This PowerPoint was used in a presentation to the *Future of Schooling in Australia* Conference, convened in Melbourne on 25 September 2007 by the Council of the Australian Federation.

Professor Barry McGaw is half-time Director of the Melbourne Education Research Institute at the University of Melbourne and half-time a consultant through McGaw Group Pty Ltd.

He returned to Australia at the end of 2005 from Paris where he had been Director for Education at the Organisation for Economic Co-operation and Development (OECD). He had previously been Executive Director of the Australian Council for Educational Research (ACER) from 1985 to 1998 and Professor of Education at Murdoch University in Perth Western Australia from 1976 to 1984. He was originally a science teacher in Queensland and was head of the Research and Curriculum Branch in the Queensland Department of Education before moving to the Chair at Murdoch University.

Professor McGaw is a Fellow of the Academy of the Social Sciences in Australia, the Australian Psychological Society, the Australian College of Educators and the International Academy of Education. He received an Australian Centenary Medal in 2003 and was appointed an Officer in the Order of Australia in 2004.

To address the question of how good Australian school education is we could take two approaches. One would be to compare it with the past; the other would be to compare it with education in other countries in the present.

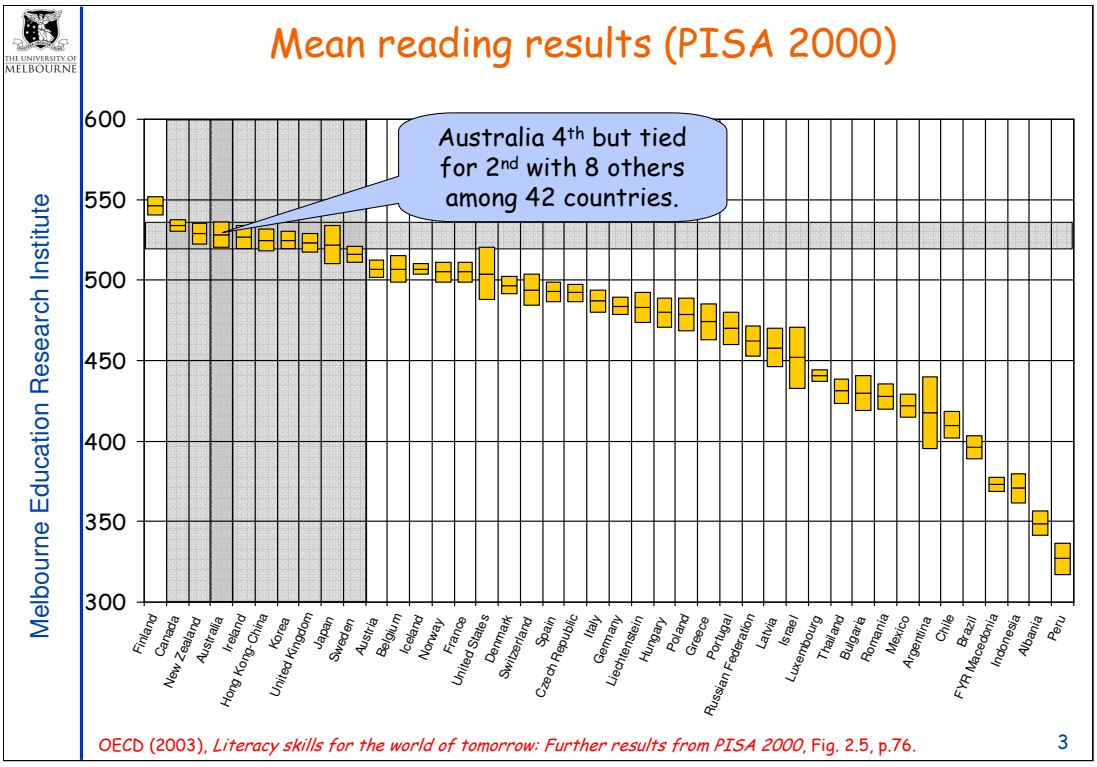
Comparisons with the past are very difficult to make if we want to use more than adults' fading memories of their own childhood and, worse, memories that are often filtered through rose-coloured glasses. Such empirical evidence from the past that exists is difficult to interpret. Old curricula and examination papers give some notion of what students were expected to learn but, in the absence of marked student responses to examination papers we can gain little appreciation of exactly what was required. We would also need good information on the nature of the student cohort.

It is better to use current international comparisons where possible. In this presentation I draw data provided by the Organisation for Economic Co-operation and Development (OECD), most particularly its Programme for International Student Assessment (PISA) for which details are available on www.pisa.oecd.org. PISA provides direct, internationally comparable assessments of the achievements of 15-year-olds in school.

In PISA 2000, students were assessed in reading literacy, mathematics and science, with reading literacy as the main domain and mathematics and science as minor domains. In PISA 2003, mathematics was the main domain and reading and science minor domains together with problem solving which was an additional domain. In PISA 2006, the three original domains were assessed, with science as the main domain.

PISA assesses students' capacity to use the knowledge and skills they have acquired rather than whether they have learned the specific content of their curricula. Sample items, illustrating the content and form of assessment, are provided on the PISA website, given above.

Other international comparisons are provided in *Education at a Glance*, OECD's annual compilation of internationally comparable statistics and indicators in education.

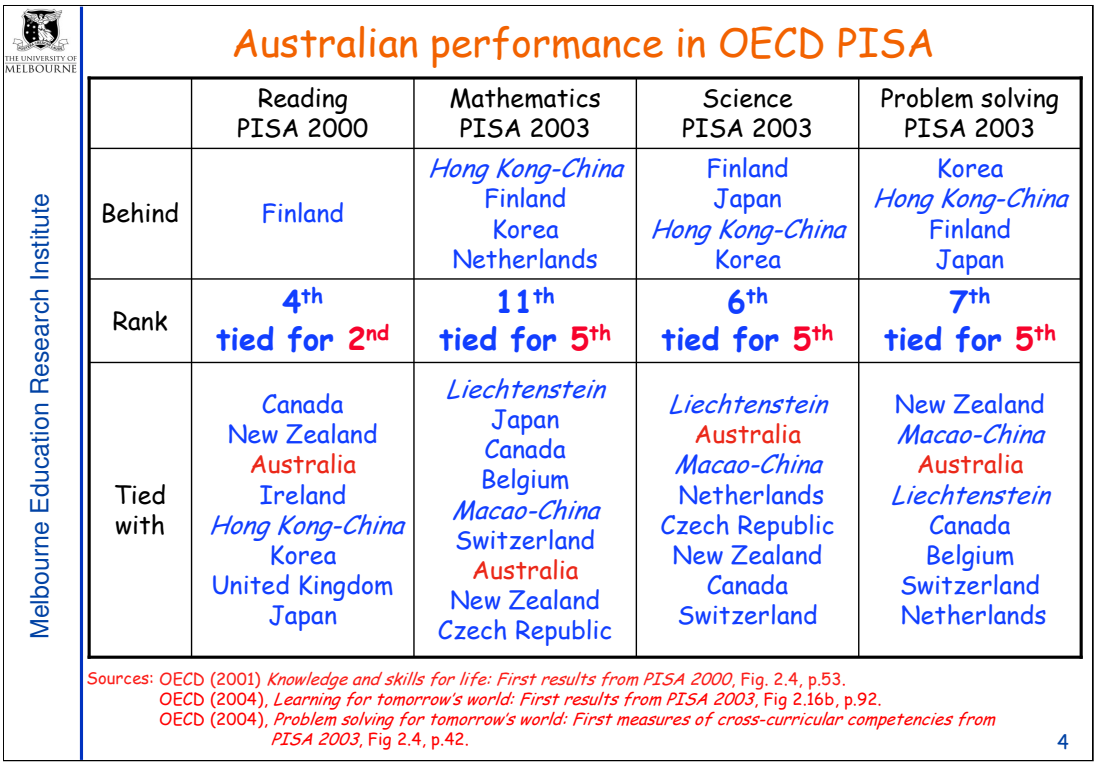


The figure above shows the mean performances of countries in reading literacy in PISA 2000. Reading literacy assessed in PISA is the capacity to use, interpret and reflect on written material.

The line in the middle of the box for each country gives the mean performance of 15-year-olds in the country. The size of a box reflects the precision with which a country's mean is estimated. Where the boxes overlap on the vertical dimension, there is no significant difference between the means for the countries. (Further details are given in the PISA report, as indicated in the source information at the foot of the figure.)

The results reveal marked variations in performance levels among the 42 participating countries – ranging from Finland, significantly better than all others at the top, to Peru, significantly worse than all others at the bottom.

Australia ranked in 4th place but its mean is not significantly different from those of two countries above it or six below it. It is, therefore, appropriate to say that Australia ranked between 2nd and 10th or that Australia tied in 2nd place with eight other countries.



In reading in PISA 2000, as shown in the previous slide, Australia ranked 4th but was tied in 2nd place, behind Finland, with Canada, New Zealand, Ireland, Hong Kong-China, Korea, the United Kingdom and Japan.

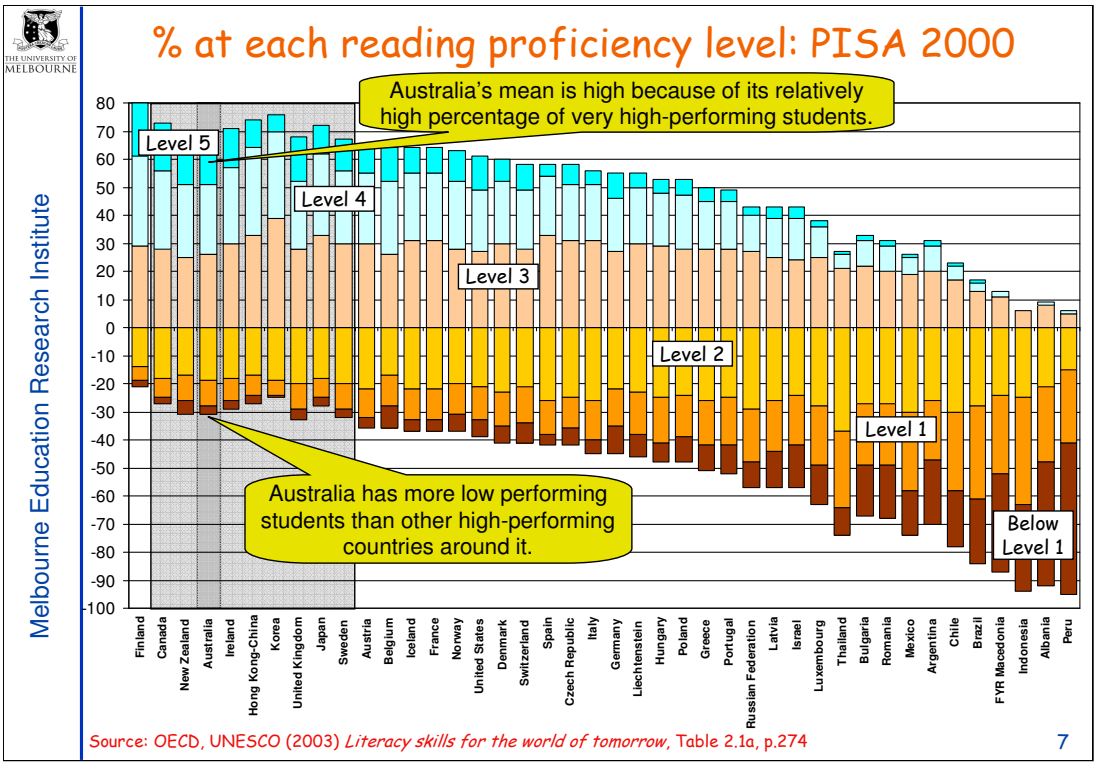
In mathematics in PISA 2003, Australia ranked 11th but, considering differences which were not significant, can be said to have tied in 5th place with Liechtenstein, Japan, Canada, Belgium, Macao-China, Switzerland, New Zealand and the Czech Republic and behind Hong Kong-China, Finland, Korea and the Netherlands. PISA assesses whether 15-year-olds can use the mathematics they have learned in school. It does not focus primarily on the curriculum content to determine whether students have learned exactly what they were intended to learn. It assesses whether students can recognise that a problem can be solved mathematically, are able to represent it mathematically and then solve it.

In science in PISA 2003, Australia ranked 6th but was tied in 5th place with Liechtenstein, Macao-China, the Netherlands, the Czech Republic, New Zealand, Canada and Switzerland behind Finland, Japan, Hong Kong-China and Korea. In science, PISA assesses whether students can recognise scientific questions, know what counts as evidence to deal with them and can marshal such evidence to do so.

In problem solving in PISA 2003, Australia ranked 7th but was tied in 4th place with New Zealand, Macao-China, Liechtenstein, Canada, Belgium, Switzerland and the Netherlands behind Korea, Hong Kong-China, Finland and Japan. (Problem solving was assessed in PISA as decision making (choosing among alternatives with constraints), system analysis and design (identifying relationships between parts of a system and/or designing a system to express relationships) and trouble shooting (diagnosing and correcting a faulty or underperforming system or mechanism). Sample items are provided in OECD (2004), *Problem solving for tomorrow's world: first measures of cross-curricular competencies from PISA 2003*, and on the OECD/PISA website (http://www.pisa.oecd.org).

In judging the performance of our education system, we should consider not only the quality of our students' performances but also their equity. This is a country that declares that one of its core values is a commitment to a 'fair go'.

One simple way to address the issue of equity is to examine the spread of results in different countries. Results will always be spread because of individual differences but international comparisons can reveal questionable characteristics of the spread in particular countries.

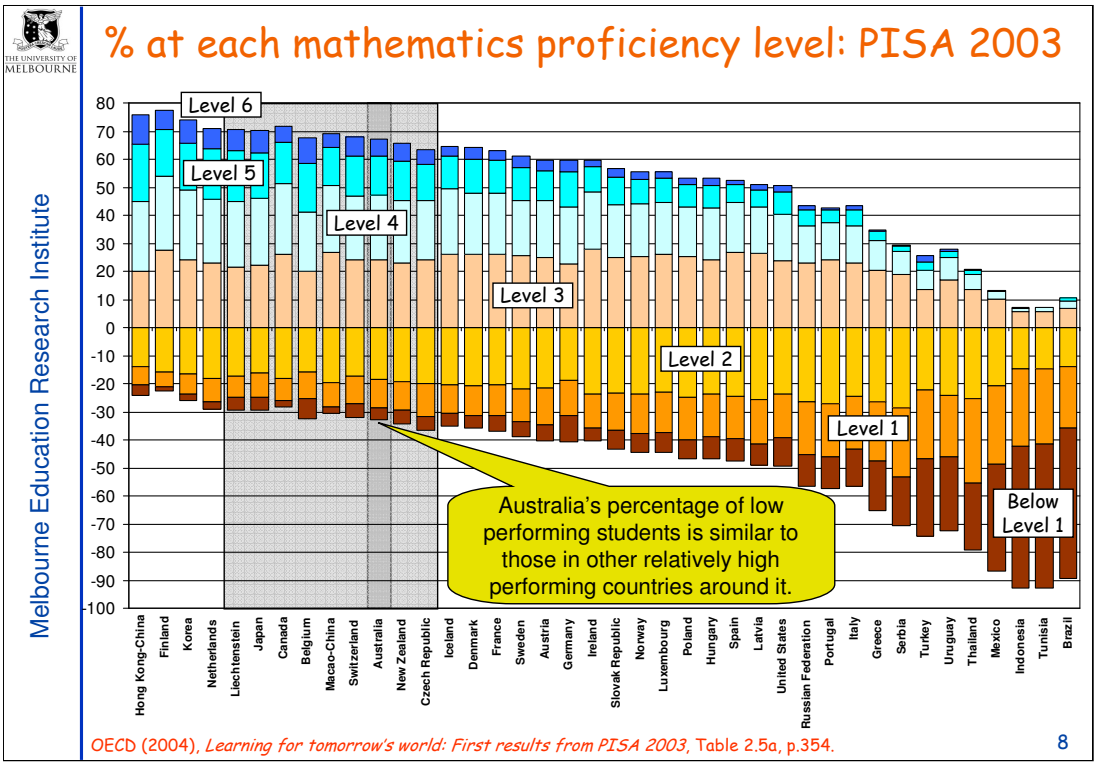


In the main domains of assessment in PISA, there is sufficient information to establish and describe well-defined levels of performance on the relevant scale. In PISA 2000, five levels of performance were defined on the reading scale, with an additional lower domain not well measured and described only as 'below Level 1'. Students at this level may be literate in the sense of being able to decode printed words and to read text but they do not have a level of literacy sufficient for further study and learning. Even those at Level 1 are highly likely to be deficient in this respect.

The figure above shows the percentage of students at each level in each country. Countries are arranged in order of their mean performance. Australia stands out in two important respects among the other high-performing countries around it. Australia has a considerably higher proportion of students at the highest level (Level 5). It also stands out as having a rather larger percentage at Level 2 or below. (New Zealand's results are similar to Australia's in both these respects.

Poorer performers in reading in Australia are left somewhat further behind than in other countries that are similarly high performing on average.

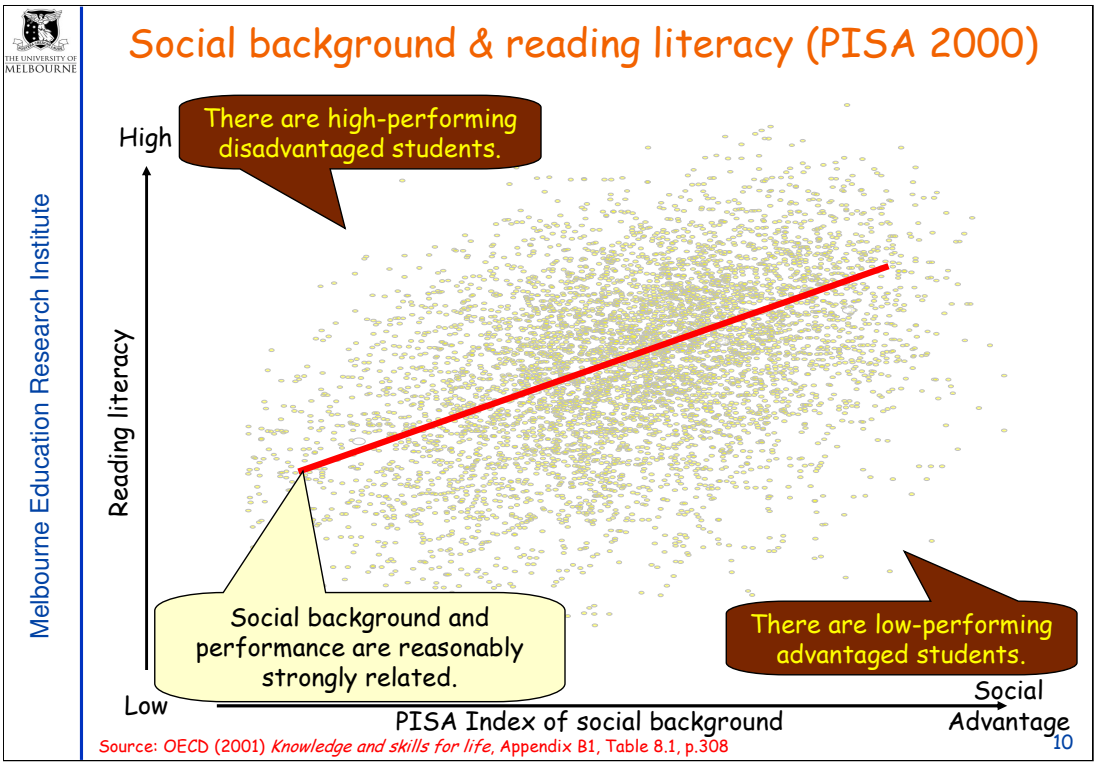
Korea provides an interesting contrast. It has a considerably smaller proportion of high achievers but a correspondingly small proportion of very low achievers.



In PISA 2003, when mathematics was the main domain of assessment, six well-defined levels of performance were described. The figure above provides the distribution of students across these levels.

This presentation shows that, in mathematics, the proportion of low achievers in Australia is in line with its overall mean. In mathematics, as distinct from reading, poorer performers in Australia are not left behind to any greater extent than in other countries that are similarly high performing on average.

A second way in which to examine equity is to investigate the relationship between students' educational performance and their social background.

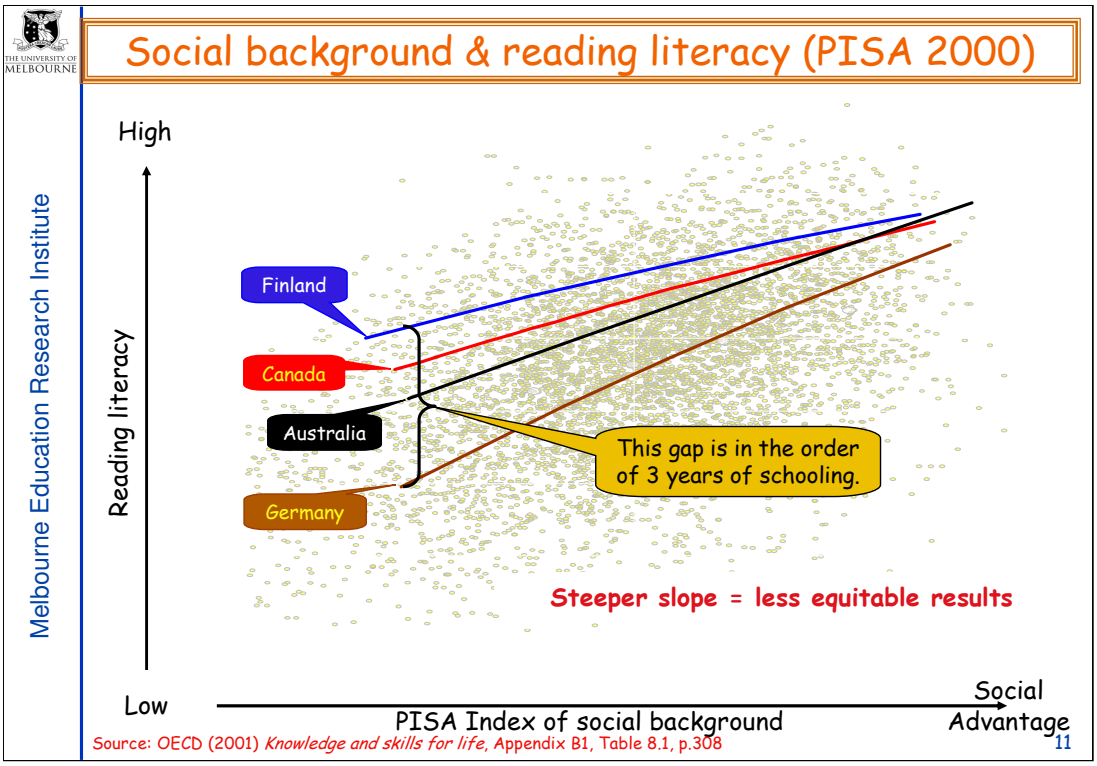


The 15-year-olds in PISA provide information on their economic and social background – parents' education and occupation, cultural artefacts in the home – that permits the construction of an index of social background that ranges from socially disadvantaged to socially advantaged. This scale is comparable across countries.

The relationship between social background and reading literacy in PISA 2000 is shown in the figure above in which the results of the 265,000 15-year-olds in the sample on both variables are plotted. The correlation is relatively high (around 0.45) indicating quite a strong relationship between the two variables. The slope of the regression line that summarises the relationship is quite steep, indicating that increased social advantage, in general, pays off with considerable increase in educational performance.

It can, nevertheless, be seen that there are many exceptions – socially advantaged individuals who do not perform well (towards the bottom-right of the graph) and students from disadvantaged backgrounds who perform well (towards the top-left of the graph).

This result has been long established in research in many individual countries and it can lead to a counsel of despair. If the relationship between social background and educational achievement is so strong, education can seem to be impotent, unable to make a difference. There is other research evidence that provides assurance that schools can make a difference to the life chances of their students but the PISA also provide additional insights because it is possible to compare regressions lines of the type above for individual countries.

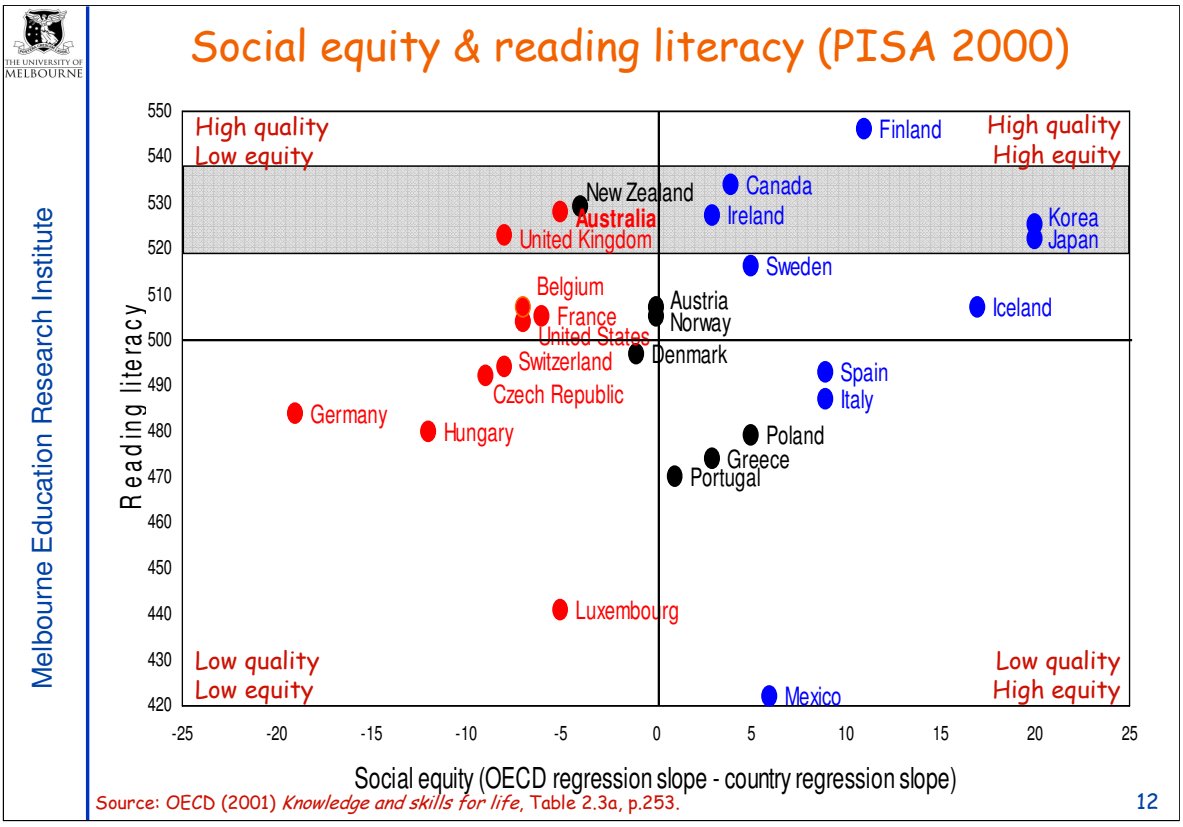


An examination of the relationship between social background and educational achievement country-by-country reveals marked differences among countries. The figure above shows the results for four countries. The lines for Finland and Canada are significantly less steep than the one for the OECD as a whole which was shown in the previous slide. Increased social advantage in these countries is associated with less increase in educational achievement than in the OECD as a whole. The results in these countries are more equitable than those of the OECD overall. Students differ in achievement but not in a way that is so substantially related to their social background.

The lines for Australia and Germany are both significantly steeper than the one for the OECD as a whole, as are those for the US and the UK which are not shown in the figure above. In all of these countries, social background is more substantially related to educational achievement than in the OECD as a whole. Their results are inequitable in the sense that differences among students in their literacy levels reflect to a marked extent differences in their social background.

The differences between these four lines at the left-hand end are substantial. Socially disadvantaged students do very much worse in some of these countries. The gap in educational achievement between similarly socially disadvantaged students in Germany and Finland represents around three years of schooling. Similarly disadvantaged students in Australia fall about half-way between, around 1½ behind their counterparts in Finland.

More detailed analysis of the German data shows the pattern to be strongly related to the organisation of schooling. From age 11, students are separated into vocational and academic schools of various types on the basis of the educational future judged to be most appropriate for them. Students from socially disadvantaged backgrounds generally end up in low-status vocational school and achieve poor educational results. Students from socially advantaged backgrounds are directed to high-status academic schools where they achieve high-quality results. The schooling system largely reproduces the existing social arrangements, conferring privilege where it already exists and denying it where it does not.



If lines for more countries were to be added to the figure on the previous slide, the pattern would become difficult to discern. The figure above provides a clearer picture for all OECD countries.

Mean performances of countries in reading literacy are represented on the vertical axis. The grey band highlights the countries with means not significantly different from Australia's.

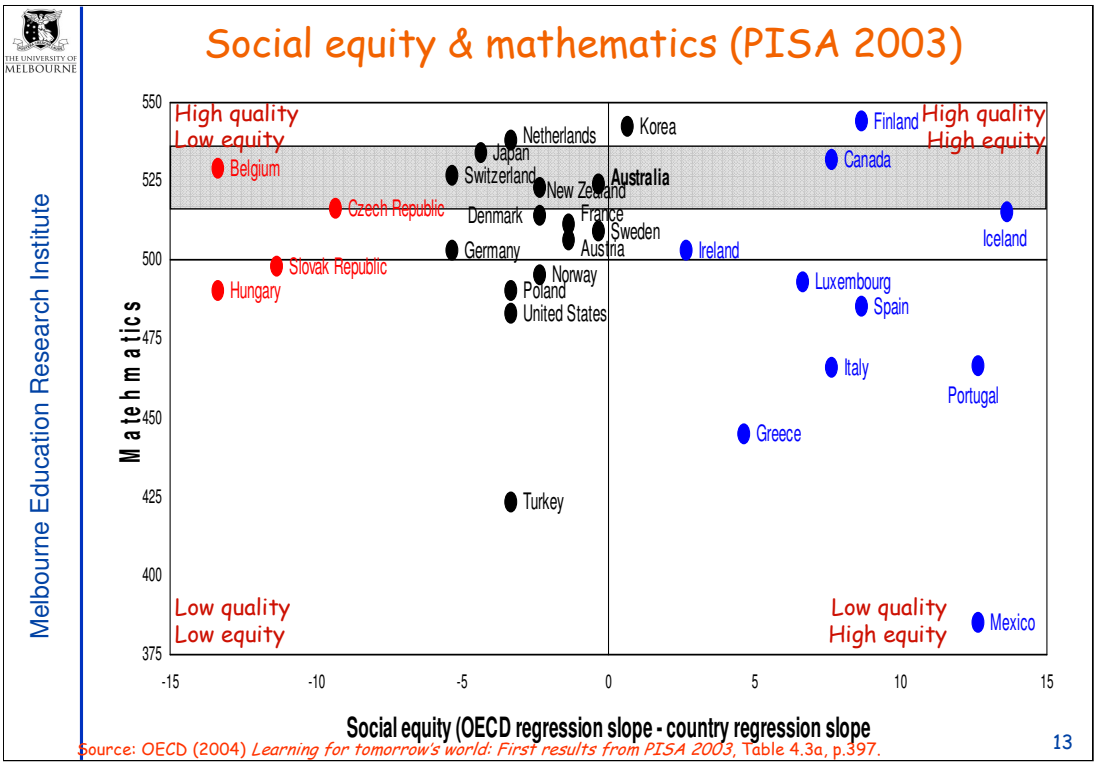
The slope of the regression line for social equity on reading literacy is represented on the horizontal axis as the difference between the slope for the OECD as a whole and a country's own slope. This places to the left countries where the slope is steeper than in the OECD as a whole (that is, countries in which social background is more substantially related to educational achievement) and to the right countries where the slope is less steep than that for the OECD as a whole (that is, countries in which social background is less related to educational achievement). Countries with slopes significantly less steep than the OECD's are shown in blue; those with lines significantly steeper are shown in red and those with lines not significantly different in slope from the overall OECD line are shown in black.

Countries high on the page are high-quality and those to the far right are high-equity. The graph is divided into four quadrants on the basis of the OECD average on the two measures.

The presence of countries in the 'high-quality, high-equity' quadrant (top right) demonstrates that there is no necessary trade off between quality and equity. They show that it is possible to achieve both together. Korea, Japan, Finland and Canada are among them.

As already indicated in the previous slide, Australia is a 'high-quality, low-equity' country, with a high average performance but a relatively steep regression line. It is in the top-left quadrant along with the United Kingdom and New Zealand.

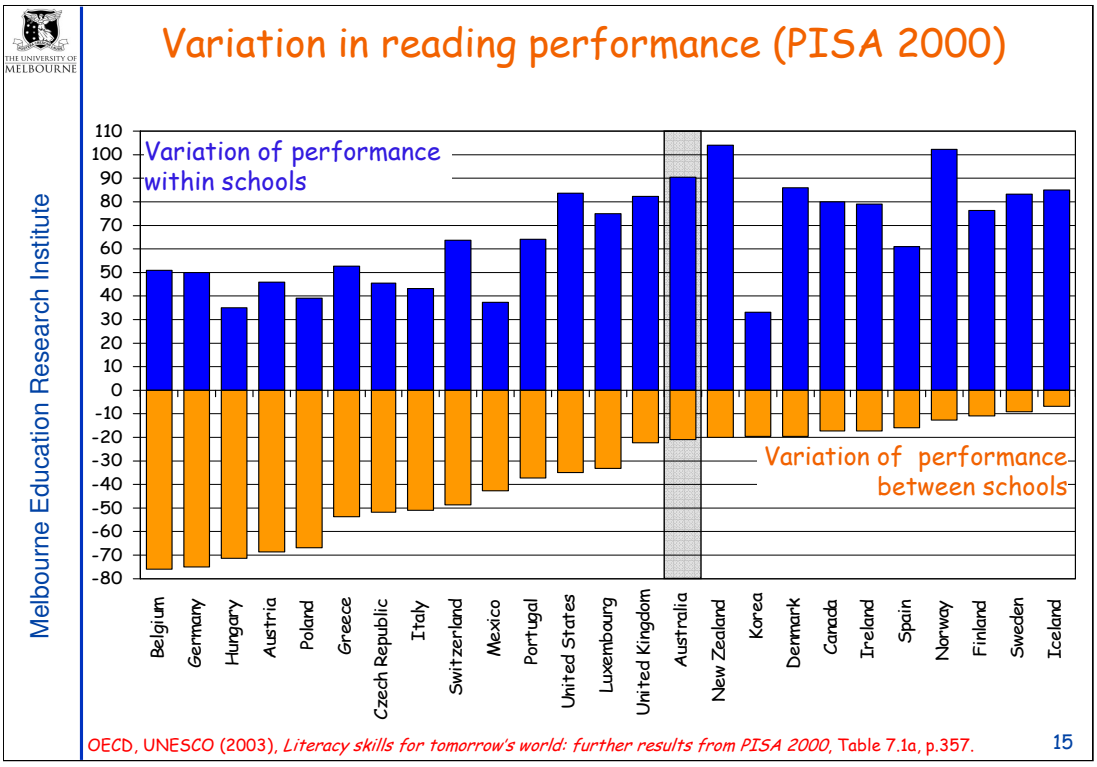
The United States is only average quality but it is low-equity. Germany, as a low-quality, low-equity country, is in the bottom-left quadrant along with a number of other countries that also begin to separate students into schools of different types as early as age 11-12.



The figure above shows the relationship between the slope of countries' regression lines and their average performance in mathematics. In this case, the line for Australia is not significantly different that the line for the OECD as a whole. While Australian mathematics performances are thus somewhat more equitable in mathematics than in reading, they remain much less equitable than the results in Canada and Finland.

There are many countries to the left of Australia in this graph (and thus with less equitable results) but the ones on which we should focus are those above the 500 line since they are the higher achieving countries. We should aspire to be clearly in the top-right quadrant of this kind of display.

A third way in which to examine equity is to investigate the variation in student performance between schools.

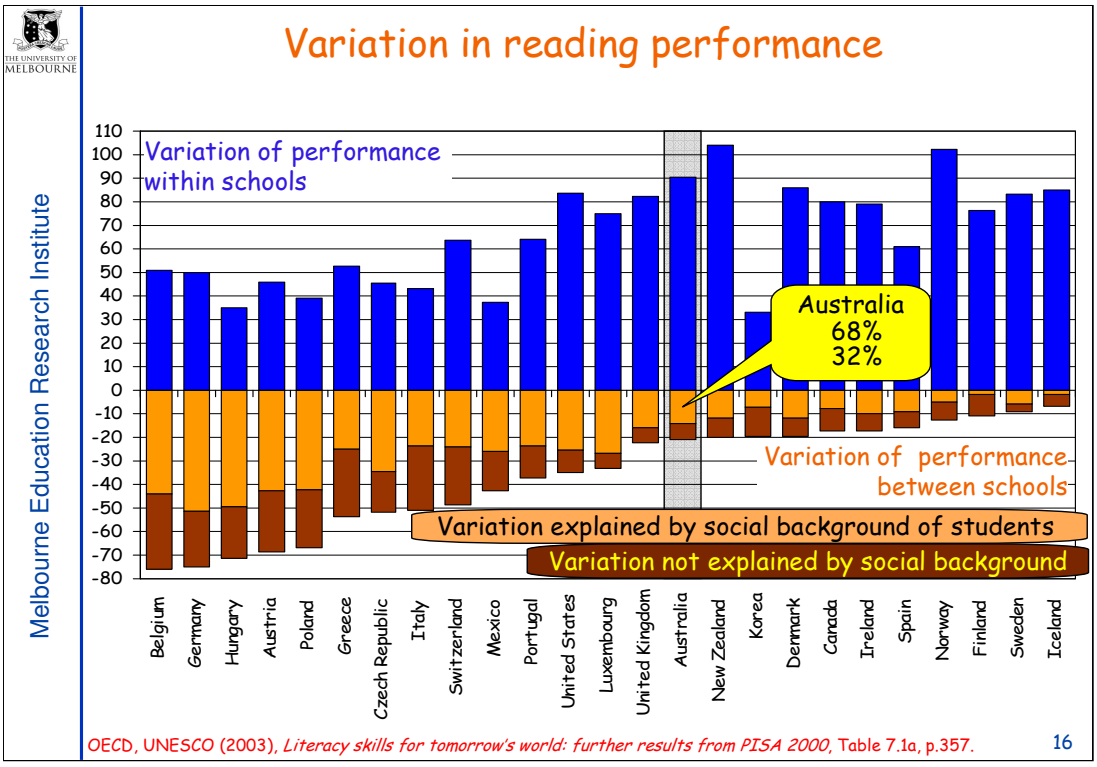


The figure above divides the variation in student performance in reading in PISA 2000 for each country into a component due to differences among students within schools, shown above the zero line, and a component due to differences between schools shown below that line. In Iceland, Finland and Norway there is very little variation in scores between schools. There choice of school is not important because there is so little difference among schools.

Among the countries in which there is a large component of variation between schools, there are some in which this occurs by design. In Belgium, Germany and Hungary, for example, students are sorted into schools of different types according to their school performance as early as age 12. The intention is to group similar students within schools differentiated by the extent of academic or vocational emphasis in their curriculum. This is intended to minimise variation within schools in order then to provide the curricula considered most appropriate for the differentiated student groups. It has the consequence of maximising the variation between schools.

In some other countries, the grouping of students is less deliberate but, nevertheless, results in substantial between-school variation. In the United States, for example, 30 per cent of the overall variation is between-schools. In Korea, 37 per cent is between schools. In Australia, 19 per cent is between schools.

For Poland, in PISA 2000, 63 per cent of the variation in reading was between-schools whereas in PISA 2003 in mathematics only 13 per cent was between schools. This remarkable difference was due to a reform in which early streaming of students into schools of different types was abandoned in favour of comprehensive schools for students up to the age at which PISA measures their performance. (Not only was the between-school variation reduced. Poland was the only country to improve its average performance significantly on all measures used in both PISA 2000 and PISA 2003. It did so largely by raising the achievement levels of its poorer performing students.)



A further way in which to examine equity is to determine the extent to which the variation between schools can be explained in terms of differences in the social backgrounds of the students. This is done in the figure above, with the between-school variation subdivided into two components: (a) variation that can be accounted for in terms of social backgrounds of the students in the schools and (b) variation that cannot be accounted for in terms of the social backgrounds of the students.

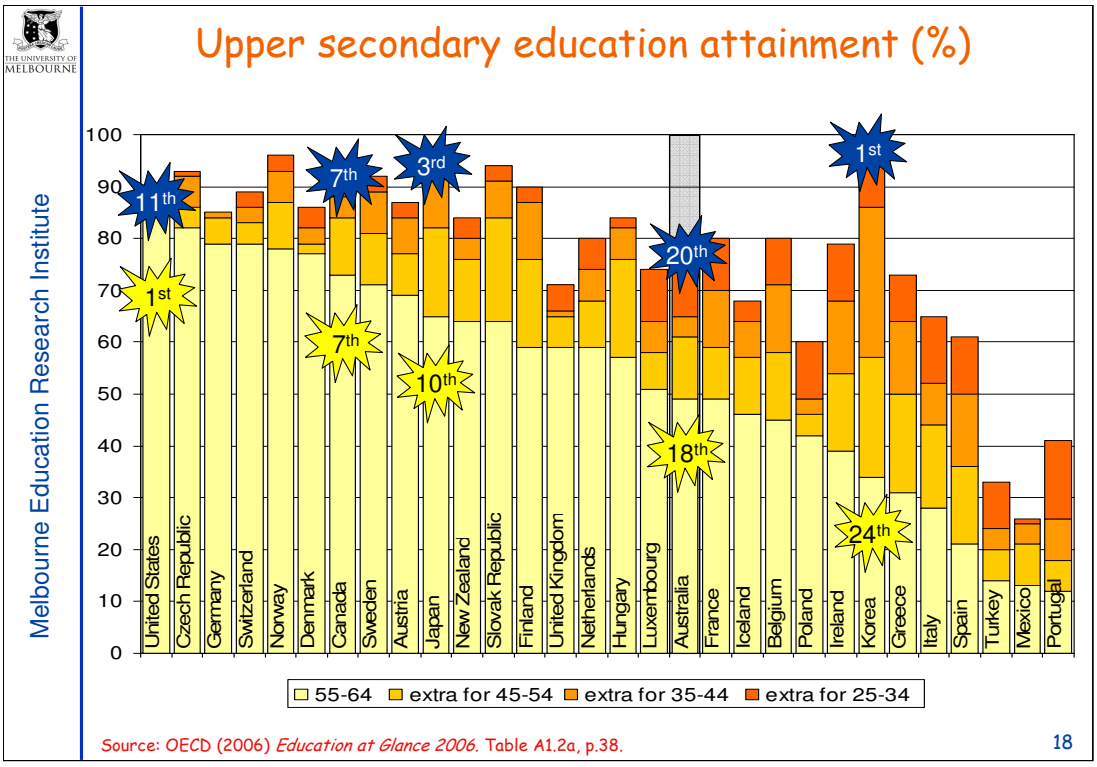
In Australia, 68 per cent of the variation between-schools can be accounted for in terms of differences between schools in the social background of their students. Among OECD countries, the percentage is higher in only Luxembourg, the United States, the United Kingdom, Hungary and Germany

In Luxembourg, Hungary and Germany, students are sorted into schools of different types and given different subsequent expectations on the basis of their educational achievement from around the age of 12 but that sorting also involves separation on the basis of social background, as indicated by the fact that the percentage of variation in performance between schools that can be accounted for in terms of differences in students' social backgrounds is 80% in Luxembourg and 69% in Hungary and Germany.

The United States at 73% and the United Kingdom at 71% are like Australia, with no formal sorting of students into schools of different types but rather with a disposition of school types that produces the same consequence. In the United States, school differences reflect community differences. In the United Kingdom and Australia, they reflect community differences and the availability of a large number of private providers that sort students in part on parents' financial capacity to pay the fees required.

In mathematics performance in PISA 2003, 70% of the variation between Australian schools can be explained in terms of differences between schools in the social background of their students.

Completion rates for upper secondary education (or equivalent) and tertiary education are relatively low in comparison with other OECD countries.



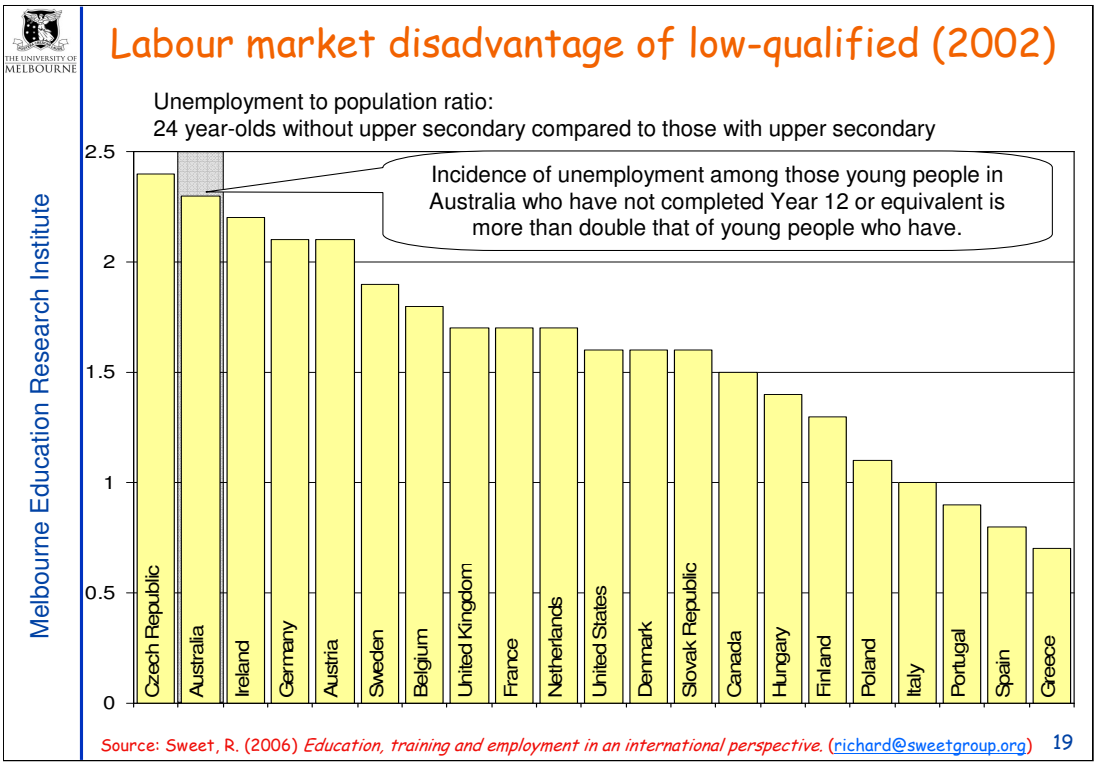
There are no internationally comparable data on trends in completion rates for upper secondary education but a picture for past decades can be obtained from the percentages of the population in different age brackets that have attained this level.

The percentage of 55-64 year-olds who have attained upper secondary education indicates completion rates 37-46 years ago. The picture is only approximate because some will have attained this level as adults, long after having left initial education, and also because some of the population will not have survived to this age-group. Younger groups provide corresponding pictures for more recent decades.

The figure above shows the attainment rates for 55-64 year-olds in OECD countries and, for successively younger age groups, the increase in the rate compared with the next oldest group. The rates for 25-34 year-olds reveal that, by 7-16 years ago, 17 of the 30 OECD countries had achieved attainment rates of 80% or higher. Australia was not among them.

The Republic of South Korea started from a low base but grew quickly, rising from 24th to 1st. Over the same period, Japan rose from 10th to 3rd. The US started from a high base but grew quite slowly, slipping from 1st to 11th. Australian rates have grown relatively slowly from a comparatively low base, with the rank slipping marginally from equal 18th to 20th. Meanwhile Canada held its ranking at 7th.

In the mid-1960s, South Korea had a GDP per capita equivalent to that of Afghanistan and behind all the countries of Latin America. South Korea is now a Member of the OECD, with a GDP per capita that just below the top two thirds of the Members. Education reform and a deep national commitment to education and skill development are recognised as key drivers of this remarkable economic growth.



The negative impact of failing to complete upper secondary education or its equivalent is evident in the labour market consequences, as Richard Sweet recently documented in the graph above. In the Czech Republic, the unemployment rate for 24-year-olds who have not completed upper secondary education or its equivalent is 2.4 times the rate for those who have. In Australia, the ratio is 2.3. Sweet concludes:

"There is normally an inverse relationship between the incidence of low qualifications and the penalty that those with low qualifications suffer in the labour market. In countries where nearly all complete upper secondary education, the cost of being one of the handful not to do so is normally high. Where many do not complete high school, the labour market consequences are generally less. However Australia seems to have the worst of both worlds: both a relatively high number of young people without an upper secondary qualification or better, and these young people being at a significant disadvantage in the labour market. The result … is that the penalty for not completing Year 12 or its equivalent is one of the highest in the OECD." [Sweet, R., Education, training and employment in an international perspective, Paper presented at a Brotherhood of St Laurence Seminar, *New Transitions: Challenges Facing Australian Youth*, Melbourne, August 2006.]

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Storyline on Australian schooling

Australian school education is high-quality.

There are equity problems:

- our weaker students do somewhat worse than those in other high-quality countries,
- social background differences matter more than in other high-quality countries,
- social background differences account for 70% of differences in school performances.

There are too many students who drop out before completing the equivalent of upper secondary education.

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Thank-you

Contact

barry.mcgaw@mcgawgroup.org
bmcgaw@unimelb.edu.au