teaching and making best use of their skills. Reforms that create additional benefits for all teachers should be given extra weight.
3. State and territory governments should implement an integrated reform package for government schools:
 - Offer \$10,000 per year cash-in-hand scholarships to high-potential students (ATAR 80 or above or comparable undergraduate academic achievement, plus strong non-academic capabilities) who agree to teach in a government school after completing their degree.
 - Create two new roles that together form an expert teacher career path with higher pay and greater responsibility:
 - *Instructional Specialists* (limited to 5-to-8 per cent of teachers) would work within schools to improve teaching practice and should be paid \$40,000 more than the highest standard pay rate for teachers;
 - *Master Teachers* (about 0.5 per cent of teachers) would work across schools to support Instructional Specialists and should be paid \$80,000 more than the highest standard pay rate for teachers.
 - Both new roles would involve a competitive recruitment process, and only applicants who meet the highest national teaching standards would be eligible to apply.
 - Run a marketing campaign to explain the reforms and re-position teaching as a challenging and rewarding career.
4. State and territory governments should fund the \$620 per student annual cost of this reform package for government schools, through a mix of re-allocating existing funding and increasing funding to fully meet their Gonski 2.0 targets.
5. Non-government schools should adopt similar reforms, but not receive additional government funding to do so.

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1 Attracting high achievers to teaching will lift student performance

Attracting top talent into teaching should be a core policy priority in Australia. This report shows that our children would learn more if we attracted more high achievers to become teachers.

Evidence shows that teachers with strong academic records are likely to be more effective in the classroom. A higher-achieving teacher workforce would give the typical Australian student an extra six to 12 months of learning by Year 9, possibly much more.

Governments must do more to make teaching an attractive career choice. Australian universities can only select the best teacher candidates – with both academic and non-cognitive skills – if enough high achievers apply in the first place.

Investing in attracting the right people to teaching will have large long-term benefits, for students' lives and Australia's economic prosperity.

1.1 High achievers make better teachers

Every good education starts with a great teacher. Effective teachers are the most important in-school influence on student learning.¹ Teachers are more likely to be effective if they are provided with the tools, guidance, and supportive school environment to their jobs well.² And a high-quality initial teacher education gives them an important foundation to build on.³ But *who* becomes a teacher is also critical. The best evidence shows that people who are good learners tend to go on to become better teachers.

1. Jensen (2010a, p. 28).

2. Grattan has explored how to improve teaching quality in several reports, including: Goss (2017), Goss and Hunter (2015) and Jensen (2010b).

3. Reforms are being made to strengthen initial teacher education in Australia but more needs to be done, as discussed in Daley et al. (2019, p. 112).

Of course, not *every* great teacher is academically strong. Some fantastic teachers were not studious themselves, and some very smart teachers struggle to inspire their students. But the best chance to improving the quality of the future teaching workforce is to encourage many more high achievers to apply.⁴

1.2 More high achievers would mean more student learning

Prior academic performance is one of the best indicators of who will do a good job as a teacher. Several large US studies show that, on average, teachers with strong prior academic achievement are rated highly by their principals, and help their own students to achieve more.⁵ Countries whose teachers have strong academic skills tend to have better student results in maths and literacy.⁶

Attracting high achievers has also been shown to work at scale: a New York City initiative cut the achievement gap between the poorest and richest schools by a quarter by encouraging high-achievers to become teachers in poorer schools.⁷ Not all studies find positive results.⁸ But the best studies use a mix of measures of teacher prior achievement, including school and university results. In these studies, people with strong academic records consistently perform better as teachers.⁹ These studies are much more rigorous than studies of other reform areas in school education.

4. Other authors who have written on this issue in Australia include Dinham et al. (2008) and Ingvarson (2016).

5. Boyd et al. (2008), Dobbie et al. (2011), Jacob et al. (2018), Rockoff et al. (2008) and Clotfelter et al. (2008), summarised in Appendix D.

6. Hanushek et al. (2019). The findings held regardless of the country's wealth.

7. Boyd et al. (2008).

8. Harris and Sass (2007).

9. Appendix D.

On average, students of high-achieving teachers get about six to 12 months or more of extra learning by age 15.¹⁰ Some studies suggest that the benefits could be much bigger than this.

A teacher's academic background is not everything, and other traits such as leadership and conscientiousness can help predict teacher effectiveness too. But current best evidence shows that academic achievement is a stronger predictor than non-academic traits of teaching quality.¹¹

1.3 If more bright young people apply to become teachers, we can select the best

High-performing education systems know that hiring the best possible talent is crucial to their success. In these systems, many high-achieving students apply to become teachers, and so universities can select the best candidates – who have both strong academic and non-cognitive skills – to enter the profession.

For example, competition is so strong in Singapore and Finland that only about one in 10 students who apply to become teachers are accepted. High demand enables these countries to filter students based on a range of criteria, including their academic records and also a mock teaching class.¹²

10. This estimate uses a conservative effect size of 0.02 on achievement in standardised tests (see Appendix D). The standard deviation in NAPLAN numeracy and reading is about 70 points, so an effect size of 0.02 suggests that lifting the average prior academic achievement of teachers by one standard deviation (the difference between an ATAR of 72 and 88), would increase their students' NAPLAN scores by 1.4 points per year. This equates to an average increase of 14 NAPLAN points by Year 9, because the effect of multiple good teachers is additive (see Jensen (2010a, p. 11)). An increase of 14 NAPLAN points in Year 9 is worth about 9 months in numeracy and 11 months in reading, based on the methodology of Goss et al. (2018).

11. Klassen and Kim (2019, p. 45).

12. Jensen (2012); and NCEE (2016).

Attracting people with good academic skills should not come at the expense of all the other qualities that make a great teacher. Courses such as medicine have combined high academic entry standards with holistic admission processes to identify the most suitable candidates. Some teaching courses in Australia have also implemented holistic admission processes.¹³

Regardless of how good an admissions process is, it is limited by the students who apply. So the more high achievers who apply, the better. Australian universities can only select candidates with *all* of the desirable traits if enough high achievers apply to teach in the first place.

1.4 Government action is needed now

Governments must plan today for the teaching workforce we need tomorrow. The job of teaching is complex, and increasingly demanding as what we want from education changes. Today, teachers are not only expected to teach students how to read and write, but also how to work in a team, think critically and creatively, and to be able to direct and navigate their own learning. We need teachers who can learn fast and adapt their teaching, so that students have the skills they need for the future.

What governments do now to set up the future teaching workforce will have big economic implications. A better-educated student population means a more productive future workforce and a stronger economy.¹⁴ A recent Productivity Commission report emphasised the importance of schooling to future productivity.¹⁵ The ratio of working-age Australians to those too young or old to work is already shrinking.¹⁶ The economic ledger gets worse every time a young Australian misses out on the opportunities that education should bring.

13. Teacher Education Ministerial Advisory Group (2014, p. 44).

14. Hanushek and Woessmann (2015); Jensen (2010a); and Dolton et al. (2011).

15. Productivity Commission (2017).

16. Wood et al. (2019, p. 33).

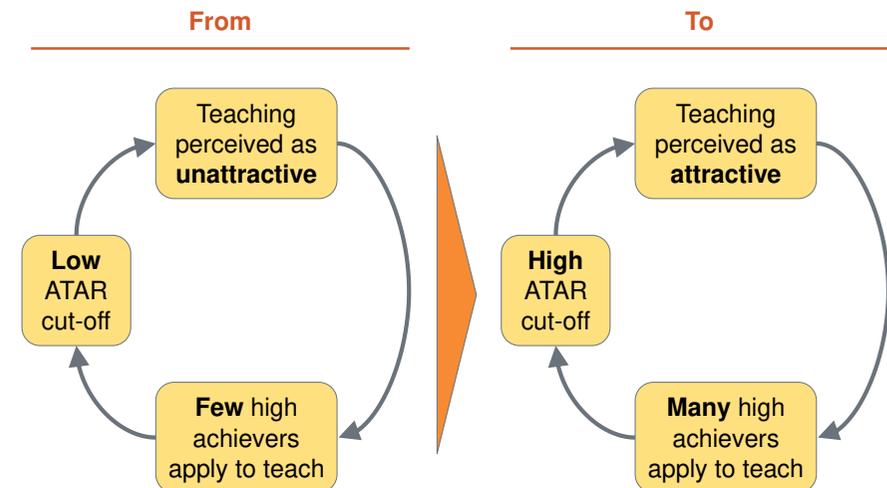
1.5 Australia can create a positively self-reinforcing cycle by making teaching more attractive to high achievers

Australia’s failure to attract bright young people to teaching is not just a ‘cultural problem’. Initiatives such as Teach For Australia prove that it is possible to attract high achievers through short-term financial incentives and better job support.¹⁷

Government policies that have an impact on teacher support, pay, and career progression strongly influence who becomes a teacher. Policy settings over several decades have failed to make teaching attractive to high achievers. This has created a negatively self-reinforcing cycle where few high achievers apply to teaching degrees, leading to low ATAR cut-offs, which in turn sends a signal that teaching is not an attractive degree. This report explains how government policy can create a positively self-reinforcing cycle, where teaching is seen as attractive by young high achievers, leading more to apply to teacher education, and in turn raising the entry scores and shifting public perceptions.¹⁸ Figure 1.1 visualises the change that needs to happen.

The next chapter shows just how few high achievers in Australia currently choose to become teachers, and how this has changed over time.

Figure 1.1: Governments can create a positive reinforcing cycle if they make teaching careers more attractive



17. Teach For Australia offers an employment-based pathway for high achievers, offering a Masters degree and a full salary while training, as well as targeted professional development and mentoring when they first start working in the classroom.

18. This report does not explore how to attract mid-career high achievers, a big issue for further research. About one third of students studying teaching in Australia are aged 25-years or older: AITSL (2018).

2 Not enough high achievers become teachers in Australia

Not enough high achievers become teachers in Australia. The problem is not new – but it is getting worse.

Over the past 10 years, demand from Australian high achievers for education courses at university has fallen dramatically, while demand from high achievers for science, IT, and health courses has risen strongly. High achievers today are much less likely to want to teach than high achievers 10 years ago – whether rich or poor, or from the city or the regions.

2.1 Too few high achievers choose to teach

Often the media focuses on low-ATAR students who gain entry to teaching, but we should be more concerned that few high achievers are interested in pursuing teaching as a career.

Only 3.3 per cent of Australian university students aged 20 and younger with an ATAR 80 or above enrol in undergraduate teaching courses (Figure 2.1).¹⁹ By contrast, 19 per cent of high achievers enrol in science, 14 per cent in health, and 9 per cent in engineering courses.

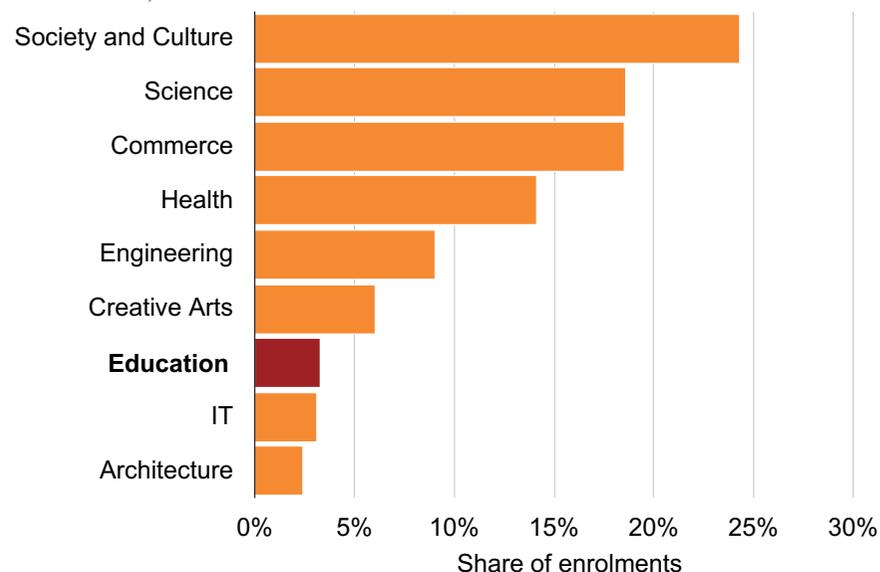
The median ATAR for undergraduate education degrees is now 74, the lowest of any broad field of study.²⁰ The higher your

19. The proportion of undergraduate students with an ATAR 80 or above is an indicator of *demand* for a course. It accounts for changes in population and the number of students who go to university.

20. 'Broad field' here refers to the two-digit ASCED field of study classification. In the more detailed four-digit field, the median ATAR for the sub-field of 'Teacher Education' is 74.1, which is lower than all but five sub-fields with more than 1,000 enrolments. Median estimated from 10 ATAR point groupings for domestic undergraduate commencements aged 20 or younger. Includes people admitted through 'other basis' whose ATAR is known. (Special data request from the Commonwealth Department of Education and Training).

Figure 2.1: Few students with an ATAR 80 or above choose undergraduate teaching

Undergraduate enrolments by broad field of study for students with an ATAR of 80 or above, 2017



Notes: Agriculture and Hospitality excluded due to low volume. 'Education' includes curriculum studies and teacher education. Includes domestic onshore commencing bachelor-degree student enrolments for all students with a known ATAR 80 or above and aged 20 or younger – regardless of the basis of admission.

Source: Special data request from the Department of Education and Training.

ATAR, the less likely you will choose teaching (Figure 2.2). Other professionally-oriented courses have the opposite pattern; the higher your ATAR, the more likely you will study law, engineering, or commerce.

While ATAR is an imperfect measure of academic strength, it is a strong predictor of success at university.²¹ Only half of low-ATAR students finish their teaching degree after 6 years, compared to 70 per cent of high-ATAR students.²²

To understand the overall calibre of entrants to teaching, it is also necessary to look at non-ATAR entry routes. While virtually every Australian who enrolls in a teaching course has an ATAR, only 17 per cent enrol *based* on their ATAR. Most enter teaching through a non-standard entry process, by transferring across from another university course, or by enrolling in a postgraduate degree (Figure 2.4).

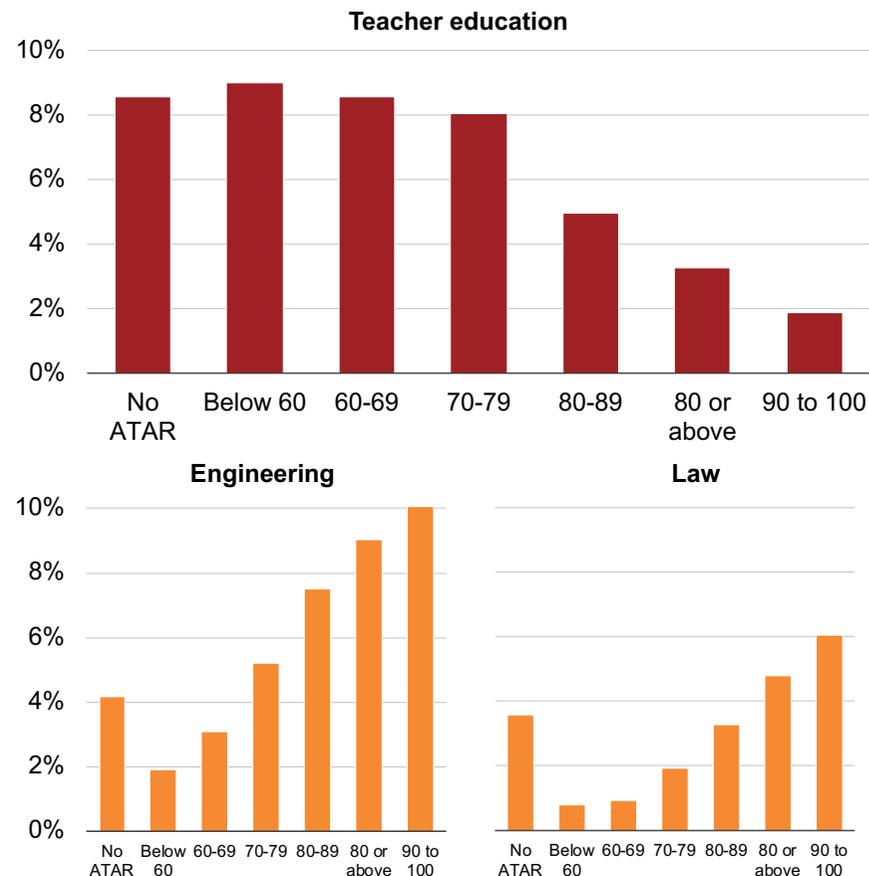
Students who use a non-standard undergraduate admissions pathway tend to have lower prior academic achievement than those admitted via ATAR. Based on the limited data that exists, students aged 20 or under who used a non-standard admission pathway to enter teacher education in 2017 had a median ATAR of 65.²³ And undergraduate education courses enrol a greater share of their students through non-standard admission processes than any other broad field of study.

Students who study teaching as a post-graduate tend to have stronger academic backgrounds, but there is limited data on this cohort.

21. Norton et al. (2018) and Norton et al. (2019). Recent research conducted by Victoria University finds that ATAR is still predictive of university performance in teacher education: Messinis and Sheehan (2015).
 22. AITSL (2018).
 23. The Commonwealth Department of Education and Training reports the ATAR of about 30 per cent of domestic undergraduate students aged 20 or younger who enrol through non-standard admissions processes.

Figure 2.2: The higher your ATAR, the less likely you will enrol in undergraduate teaching

Undergraduate enrolments by field of study and ATAR group, 2017



Notes: Engineering refers to the broad field of study ‘Engineering and related technologies’, but for law and teaching the narrow fields. Domestic onshore commencing bachelor-degree student enrolments for all students with a known ATAR 80 or above and aged 20 or younger – regardless of the basis of admission. Double degrees counted twice.

Source: Special data request from the Department of Education and Training.

2.2 Demand from high achievers has fallen

Today, demand from high achievers to enter teaching is low. It hasn't always been this way. There have been big changes to the nature of the teaching workforce over time.

2.2.1 Big drops over the past 30 years

Far fewer high achievers in Australia choose teaching today than 30 years ago. In 1988, young teachers were most likely to come from the top one fifth of school students in maths and reading; around 30 per cent of 23-year-old teachers were from the top one fifth of students in reading, and 25 per cent in maths. By 2017, only 19 per cent came from the top quintile of each subject. Figure 2.3 shows the change in the distribution of 23-year-old teachers across achievement quintiles since 1988.

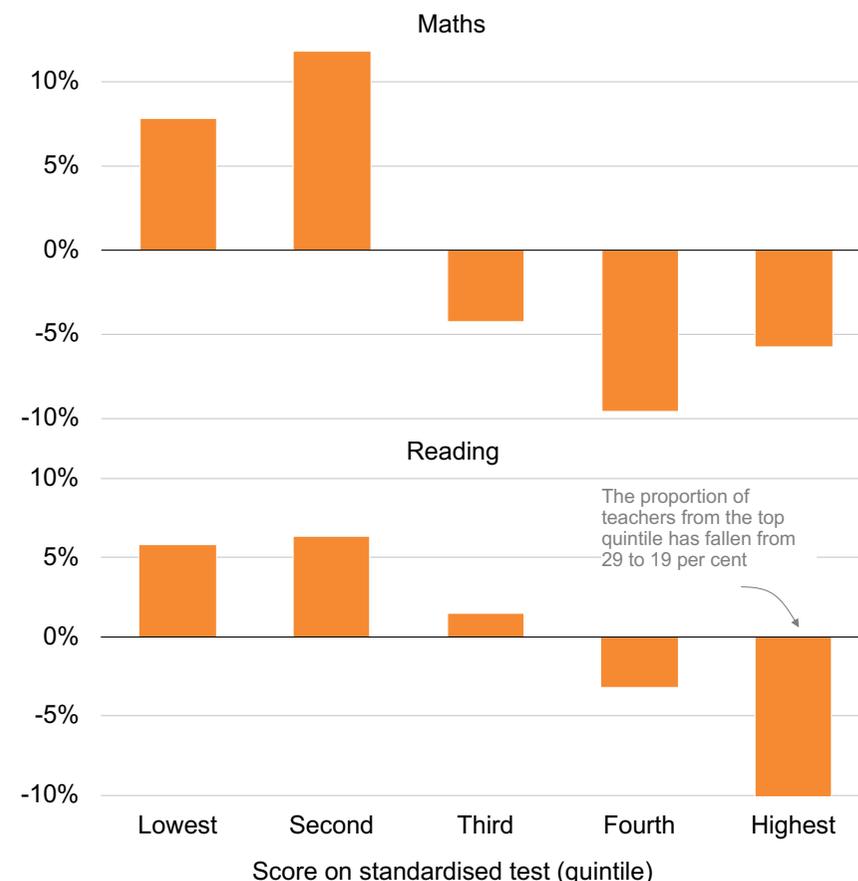
Declines in the prior achievement of young teachers were greatest in the 1980s as women took new opportunities in other professions. But declines still continue today. Now, teachers are most likely to come from the *second bottom* quintile of students.

2.2.2 Over the past decade, demand from high achievers has fallen more for education than any other field of study

A 20-year-old with an ATAR 80 or above enrolled in an undergraduate university course in 2017 was *one third* less likely to choose teaching than a similar student in 2006 (Figure 2.5).²⁴ Demand from high achievers fell more for teaching than for any other undergraduate field of study. By contrast, demand from high achievers for science, IT, and health courses rose significantly.

24. The *number* of high-achieving students enrolling in undergraduate teaching has also dropped in absolute terms, from 2500 students in the year 2006 to 2060 students in the year 2017.

Figure 2.3: Fewer high-achievers become teachers today than in 1988
Percentage point change in share of 23-year-old teachers from each quintile, 1988 to 2017

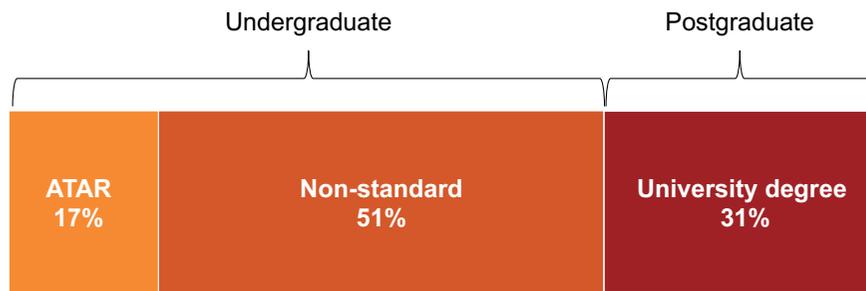


Notes: Analysis from the Longitudinal Survey of Australian Youth, which follows young people from school through to the workforce. Quintile of achievement is among students who have not dropped out of the survey by the year in which they turn 23-years-old, who tend to be higher-achieving students. 2017 results taken from teachers who took the PISA test in 2009, most of whom were 23 in 2017. 1988 results comes from an earlier standardised test. Includes primary and high school teachers but not early childhood educators.

Source: NCVET (2018).

Figure 2.4: Only a small fraction of students are admitted into teaching using their ATAR score

Students admitted to education degrees by admission method, 2016

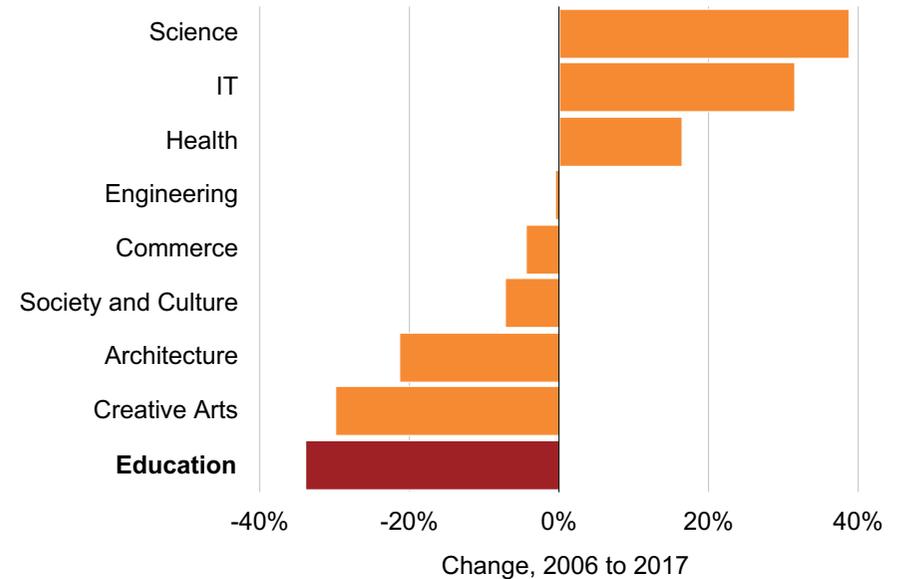


Note: Includes international students, who represent 4 per cent of the cohort. Some non-standard admission students starting an undergraduate education degree are lateral transfers from other university courses and are probably admitted on the basis of their university results. Others have not studied at university and the basis of their admission is harder to determine.

Source: AITSL (2018).

Figure 2.5: Undergraduate education courses are attracting a much smaller share of high achievers than 12 years ago

Undergraduate enrolments by broad field of study for students with an ATAR of 80 or above, 2006 to 2017



Notes: Agriculture and Hospitality excluded due to low volume. 'Education' includes curriculum studies and teacher education. Includes domestic onshore commencing bachelor-degree student enrolments for all students with a known ATAR 80 or above and aged 20 or younger – regardless of the basis of admission.

Source: Special data request from the Department of Education and Training.

While the median ATAR for teaching has fallen over the last 12 years, the decline is not due to an increase in the number of teaching places offered by universities. Over the past 12 years, Australian universities enrolled 17 per cent more domestic undergraduate teaching students aged 20 or younger. Meanwhile, the number of enrolments from high achievers grew much faster – increasing by 23 per cent.²⁵ They were just less likely to choose teaching than earlier cohorts.

2.2.3 Non-standard and post-graduate routes into teaching are also admitting fewer high achievers

The average level of prior academic achievement of students entering through non-standard routes appears to have fallen over the past decade. The median ATAR of non-standard teaching students, where the data exists, fell from 69 in 2006 to 65 in 2017.²⁶

Less is known about the prior academic achievement of postgraduate students, but what limited information we have is concerning. An estimated 18 per cent of postgraduate students who started a teaching degree in 2006 had not completed their course six years later; among those who started a teaching degree in 2011, the figure rose to 21 per cent.²⁷ High achievers are much more likely to complete a course once they begin it, and so rising non-completion rates suggest that the prior achievement of postgraduate students might be slipping too.

25. Includes domestic onshore commencing bachelor-degree student enrolments for all students with a known ATAR 80 or above and aged 20 or younger – regardless of the basis of admission. Double degrees counted twice. (Special data request from Department of Education and Training.)

26. The Commonwealth Department of Education and Training reports the ATAR of about 30 per cent of domestic undergraduate students aged 20 or younger who enrol through non-standard admissions processes.

27. AITSL (2018, p. 68).

2.2.4 Fewer high achievers from all backgrounds are choosing teaching

Teaching has historically been an attractive option for high-achieving students from regional and low socio-economic (SES) areas – especially those hoping to stay in their local community.²⁸ But its popularity is waning even among these groups. From 2006 to 2017, demand among these groups fell even further than their more advantaged and metropolitan peers (Figure 2.6).

More broadly, high achievers – from the city and the regions, rich and poor – are all much less likely to want to teach than a decade ago.

2.3 Australia doesn't compare well internationally

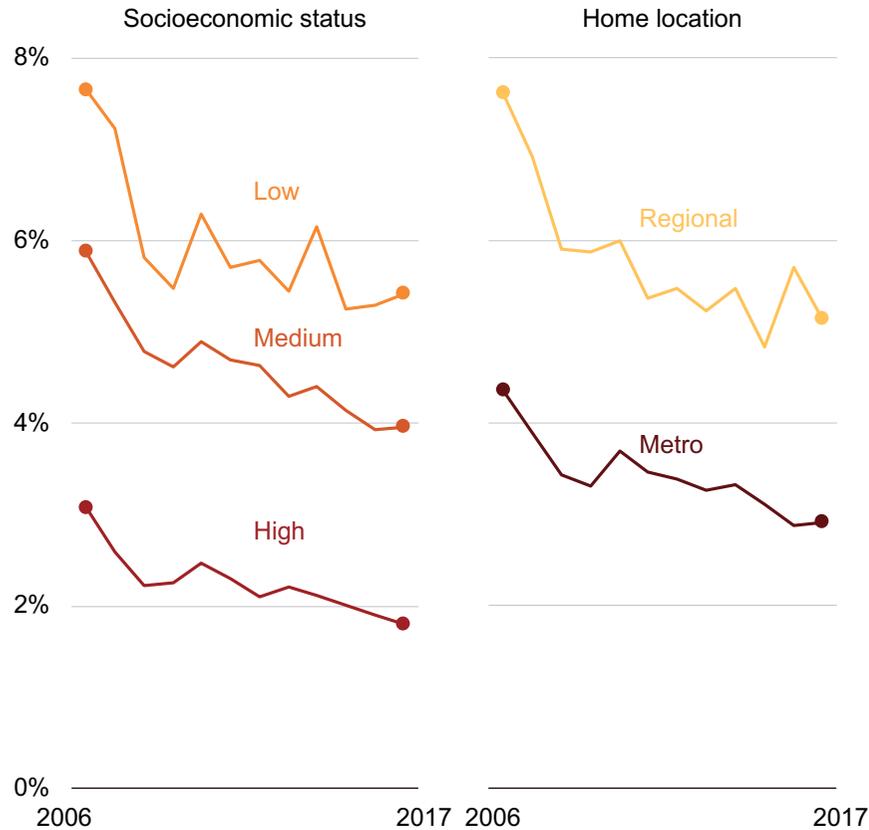
International data shows fewer high-achieving 15-year-olds in Australia are interested in becoming a teacher than in many other countries (Figure 2.7). The average 15-year-old who wants to become a teacher performs at around the 52nd percentile of Australian school students in maths, and 60th in reading. In other countries, far more high achievers want to teach. In Germany for instance, aspiring teachers sit at the 75th percentile in reading skills.

Teaching doesn't have to become the most highly sought after or most prestige career, but we do need more high achievers in teaching (Box 1). The next chapter explores what it will take to achieve this.

28. Stokes and Tyler (2003).

Figure 2.6: Demand has fallen fastest among high achievers from regional areas and poorer families

Undergraduate enrolments in teacher education for students with an ATAR of 80 or above, 2006 to 2017

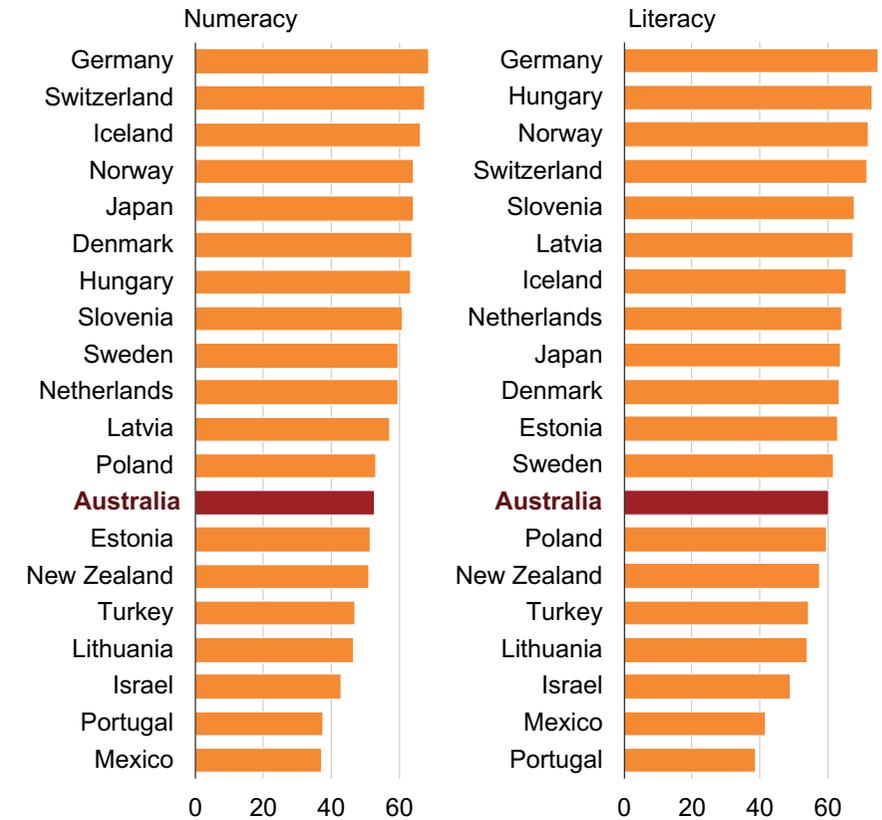


Notes: Includes domestic onshore commencing bachelor-degree student enrolments for all students with a known ATAR 80 or above and aged 20 or younger – regardless of the basis of admission. Double degrees counted twice.

Source: Special data request from the Department of Education and Training.

Figure 2.7: Fewer high-achieving 15-year-olds are interested in becoming a teacher in Australia than in other countries

Maths and reading PISA score of students expecting to work in teaching, percentile of each country's PISA achievement, 2015



Notes: Programme for International Student Assessment (PISA) is an international test of 15-year-old students. Non-OECD countries excluded. Data unavailable for some OECD countries.

Source: Han et al. (2018).

Box 1: Australia is behind Finland, but we could catch up

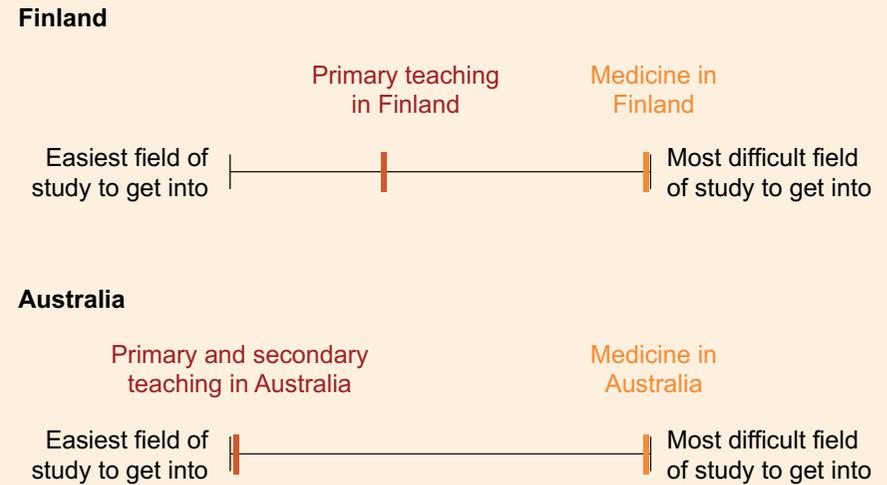
Finland is a high performer on education. It is also one of the few countries that is easy to compare to Australia in terms of the demand from high achievers, given the way their university system works.^a

In Finland, teaching sits broadly in the middle of the pack (Figure 2.8). By contrast, in Australia, teaching is the easiest field of study to get into. That sends all the wrong signals.

Teaching doesn't have to become the most competitive course to get into, but it should be more challenging than it is today. With a moderate and achievable increase in demand from high achievers, Australia could catch up to one of the world's best education systems.

Figure 2.8: It is much easier to get into a teaching degree in Australia than in Finland

Average Matriculation score (Finland, 2011-2013) and average ATAR (Australia, 2017) relative to admission scores for other fields of study



Notes: Because Finland and Australia use different academic ranking systems, the difficulty of entry into each course is calculated relative to the average entry score for other courses. The list of Finnish fields of study excludes polytechnic courses (except for nursing); including polytechnic courses would raise the relative ranking of primary teaching slightly. 'Fields of study' are broad categories of degree. Some individual university courses have lower average ATARs than teaching. The ranking of Australian fields of study is based on average ATAR score but does not include people admitted via alternate pathways.

Sources: Special data request from the Department of Education and Training; Kerr et al. (2015).

a. Auguste et al. (2010).

3 More high achievers would teach if it offered better pay and greater career challenge

This chapter sheds light on what high-achieving young Australians think of teaching as a career, and why they choose the careers they do. It details the findings of a new Grattan Institute survey, conducted for this report, of almost 950 people aged 18 to 25 who obtained an ATAR of 80 or higher. We asked what motivates them, and what might encourage them to choose teaching as a career.²⁹ Appendix A provides details about how we did the survey, the questions, and a summary of the answers.

The good news is that young high achievers are open to the idea of becoming a teacher: about 70 per cent said they would consider it. But for young high achievers, teaching falls short in two key areas: intellectual challenge, and pay. And while high achievers want to do something that will make a difference, altruism isn't enough.

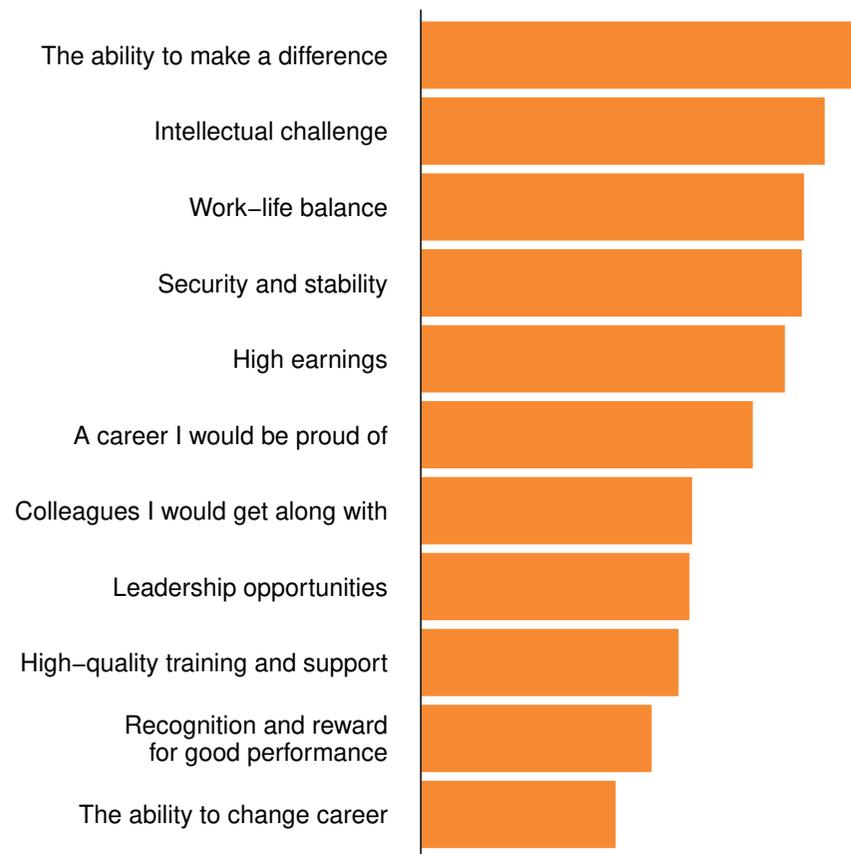
3.1 High achievers want to make a difference, but believe they can do so in careers other than teaching

High achievers want to make a difference. Our survey respondents ranked making a difference as the most important factor for them when choosing a career, closely followed by intellectual challenge (Figure 3.1).

29. Our survey is the first of its kind in Australia. The career motivations of existing teachers and teacher education students have been well studied (Watt and Richardson (2007)) as well as the career aspirations of school students in Australia (Gore et al. (2016)). But our survey seeks to understand the motivations of young high achievers (specifically), including those who have chosen different careers to teaching.

Figure 3.1: High achievers say ‘the ability to make a difference’ and ‘intellectual challenge’ matter a lot

Respondents’ rankings of career attributes, relative score



Notes: Scale represents a relative score of the average rank respondents gave to each attribute, adjusting for the fact that not every respondent ranked every attribute.

Source: Grattan Institute survey of high-achieving young Australians.

The vast majority of high achievers (94 per cent) thought that teaching would give them the opportunity to make a difference. But it is not alone. Almost exactly the same proportion (91 per cent) thought they could make a difference in other careers (Figure 3.2).

Many respondents spoke of teaching's positive effect on students' lives, but some were concerned that as a teacher they could make a difference for only one group of students at a time. One respondent said they chose another profession because it offered them 'the ability to make a difference beyond a single classroom'.

3.2 Teaching falls short on career challenge, and pay

Career choices take account both of what people value and which careers they think will deliver on those valued attributes. Figure 3.3 shows the gaps between what high achievers think their chosen careers will provide them compared to teaching, ranked in order of what they say is important to them.

The two most important attributes (as rated by the respondents) where teaching falls well short are intellectual challenge and pay.

Teaching also falls short in other areas, such as 'the ability to change career', and 'recognition and reward for good performance'. But these attributes are ranked as less important by our high achievers, and so are less likely to be influential in their career decisions.

High achievers rank work-life balance as the third most important factor when choosing a career, but only 46 per cent thought they would achieve it in their chosen profession.³⁰ High achievers' career decisions suggest they are willing to trade-off work-life balance for other factors they rate as more important.

30. See Appendix A for further details.

Figure 3.2: High achievers think teaching would give them the opportunity to make a difference – but so would other careers

Respondents who said that they probably or definitely would be able to make a difference



Source: Grattan Institute survey of high-achieving young Australians.

3.3 Young high achievers don't see ongoing career challenges in teaching

High achievers in our survey didn't necessarily think teaching would be easy. One respondent wrote: 'You're not just a teacher, you're a role model and a guardian. And if you want to do that properly, and nurture kids to be their best and do what they love, then it's really difficult.'

But respondents feared that teaching would not offer them continued career challenges. One high achiever wrote that they were concerned about getting 'bored teaching the same thing year after year'.

Many think teaching lacks career progression opportunities – an aspect closely related to intellectual challenge. About 90 per cent of respondents thought their chosen career would provide such opportunities, but only 64 per cent thought teaching would. One wrote: 'If we had the opportunity to expand the scope of promotions available, that would provide a strong incentive [to teach]. Relative to the corporate world, it feels like teachers don't have a clearly defined career progression path.'

Respondents to our survey are not alone in thinking teaching lacks progression opportunities. A 2013 survey of teachers found that 71 per cent of those younger than 35 were seeking a promotion, and the number one reason was that they wanted challenges beyond classroom teaching.³¹

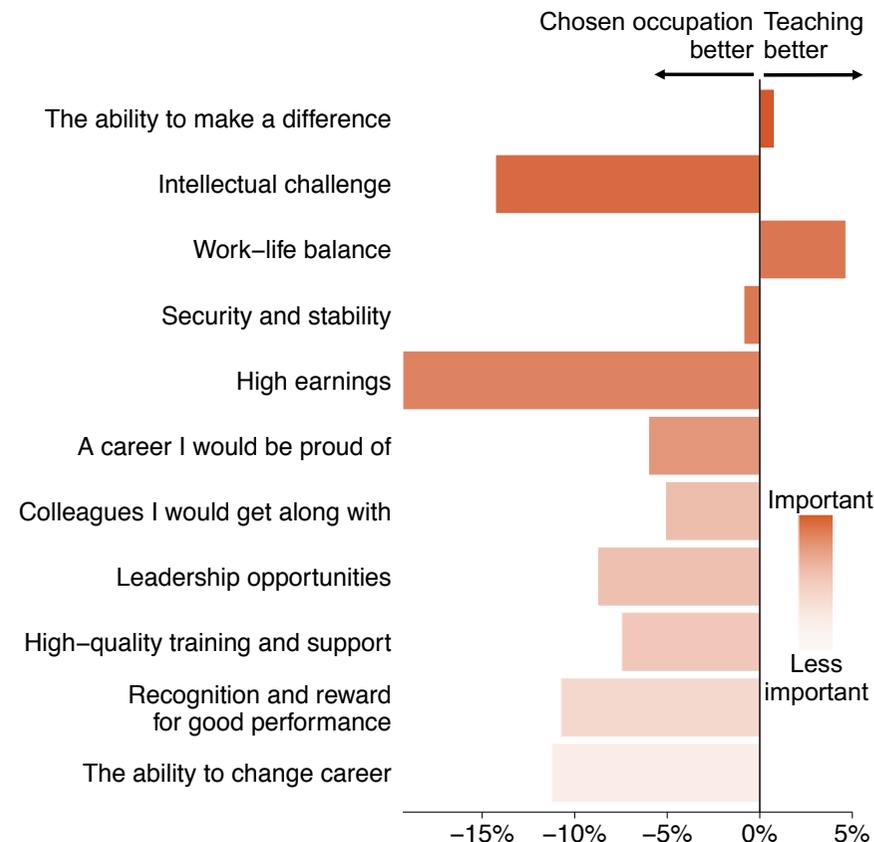
3.4 High achievers know that the pay isn't great in teaching

About 76 per cent of high achievers in our survey said that their chosen career would provide adequate pay, but only 19 per cent thought teaching would.

31. McKenzie et al. (2014).

Figure 3.3: High achievers say teaching falls short on intellectual challenge, and pay

Young people who state that a career in teaching is more likely to provide a given attribute than their chosen occupation



Note: Career attributes are ordered top-to-bottom from most to least important, as per Figure 3.1. The data in the chart show the difference (i.e. teaching minus chosen occupation) in the percentage of respondents who answered that a given career was likely or very likely to provide each attribute.

Source: Grattan Institute survey of high-achieving young Australians.

Respondents predicted they would eventually earn \$142,000 a year in today's dollars in their chosen careers, compared to only \$93,000 in teaching.³² High achievers are right about the limited earnings potential in teaching: Chapter 4 shows that teacher pay is much too flat in Australia. Clearly, to attract more high achievers to teaching, salaries for top teachers need to be more competitive.

3.5 Altruism is not enough

Our survey finds that teaching falls short on career challenge and pay. But this does not mean that high achievers' altruistic motivations are unimportant. In fact our survey shows all high achievers want to make a difference in their chosen careers; but they believe they could get this in their chosen careers nearly as much as in teaching.

Many studies show that when directly asked, young people say they focus on altruistic factors when thinking about their career choices.³³ But the popularity of university courses that lead to occupations with high social status and pay (see Figure 3.4) suggests that extrinsic motivators also play a strong part. Put bluntly, high achievers choose degrees with high earnings potential, creating a high level of competition that in turn leads to high ATAR entry scores.

Our findings show that a mix of altruistic, intrinsic, and extrinsic factors matter to all young high achievers; but that teaching falls short on extrinsic attributes compared to other career options. Our findings are consistent with a similar large-scale US survey of high achievers in 2010, and some Australian research.³⁴

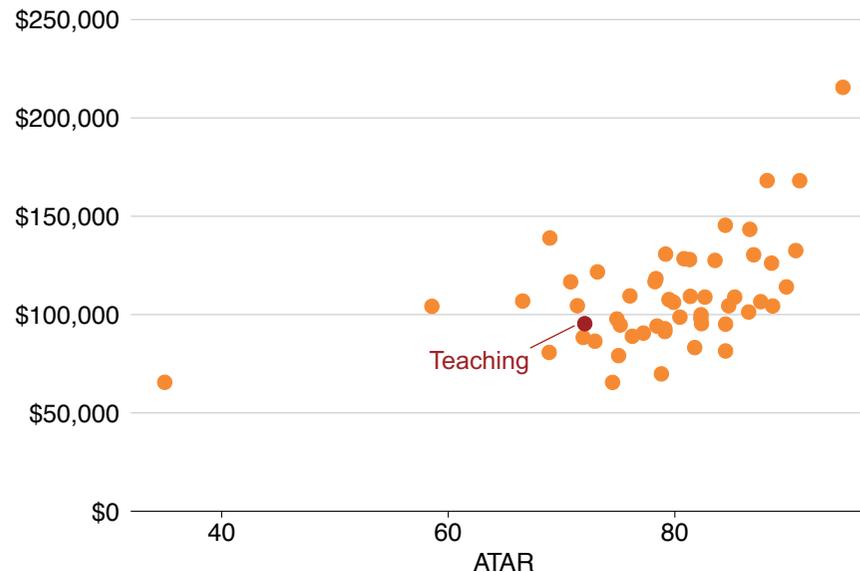
32. Based on the median prediction of all survey participants. Their prediction is about right – the median income for teaching graduates now in their 40s and working full-time is about \$94,000: ABS (2017).

33. Gore et al. (2015).

34. A US survey of young high achievers by Auguste et al. (2010) showed that teaching falls short relative to other professions most in pay and status. In

Figure 3.4: People with high ATARs tend to choose degrees with high earning potential

Median income of 40-49 year-old full-time workers with a bachelor degree, 2016



Notes: Based on Census total income, which includes salaries as well as investment income. Income estimated from grouped Census data using a monotone cubic spline (see Von Hippel et al. (2017)), which may be less accurate for incomes greater than the highest group in the census – \$156,000. Does not include people who go on to postgraduate study in another field. Degree refers to four-digit Australian Standard Classification of Education (ASCED) code.

Sources: Special data request from the Department of Education and Training, ABS (2017).

3.6 What governments can do to attract more high achievers

It is easy to ask someone to compare careers against different attributes, or to talk about how they perceive different careers (see Box 2). It is much harder to understand what might actually change their mind.

Our survey examines what governments can *do* to attract high achievers to teaching, by forcing respondents to pick from a selection of reform packages. Each package has a slightly different rate of starting pay, top-end pay, and other possible reform levers. By forcing high achievers to trade-off different combinations of reform levers, we can understand more about which levers they value the most.

We found that high achievers value upfront financial support while studying, as well as better pay and career challenge (Appendix B gives the full results). These findings inform the recommendations made in Chapter 4.

Box 2: What high achievers say about teaching

We asked young high achievers to put in their own words how they perceive teaching as a career and what would entice them to apply. Their words strongly reinforce that pay and challenge are the biggest things holding them back.

As summarised by one high achiever, teaching needs ‘better pay, more intellectual challenge and the ability to . . . move forward’.

For some, status was important. One high achiever said they would consider teaching if it ‘wasn’t looked down upon’ and ‘ATAR requirements weren’t so low’. Another said they would need ‘less stigma – and more opportunities to progress further’.

Across all the open-ended responses, ‘pay’ and ‘salary’ were the most common words, mentioned 185 times.

Pay was often intertwined with status. One high achiever wanted ‘overall greater respect for the position and better compensation’.

Australia, Stokes and Tyler (2003) performed a focus group on this topic which provided broadly similar findings.

4 A package of reforms will deliver big returns

This chapter prioritises government reforms likely to deliver the best returns from efforts to attract high achievers to teaching. We recommend a \$1.6 billion reform package for government schools that would double the proportion of high achievers entering teaching within a decade.

The quickest and most cost-effective way to get high achievers into teaching is to offer them cash-in-hand scholarships while they are studying. But scholarships don't necessarily help high achievers once they start teaching, so the package also establishes an expert teacher career path for Australia's best teachers, with much higher pay linked to expertise and new jobs designed to improve teacher professional learning. Together with a new marketing initiative, the package would send a strong signal to high achievers and the broader community that teaching is a rewarding and challenging career choice.

The package will help to both attract more high achievers and improve professional learning and support for current teachers, especially beginning teachers. This makes the benefits very large for the overall future workforce – and for future students.

4.1 A package of reforms is the best approach

Policies to make teaching more attractive should attract high achievers, make good use of them, and be cost-effective. Reforms with additional benefits for all teachers should be given extra weight. Using this framework, we recommend a three-part package of reforms for both state governments and non-government school sectors:

1. Offer \$10,000 per year cash-in-hand scholarships to high achievers if they choose to study to become a teacher;³⁵
2. Create two new roles that together form an expert teaching career path with higher pay and greater responsibility for developing other teachers:
 - An Instructional Specialist role for 5-to-8 per cent of teachers, paid \$40,000 a year more than highest standard pay rate for teachers;
 - A Master Teacher role for up to 0.5 per cent of teachers, paid \$80,000 a year more than highest standard pay rate for teachers;
3. Launch a marketing campaign to promote the reforms and re-position teaching as a rewarding and challenging career.

No component of the package excels on all four criteria on its own. But the overall package ticks all the boxes (Table 4.1). The rest of this chapter discusses each component in detail. Appendix C explains why we have not recommended some other policies.³⁶

-
35. Scholarship applications would be open to students with an ATAR 80 or above or a comparable level of achievement at university. Scholarship recipients should also have good non-cognitive skills in the areas that matter to teaching.
 36. Appendix C discusses one policy lever that needs further consideration; better incentives to attract high-performing teachers to disadvantaged schools. High achievers want this opportunity, but would probably need extra support to be successful in such a challenging context.

Table 4.1: Our recommended package ticks all the boxes

Component of package	Attract high achievers	Make good use of high achievers	Additional benefits for all teachers	Annual cost for government schools
1. Scholarship of \$10,000 a year for high achievers	✓✓✓✓	✗	✗	\$0.35 bn
2. New roles for:				
– Instructional Specialists (paid \$40,000 more than the highest standard pay for teachers); and	✓✓✓	✓✓✓	✓✓✓	\$1.23 bn
– Master Teachers (paid \$80,000 more than the highest standard pay for teachers)				
3. Marketing campaign	✓✓	✗	✗	\$0.02 bn
Overall package	✓✓✓✓✓	✓✓✓	✓✓✓	\$1.60 bn

Notes: Costs refer to implementing reforms in all Australian government schools. The costs to implement the reforms across all non-government schools would be about half as large but is harder to estimate because there is less available information on current teaching salaries. The \$10,000-a-year scholarship would be given to high achievers while they are studying to become a teacher. Costings assume that 5-to-8 per cent of the teacher workforce would be Instructional Specialists, and 0.5 per cent would be Master Teachers. The annual cost of the package would be lower than shown for the first few years of implementation as the numbers of Instructional Specialists and Master Teachers builds to the desired level.

Source: Grattan analysis.

4.2 Component 1: Offer \$10,000 teaching scholarships to high achievers

Scholarships would attract many more high achievers to teaching. In our survey (Appendix B.2) high achievers value \$10,000 cash-in-hand scholarships almost as much as the suggested \$80,000 pay rise to top-end teacher salaries.

Every student who receives an ATAR 80 or above – or a similar achievement level at university for post-graduate students – should be eligible to apply for a \$10,000 per year cash-in-hand scholarship if they choose to study teaching.

Scholarships for high achievers have been shown to be effective in the UK. The UK government has massively increased scholarships over the past eight years, and now offers them to about 60 per cent of students entering teaching, at a cost of £250 million per year. For every £1,000 increase in the total value of a scholarship, there has been a 2.9 per cent increase in applications.³⁷ Of those who take the scholarship, 89 per cent end up working in a public school.³⁸

We estimate that our scholarships proposal would attract about 16,000 high-achieving students each year, increasing the number of high achievers who select teaching by 70 per cent.

Scholarships would be available for study in both undergraduate and post-graduate teacher education courses. They should not be awarded on academic results alone. Scholarship applicants would also need to demonstrate they have commitment and personal capabilities important to teaching.

For maximum impact, all three sectors (government, independent, and Catholic) should offer scholarships. But each sector would need to separately fund their scholarships.

37. Foster (2019, p. 18).

38. UK Dep't of Education (2018).

State governments should fund about 10,000 scholarships each year, in line with government schools' share of the teacher workforce.³⁹ This would cost about \$350 million per year.⁴⁰ To ensure they don't 'take the money and run', people who receive government-funded scholarships would have to agree to work as a teacher in a government school for a set number of years.

Scholarships would encourage more high achievers to consider teaching, and Component 2 would help to keep them engaged in teaching throughout their careers.⁴¹

4.3 Component 2: Establish an expert teacher career path with new roles at higher rates of pay

High achievers want better pay as well as more challenging career paths. Creating an expert teacher career path for the best teachers would achieve both objectives: it would enable top teachers to take on significant new responsibilities, at significantly higher rates of pay.

We suggest two new roles, open to all teachers who can demonstrate the required standard of expertise. Instructional Specialists would work to improve teaching within their school, and should be paid \$40,000 more than the highest standard pay rate for teachers. Master Teachers

39. An estimated 63 per cent of teachers work in government schools: Productivity Commission (2019, table 4a.2).

40. This estimate assumes scholarships cover teaching degrees (only) at both undergraduate and post-graduate levels. Postgraduate scholarships would be for two years and undergraduate for four. The estimated split is in line with the current allocation of undergraduate teaching and postgraduate degrees (see Figure 2.7). The cost of the scholarships is also self-regulating: if fewer high achievers apply than expected, the cost is less.

41. For very high achievers who have many options, retention will be a bigger challenge. About 80 per cent of chemistry, maths, and physics graduates who receive scholarships in the UK enter the teaching workforce, compared to 89 per cent for other graduates. UK Dep't of Education (2018).

would work across schools, and should be paid \$80,000 more than the highest standard pay rate for teachers.

It is important for top teachers to get better pay. But it should not be ‘money for nothing’; teachers in the new roles would be required to ‘give back’ by helping lift the quality of the teaching workforce. Tying higher pay to specific jobs will also prevent a cost-blowout.

We recommend this reform be phased in over a decade, to ensure the right selection, training, and support processes are in place. It would build on existing efforts to certify teachers as Highly Accomplished and Lead Teachers (HALTs), as well as various state-level programs with similar objectives.⁴²

4.3.1 Higher pay at the top will attract high achievers to teaching

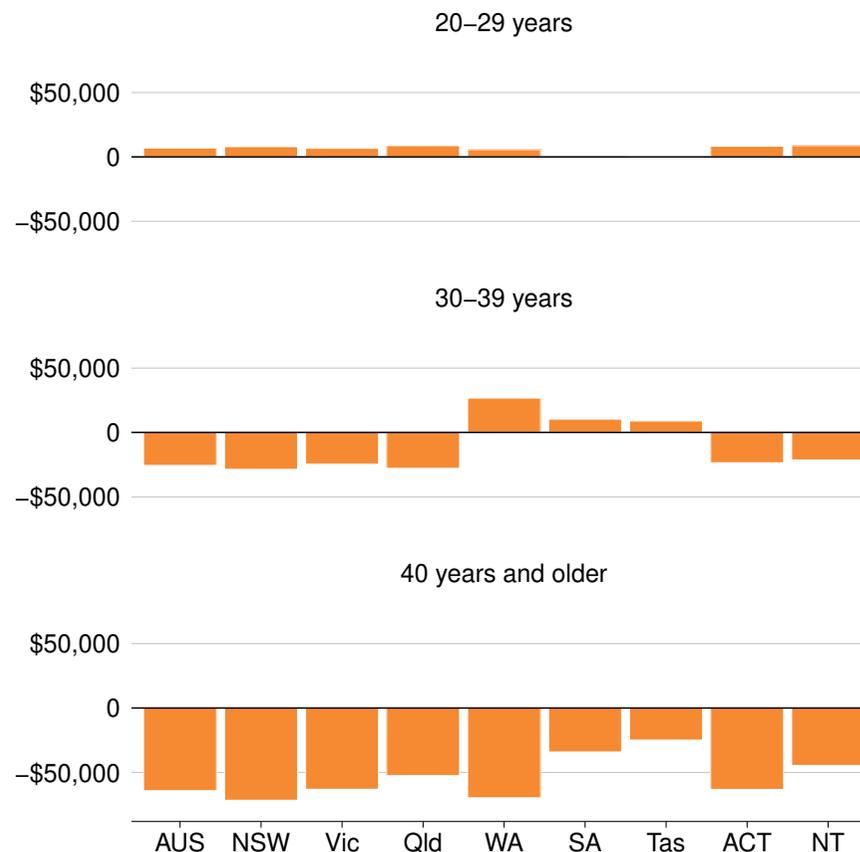
To attract high achievers to teaching, top-end salaries need to be competitive with what they can earn in other professions.

Few high achievers in our survey thought teaching would provide them with adequate pay. They nominated increased pay as the single most important initiative that would encourage them to teach (Appendix B.2).

Figure 4.1 shows the salary differentials between full-time teachers and other similarly educated full-time workers at the 80th percentile of pay. High performing teachers in their 20s get paid close to other high performers in their 20s who have a bachelor degree. But by the time these teachers hit their 30s and 40s, their pay is a lot less than their university peers in other professions.

Figure 4.1: Young high-achieving teachers earn competitive incomes, but older teachers do not

Income differential between full-time teachers and other full-time workers with a bachelor degree, at the 80th percentile of income, 2016



Notes: See Figure 3.4 for notes on income estimates.

Source: ABS (2017).

42. HALTs are teachers who have been certified as meeting the two highest levels of the Australian national teacher standards.

Figure 4.2 shows older teachers earn *many tens of thousands of dollars* a year less than their peers in medicine, law, and engineering.⁴³

The pay gap between teaching and other professions hasn't always been there. In 1986, the average income of a female teacher was 2 per cent *higher* than the average for all female professionals, and the average income of a male teacher was about the same as the average for all male professionals (Figure 4.3).⁴⁴ But by 2018, female teachers earned 8 per cent less on average than other female professionals, and male teachers earned 16 per cent less on average than other male professionals.

A key reason Australian teachers have limited opportunity to get paid a competitive salary is that the pay scale within teaching is a lot flatter in Australia than in many comparable countries. Australia's top teacher salary is only 40 per cent higher than the starting salary; well below the OECD average of 80 per cent.⁴⁵ In Australia, salaries for teachers top out after 10 years; again, below the OECD average.⁴⁶

The Productivity Commission highlighted the problem of Australia's relatively flat pay scale for teachers back in 2012, but it is still an issue today.⁴⁷

43. Of course, a high achiever with an education degree earning at the 80th percentile of income would not necessarily earn at the 80th percentile in other professions, especially if the workforce is more competitive. But 2016 Census data shows that a high achiever with an education degree would only need to be 'average' in a profession such as law to earn more. A typical law graduate working full-time in their 40s has an income of \$145,000; they would need to be at the 97th percentile of education graduates to earn an equivalent salary. More generally, Norton et al. (2019, pp. 32–33) shows that bachelor-degree students with higher ATARs are expected to earn more over their lifetime than bachelor-degree students with lower ATARs.

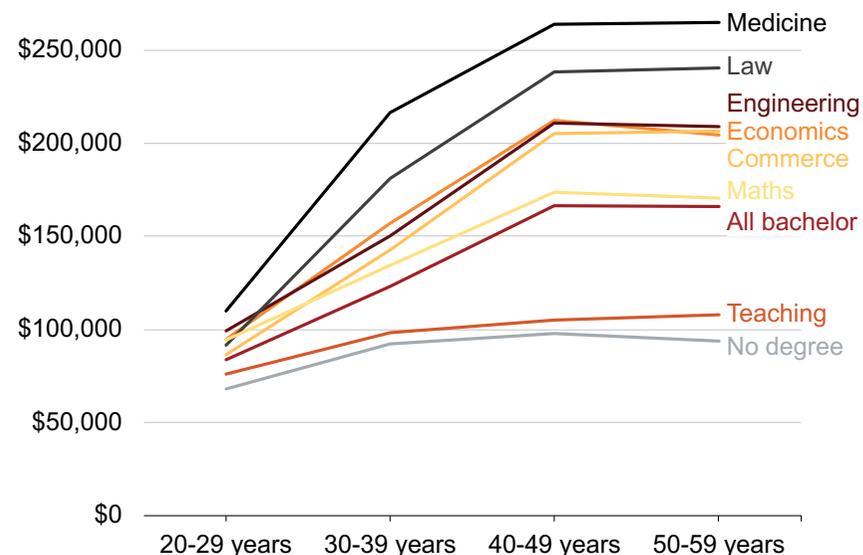
44. Relative teacher pay has been falling since at least 1976: Leigh and Ryan (2008).

45. OECD (2018, Section D3.2).

46. Ibid.

47. Productivity Commission (2012).

Figure 4.2: Teachers quickly fall behind their peers in other professions
80th percentile total yearly personal income of full-time workers holding a bachelor degree, by field of study, 2016



Notes: Includes people who studied a teaching degree but now work as principals. Four-digit fields of education chosen because they have the highest median ATAR. 'No degree' includes all levels of education below bachelor. See Figure 3.4 for notes on income estimates.

Source: ABS (2017).

Higher pay really does attract high achievers

A range of research confirms the direct link between pay and career choices for high achievers. In Australia, one study found that more high achievers entered teaching courses when pay was high relative to other professions.⁴⁸ The same study also found that high achievers within teaching are not rewarded. In other professions, by contrast, there is a ‘return to aptitude’ – high achievers tend to earn higher-than-average incomes as they progress in their chosen career.

In the US, school districts with steeper pay scales attract higher-achieving teachers.⁴⁹ And countries that pay teachers well tend to have teachers who are academically stronger (relative to other professionals) as well as better student results.⁵⁰

Recent increases to teacher pay have not kept pace with other professions

Several states have made efforts to raise top teacher salaries in recent years, but teacher incomes are still not keeping up with professional pay elsewhere.⁵¹ After accounting for inflation, the 80th percentile of middle-aged teacher salaries has risen by about 15 per cent in the past 10 years, compared to about 23 per cent for all professionals (Figure 4.4).⁵²

48. Leigh (2012) looked at pay for teachers in Australia between 1989 and 2003.

49. Hartney (2018).

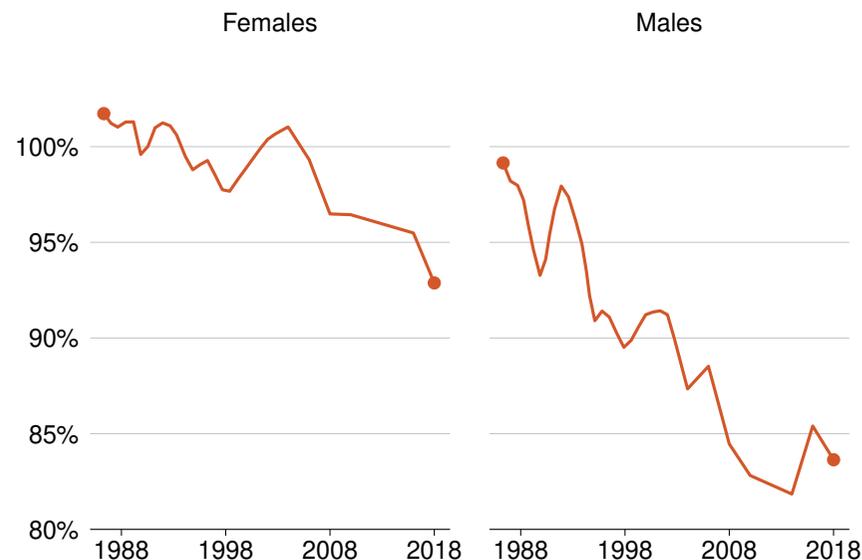
50. Studies that compare student results across countries should be treated with caution. The best estimate is that a 15 per cent pay increase for teachers is associated with an 8 per cent increase in student achievement. Dolton et al. (2011).

51. For a recent paper on this issue see Ingvarson (2018).

52. ‘Incomes’ here refers to both salary and non-salary incomes. Limitations of Census data mean we cannot easily isolate salary income. But given that salary is about 94 per cent of teachers’ total incomes, and 89 per cent for professionals, these income gaps at the top end would still be very large even if non-salary income were taken into account.

Figure 4.3: Since the 1980s, teacher pay has fallen well below pay in other professions

Average teacher salaries as a percentage of all professionals, 1986 to 2018



Notes: Salaries measured as the average weekly cash earnings of full-time non-managerial adult employees. In 2006 the ABS started including salary sacrifice income and changed the definition of ‘professional’. For years 2010-2018 aggregate incomes for all professionals were not available, and so they were calculated using the weighted average of all professional occupations. The weights were derived from the number of full-time workers in each occupation and gender category in the 2016 Census.

Sources: ABS (2018) and Leigh (2012).

Increase top-end pay by large amounts for the new roles

To balance benefits and costs, we recommend the new Instructional Specialists get a salary \$40,000 per year more than the top salary for a standard classroom teacher. So Instructional Specialists would get about \$140,000 per year.⁵³ This income is more in line with options high achievers can earn elsewhere. Master Teachers, whose job would be more akin to that of a regional or district officer, would earn \$80,000 more than the top salary for a standard classroom teacher. So Master Teachers would get about \$180,000 per year (see Figure 4.5).⁵⁴ Together, they dramatically steepen the pay scale for the best teachers, as seen in Figure 4.6.

These are good salaries, much more than teachers can currently earn without moving out of the classroom and into school leadership. But this is the size of pay increase needed to double the number of high achievers entering teaching. In turn, this would mean that the vast bulk of new teachers entering the workforce are academic high-achievers, transforming the profession.⁵⁵

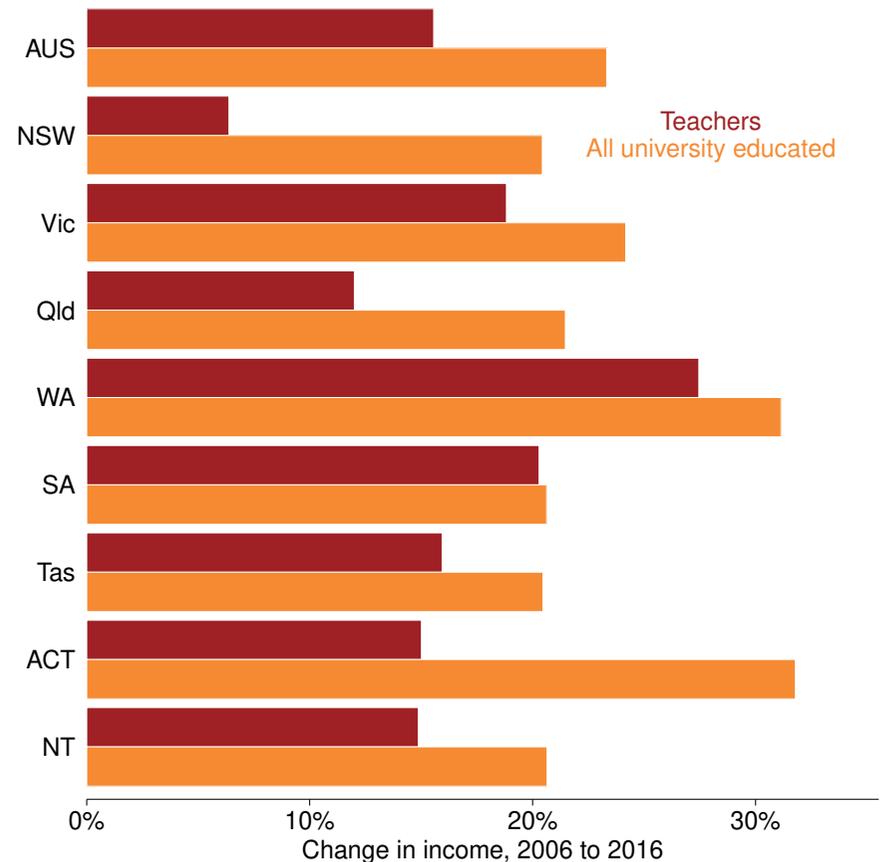
Higher levels of pay should be explicitly linked to new jobs with extra responsibilities, not just experience. Teachers would also have to demonstrate high levels of teaching expertise to be eligible to apply for these jobs.

53. Our proposed salary for Instructional Specialists of \$140,000 is estimated by adding \$40,000 more to a regular classroom teacher's salary, seen in Figure 4.5. Instructional Specialists in smaller schools might have less time to support other teachers, and somewhat lower salaries.

54. Our proposed Master Teacher salary of around \$180,000 is estimated by adding \$80,000 more to a regular classroom teachers salary.

55. Our survey results suggest there is no 'sweet spot' for what amount to increase top-end pay for teachers. In fact, there was a one-for-one, or linear, relationship between pay and attraction; each additional \$10,000 had the same effect on the attractiveness of teaching as the first. We only tested up to \$180,000, and it is likely that at some point the marginal \$10,000 would have less effect.

Figure 4.4: Over the past decade, top teacher incomes have not kept pace with incomes for people at the top of other professions
 Increase in gross weekly income for the 80th percentile of full-time workers aged 40 and above, 2006 to 2016, inflation adjusted



Notes: See Figure 3.4 for notes on income estimates.

Source: ABS (2017).

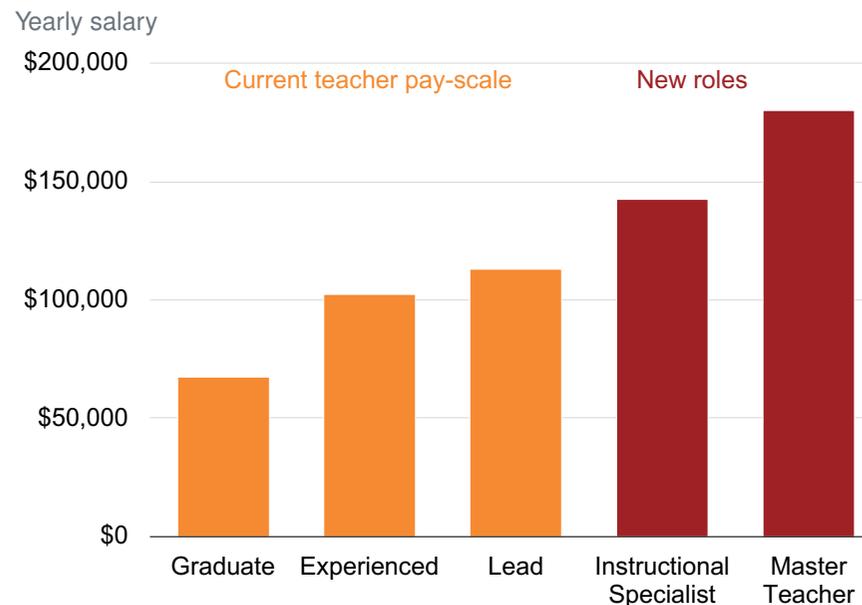
Figure 4.5: Our proposed higher salaries for two new roles

State	Current top salary for regular classroom teachers	Current top salary for lead teachers with instructional leadership	Our proposed salary for Instructional Specialists	Our proposed salary for Master Teachers
NSW	\$102,806	\$109,427	\$142,806	\$182,806
VIC	\$102,778	\$112,882	\$142,778	\$182,778
Qld	\$101,000	\$121,975	\$141,000	\$181,000
WA	\$105,049	\$116,626	\$145,049	\$185,049
SA	\$98,806	\$113,341	\$138,806	\$178,806
Tas	\$97,763	\$114,927	\$137,763	\$177,763
NT	\$105,172	\$127,414	\$145,172	\$185,172
ACT	\$106,448	\$112,574	\$146,448	\$186,448

Notes: 'Regular' classroom teacher top salary is based on classroom teacher role at the top of the highest salary band, as at 1 August 2019. 'Lead' teacher refers to: NSW highly accomplished (band 3); Victoria learning specialist; Queensland highly accomplished teacher' WA Level three classroom teacher; SA Lead teacher, with certification; Tasmania Band 2 Teacher; NT Lead Teacher, with certification allowance of \$22,242; ACT HALT, with certification allowance of \$6,162.

Sources: Various state government Enterprise Bargaining Agreements.

Figure 4.6: Our package would steepen the pay scale for the best teachers



Sources: Various EBAs; Grattan Institute analysis.

4.3.2 An expert teacher career path will attract high achievers

High achievers want intellectually challenging career paths, but that doesn't necessarily mean moving into traditional school management. Respondents to our survey were nearly twice as attracted to the potential to become an 'expert teacher' than the idea of being a school principal, as seen in Appendix B.

Young people want to go into a profession where expertise – and not years of experience – is the key criteria for promotion.

As proposed in our 2016 report, *Circuit breaker*, we suggest two new roles for those with deep expertise in teaching, where they become responsible for helping other teachers improve.⁵⁶

This workforce model is seen in high-performing systems, such as Shanghai and Singapore, where an elite cohort of specialist teachers sets the direction for effective practice.⁵⁷

We propose two new roles:

- *Instructional Specialists* would help lead teaching instruction in their own school, splitting their time between teaching students and supporting other teachers.
- *Master Teachers* would work across schools, supporting, developing, and overseeing Instructional Specialists.

Teachers in the new positions would help lift the quality of the broader teaching workforce, by working closely with other teachers to help define and demonstrate great teaching. They would set high standards for teaching practice, and then help teachers develop and improve to meet those standards. These roles are further described in Box 3.

56. Goss and Sonnemann (2016, Part B). See also Recommendation 16 in Gonski et al. (2018, p. xiv), which emphasised the need for better career pathways, with accelerated progression, higher pay and extra responsibilities.

57. Jensen (2012, pp. 24–26).

Box 3: What Instructional Specialists and Master Teachers would do

Instructional Specialists would work intensively in their own schools to lead the teaching practice of other teachers. They would carry a half-time teaching load. They would specialise in a given area, for example a subject or skill, and help other teachers improve. Instructional Specialists would engage other teachers in professional learning activities that are relevant, practical, and close to classroom practice.^a They help teachers improve through coaching, leading teams, observing and providing meaningful feedback on teaching practice.

Master Teachers would guide Instructional Specialists and work at a sub-regional or district level across clusters of schools. Master Teachers would be the pedagogical leaders in their subject or area of expertise, and would seek to improve teaching practice in their domain. They would give specific guidance to Instructional Specialists via mentoring and cross-school networks. They would help to communicate teacher needs and best practice back to regions and central office. This mediating 'layer' of Master Teachers is a big gap in most Australian school systems.

a. Studies on effective professional learning include Timperley et al. (2007), Yoon et al. (2007), Scher and O'Reilly (2009), Kennedy (2016) and Kraft et al. (2018).

A big focus of the new roles would focus on supporting beginning teachers, a reform that high achievers are especially interested in.⁵⁸ They would also help older and more experienced teachers too.

There are downsides to taking the best teachers away from teaching directly to students. But current evidence suggests these downsides are outweighed by the benefits from helping all teachers improve.⁵⁹

4.3.3 Our new roles go further than current jobs for top teachers

Some states and territories give top teachers more pay and responsibilities to develop others, but often these have been short-term policies.⁶⁰ Coaching programs abound, but they often chop and change, and coaches are not always experts in the areas that they are coaching in.⁶¹

Victoria and WA have introduced longer-term roles for top teachers to develop other teachers.⁶² But the selection processes for such

58. Our survey results show high achievers are interested in mentoring and supporting beginner teachers (See Appendix B). It is likely that young high achievers might value on-the-job support even more once they start teaching. One US study showed that high-performing *current* teachers placed more weight than young high achievers on better school support. See Auguste et al. (2010).

59. Several meta-analyses on teacher professional learning show positive effects, especially on coaching: Timperley et al. (2007), Yoon et al. (2007), Scher and O'Reilly (2009), Kennedy (2016) and Kraft et al. (2018). Backes and Hansen (2018) describe a model that uses a master teacher to coach other teachers and has large effects on students' maths scores, while Hansen and Backes (2018) argues that this model is more effective than an alternative model that increases the student load of effective teachers.

60. For example, Queensland introduced a 'Master Teacher' program to use the best teachers to develop others, but it lasted only a few years and did not have a strong subject focus.

61. For example, some programs employ coaches for both literacy and numeracy, despite the fact that these are very different areas of expertise.

62. For example, WA has created a 'level 3' category of classroom teacher, and Victoria recently introduced Learning Specialists.

positions are weak, there is not enough funding, and teachers in these roles get too little time and oversight to do their jobs properly.⁶³

Our proposed two new positions are different to existing programs, because they provide:

- More specialisation, in particular by subject, or a skill area such as the use of assessment data.⁶⁴
- A new mediating layer of Master Teachers who work at a sub-regional or district level.
- A big focus on beginning teachers, so that they are intensively trained and supported in their first few years.
- More stable jobs, but with rigorous performance management. Over time, the roles would be embedded in teaching career structures.
- Sufficient time, training, and support to enable people to do the jobs effectively.

4.3.4 Teacher certification would be a pre-requisite

To be eligible for the new roles, teachers would need to first be certified at the highest levels against the *Australian Professional Standards for Teachers*.⁶⁵ Certified candidates would then compete for a limited number of Instructional Specialist or Master Teacher positions.

63. We plan to publish a further report on this topic in coming months.

64. See Goss and Hunter (2015) for a discussion of Targeted Teaching. Several studies show the benefits of subject specific teaching skills, such as Guskey and Yoon (2009), Hill et al. (2005) and Baumert et al. (2010).

65. The *Australian Professional Standards for Teachers* make explicit the elements of effective teaching at different career stages. We propose that, to be eligible to apply for an Instructional Specialist job, a teacher must be certified at a Highly Accomplished level on AITSL's national teacher standard, or equivalent. To be eligible to apply for a Master Teacher job, a teacher must be certified at Lead Teacher level on AITSL's national teacher standard, or equivalent.

Since 2013, the Australian Institute of School Leadership and state and territory governments have led a major effort to certify Highly Accomplished and Leading Teachers (HALTs) against these standards.⁶⁶ These efforts can help to identify teachers with outstanding teaching expertise. This is a positive step.⁶⁷ But it is not enough. While certification recognises high standards of teaching practice, it does not necessarily change the teacher's day job.⁶⁸

In time, about 15-20,000 teachers would need to be certified as HALTs to fill the number of envisaged Instructional Specialist and Master Teacher jobs. This is many more teachers than are certified today. To achieve this increase, the certification process must be efficient, rigorous, and affordable. The amount of time teachers need to devote to preparing for certification should be kept to a minimum. But a slow roll-out with rigorous certification is better than a fast roll-out with less rigorous selection processes. Keeping standards high is vital.

4.3.5 Control costs by limiting the number of new positions

Increased top-end pay can blow out to large-scale pay rises. For example, the national Advanced Teacher Skills Scheme in the 1990s was intended to increase top-end pay for only the highest-performing teachers. But it was poorly implemented, and in Victoria pay rises were given to virtually anyone who applied.⁶⁹

Linking increased top-end pay to a specific job reduces the risk of a cost blow-out. We estimate that 1-to-2 Instructional Specialists would

be required in a medium-sized primary school, and 4-to-7 in a medium-sized secondary school.⁷⁰ This corresponds to 5-to-8 per cent of the teaching workforce – a firm limit on the number of teachers who would get the increased pay.⁷¹

We estimate that only 0.5 per cent of the teacher workforce would be required to become Master Teachers. That would equate to 1,000 Master teachers across Australia.

Creating this well-paid career path could make being a school principal less attractive. More work is needed to determine whether principals should be paid more, given the proposed pay rates for Instructional Specialists and Master Teachers, and pay rates for managers in comparable professions. We estimate that an average \$20,000 increase in principal and assistant principal salaries would resolve this issue and cost about \$250 million each year.⁷²

4.3.6 Establishing an expert career pathway is not cheap

Creating an expert career path requires a significant investment. We calculate it would cost government schools **\$1.23 billion** per year once fully implemented.⁷³ This cost is made up of:

70. A 'medium-sized' primary school is defined as having 300-450 students, and a 'medium-sized' secondary school is defined as having 900-1,100 students, based on analysis of the Australian Curriculum, Assessment and Reporting Authority school profile database: ACARA (2018). Our estimated range for the number of Instructional Specialists for each school is based on Instructional Specialists spending up to 50 per cent of their time on the new role.
71. Our estimate of 5-to-8 per cent of the workforce is based on a bottom-up estimation of the time required to do the Instructional Specialist job, including activities such as coaching, observations, giving individualised feedback to teachers in schools. A range of 5-to-8 per cent is given because the number of Instructional Specialists varies according to school size.
72. Any pay increases for school leadership positions should take account of the difference in pay between principal and associate principal positions, which varies by jurisdiction.
73. The cost for non-government schools would be about half this figure.

66. National certification, which is a voluntary process, is available to teachers in all sectors in many states and territories. There are now more than 600 teachers certified under this scheme.

67. NSW evaluated the HALTs program and found a positive impact: SiMERR (2015).

68. Some state governments have moved to link these roles with increased pay, and a network for HALTs was established in 2014.

69. Ingvarson (1996).

- **\$490 million** to ‘backfill’ teachers who move into the positions of Instructional Specialists (who will spend significant time dedicated to guiding other teachers).
- **\$490 million** to fund the \$40,000 salary boost for the 5-to-8 per cent of teachers who become Instructional Specialists.⁷⁴
- **\$80 million** to ‘backfill’ rosters so that each graduate teacher has allocated time during their first two years for mentoring by Instructional Specialists.
- **\$160 million** to fund the 0.5 per cent of the teacher workforce who would become Master Teachers with no class time.

4.4 Component 3: Launch a marketing campaign

Once the other components are being introduced, a national marketing campaign should be launched to raise awareness of the reforms and re-position teaching as a challenging and stimulating job. Young people are heavily influenced in their career choices by their parents and peers,⁷⁵ so the campaign should be designed to shift broad public opinion as well as to directly appeal to young high achievers.

Of course, the new marketing investment has to be in the context of the other elements of our recommended package. Without improvements to pay, career opportunities, or the nature the job itself, a marketing campaign about teaching would be an empty gesture.

The Australian Defence Force spends about \$45 million each year on marketing campaigns to recruit top talent.⁷⁶ We recommend education

74. Instructional Specialists in large schools would spend 50 per cent of their time supporting other teachers. Instructional Specialists in small schools would get less time to support other teachers, and so be paid a slightly lower salary.

75. See Appendix A.

76. Wallbank (2019).

departments fund a \$20 million teaching campaign each year. They should learn from prominent marketing campaigns in the US and UK.⁷⁷

4.5 Impact and timing of the reform package

We estimate that our recommended reform package would double the proportion of high achievers who choose teaching within the next decade.⁷⁸ In the long term, the reform package could be expected to pay for itself many times over, because a better-educated population would boost future GDP growth.⁷⁹ But it would be a slow process, because the reforms would first need to increase the effectiveness of teaching before flowing through to better student results, and then increased productivity as the better-educated students become a larger share of the workforce.

If our reform package is implemented, most *new* teachers graduating from initial teacher education would be high achievers within a decade. But it would take about 40 years for the entire teaching workforce to turn over.

The expert career pathway acts faster, because Instructional Specialists and Master Teachers would boost the effectiveness of the *current* workforce by improving teacher professional learning for all.⁸⁰

77. UK Dep't of Education (2019); and Rich (2013).

78. We estimate the likely impact of pay reforms on attracting high achievers based on Leigh (2012) findings on the historical relationship between teacher pay and cognitive skills in Australia. We then estimate the effect of non-pay reforms by comparing their relative worth to the pay levers in our survey of high achievers (Appendix B.2). To be conservative, when estimating the impact of the package of reforms, we assume that the additional impact of each additional reform is weaker than the impact of the first.

79. Hanushek and Woessmann (2015).

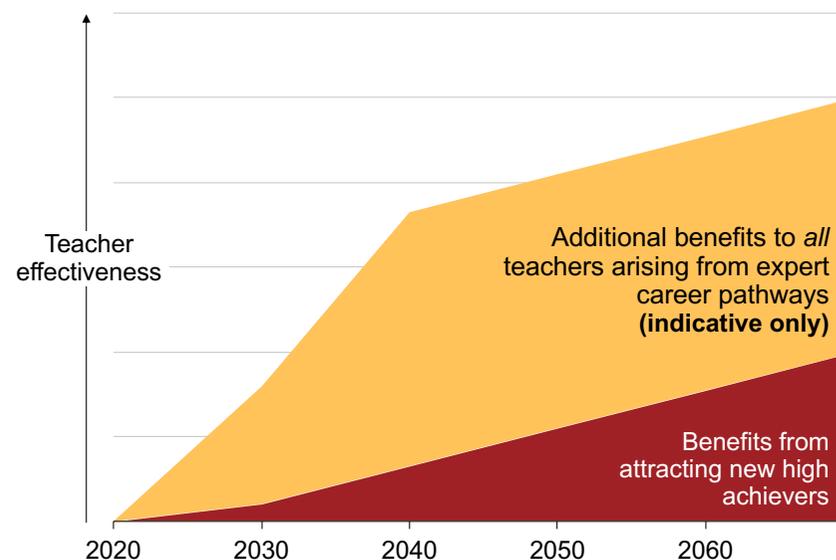
80. We recommend phasing-in the Instructional Specialist and Master Teacher roles over about 10 years. The time could be used to resolve any problems in identifying suitable candidates, and to backfill classroom roles.

Figure 4.7 shows the direct benefits from attracting high achievers, and the additional benefits from the expert career pathways that help all teachers improve. The estimate of the benefits from better career pathways is indicative only, because the evidence-base for improving teacher professional learning is less rigorous, and implementation can be difficult.⁸¹ By contrast, the benefits that arise from attracting high achievers are much easier to predict.

The final chapter explains how governments should pay for our reform package.

Figure 4.7: The expert teacher career path provides bigger and quicker benefits than just attracting high achievers

Anticipated increase in teacher effectiveness from our recommended package



Notes: The modelling of the benefits from ‘attracting high achievers’ (in dark red) is based on an increase in demand from high achievers in response to our reforms to pay, mentoring, expert career pathways, and scholarships. Using Leigh (2012), we find that this will result in a one standard deviation increase in the average prior achievement of new teachers (about 14 ATAR points), improving the results of each student taught by a newly attracted teacher by 2 per cent of a standard deviation for each year of education across 10 years of schooling (Appendix D). Workforce turnover is estimated to take 40 years. The modelling of ‘additional benefits to all teachers’ (in yellow) is based on an increase in the productivity of all teachers resulting from expert career pathway reforms, separate from the attraction benefits. This is estimated to be 3 per cent of a standard deviation improvements in results, based on conservative estimates of compulsory professional development programs: Kennedy (2016).

81. Systematic reviews of teacher professional learning literature have produced a wide range of effect sizes. We assume a conservative effect size of 0.03 standard deviations per year. This is based on recent systematic studies of instructional coaching: Kennedy (2016) and Kraft et al. (2018).

5 Funding the new reform package

Our proposed reform package is expensive, but not extravagant. State governments will face tough choices, while non-government schools should pay their own way.

5.1 Our reform package is expensive, but not extravagant

We estimate that our reform package would cost about \$620 per government school student per year. But this adds up, given that there are nearly four million school students in Australia. At \$1.6 billion a year for government schools, and about half that amount for non-government schools, our reform package represents about 4 per cent of the \$60 billion that Australian governments spend on schooling each year.

The reform package should be funded by:

- **Re-allocating funding** from existing activities, by
 - Redirecting funding from initiatives that overlap with the Instructional Specialist career track;⁸²
 - Cutting ineffective programs such as Reading Recovery;⁸³
 - Removing constraints that impact teacher time so that it can be spent on higher impact activities
- **Increasing funding** to cover any remaining gap.

82. For example, funding from existing senior teacher roles in WA (Level 3 teachers) and Victoria (Learning Specialists) could in time be re-directed to the new roles, covering about 10-to-20 per cent of the higher pay levels.

83. CESE (2015).

Funding increases should be part of the mix because, if anything, Australia spends too little on school education rather than too much: comparable OECD governments spend 20 per cent more than Australia after adjusting for enrolments and national wealth.⁸⁴

In theory, the 2017 'Gonski 2.0' legislation means that funding is already going to increase for most schools and school systems. But in reality, funding increases will be much smaller than planned for many government schools.⁸⁵ And opportunities to redirect funding or cut ineffective programs are likely to be limited for school systems that are currently under-funded.

This creates a tough choice: unless they want to keep pushing high achievers away from teaching, state governments and non-government system leaders must either find the money or increase class sizes.⁸⁶

5.2 State governments face tough choices

Government schools are more likely to need increased funding than non-government schools. On average, government schools are funded at 89 per cent of their Schooling Resource Standard (SRS), while non-government schools are already funded at close to 100 per cent of the SRS on average.⁸⁷

This funding gap has widened since 2008. After accounting for wages, effective funding for government schools grew by just \$155 per student

84. Daley et al. (2019, p. 106) The analysis compares public spending per student in 2015 as a percentage of GDP per capita. Including private spending, comparable countries spend 9 per cent more than Australia.

85. Bradshaw et al. (2019).

86. Larger classes offer much bigger potential savings than any other trade-off. Increasing average class size by one to two students would pay for our package.

87. See Goss and Sonnemann (2016, p. 13) for a description of the SRS model.

from 2008 to 2017; increased Commonwealth funding was offset by effective state funding cuts (Figure 5.1).⁸⁸ By contrast, effective funding for non-government schools grew by \$1,430 per student.⁸⁹

Full funding for government schools (*i.e.* 100 per cent of SRS) would deliver on average an extra \$1,900 per student – triple the cost of our reform package.⁹⁰ But the Commonwealth failed to hold the states to account in the recently signed National Education Reform Agreement.⁹¹ Most government schools will not reach even the 95 per cent target set in the ‘Gonski 2.0’ legislation.⁹²

First, the agreement devalues the target by letting states count depreciation – a capital expense – as recurrent funding.⁹³

Second, the timelines to reach the target have been dramatically extended. For example, Queensland’s special deal means it does not need to increase its real funding to government schools for six years and will not reach its diluted 75 per cent target until 2032.

To the extent that government schools need more money to deliver our reform package, it is time for state governments to stump up. State governments run 70 per cent of Australia’s schools, making them well-placed to identify opportunities for cuts and trade-offs.

88. In other words, state funding increased slower than wages and enrolments.

89. Goss (2019).

90. In other words, at a national level this reform would account for about one-third of the extra funding that government schools would get if they were to reach their full Gonski target. In practice, funding for government schools varies substantially by state: see Goss and Sonnemann (2016, Figure 2.1). Western Australia and the ACT already fully fund their government schools, so they should re-allocate rather than increase funding.

91. COAG (2019).

92. By 2023 the Commonwealth will fund government schools at 20 per cent of SRS, and states were meant to increase funding to at least 75 per cent.

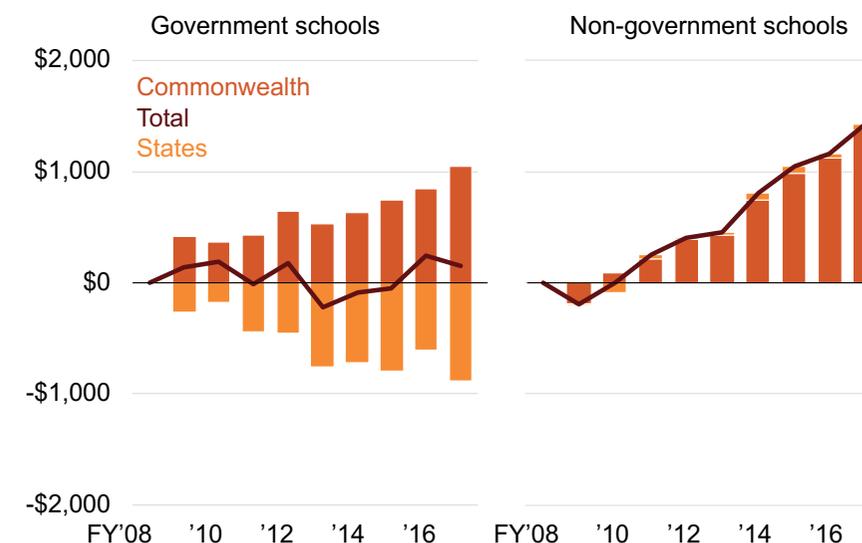
93. Up to 4 per cent of SRS; states also can include regulatory costs that do not apply to non-government schools and were not part of the original calculation of SRS.

And the main reason government schools are underfunded in most states is because the states have failed to properly fund them.

By contrast, non-government schools should pay their own way. They are on track to reach 100 per cent of SRS by 2023, on top of their big funding increases since 2008.

Figure 5.1: Total funding has increased for non-government schools but stagnated for government schools

Change in per student funding, 2007-08 to 2015-16, wage-adjusted



Notes: Recurrent state and territory government expenditure on government schools includes user cost of capital. Wages adjusted to \$2015-16 by ABS Total hourly rates of pay for the private education and training sector, excluding bonuses.

Source: See Goss (2019) for a state-by-state analysis of changes in effective funding.

Appendix A: Grattan Institute survey of high achievers

Between 14 March 2019 and 27 May 2019, Grattan Institute conducted an online survey of students who achieved an ATAR of 80 or above. It was hosted on Survey Gizmo and promoted via Grattan’s social media channels on Facebook and Twitter.

Facebook advertising was used to recruit Australians aged 18-25 and with an ATAR of 80 or above. The first round of advertising, which recruited about 50 respondents, offered the chance to win a \$100 VISA debit voucher as incentive to click on the link. This incentive was not found to increase the number of respondents, and so was discontinued, but all participants were still entered into the draw.

Ultimately, the survey received about 950 responses, most from people with an ATAR above 90 (Question 3).

Respondents were more likely to be female (Question 2), younger (Question 1), and have highly educated parents (Question 13). Only 5 per cent of the respondents came from Queensland (Question 12), possibly because ‘ATAR’ is a less common term in that state.⁹⁴

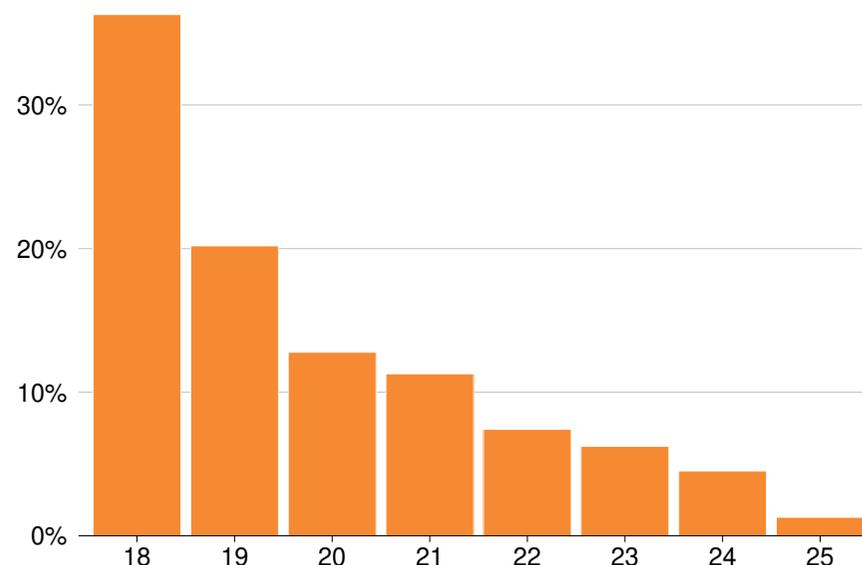
About 7 per cent of respondents were either already teachers or planning on becoming a teacher (Question 4).

Respondents mainly relied on their parents for career advice; of those who selected ‘other’, the vast majority wrote that they relied on themselves when making career decisions (Question 14).

Results of the ‘gap’ analysis are in Figure 3.3. These results are also presented in the table encompassing Questions 7, 11 and 17.

The final question was a ranking exercise, as shown in Figure 3.1. Because not all participants ranked each factor, a weighted average

Question 1: What is your age?



Source: Grattan Institute survey of high-achieving young Australians.

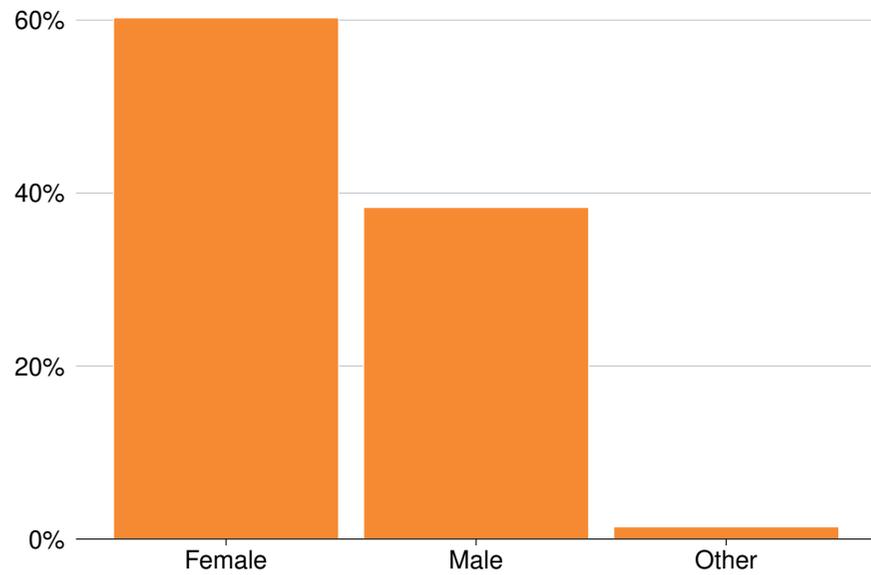
was used to find the most favoured attribute. More points were given to factors that were more often ranked higher on the list of qualities, and more importance was given to respondents who ranked more factors.

94. Queensland has roughly one fifth of Australia’s population.

Questions 7 and 11: How likely is this occupation/teaching to provide you with the following? (per cent)
Question 17: Please rank the following qualities from most to least important when choosing your occupation

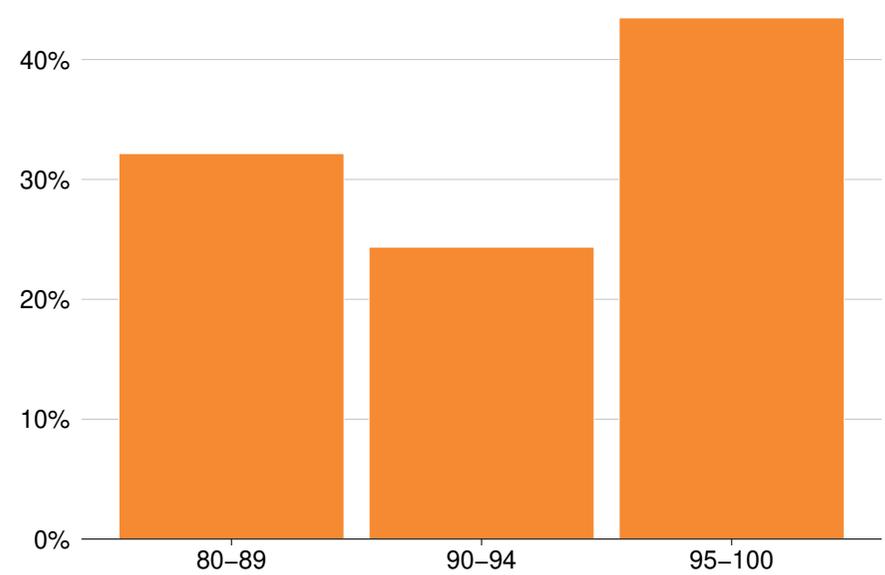
Question	Overall rank		Definitely will	Probably will	Probably won't	Definitely won't
The ability to make a difference	1	Chosen occupation Teaching	58 60	33 34	8 5	1 1
Intellectual challenge	2	Chosen occupation Teaching	73 13	24 41	2 37	1 9
Good work/life balance	3	Chosen occupation Teaching	13 28	41 40	39 25	7 7
Security and stability	4	Chosen occupation Teaching	28 19	52 59	17 20	3 3
High earnings over the course of my career	5	Chosen occupation Teaching	31 3	45 16	21 62	3 19
A career I would be proud to tell people I have	6	Chosen occupation Teaching	70 32	27 47	3 17	0 3
Colleagues who I want to work with	7	Chosen occupation Teaching	22 8	67 66	9 21	1 4
Opportunities to advance to a leadership position	8	Chosen occupation Teaching	44 21	46 43	9 33	1 3
High quality training and support	9	Chosen occupation Teaching	34 12	56 55	9 30	1 3
Recognition and reward for good performance	10	Chosen occupation Teaching	22 7	59 42	18 44	1 7
The ability to change career if I want to	11	Chosen occupation Teaching	29 9	52 39	17 46	1 6

Question 2: What is your gender?



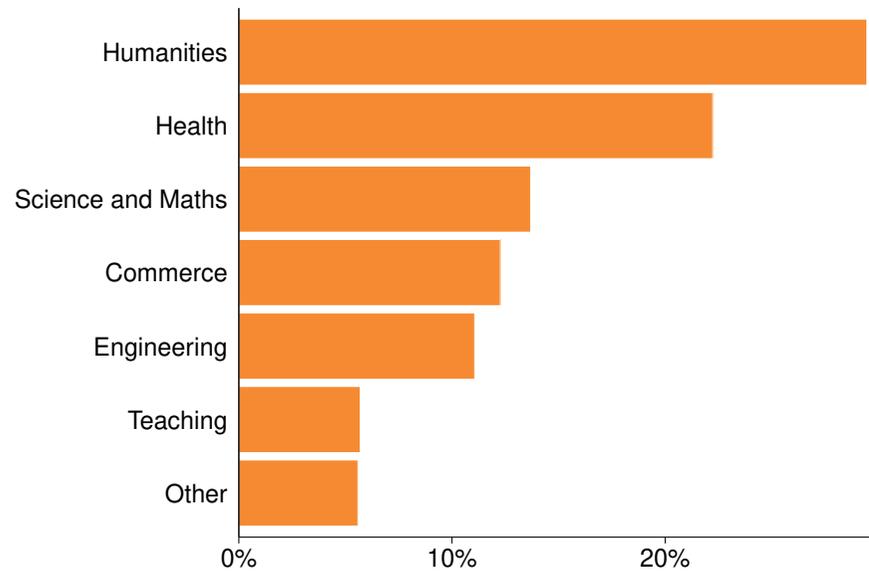
Source: Grattan Institute survey of high-achieving young Australians.

Question 3: What was your ATAR?



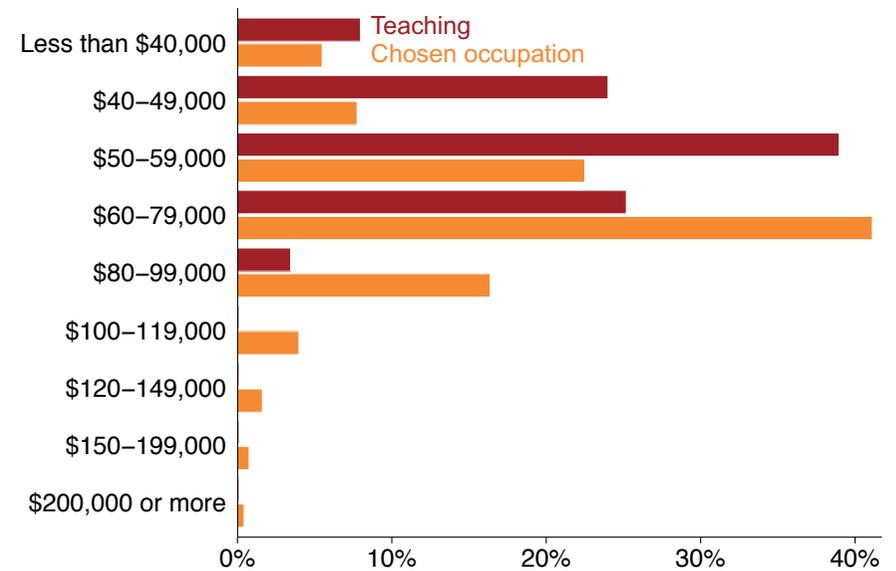
Source: Grattan Institute survey of high-achieving young Australians.

Question 4: What kind of occupation do you most expect to have in 5-7 years?



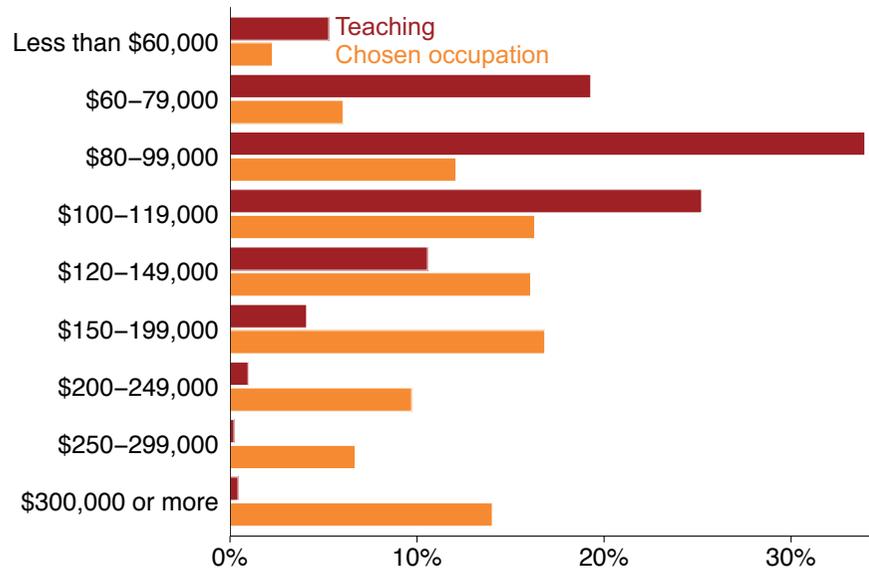
Source: Grattan Institute survey of high-achieving young Australians.
 Note: Survey respondents were given a list of 20 occupations or could write their own answer. Answers grouped into categories by Grattan.

Questions 5 and 9: What do you think the starting salary (before tax) is in this occupation?



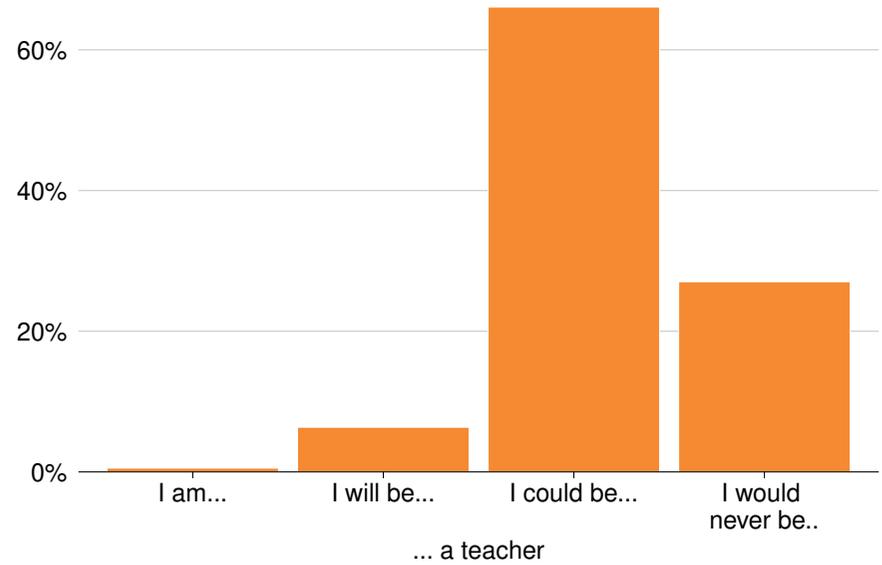
Source: Grattan Institute survey of high-achieving young Australians.

Questions 6 and 10: What do you think is the highest amount (before tax) you will earn per year in this occupation throughout your life?



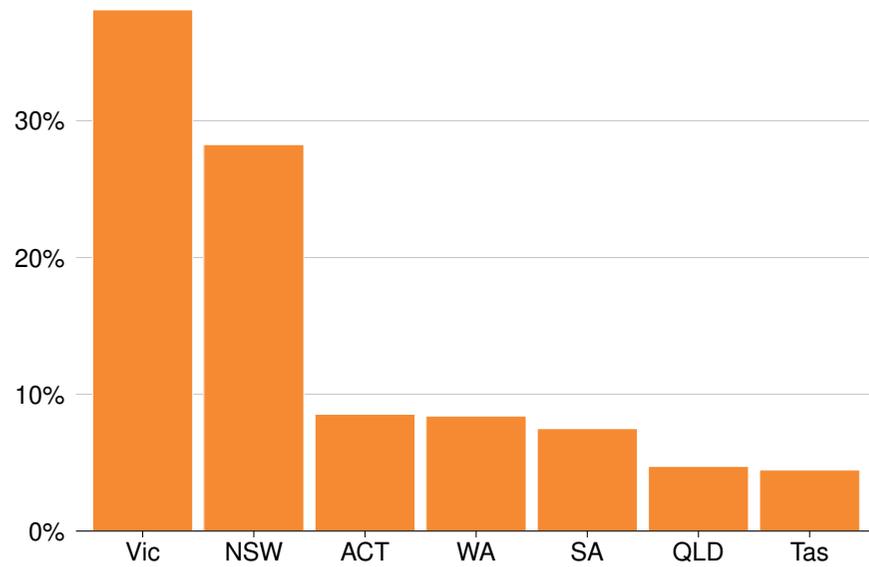
Source: Grattan Institute survey of high-achieving young Australians.

Question 8: Have you ever considered becoming a primary or secondary school teacher?



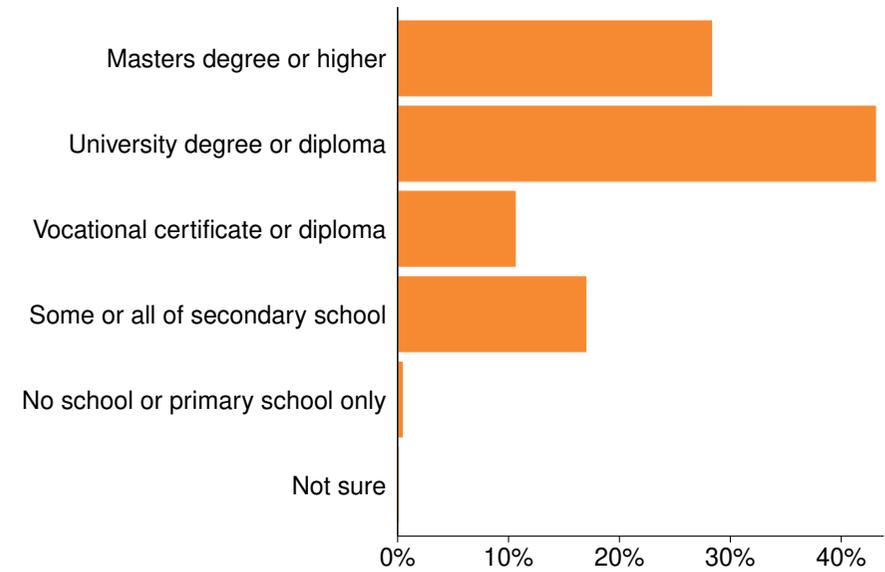
Source: Grattan Institute survey of high-achieving young Australians.

Question 12: What is your postcode?



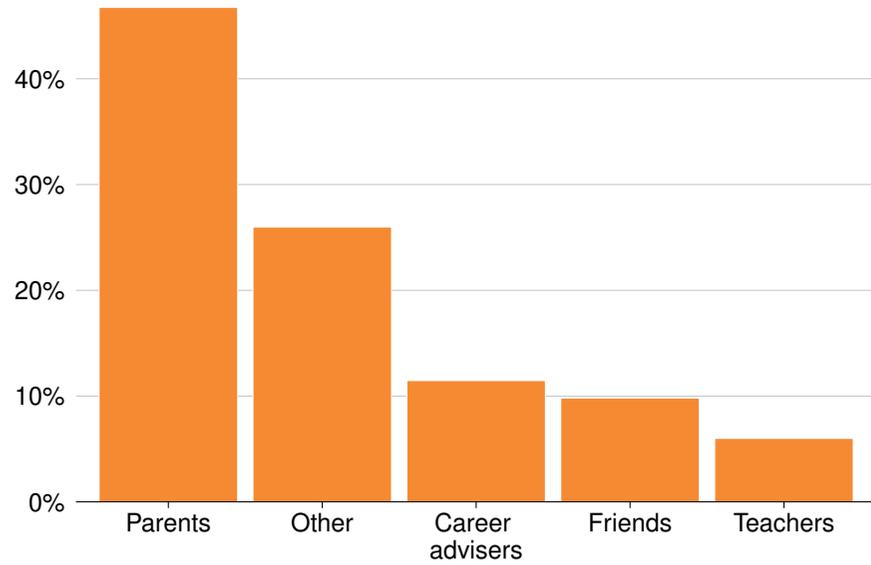
Source: Grattan Institute survey of high-achieving young Australians.

Question 13: What is the highest level of education completed by your parents?



Source: Grattan Institute survey of high-achieving young Australians.

Question 14: Who do you rely on most when making career decisions?



Source: Grattan Institute survey of high-achieving young Australians.

Appendix B: Conjoint analysis

As part of Grattan Institute’s survey of young high achievers, we conducted a conjoint analysis. Conjoint is a survey technique commonly used in market research to understand how people trade-off different benefits against each other. We used conjoint to better understand how high-achieving students value different changes that could be made to teaching.

B.1 Conjoint methodology

Participants were shown a group of ‘packages’ and were required to choose between them, as shown in Figure B.1. Each package contained a random selection from a list of qualities in three domains: starting pay, pay at the top, and other enticement.

Once respondents selected their preferred package, a new set of randomly generated packages was shown and they were asked to choose again. This process was repeated 10 times for each participant.

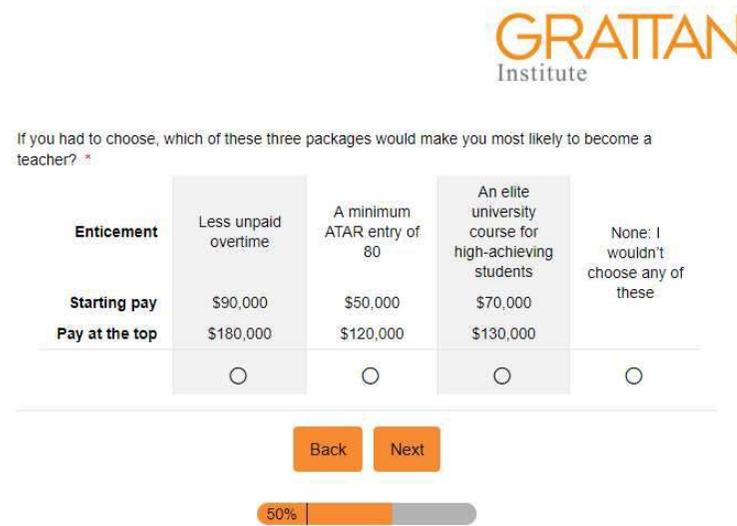
The results of their choices were analysed to find which qualities were most likely to entice high achievers.⁹⁵

Conjoint analysis allows comparison of the relative importance of each attribute within its group, but comparing attributes across domains is more fraught. For starting pay and top pay, the relationship between extra money and attractiveness is linear. But to compare these results with non-pay attributes, we must assume that the least-valued attribute (a minimum ATAR of 70) has no value to survey respondents. For this reason, comparisons across groups should be interpreted as directional in nature only.⁹⁶

95. Rockoff et al. (2008).

96. For more information about analysing conjoint results, see Orme (2005).

Figure B.1: Conjoint survey question example



Source: Grattan Institute survey of high-achieving young Australians.

B.2 Conjoint results

Figure B.2 shows the results. The bars represent the relative importance of each factor when compared to the least attractive factor in each group.

We can see that **increasing teacher pay** is very highly valued. Increasing pay at the top by \$80,000 was the single biggest lever tested in our survey.

The next biggest lever is **scholarships** while studying. High achievers valued \$10,000 scholarships almost as much as an \$80,000 rise to top-end salary. This makes intuitive sense, given \$10,000 is a lot of money for a student who has not yet worked full time.

Extra mentoring, support, and career challenge were reasonably attractive. The reform ‘being supported during the early years with a mentor and extra support’ was reasonably important, along with ‘**a career path to instructional specialist who guides others**’.

These two reforms reinforce one another, given instructional specialists would be responsible for improving on-the-job teacher support, including graduate support. Interestingly, the new career path was seen as more attractive to high achievers than becoming a school principal.

The findings on **working in a disadvantaged school** should be interpreted carefully. High achievers rated the opportunity to make a difference in a disadvantaged school as more important than other reform options. But as shown in Chapter 3, high achievers believe they can make a difference in their chosen careers too.

Respondents rated a number of other reforms as less important. Attending an elite university course and reducing unpaid overtime

were not highly valued.⁹⁷ Increasing starting pay by up to \$40,000 was valued about as much as a similar pay increase at the top-end, but bigger increases to starting salary were not tested because they would be extremely expensive and therefore not a practical reform option.

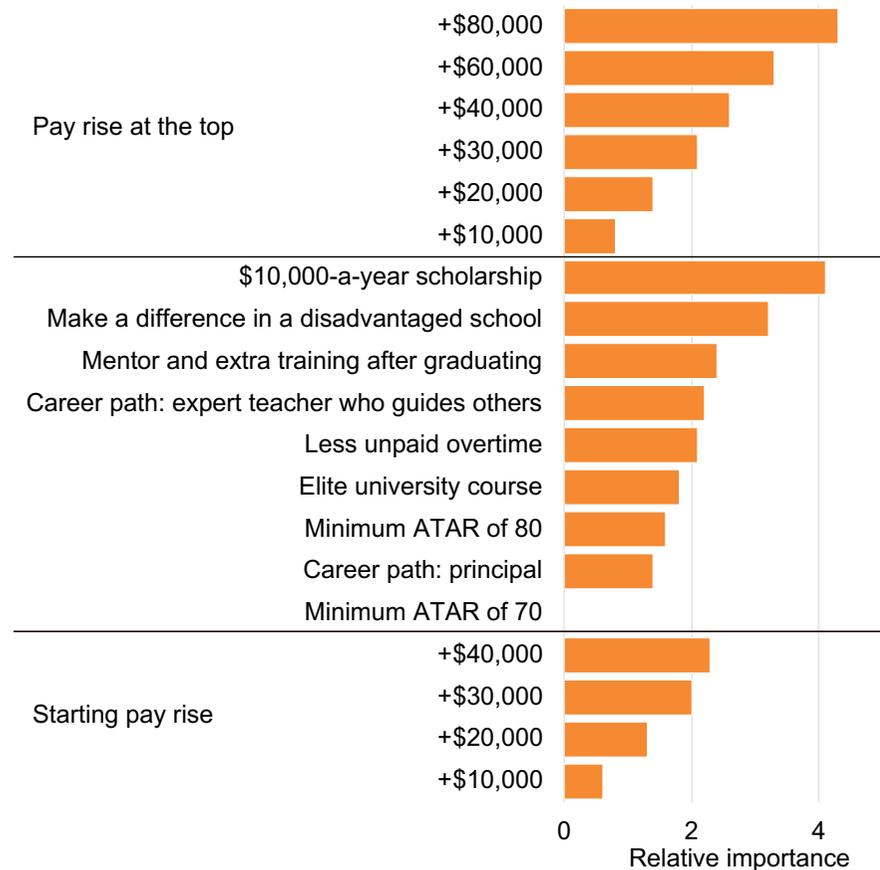
Raising the minimum ATAR to 80 for teacher education was shown to have small effects on attracting high achievers. But given it is a cheap reform, it could be a simple way to send a market signal that teaching is not just a fall-back career choice.⁹⁸

97. This is consistent with the finding in Chapter 2 that high achievers were willing to trade-off work-life balance in their chosen careers, even though they said they valued it highly.

98. We recommended an ATAR minimum of 80 in Daley et al. (2019, p. 111). This issue is discussed further in Appendix C.

Figure B.2: High achievers rate increased pay as the most important reform that could entice them to teaching

Part worth probabilities of different teaching attributes tested in conjoint analysis.



Source: Grattan Institute survey of high-achieving young Australians.

Appendix C: Analysis of other policy options

Based on our survey findings and taking into consideration our prioritisation criteria in Chapter 4, we make the following comments on five potential reform areas:

1. Do not increase the starting salary of teachers

Increasing the starting salary of teachers would be very expensive given it would apply to all new teachers and would probably require increasing pay across the wage scale as teachers progress. It would be much more expensive than our recommendation to increase pay to selected top teachers.

2. Reducing unpaid overtime will not help attract high achievers

Our survey results show that many of the jobs that high achievers are choosing already involve very long hours. So reducing unpaid overtime for teachers would probably not have much effect in attracting more high achievers to teaching. Reducing unpaid overtime would also be extremely expensive; backfilling even four hours of unpaid teacher's time a week would cost \$2.3 billion a year.

3. Creating or expanding elite teaching courses at university is unlikely to attract high achievers.

Our survey found this would not have much effect in attracting more high achievers to teaching. It might, however, be a worthwhile reform for other reasons.

4. Raising ATAR minimum to 80 could have a small impact as a marketing signal

Raising the minimum ATAR to 80 for teacher education was shown to have small effects on attracting high achievers in our survey. But it is

a cheap reform, and a way to send a signal that teaching is not just a fall-back career choice. However, there is a risk of teacher shortages in some areas or subjects unless higher ATAR requirements are accompanied by policies to encourage high achievers into teaching. We have not considered ways to best tighten entry standards to teaching in this report, but this is an area for ongoing policy attention.⁹⁹

5. Be cautious about using targeted placements in disadvantaged schools as a way to attract high achievers

Our survey shows that high achievers are interested in 'making a difference in a disadvantaged school'. In fact this reform option was more powerful than other reform options such as extra support for graduates or an expert career path.

But high achievers also think they can make a difference in their chosen professions. So it is not clear how much impact the opportunity to work in a disadvantaged school might have on attracting more high achievers.

Initiatives such as Teach For Australia provide targeted placements to work in disadvantaged schools, with demonstrated results in attracting young high achievers to teaching. But more broadly, young people can already choose to work in a disadvantaged school if they wish to do so. However disadvantaged schools in Australia still find it hard to recruit the staff they need because too few teachers take up the challenge.¹⁰⁰

More research is needed in Australia on what would attract the best teachers to the schools that need them most.

99. Previously we recommended an ATAR minimum of 80: Daley et al. (2019, p. 111).

100. Daley et al. (Ibid., pp. 104–105) Principals in Australia's disadvantaged schools report greater difficulty in recruiting the staff they need than principals in advantaged schools. And this gap is bigger than in comparable countries.

Appendix D: Overview of the literature

Table D.1: Teachers with strong prior academic achievement get better student results

Study	Population	Teacher achievement metric	Did high-achieving teachers do better?	Student outcome metric	Annual increase in student test scores
Jacob et al. 2018	927 new Washington D.C. public school teachers and their students	SAT, GPA, and college selectivity	Yes		0.026
Dobbie et al. 2011	379 Teach for America entrants in New York City and their students	Undergraduate GPA	Yes	Gain on standardised tests	0.043 (maths only).
Rockoff et al. 2008	384 newly commencing teachers in New York City and their students	Teacher pathway, college selectivity, IQ test, and maths knowledge	Yes (in most models)		0.033 (maths only)
Boyd et al. 2008	All students in New York City public schools	SAT scores, ITE exam marks, undergraduate competitiveness, and pathway into teaching	Yes		0.03
Clotfelter et al. 2008	137,000 North Carolina public school students	End of university test score, and college selectivity	Yes	Achievement on standardised tests	0.02
Harris and Sass 2007	All students in Florida public schools	SAT score	No		N/A
Hanushek et al. 2019	Multiple countries	Cognitive tests (PIAAC)	Yes	Achievement on PISA	0.01-0.02

Notes: The annual increase is defined as the average proportion of a standard deviation of student achievement associated with a 1 standard deviation increase in prior teacher achievement. The standard deviation of student gain is typically smaller than the standard deviation of achievement, so the annual increase typically looks larger. To compare with the other studies, the test score increase from Hanushek et al. (ibid.) is the total effect for 15-year-olds found in this study (0.1-0.2) divided by 10 years of schooling. GPA = Grade Point Average, ITE = Initial Teacher Education, PIAAC = Programme for the International Assessment of Adult Competencies, PISA = Programme for International Student Assessment, SAT = Scholastic Assessment Test.

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