

**International benchmarking of
Australian schools**

Barry McGaw
Director
University of Melbourne Education Research Institute
Former Director for Education
Organisation for Economic Co-operation and Development (OECD)

Curriculum futures

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mcgaw group pty ltd
ABN 34 117 491 228

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Professor Barry McGaw is half-time Director of the Melbourne Education Research Institute at the University of Melbourne and works half-time as 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 and the Australian College of Educators. He received an Australian Centenary Medal in 2003 and was appointed an Officer in the Order of Australia in 2004.

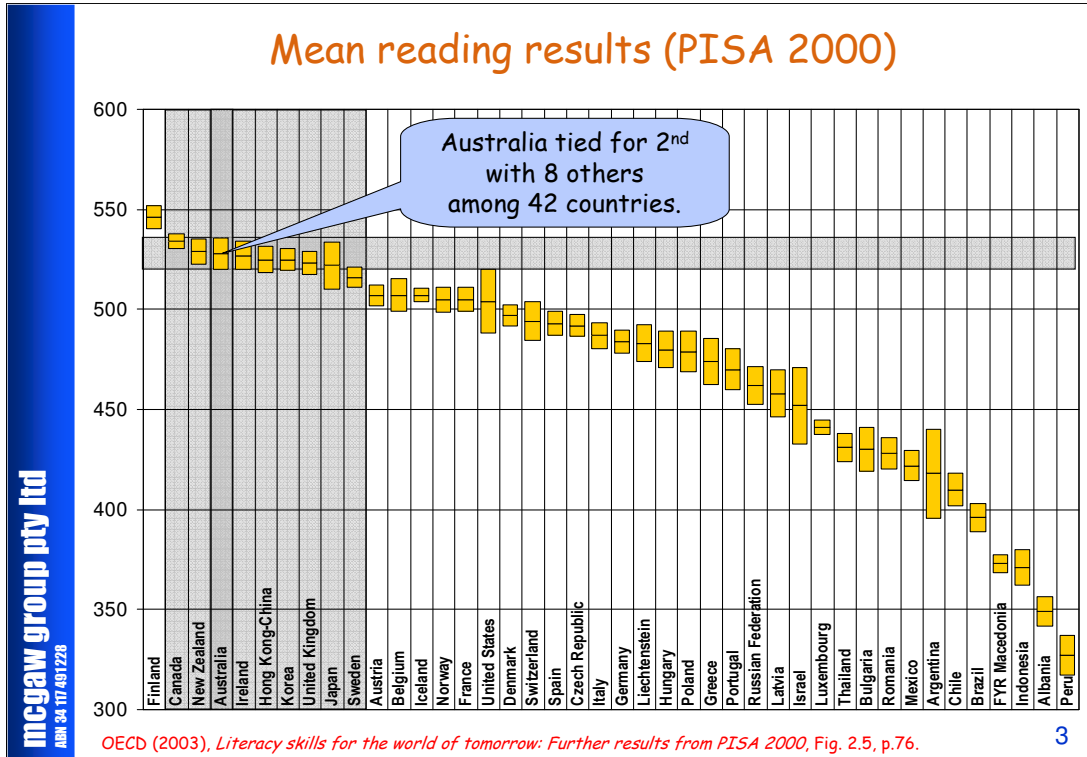


Evidence on the quality of student performance is provided by OECD's Programme for International Student Assessment (PISA) for which details are available on www.pisa.oecd.org. PISA provides direct, internationally comparable assessments of the achievements of 15-year-olds in school.

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 international comparisons in education..

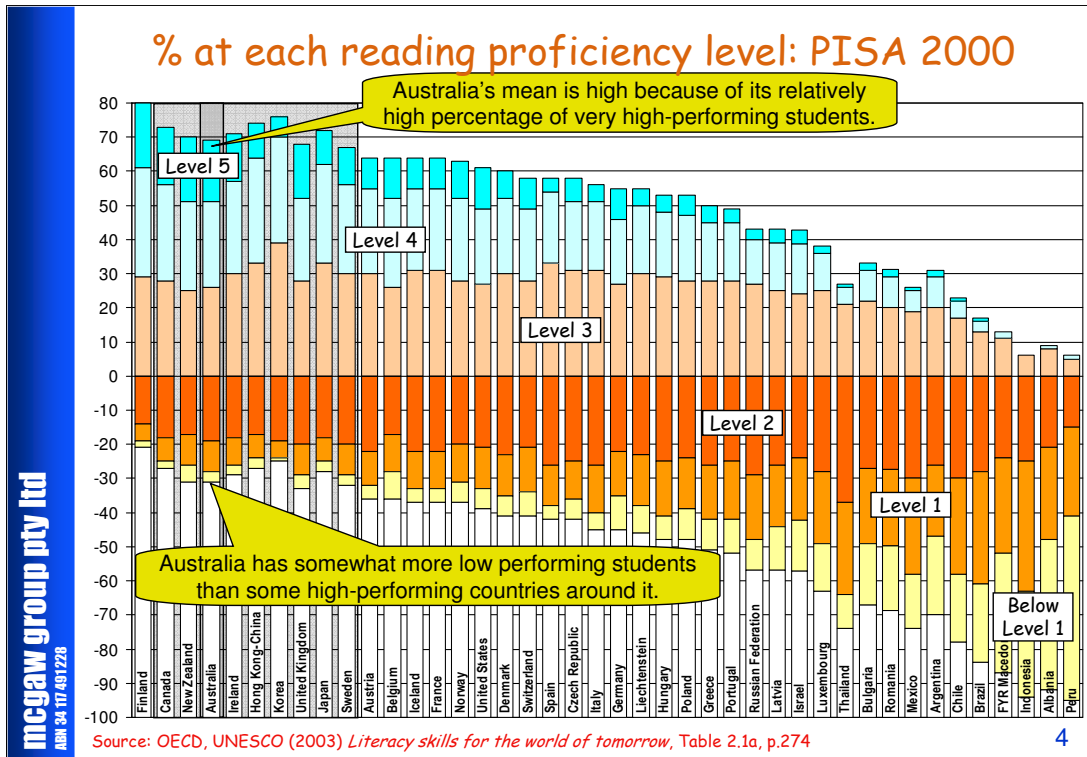


The figure above shows the mean performances of countries in reading literacy in PISA 2000. Reading literacy assessed in PISA is the capacity to use, interpret and reflect on written material.

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 indicated 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 among the 42 participating.



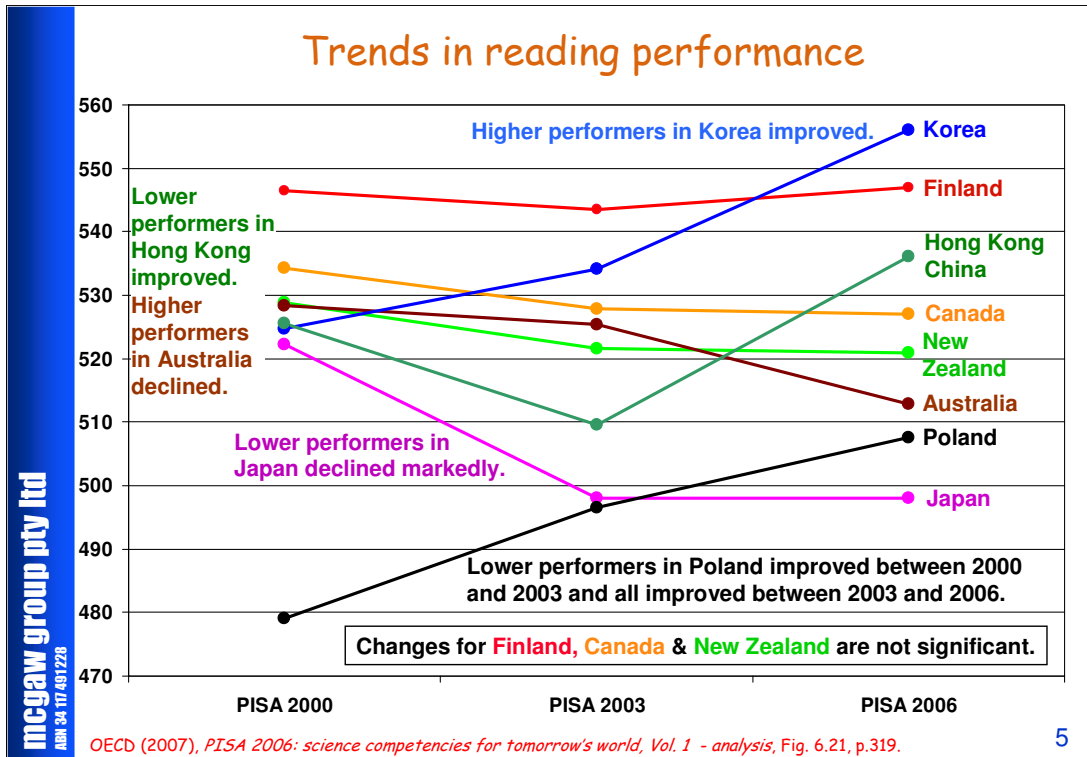
In the main domains of assessment in PISA, there is sufficient information to establish and describe well-defined levels of performance on the relevant scale. In PISA 2000, five levels of performance were defined on the reading scale, with an additional lower domain not well measured and described only 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 with those around Australia covered by the grey box being the ones with mean performances not significantly different from Australia's.

Australia stands out in two important respects from some of the other high-performing countries around it. Australia has a considerably higher proportion of students at the highest level (Level 5). It also has a rather larger percentage at Level 2 or below than some of the others. (New Zealand, Ireland, the United Kingdom and Sweden have similar patterns.)

There is, thus, a slightly higher proportion of poorer performers in reading in Australia than in some of the 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 fact, Korea has the mostly narrowly dispersed student performances.



Each PISA assessment reports on the same scale, so it is possible to examine not only changes in relative positions of countries but also changes in performance levels. In the three PISA surveys now published, Australia's relative position in reading literacy was:

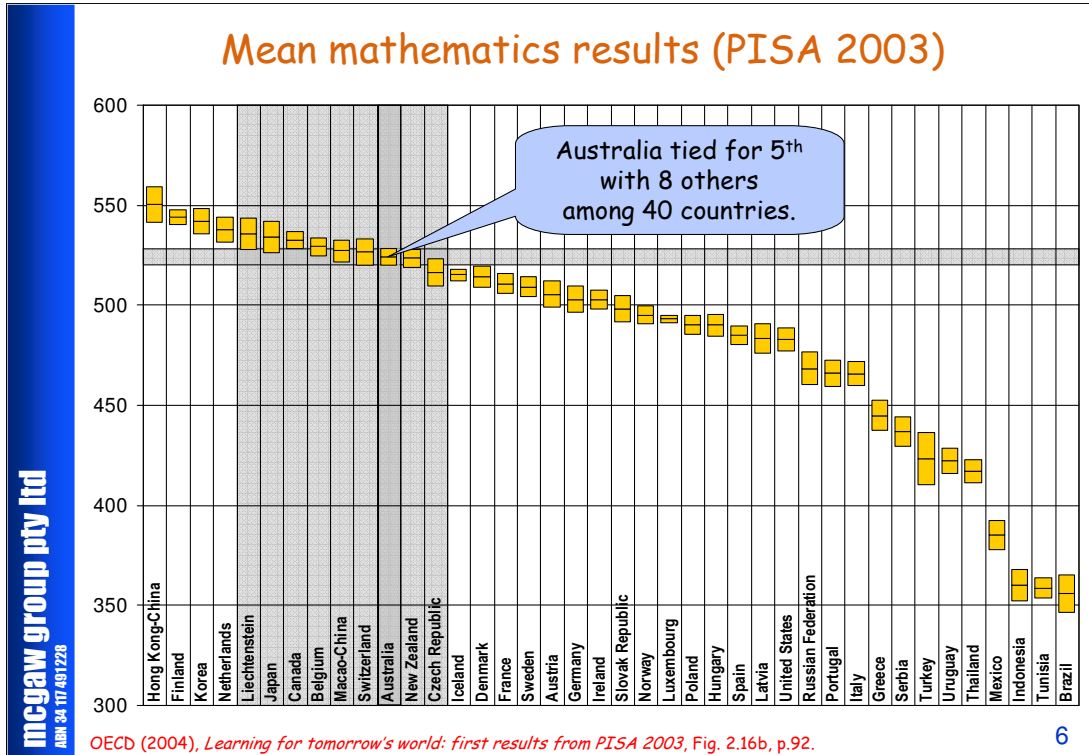
- PISA 2000: ranked 4th but tied in 2nd place with 8 others among 42.
- PISA 2003: ranked 4th but tied in 2nd place with 5 others among 40.
- PISA 2006: ranked 7th but tied in 6th place with 5 others among 56.

Australia's rank dropped because the Australian mean performance declined to 513 in 2006 from 528 in 2000 and 525 in 2003. This decline, which was statistically significant, occurred primarily because of a decline in performances at the highest level. The reasons for this are not immediately evident but a reasonable suspicion would be that constant attention to basic skills, plus somewhat erroneous assertions in many public comments that "Australia's problem lies among its low performers" or "in its long tail" have created too much focus on minimum performance requirements and insufficient attention to the highest performers.

Korea, on the other hand, significantly improved its mean performance and did so by raising its performances at the highest levels. The sources of this improvement appear to be a new curriculum with more emphasis on essay tests and expanded use of essays in assessments for university entrance.

Poland also improved considerably and is now among those not different from Australia. In 2000, 15-year-olds were streamed into different kinds of academic and vocational schools whereas those in 2003 and 2006 were in the comprehensive schools created under a major reform. Poland pulled up the lower performers between 2000 and 2003 and all in the next 3 years.

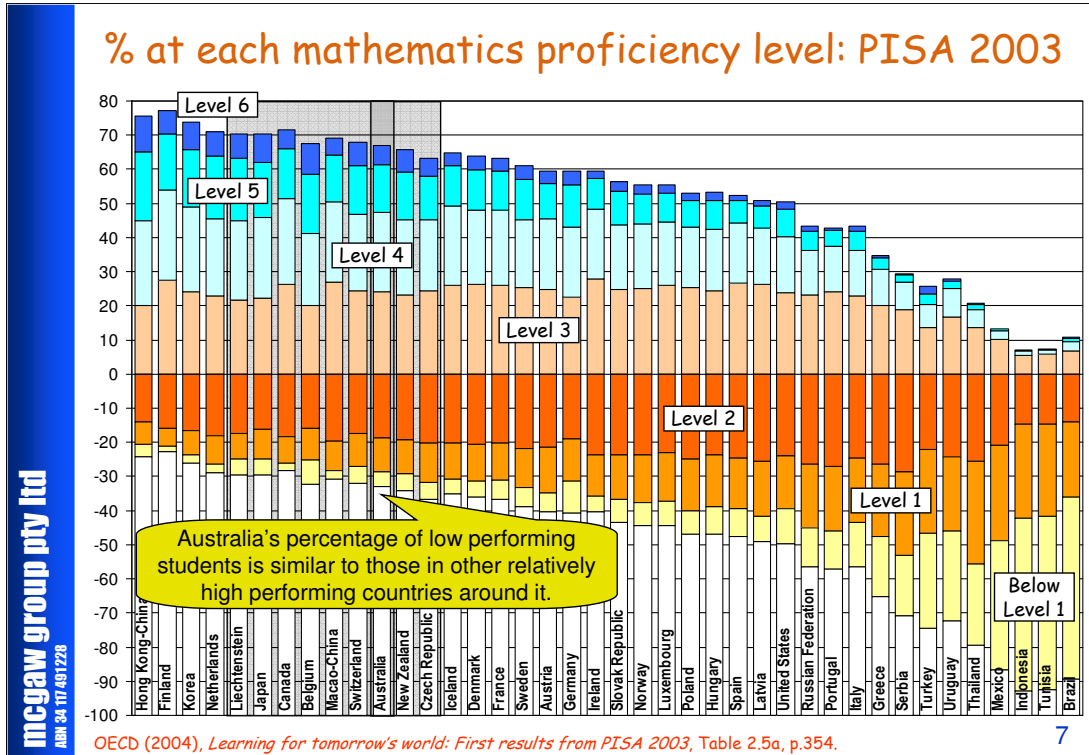
The decline in Japan between 2000 and 2003 was due to worsening performance at the bottom end; the rise in Hong Kong between 2003 and 2006 was due to improvement among high performers. There were no significant changes for Finland, Canada and New Zealand.



In PISA 2003, mathematics was the main domain of assessment. In this case, Australia ranked 11th overall out of the 40 participants but was not significantly different from six immediately above it or two immediately behind it. Australia, therefore, tied in 5th place with these eight other countries.

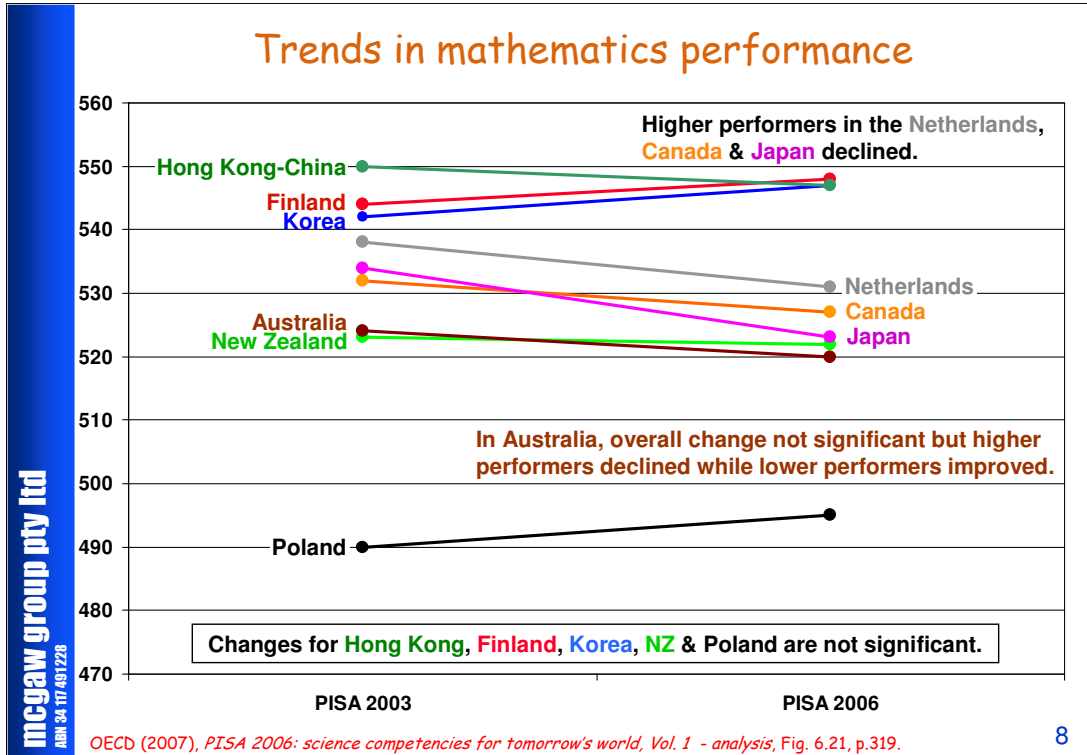
The countries significantly ahead of Australia were Hong Kong-China, Finland, Korea and the Netherlands.

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. Instead, it assesses whether students can recognise that a problem can be solved mathematically, are able to 'mathematise' it (i.e. represent it mathematically) and then solve it.



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 figure shows that, in mathematics, the proportion of low achievers in Australia is in line with its overall mean. In mathematics, the proportion of poorer performers in Australia is, therefore, not greater than in other countries that are similarly high-performing on average.



The PISA 2000 assessments in mathematics are not expressed on the same scale as those of PISA 2003 and PISA 2006. Relative positions can be compared across the three but absolute performance levels only for 2003 and 2006. Australia's relative positions in mathematics in the three were:

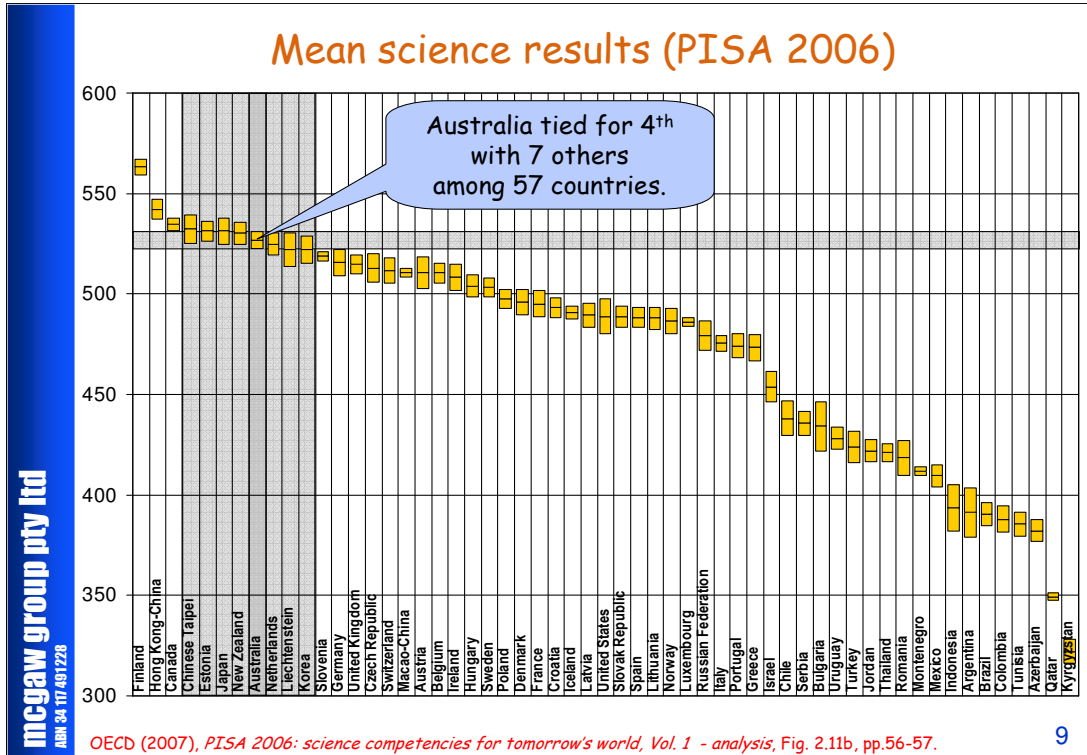
- PISA 2000: ranked 6th but tied in 3rd place with 7 others among 42.
- PISA 2003: ranked 11th but tied in 5th place with 8 others among 40.
- PISA 2006: ranked 13th but tied in 9th place with 5 others among 56.

Australia's slip in ranking between 2003 and 2006 was not due to a decline in Australia's mean performance. The 4 countries that were significantly ahead in 2003 (Hong Kong-China, Finland, Korea and the Netherlands) remain so but have been joined by 3 that were not different from Australia in 2003 (Switzerland, Canada and Macao-China) and one participating for the first time in 2006 (Chinese Taipei). The competition is moving so, by standing still, Australia has slipped relatively.

While Australia's 2006 mean is not significantly different from its 2003 mean, there was a decline in performance at the top end (as in reading literacy) but an offsetting improvement at the bottom end.

Performances were significantly lower in 2006 than 2003 for the Netherlands, Canada and Japan, in each case due predominantly to declines among high performers. Despite these declines, all three remain significantly ahead of Australia.

There were no significant differences between 2003 and 2006 results for Hong Kong-China, Finland, Korea, New Zealand or Poland.



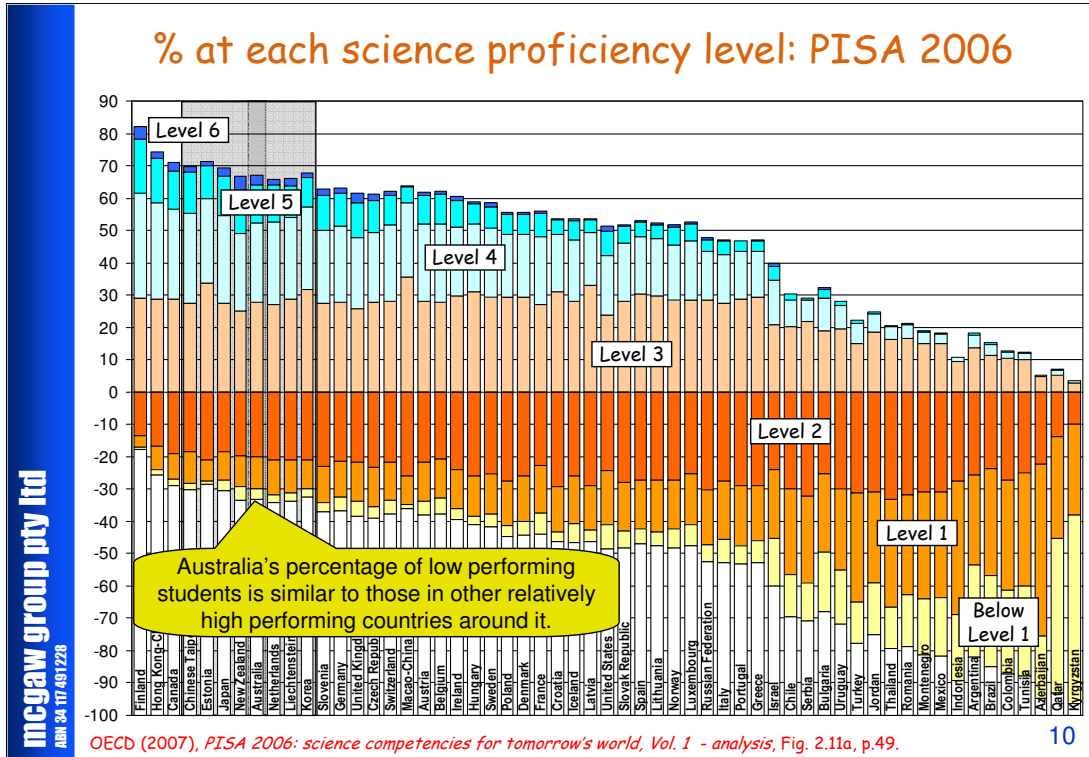
Science was the main domain of assessment in PISA 2006 and results are reported on a new scale that does not permit direct comparisons of absolute performance levels with those in previous PISA cycles. They do permit comparisons of relative positions. Australia's were:

- PISA 2000: ranked 8th but tied in 3rd place with 7 others among 42.
- PISA 2003: ranked 6th but tied in 5th place with 4 others among 40.
- PISA 2006: ranked 13th but tied in 9th place with 5 others among 56.

The drop from a tied rank of 3rd in 2000 to 5th in 2003 was due to Finland and Hong Kong-China being significantly ahead of Australia in 2003 after having been not different from Australia in 2000.

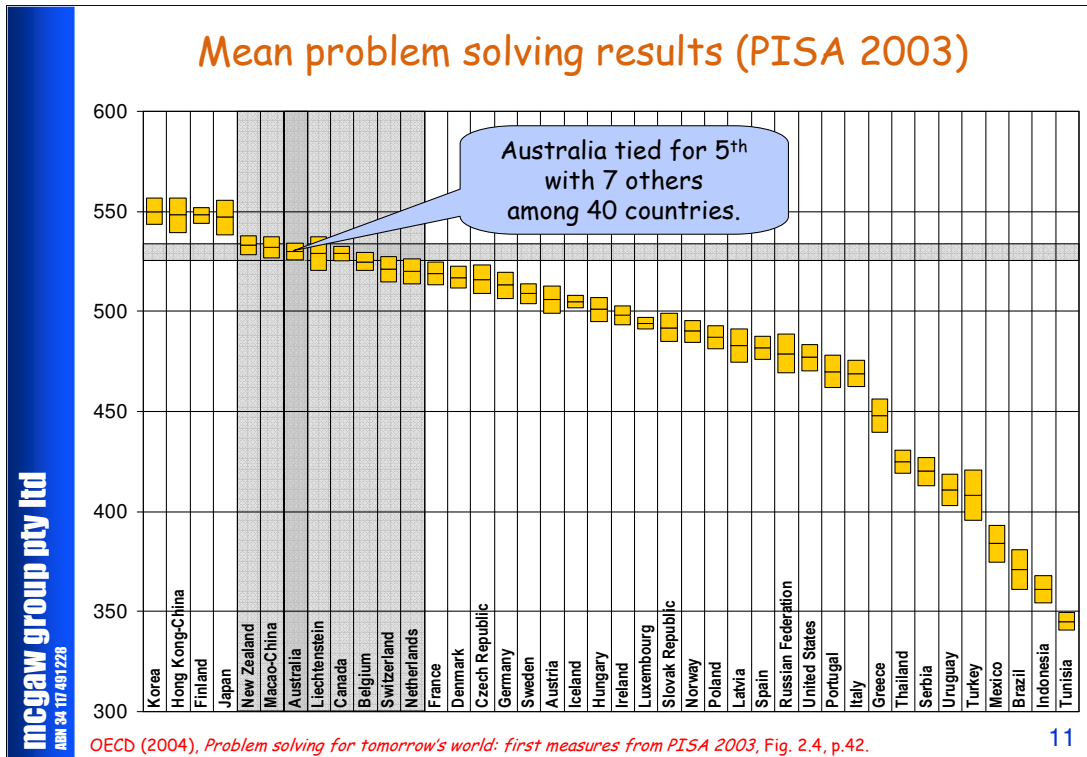
Australia's relative position improved from a tied rank of 5th in 2003 to a tied rank of 4th in 2006. Finland and Hong Kong-China remained ahead and Canada moved to a position significantly ahead while Japan and Korea dropped back to being not different from Australia.

In science, PISA assesses whether students can use what they have learned. It assesses whether students can recognise a scientific question, know what counts as evidence to deal with such a question and can marshal such evidence to deal with a question.



In PISA 2006, with science as 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 figure shows that, in science as in mathematics, the proportion of low achievers in Australia is in line with its overall mean. In science, therefore, the proportion of poorer performers in Australia is not greater than in other countries that are similarly high-performing on average.



In PISA 2003, problem solving was assessed as an additional minor domain.

Australia ranked 7th overall but was not significantly different from two immediately above or five immediately below. Australia thus tied in 5th place with seven others among the 40 participating countries.

Three types of problem solving were assessed in PISA:

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;

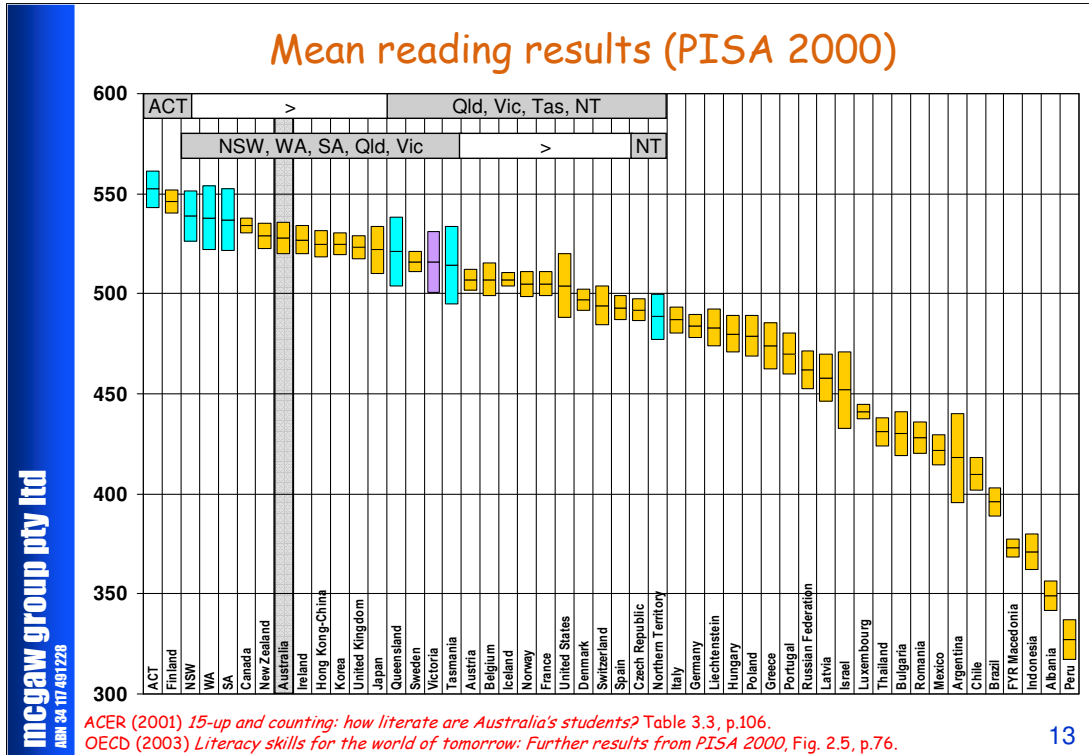
Trouble shooting

- 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>).



The Australian component of PISA has been undertaken by the Australian Council for Educational Research, which is also the lead agency in the international consortium of research agencies contracted to undertake the full international PISA surveys for the OECD. ACER has published Australian national reports for each PISA survey in which comparisons among the Australian States and Territories are reported. This permits the performances of the States and Territories to be seen in both a national and an international context.



The figure above shows the mean performances in reading literacy in PISA 2000 for the OECD countries, included in slide 3, and also those of the Australian States and Territories. Australia as a whole performed well, as already noted. The boxes for the separate Australian jurisdictions are larger than the one for Australia because the smaller sample sizes for the States and Territories yield less precise estimates of their mean performance than the whole sample does for the national mean.

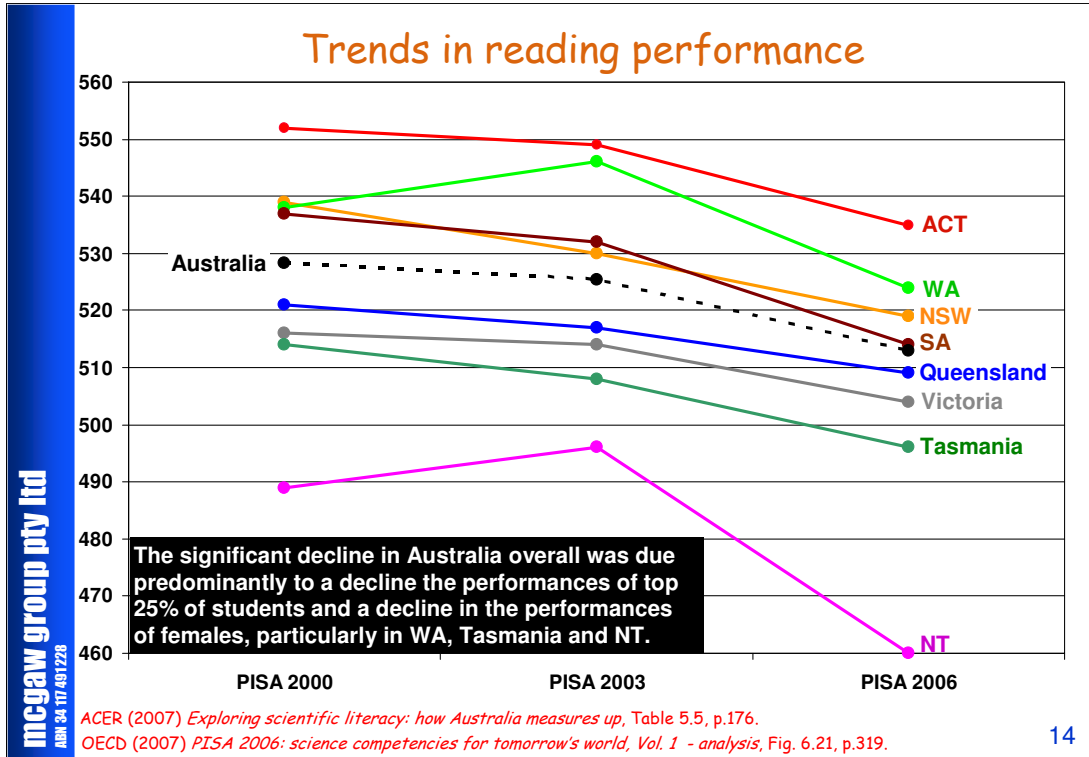
Four of the Australian jurisdictions – the Australian Capital Territory, New South Wales, Western Australia and South Australia – performed as well as Finland.

The Australian Capital Territory performed significantly better than four of the other Australian jurisdictions: Queensland, Victoria, Tasmania and the Northern Territory. New South Wales, Western Australia, South Australia, Queensland, Victoria and Tasmania were not significantly different from each other and all of them except Tasmania were significantly better than the Northern Territory.

The poorest performing Australian jurisdiction, the Northern Territory, performed at the same level as many major countries, including France, the United States, Denmark, Italy and Germany

Full details of the Australian results are provided in:

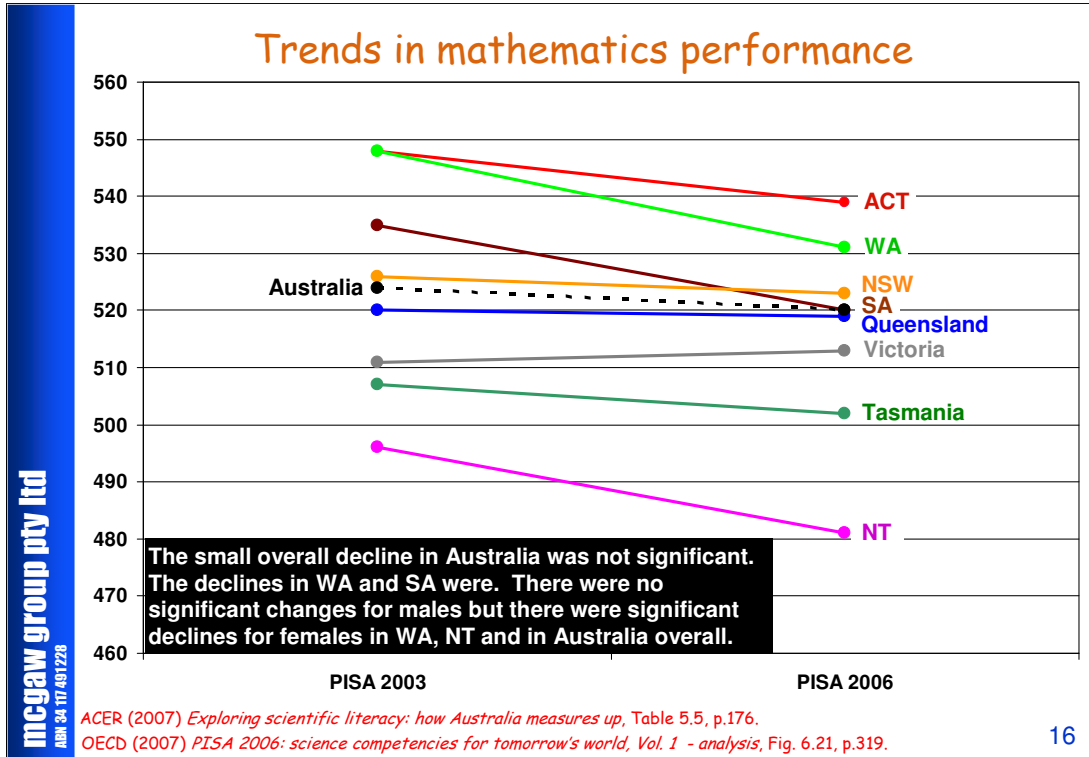
Lokan, J., Greenwood, L. & Cresswell, J. (2001) *15-up and counting, reading, writing, reasoning...: how literate are Australia's students?* Melbourne: Australian Council for Educational Research.



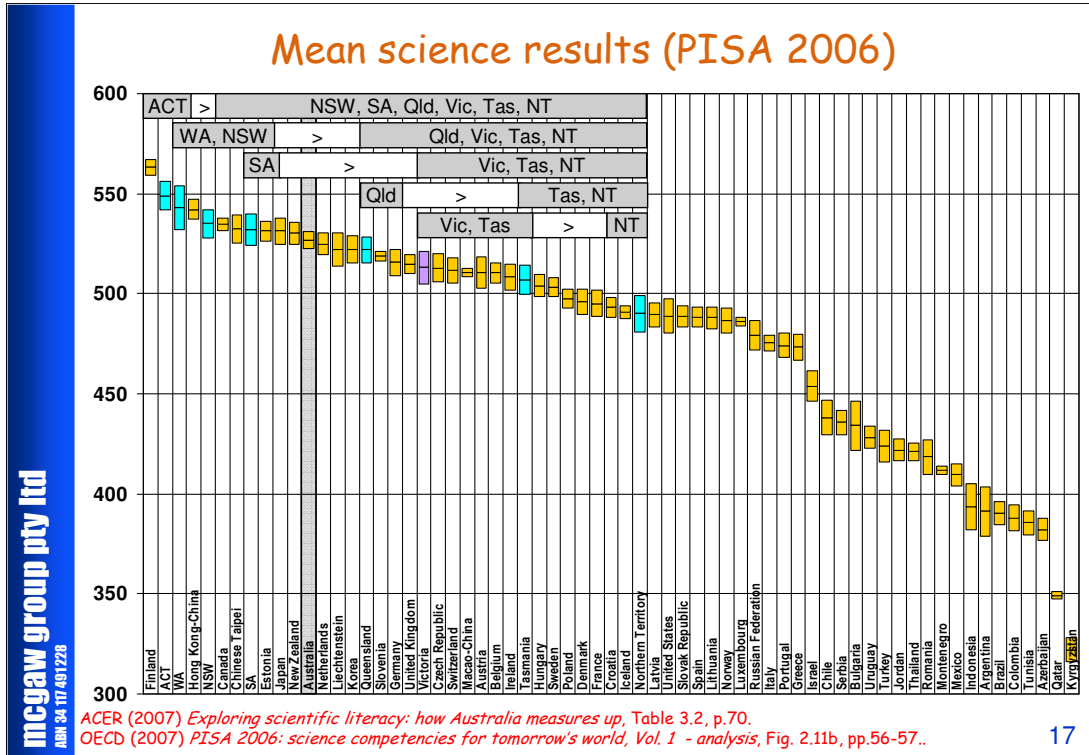
As noted earlier, Australia's overall performance in reading declined significantly between 2003 and 2006, with this being due to a decline among higher performers.

The figure above shows the trends in means for Australia as a whole and for the six States and two Territories separately. It is clear that Australia's 2003 performance was somewhat helped by the improvements between 2000 and 2003 in Western Australia and the Northern Territory, though it needs to be recognised that the overall Australian mean is more heavily influenced by the larger States which are, appropriately, more heavily represented in the national sample.

Behind the decline in Australia's overall mean performance to 2006 was a marked decline in the performance of females, particularly in Western Australia, Tasmania and the Northern Territory.



While the small overall decline in the Australian mean between 2003 and 2006 was not significant, the declines in Western Australia and South Australia were. In addition, there were significant declines in the performances of females in Australia overall and in Western Australia and the Northern Territory.



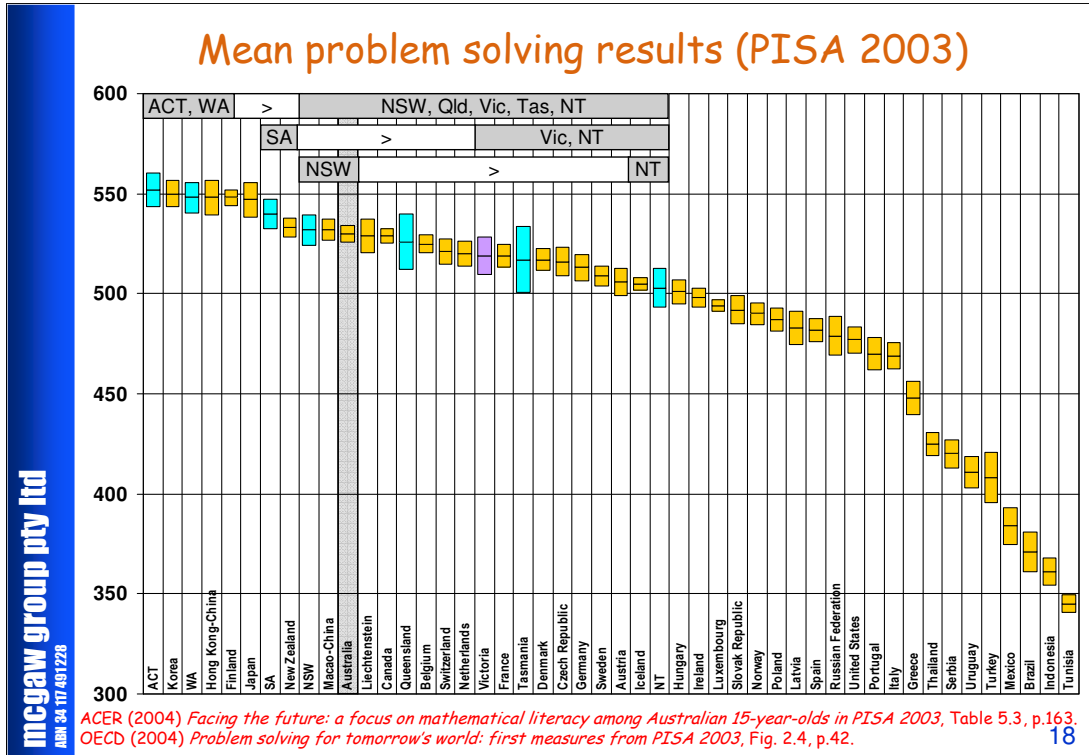
In science in PISA 2003, no Australian State or Territory matched the performance of Finland the Australian Capital Territory, Western Australia, New South Wales and South Australia were clearly at the level of the other very high-performing countries.

Comparisons among the Australian jurisdictions, revealed that:

- the Australian Capital Territory performed significantly better than all other Australian jurisdictions except Western Australia;
- Western Australia and New South Wales were significantly better than Queensland, Victoria, Tasmania and the Northern Territory;
- South Australia was significantly better than Victoria, Tasmania and the Northern Territory;
- Queensland was significantly better than Tasmania and the Northern Territory;
- Victoria and Tasmania were significantly better than the Northern Territory.

Full details of the Australian results in PISA 2003 are provided in:

Thomson, S. & De Bortoli, L. (2007) *Exploring scientific literacy: how Australia measures up – the PISA 2006 survey of students' scientific, reading and mathematical literacy skills*. Melbourne: Australian Council for Educational Research.



In problem solving in PISA 2003, the Australian Capital Territory and Western Australia matched Korea, Finland and Japan at the top of the international comparisons.

Comparisons among the Australian jurisdictions, revealed that:

- the Australian Capital Territory and Western Australia performed significantly better than all other Australian jurisdictions except South Australia;
- South Australia was significantly better than Victoria and the Northern Territory;
- New South Wales was was significantly better than the Northern Territory.

The Australian Capital Territory performed significantly better than all other Australian jurisdictions except South Australia.

Full details of the Australian results in PISA 2003 are provided in:

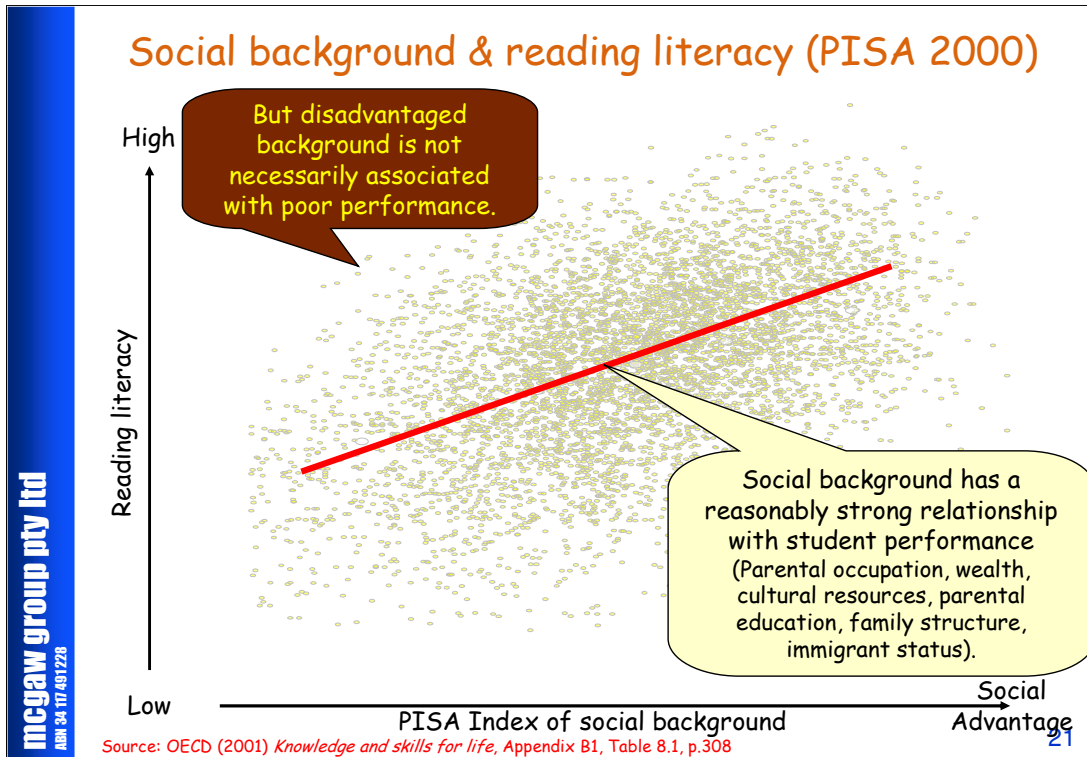
Thomson, S., Cresswell, J. & De Bortoli, L. (2004) *Facing the future: a focus on mathematical literacy among Australian 15-year-old students in PISA 2003*. Melbourne: Australian Council for Educational Research.



In judging the performance of our education system, we should consider not only the quality of students' performances but also their equity.



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



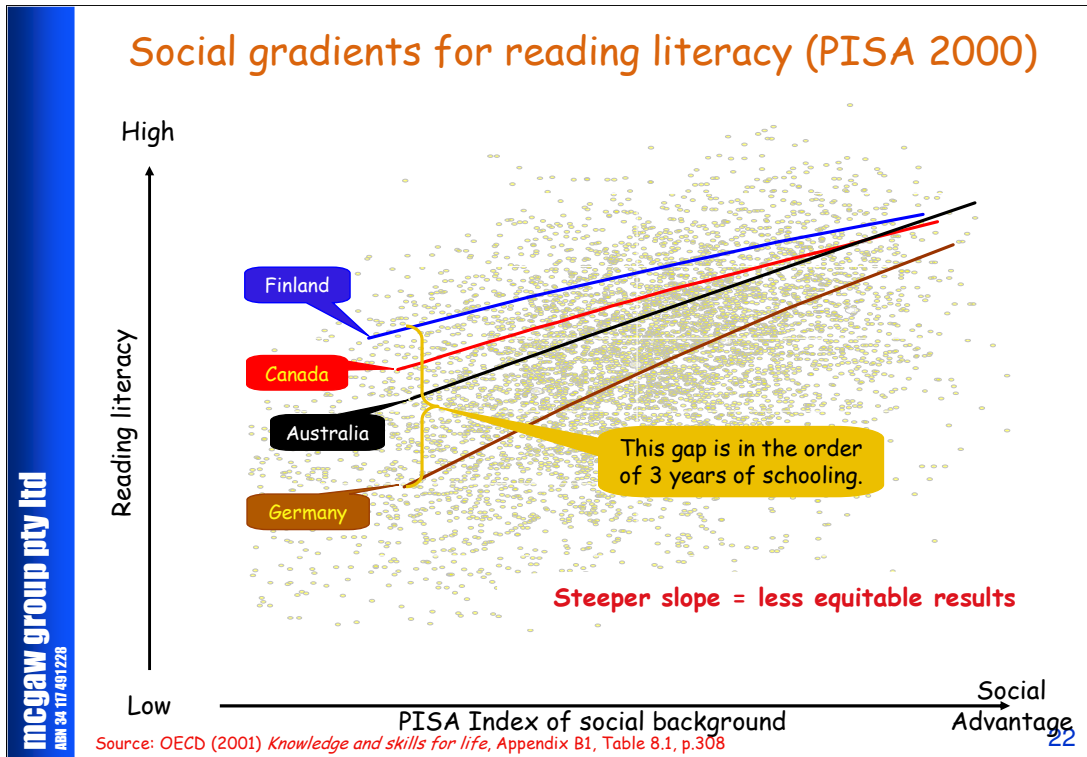
The 15-year-olds in PISA provide information on their economic and social background – parents’ education and occupation, cultural artefacts in the home – that permits the construction of an index of social background that ranges from socially disadvantaged to socially advantaged. This scale is comparable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

The slope of the regression line used in this fashion has been referred to as a ‘socioeconomic gradient’ or a ‘social gradient’.

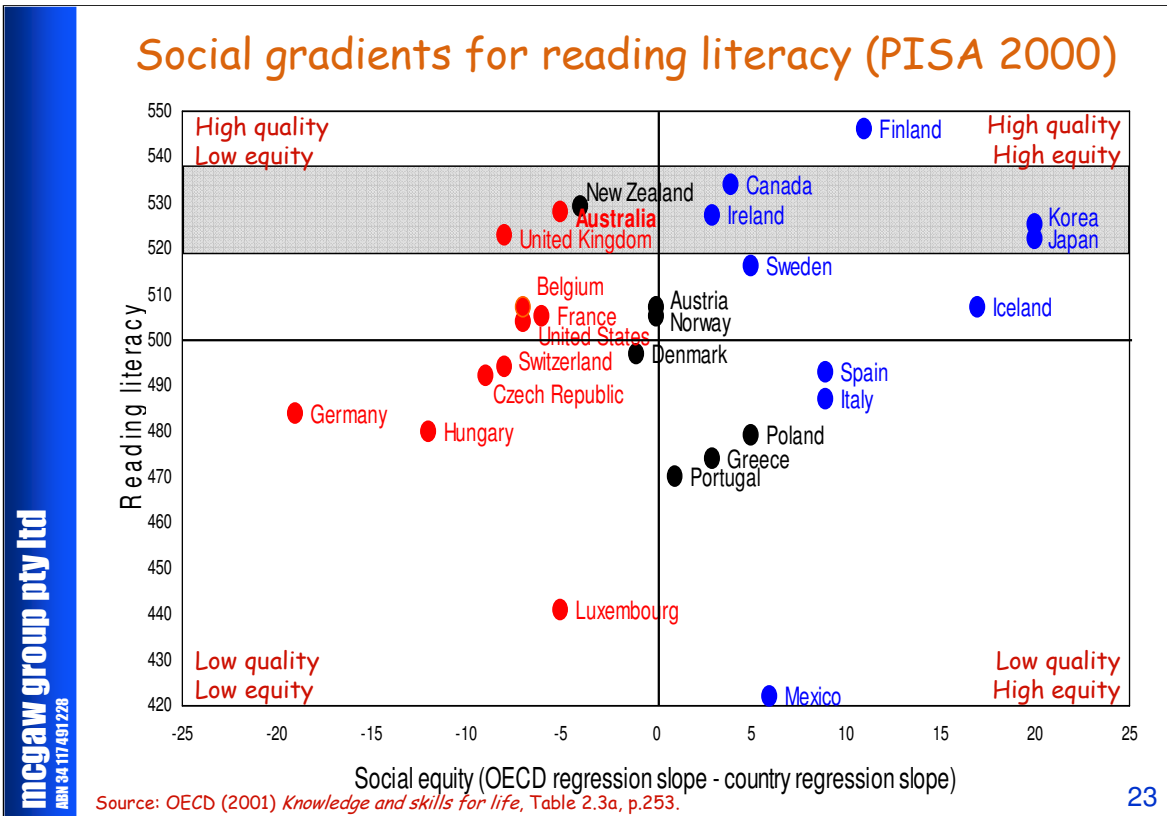


An examination of the relationship between social background and reading achievement country-by-country reveals marked differences among countries. The figure above shows the results for four countries. The lines for Finland and Canada are significantly less steep than the one for the OECD as a whole 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.

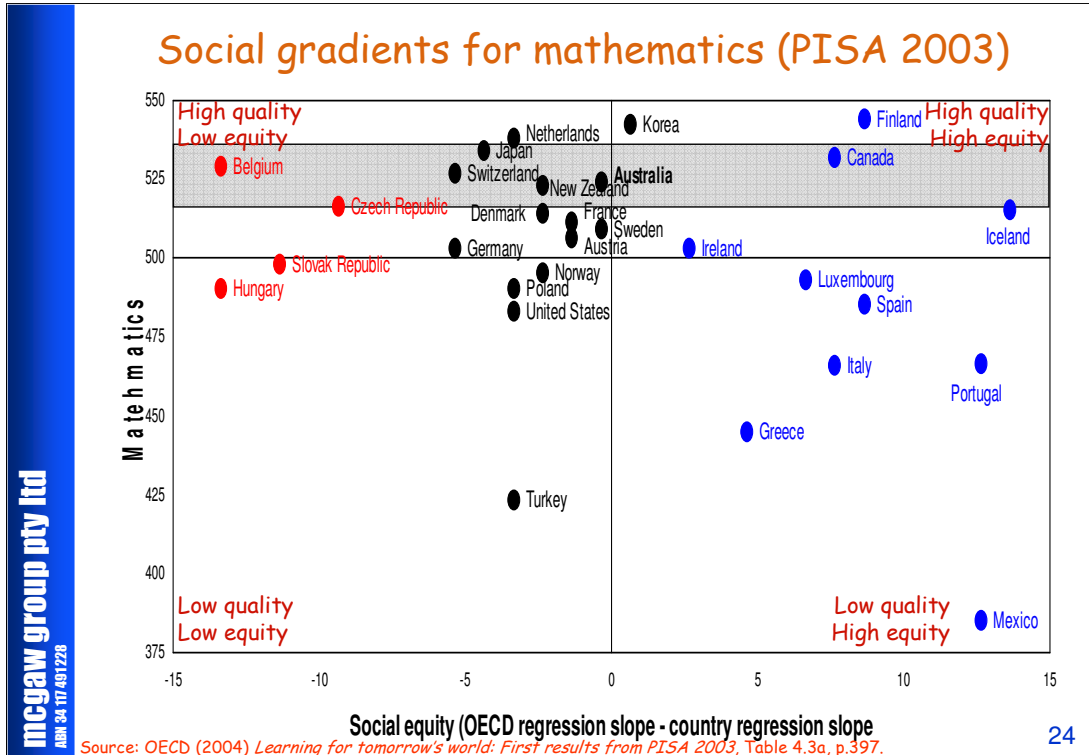
The slope of the regression line for social equity on reading literacy is represented on the horizontal axis as the difference between the slope for the OECD as a whole and a country's own slope. This places to the left countries where the slope is steeper than in the OECD as a whole (that is, countries 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.

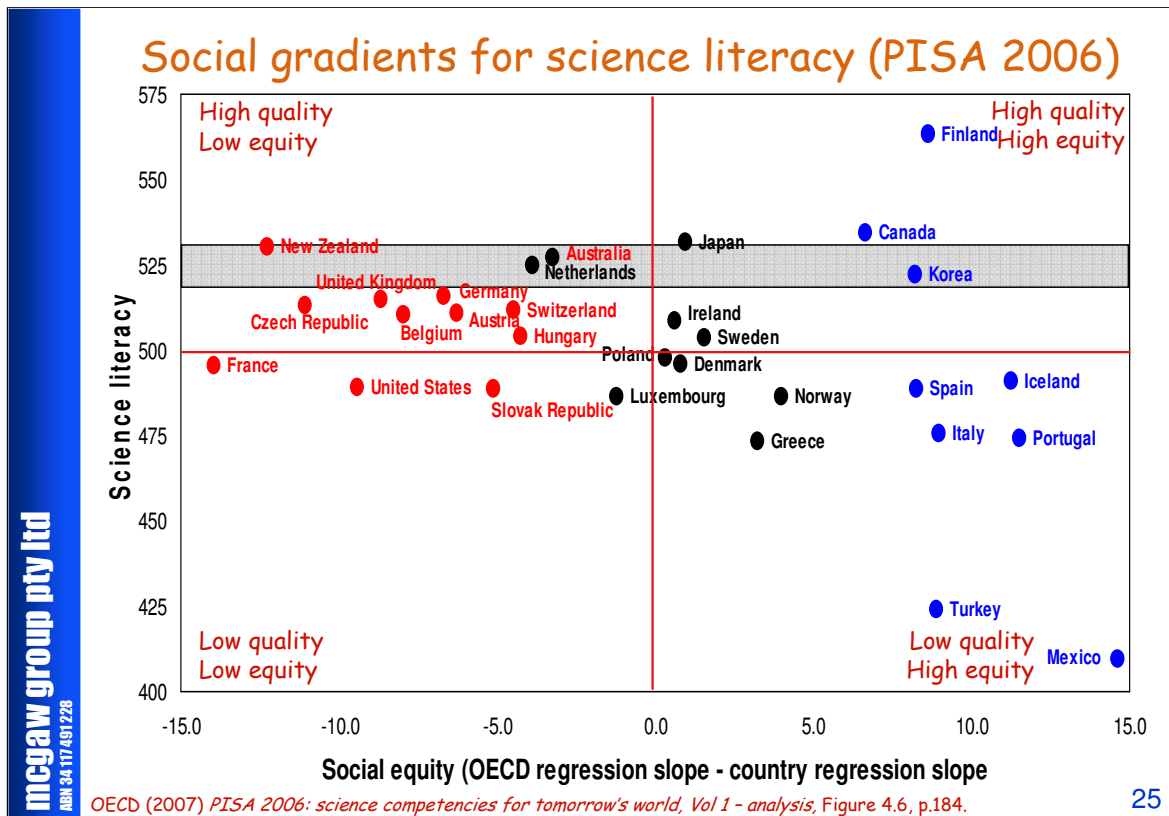
As already indicated in the previous slide, Australia is a 'high-quality, low-equity' country, with a high average performance but a relatively steep regression line. It is in the top-left quadrant along with the United Kingdom and New Zealand.

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 11-12.



The figure above shows the relationship between the slope of countries' regression lines and their average performance in mathematics in PISA 2003. In this case, the line for Australia is not significantly different from 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 in the grey band containing countries equal to Australia in quality and those above that band. In particular, we should aspire to match Finland and Canada which again are high-quality and high-equity.

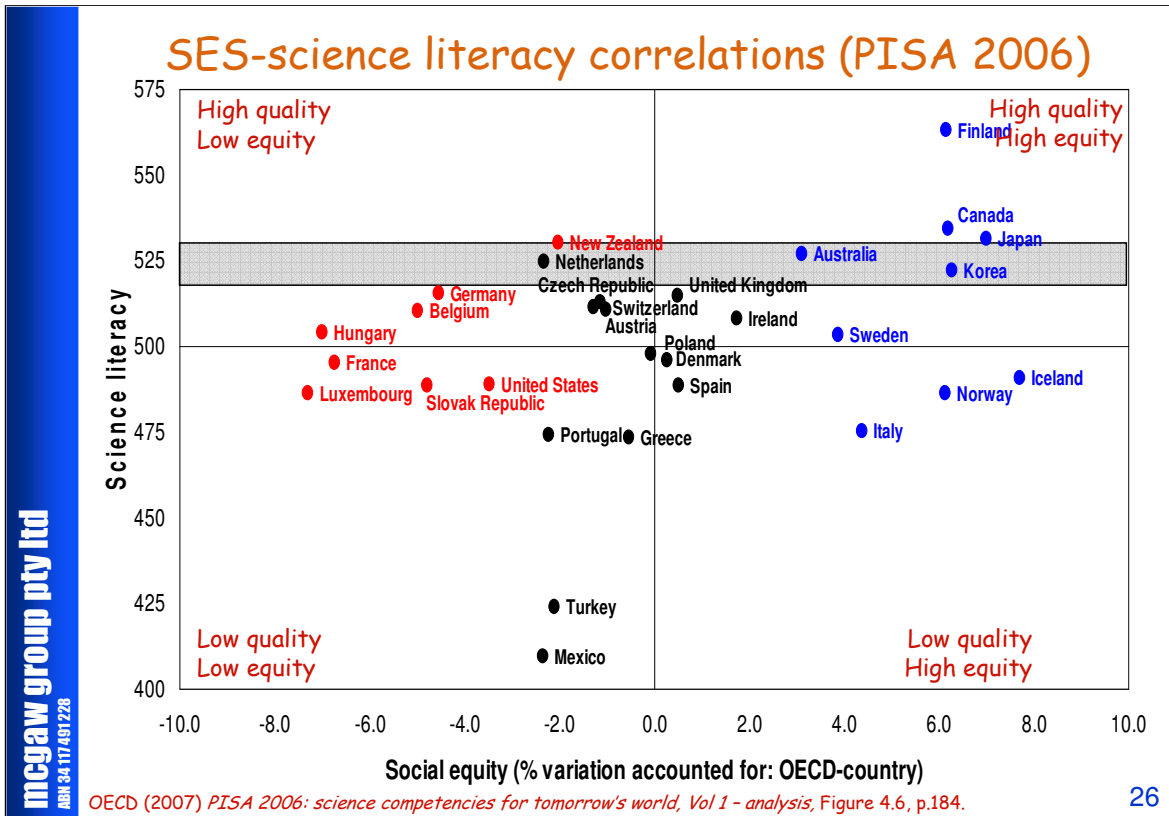


The figure above shows the relationship between the slope of countries' regression lines and their average performance in science in PISA 2006. In this case, the line for Australia is significantly steeper than the line for the OECD as a whole. Australian performances are again much less equitable than those in Canada and Finland and this time, as in reading in PISA 2000, also less equitable than those in Korea.

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 in the grey band containing countries equal to Australia in quality and those above that band. In particular, we should aspire to match Finland, Canada and Korea.

Focusing on the slope of the regression line (what Willms calls the 'social gradient') provides one perspective on the relationship between social background and educational achievement. It is an indicator of the magnitude of the average differences in educational achievement associated with particular differences in social background.

An alternative is to focus on the correlation (or the squared correlation as a measure of the percentage of variance in achievement accounted for by differences in social background) as an indicator of how well the regression line summarises the relationship for a particular country. On this indicator of equity, Australia appears somewhat better than with the social gradient indicator. It is in the 'high-quality, high-equity



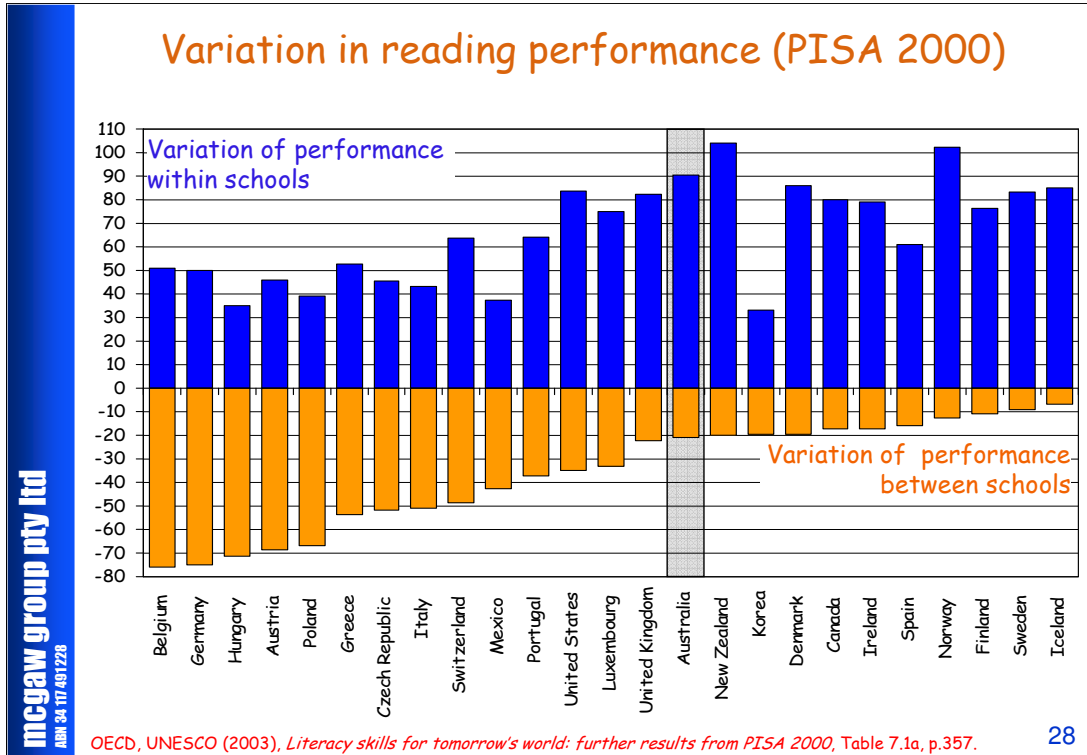
Focusing on the slope of the regression line (the 'social gradient') provides one perspective on the relationship between social background and educational achievement. It is an indicator of the magnitude of the average differences in educational achievement associated with particular differences in social background.

An alternative is to focus on the correlation (or the squared correlation which gives the percentage of variance in achievement accounted for by differences in social background). It provides an indicator of how well the regression line summarises the relationship for a particular country.

The social gradient expresses how big a difference in educational achievement is associated with differences in social background. The squared correlation (percentage of variance accounted for) indicates how well the social gradient describes the position for individuals, as opposed to all individuals on average. On this second indicator of equity, Australia appears somewhat better than with the social gradient indicator. It is in the 'high-quality, high-equity' quadrant as shown above. Finland, Canada and Korea, however, all outperform Australia on this indicator, as does Korea.



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



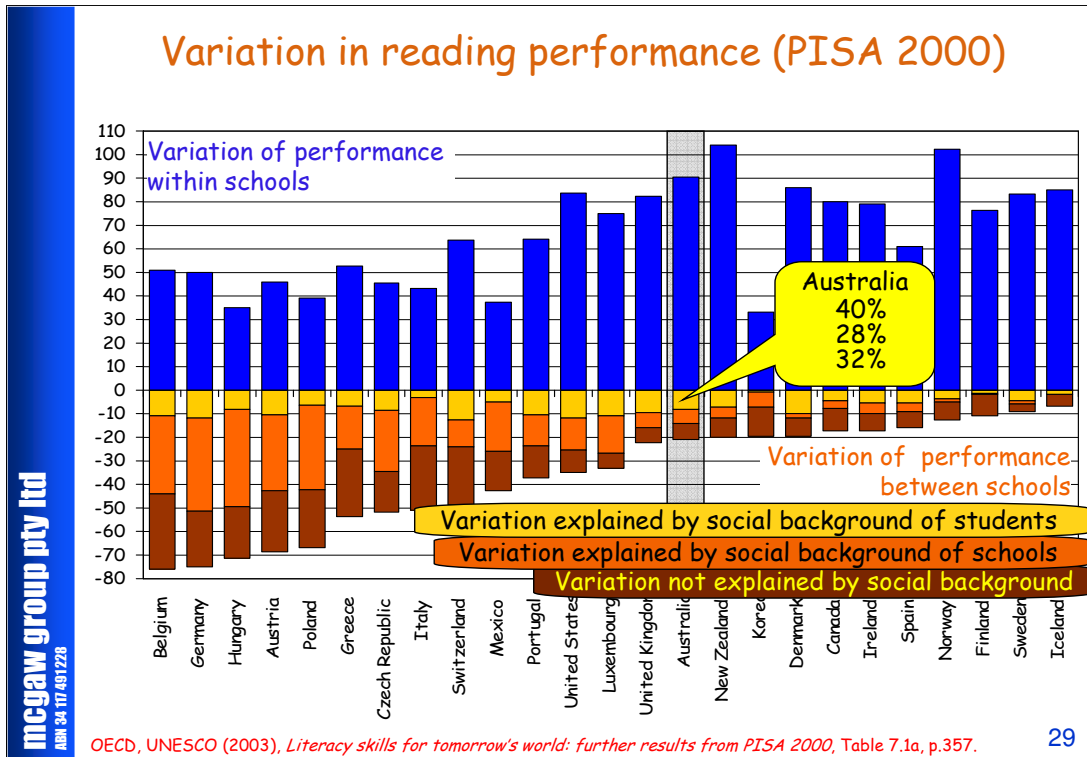
The figure above divides the variation in student performance in reading in PISA 2000 for each country into a component due to differences among students within schools, shown above the zero line, and a component due to differences between schools shown below that line.

In Iceland, Finland and Norway there is very little variation in scores between schools. Choice of school is not very 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.)



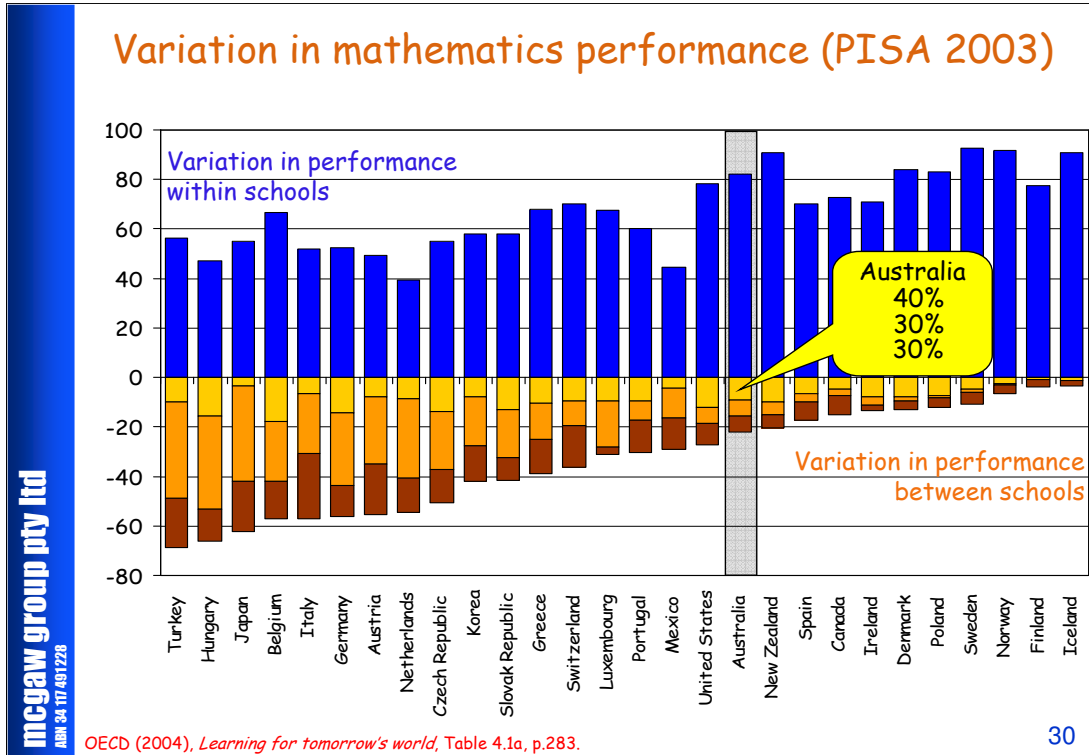
A further way in which to examine equity is to determine the extent to which the variation between schools that can be accounted for in terms of students' social backgrounds can be explained in terms of:

- the social backgrounds of the individual students in the schools
- the average social background of the students in the schools.

The first indicates the impact of students' own social backgrounds, the second the impact of the company they keep in school. In Australia, 68 per cent of the variation between-schools that can be accounted for in terms of differences between schools in the social background of their students splits into 40 per cent due to individual social background and 28 per cent due to the average social background of students in the schools.

Where differences in social background account for a large percentage of the between-school variation, this suggests that the educational arrangements in the country are inequitable. Where much of the account derives from the social background of other students in the school, it suggests that there is a benefit for advantaged students in keeping company with similarly advantaged students but a compounded disadvantage for disadvantaged students keeping company with others like themselves. That suggests a difficult policy conundrum for those who might want different groupings to ameliorate the influence of social background on disadvantaged students because it implies that reduction in disadvantage for them could only be won by a reduction in advantage for the advantaged.

Additional analyses of the PISA 2000 data for Austria, however, offer a more encouraging conclusion. These analyses suggest "that students with lower skills benefit more from being exposed to clever peers, whereas those with higher skills do not seem to be affected much. Social heterogeneity, moreover, has no big adverse effect on academic outcomes. These results imply considerable social gains of reducing stratification in educational settings" (Schneeweis & Winter-Ebmer, *Peer effects in Austrian schools*. Working Paper No. 0502, Department of Economics, Johannes Kepler University of Linz, Austria 2005, p.2).



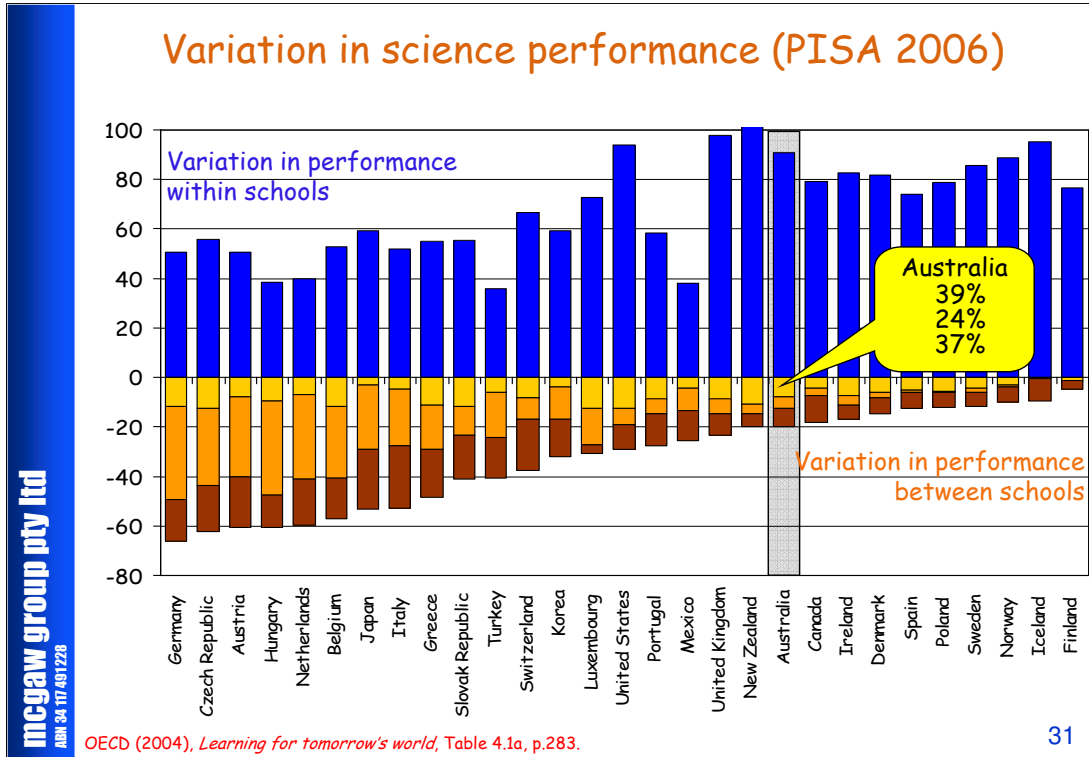
The figure above provides the same analysis as the one in the previous slide but, in this case, for mathematics in PISA 2003. In Australia, 70 per cent of the variation between-schools in mathematics performance can be accounted for in terms of differences between schools in the social background of their students splits into 40 per cent due to individual social background and 30 per cent due to the average social background of students in the schools.

Overall, the pattern is similar to that in the previous slide except for Poland for which:

- in PISA 2000, 63 per cent of the variation in reading was between-schools,
- in PISA 2003, 13 per cent of the variation in mathematics 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. The 15-year-olds in PISA 2000 were under the old system while those in PISA 2003 were under the new system.

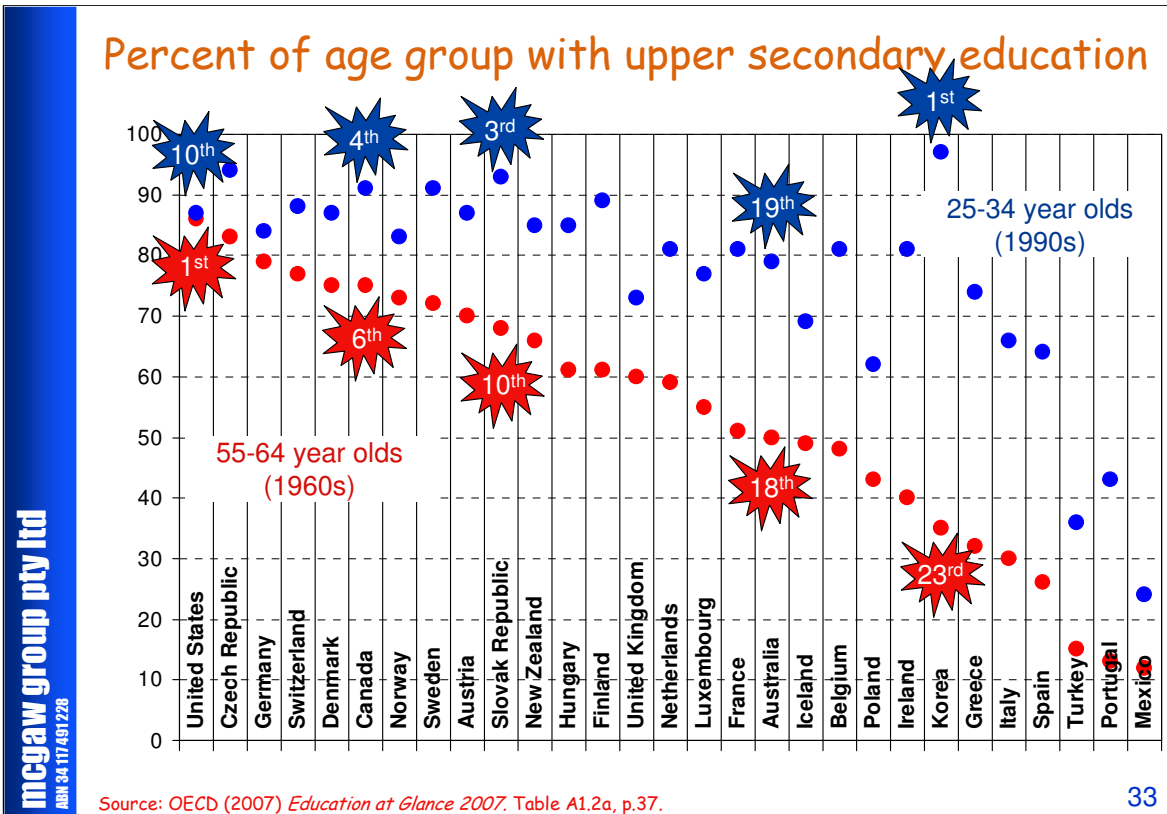
More remarkable still, Poland was the only country to improve its average performance significantly on all measures used in both PISA 2000 and PISA 2003. It did so largely by raising the achievement levels of its poorer performing students. Expectations of the weaker students were increased and their performances were improved when they were not consigned to be only with others like themselves. As noted earlier, Poland has continued this improvement in reading with a further significant improvement between 2003 and 2006.



The figure above provides the same analysis as in the previous two slides but, in this case, for science in PISA 2006. In Australia, 63 per cent of the variation between-schools in science performance can be accounted for in terms of differences between schools in the social background of their students – 39 per cent due to individual social background and 24 per cent due to the average social background of students in the schools.



In judging the performance of our education system, we should consider not only the quality of students' performances but also their quantity of education that our system delivers to the population.



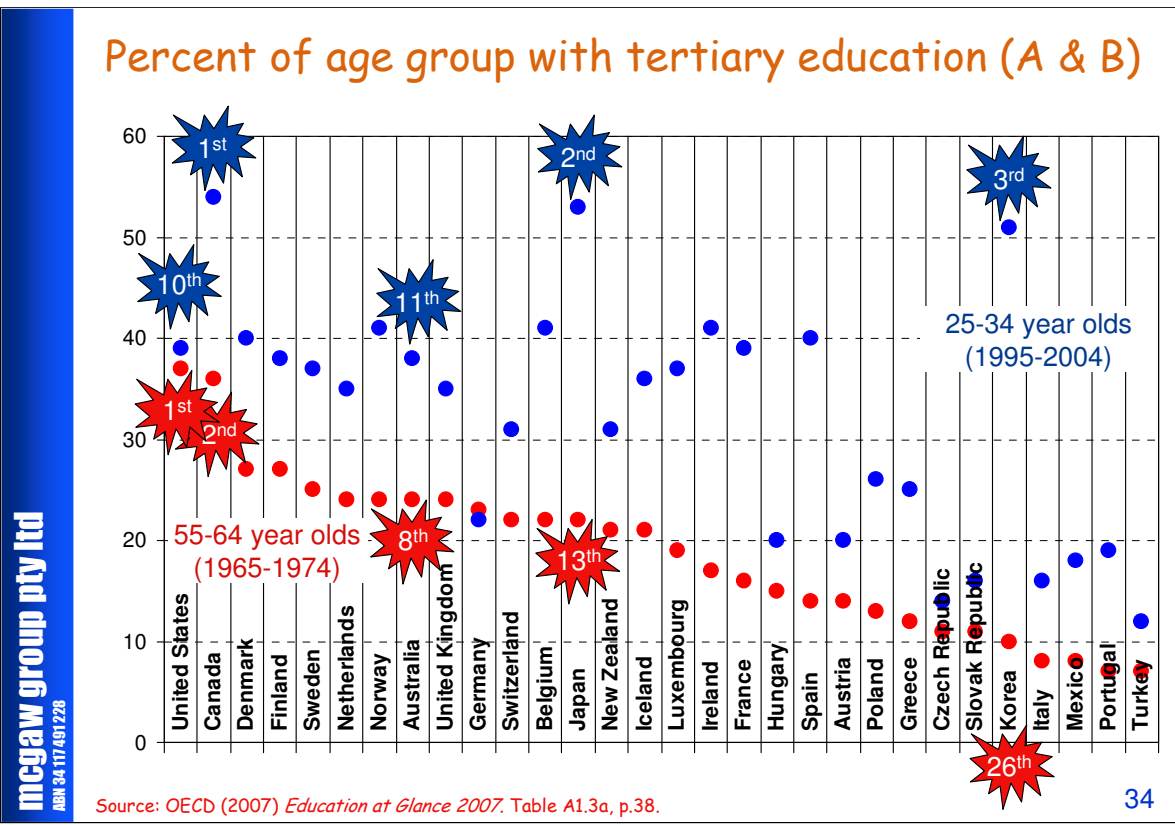
There are no internationally comparable data on trends in completion rates for upper secondary education or equivalent but a picture for past decades can be obtained from the percentages of the population in different age brackets that have attained this level.

The percentage of 55-64 year-olds who have attained upper secondary education indicates completion rates in the 1960s (around 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 and 25-34 year-olds. The rates for 25-34 year-olds reveal that, by the 1990s, 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 23rd in the 1960s to 1st by the 1990s. 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 10th. Australian rates have grown relatively slowly from a comparatively low base, with the rank slipping marginally from equal 18th to 19th. Meanwhile Canada rose from 6th to 4th.

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 ranks it 23rd among the 30 OECD countries. Education reform and a deep national commitment to education and skill development are recognised as key drivers of this remarkable economic growth.



Changes in completion rates of tertiary education can also be estimated using current information on different age groups in the population.

As with completion rates for upper secondary education or its equivalent, Korea and Japan have increased dramatically over the period from 1965-1974 to 1995-2004, in this case rising to 2nd and 3rd respectively among OECD countries and behind only Canada. The United States dropped from 1st to 10th and Australia dropped from 8th to 11th.

Thank-you

Contact

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