

# PISA in Brief

from Australia's perspective

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B

C

*Highlights from the full Australian report*

15-UP AND COUNTING, READING WRITING, REASONING ...  
HOW **LITERATE** ARE AUSTRALIA'S STUDENTS?

# What is PISA? (Programme for International Student Assessment)

*PISA is a new survey of the knowledge and skills of 15-year-olds, mainly in industrialised countries.*

- The survey, first carried out in 2000, will be repeated every three years, so that changes over time can be measured.
- 265 000 students from 32 countries took part in PISA 2000.
- Students answered a pen-and-paper assessment booklet in their schools. They also answered a 30-minute questionnaire about themselves, and their principals answered a 30-minute questionnaire about their schools.
- Students were asked about their home backgrounds, their attitudes to school and learning, and the strategies they used when studying.
- Principals were asked about the atmosphere and resources for learning at the school, and the kinds of programs the students were studying.

*PISA is a new way of looking at students' performance.*

- PISA 2000 assessed young people's ability to apply their knowledge and skills to real-life problems and situations, rather than how well they had learned a specific curriculum.
- PISA 2000 assessed literacy in reading, mathematics and science. In the way the word 'literacy' is used, it means much more than the common meaning of being able to read and write.
- To answer the PISA 2000 assessment tasks correctly, students had to understand key concepts, use a range of processes in the correct way and apply their knowledge and skills in different situations.
- Some of the assessment tasks were multiple choice questions, but many required students to construct their answers and write them in.

*PISA looks for answers to several important questions related to education, such as:*

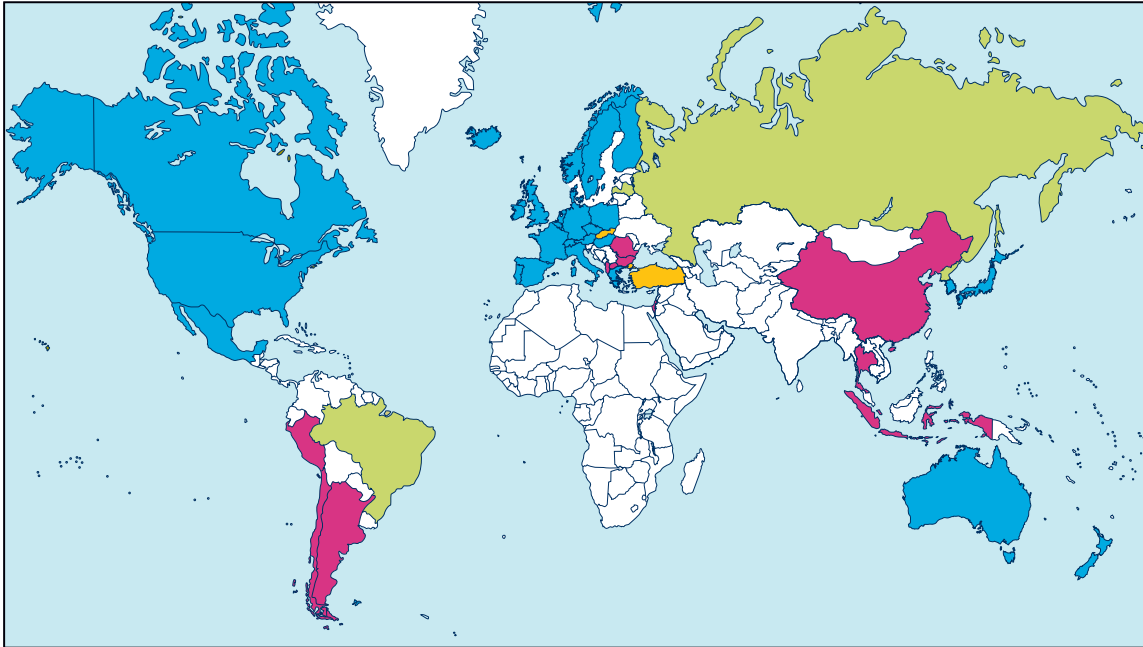
- How well prepared are young people to deal with challenges they will meet in the future?
- What skills do young people have that will help them adapt to change in their lives? Are they able to analyse, reason and communicate their arguments and ideas to others?
- Are some ways of organising schools and school learning more effective than others?
- What influence does the quality of school resources have on students' learning?
- To what extent is student performance dependent on their home backgrounds? How can opportunities be improved for students from disadvantaged backgrounds?



Photograph: David Crosling, News Ltd.

# PISA Participants

The countries that took part in PISA 2000, and some other countries that have joined the project since then and will take part in future assessments, are shown on this map.



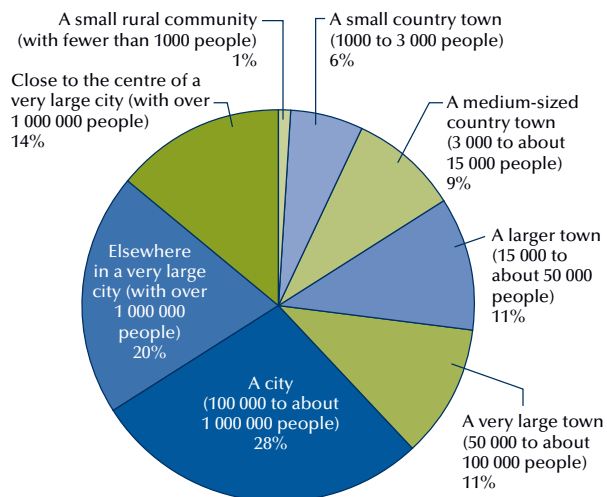
■ OECD countries     
 ■ Non-OECD countries     
 ■ Countries where the assessment will be completed in 2002     
 ■ OECD countries participating in PISA from 2003 onwards

Australia Austria Belgium Canada Czech Republic Denmark Finland France Germany Greece Hungary Iceland Ireland Italy	Japan Korea Luxembourg Mexico Netherlands New Zealand Norway Poland Portugal Spain Sweden Switzerland United Kingdom United States	Brazil* Latvia Liechtenstein Russian Federation	Albania Argentina Bulgaria Chile China Special Administrative Region of Hong Kong Indonesia Israel Macedonia Peru Romania Thailand	Slovak Republic Turkey
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## Who took part in Australia?

About 6200 students from 231 schools around Australia took part in PISA 2000. The schools were randomly selected by a computer, and so were the students.

The diagram shows how many schools from each kind of locality were in the PISA sample.



# What PISA tells us

*This pamphlet summarises results from PISA 2000. It tells us about how students performed and describes wider findings about what lies behind their results.*

The pamphlet focuses on Australia's results, including how the Australian students performed in comparison with students from other countries.

The full Australian report is called *15-Up and Counting, Reading, Writing, Reasoning ... How Literate are Australia's Students?* The full international report is called *Knowledge and Skills for Life*

– *First Results from PISA 2000.* (See back cover for how to obtain these reports.)

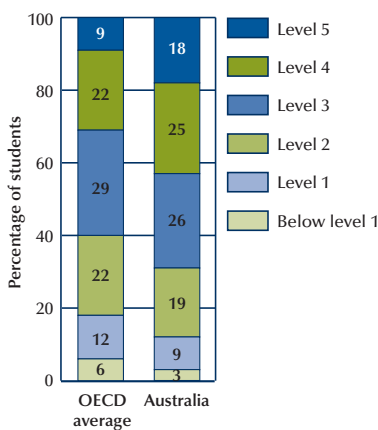
PISA 2000 assessed students' capacities to apply knowledge and skills in reading, mathematics and science. More assessment time was given to reading. In 2003, more time will be given to mathematics and, in 2006, more time will be given to science. The broad ranges of knowledge and skills assessed are referred to as reading, mathematical and scientific literacy. They are widely seen as essential for students to have in order to be well prepared for adult life.

Students' scores are reported on a separate scale in each of the three literacy areas. Each scale was devised so that the average score across OECD countries is 500 points with about two-thirds of the students scoring between 400 and 600 points.

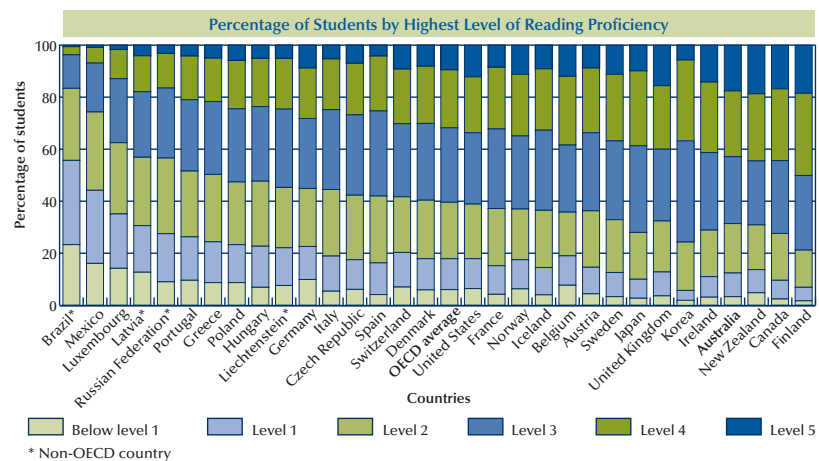
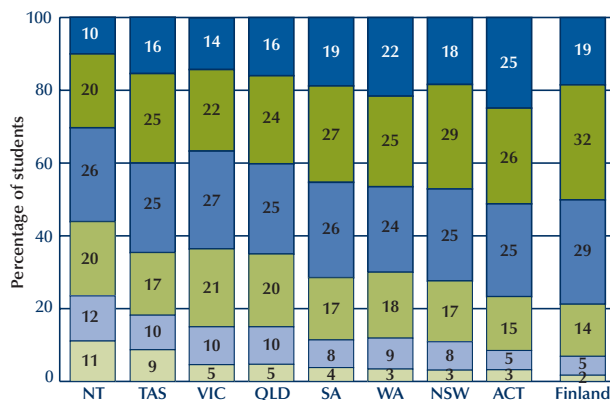
First, results for reading are shown, on this page and on pages 4 and 5. Some mathematics and science examples are on pages 6 and 7. International comparative results are on pages 8 and 9 and more results for the Australian states are on page 10. The rest of the pamphlet discusses results in relation to other student and school characteristics.

## What students can do in reading literacy

For reading, five levels of literacy are described. Level 5 is the highest and Level 1 the lowest. In every country, some students could not do even the easiest reading tasks.



Results of all countries and of the Australian states and territories are shown on the charts to the right, in order of mean performance on the reading literacy scale.



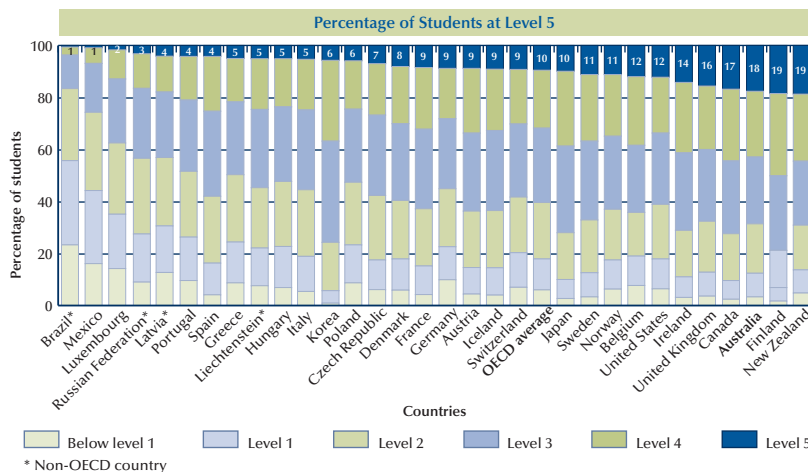
*On average, one in ten students across the OECD could do PISA's hardest reading tasks...*

### Example 1

Students were shown a tree diagram of a country's working age population, and were given descriptions of the labour force status of individual workers. They had to decide in which category of the diagram each worker belonged. They had to work out what criteria to use to classify the workers, and use information that was provided in footnotes to the diagram. This question is placed at a difficulty level of over 700 points on the reading scale.

This chart shows the percentages of students reaching the highest reading proficiency level.

Eighteen per cent of Australian students were placed at this level, compared with 12 per cent for the OECD as a whole.



### Example 2

In another difficult reading task, students read a three-page story and were asked to say whether it had an appropriate ending, explaining why. This task required them to reflect on what they had read, including understanding the metaphors in the story. The question is placed at about 650 points on the reading scale.

*...and, on average, one student in six could do no more than PISA's simplest reading tasks*

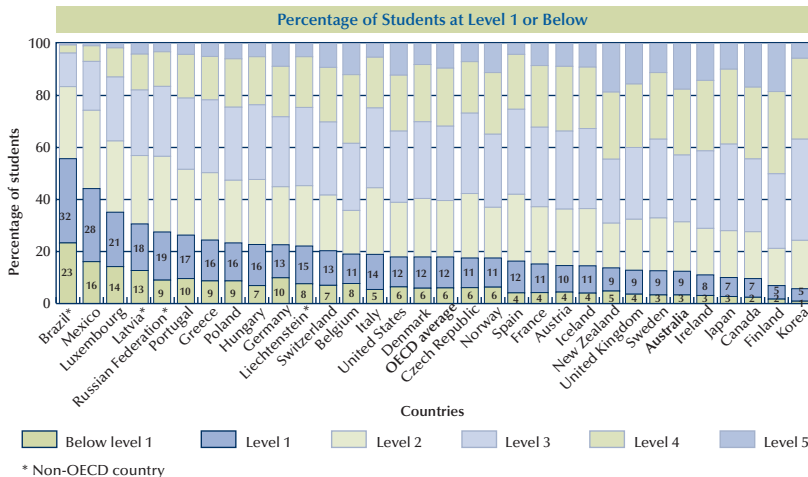
The chart below shows the percentages of students reaching no more than the two lowest levels. Nine per cent of Australian students were placed at Level 1 compared with the OECD average of 12 per cent; and 3 per cent of Australian students did not reach Level 1, compared with the OECD average of 6 per cent.

### Example 1

Students were asked a question about a sentence in an article on features of good sports shoes. The question was easy because the information was directly stated in the text, in a prominent place under a heading. The task, placed at 392 points on the reading scale, was one of the easiest in the test.

### Example 2

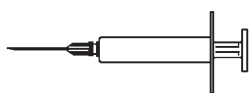
In another easy reading task, students read a magazine article, written for young people, explaining the purpose of DNA testing. In a multiple-choice question, they needed to recognise that the main purpose of the article was to provide information, not to warn, amuse or convince readers. This question was placed at about 400 points on the reading scale.



## Examples of reading tasks of average difficulty

Students were given an office notice about Flu Immunisation. The first part is shown here:

### ACOL VOLUNTARY FLU IMMUNISATION PROGRAM



As you are no doubt aware, the flu can strike rapidly and extensively during winter. It can leave its victims ill for weeks. The best way to fight the virus is to have a fit and healthy body. Daily exercise and a diet including plenty of fruit and vegetables are highly recommended to assist the immune system to fight this invading virus.

ACOL has decided to offer staff the opportunity to be immunised against the flu as an additional way to prevent this insidious virus from spreading amongst us. ACOL has arranged for a nurse to administer the immunisations at ACOL, during a half-day session in work hours in the week of May 15. This program is free and available to all members of staff.



Participation is voluntary. Staff taking up the option will be asked to sign a consent form indicating that they do not have any allergies, and they understand they may experience minor side effects.

The notice also explained who should and should not be immunised, and gave details of how to sign up for the program.

*The question shown here → requires the notice to be read carefully for details, and is at proficiency Level 2. It is placed at about 440 points on the reading scale.*

*The next question from the Flu task is at proficiency Level 3, and requires a different kind of skill. Students were asked if they thought the writer had succeeded in making the style of the information sheet friendly and encouraging, and why.*

Here are two sample answers, which were both marked correct:

↓

NO IT LOOKS SCARY WITH  
THE BIG NEEDLE AND THAT MONSTER

It is very clear and effective  
and it catches your eye when you  
see the picture of the germ and  
the needle.

*Which one of the following describes a feature of the ACOL flu immunisation program?*

- A Daily exercise classes will be run during the winter.
- B Immunisations will be given during working hours.
- C A small bonus will be offered to participants.
- D A doctor will give the injections.

PISA reading tasks become harder as more pieces of information have to be found, interpreted or connected, as ideas or information are less explicitly defined in the text, as more critical and evaluative skills need to be applied, and as the content becomes less and less familiar.

The full set of released PISA 2000 reading literacy tasks is on [www.pisa.oecd.org](http://www.pisa.oecd.org)

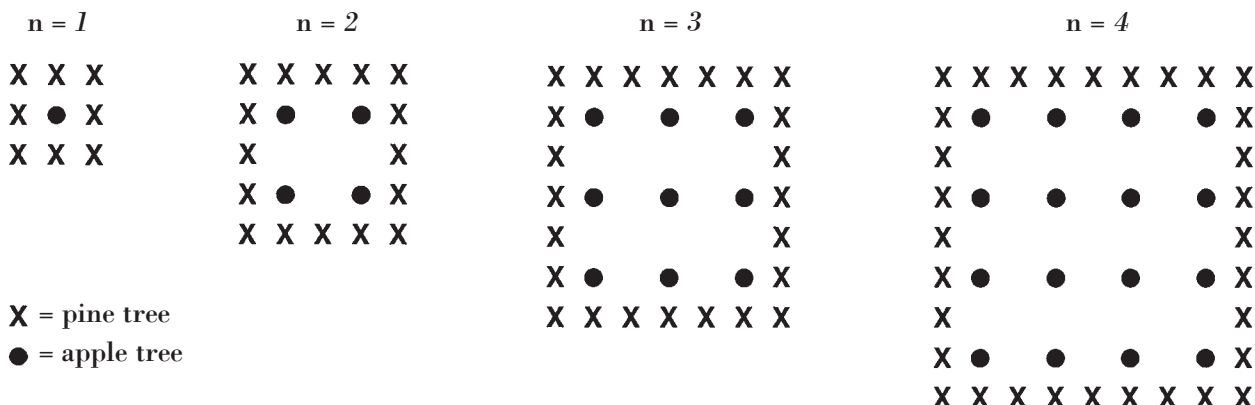


## Examples of PISA mathematical literacy tasks

The text alongside had three questions associated with it. The first and third are shown here.

A farmer plants apple trees in a square pattern. In order to protect the trees against the wind he plants pine trees all around the orchard.

Here you see a diagram of this situation where you can see the pattern of apple trees and pine trees for any number (n) of rows of apple trees :



The first question asked students to extrapolate from the diagrams given and complete a table to show how the numbers of apple trees and pine trees would increase as the size of the orchard is increased. To do this, students had to interpret the written description and understand the illustrated pattern, and they then had to extend the pattern and successfully complete a table following the two relationships through as the number of rows increases. This task was placed at a difficulty of 550 on the mathematics scale.

The third question, which asked students to work out which type of tree would increase faster in number if the farmer wanted to make the orchard very large, and explain why, was even more difficult (placed at more than 720 points on the scale). Students had to think mathematically and recognise that the number of apple trees increased in proportion to the square of the number of pine trees.

Suppose the farmer wants to make a much larger orchard with many rows of trees. As the farmer makes the orchard bigger, which will increase more quickly: the number of apple trees or the number of pine trees? Explain how you found your answer.

The number of apple trees will increase more quickly because that number, say 30, will be squared and so increase faster than  $8 \times 30$ . The next sequence could be 31, and this time itself will give an ever increasing no. than something always multiplied by 8 which will obviously only go up 8 each time.

Complete the table

n	Number of apple trees	Number of pine trees
1	1	8
2	4	16
3	9	24
4	16	32
5	25	40

In the second question (not shown), the students had to find the value of 'n' for which the number of apple trees would equal the number of pine trees. This question was difficult and was placed at 665 points on the mathematics scale.

In a Level 1 mathematics task (not shown), students were given a graph of the speed of a racing car around a race track, and were asked a multiple-choice question about where on the track the car was travelling the slowest. This required only a very basic level of understanding of the concept of change and how the lowest speed was shown by the lowest point on the graph. This question was placed at about 400 points on the scale.

PISA mathematics tasks become more difficult as the number and complexity of steps increases, as more material needs to be connected, more reflection on methods and situations is required and more abstract representations have to be interpreted or provided.

The full set of released PISA 2000 mathematical literacy tasks is on [www.pisa.oecd.org](http://www.pisa.oecd.org)

## Examples of PISA scientific literacy tasks

Students were given some extracts from the diary of a 19th Century Hungarian doctor, Semmelweis, who was alarmed at the death rate from post-childbirth fever in one ward of a hospital. Data on deaths from this and another ward over several years were presented in a graph. One of the diary entries contains the statement that ‘for centuries science has told us that ... causes may be changes in the air or some extraterrestrial influence or a movement of the earth itself, an earthquake’. Then this piece of text was presented:

Nowadays not many people would consider extraterrestrial influence or an earthquake as possible causes of fever. We now know it has to do with hygienic conditions. But in the time Semmelweis lived, many people, even scientists, did! However, Semmelweis knew that it was unlikely that fever could be caused by extraterrestrial influence or an earthquake. He pointed at the data he collected and used this to try to persuade his colleagues.

*Students were then asked to imagine that they were Semmelweis and use his data to support the argument that earthquakes are unlikely to be the cause of the disease. An example of a correct answer follows. The question was difficult, being placed at 666 on the science scale. (Spelling and grammatical errors were not penalised.)*

Suppose you were Semmelweis. Give a reason (based on the data Semmelweis collected) why puerperal fever is unlikely to be caused by earthquakes

If it were caused by earthquakes, the lines of ward 1 and ward 2 would be much more similar as earthquakes would affect both wards

*The discussion of hospital wards provided the context for an easier question, requiring students to use common scientific knowledge to explain why some measures taken in hospitals are effective. This question was placed at about 470 points on the science scale and is moderately easy.*

Explain why high temperature (while washing sheets) helps to reduce the risk that patients will contract a fever.

Because high temperature kills many types of harmful bacteria.

Other important scientific literacy skills in PISA are:

- being able to recognise questions that can be answered in scientific research
- identifying evidence or data needed
- drawing conclusions from evidence
- communicating ideas and conclusions effectively.



PISA science questions become harder as concepts increase in complexity, more data are needed or provided, more reasoning and connecting between steps are required and communication needs to be more precise.

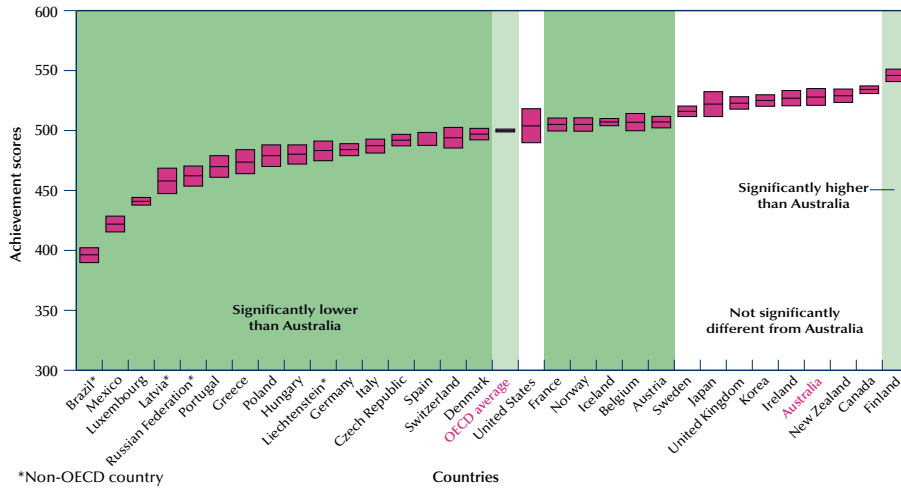
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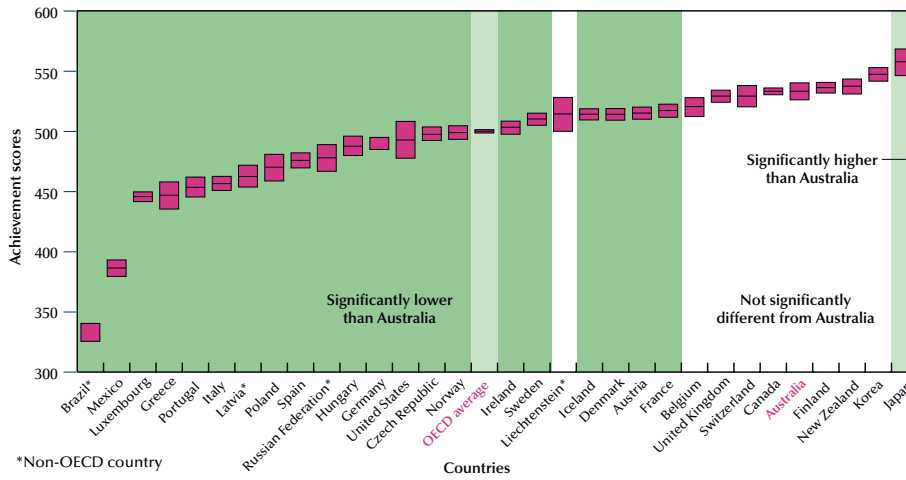
# Reading, mathematical and scientific literacy results, by country

The figures on this page show the mean score for each country on each of the three literacy scales. (See next page for how to read the charts.)

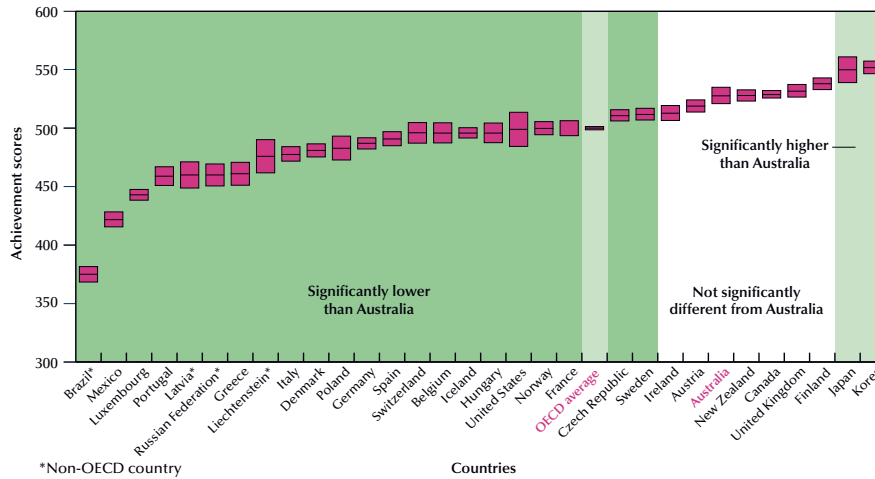
## Reading literacy



## Mathematical literacy



## Scientific literacy



## Reading, mathematical and scientific literacy results, by country (continued)

### How to read the charts at left

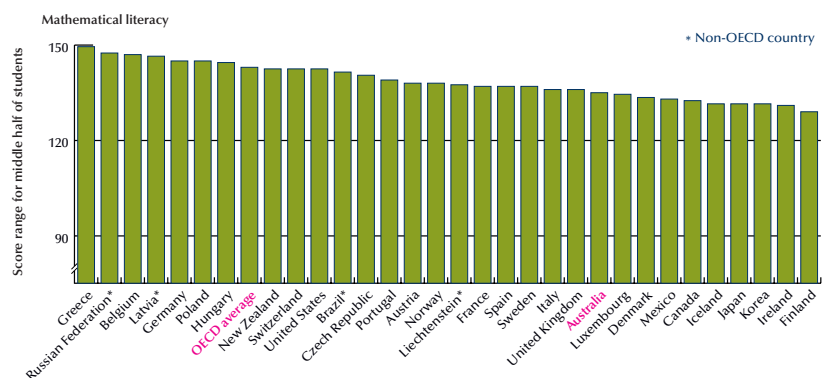
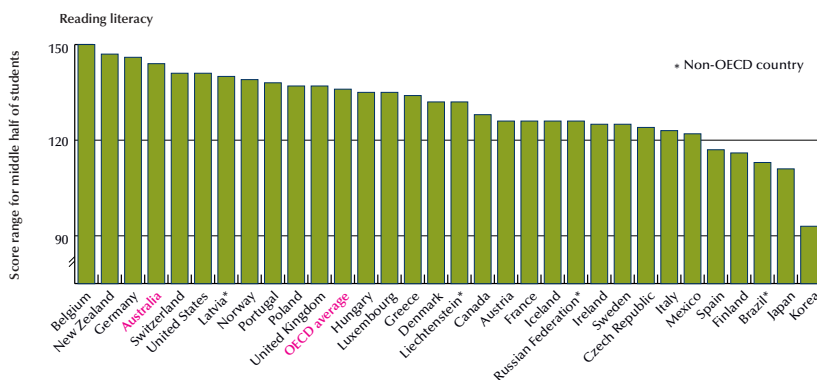
Each coloured block with the black line across it shows the best estimate of the country's mean (the middle line) and the range (the coloured block) within which the mean would be expected, with 95% certainty, to fall if many samples were drawn in the same way from the same population.

Details of the comparisons of country mean scores are contained in the full report. It is clear that the mean scores of most countries next to each other on the graph, and sometimes for several countries in a row, are quite similar. Where their coloured bars overlap, the precise rank order placement of countries cannot be determined. The mean scores can be tested for statistically significant differences, however.

The charts show good to excellent results for Australia. Taking statistical significance into account:

- Australia's performance was well above the OECD average in all three areas;
- students in Finland were the only ones who clearly performed better in reading literacy than the Australian students;
- students in Japan were the only ones who clearly performed better in mathematical literacy than the Australian students;
- students in Korea and Japan were the only ones who clearly performed better in scientific literacy than the Australian students; and
- the Australian students performed better than students from 21 countries in reading literacy, 21 countries in mathematical literacy, and 22 countries in scientific literacy.

Another perspective on the results is given in the charts below. These show the range of scores in the middle half of the distribution of results in Australia (that is, without the highest- and lowest-achieving quarters). Australia had one of the largest spreads of results for the middle half of students in reading literacy, but was well below the OECD average in spread of mathematical literacy results. The relatively large spread of results in reading suggests that we may not be catering as well as we might for our lower-achieving students.



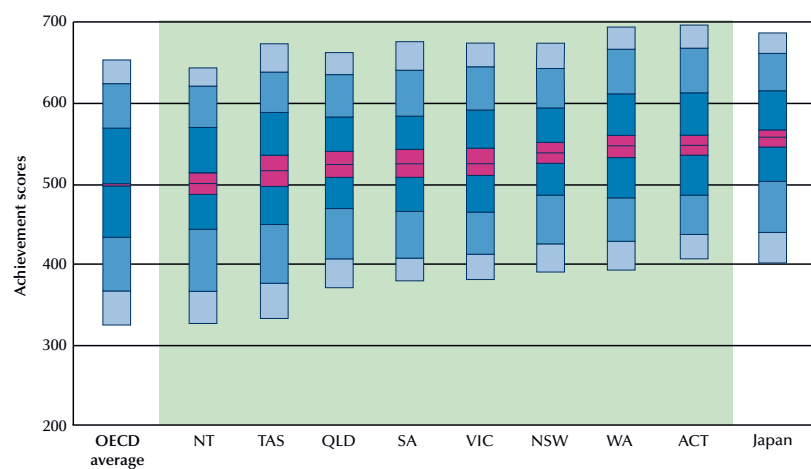
# Reading, mathematical and scientific literacy results, by Australian state and territory

*The figures on this page show the distributions of results on each of the three literacy scales for the Australian states and territories, arranged in order of achievement. (See next page for how to read the charts.)*

## Reading literacy



## Mathematical literacy



## Scientific literacy



## Reading, mathematical and scientific literacy results, by Australian state and territory (continued)

### *How to read the charts at left*

As for the countries, each coloured block with the black line across it shows the best estimate of the state's mean (the middle line) and the range (the coloured block) within which the mean would be expected, with 95% certainty, to fall if many samples were drawn in the same way from the same population. The charts also show the distributions of results for the middle half, then all but the top highest and lowest 10 per cent, then all but the highest and lowest 5 per cent of students, going out from the middle of the bars.

Details of the comparisons of state and territory mean scores are contained in the full report. Just as for the countries, it is clear that many of the mean scores are quite similar.

The majority of comparisons between the Australian states and territories showed that differences were not significant. Results in mathematical literacy were the most uniform. Taking statistical significance into account:

- on average, students in all the Australian states and territories performed at or better than the OECD average in all three areas;
- in reading literacy, ACT students performed better than students in Queensland, Victoria, Tasmania and the NT, and students from NSW, WA, SA, Queensland and Victoria performed better than students from the NT;

- in mathematical literacy, ACT students performed better than students in Tasmania and the NT, and students from NSW and WA performed better than students from the NT; and
- in scientific literacy, ACT students performed better than students from Queensland, Victoria, Tasmania and the NT, students from WA performed better than students from Tasmania and the NT, and students from SA, NSW and Queensland performed better than students from the NT.

These results do not take into account differences in socioeconomic background (SES) of students in the various states and territories. When SES differences are brought into the equation, some of the achievement differences 'disappear'. The relationship of SES to achievement is discussed later in this pamphlet.

### **Results for boys and girls**

In all countries, girls performed significantly better than boys in reading literacy. In a few European countries and in New Zealand, the difference in results between girls and boys was equivalent to three-quarters or more of a proficiency level in some of the reading processes measured. (One proficiency level of achievement equates to about 70 points on the reading literacy scale.)

In Australia the difference was just below half a proficiency level. There were uneven differences in the Australian states and territories.

Differences between boys' and girls' results in Queensland and Tasmania were more than twice as large as they were in the ACT, and 1.5 times as large as they were in some other states.

Internationally, boys performed better than girls in mathematical literacy in about half the countries, mostly European countries but including Brazil, Canada and Korea. Australia was not included in the countries with significant gender differences in mathematics.

There was no gender difference in mathematics performance in any of the Australian states and territories.

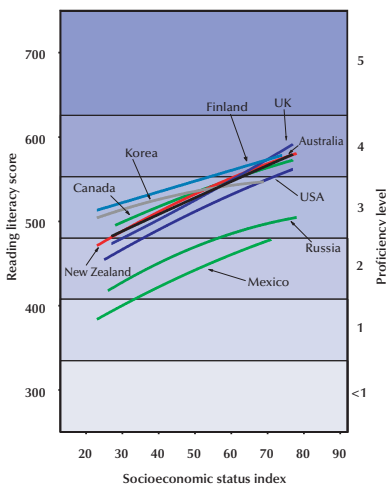
In scientific literacy, boys performed better than girls in Austria, Denmark and Korea, and girls performed better than boys in Latvia, New Zealand and the Russian Federation. There was no difference between boys and girls in science performance in Australia as a whole or in any of the states and territories.



# Achievement differences in relation to other student characteristics

## Socioeconomic status (SES)

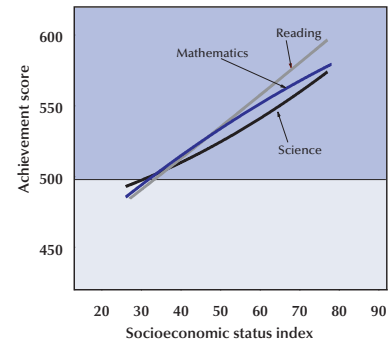
Achievement was related to students' socioeconomic status (SES) in all countries (using an international index based on parents' occupations), but there were differences by country in the extent of the relationship. This chart shows reading literacy results for several countries in relation to the SES index.



The countries included in the chart with Australia are the other members from the forum for Asia-Pacific Economic Cooperation (APEC) that participated in PISA, the UK and Finland, as the highest achieving country. Each line is a graph of students' reading scores plotted against their score on the SES index.

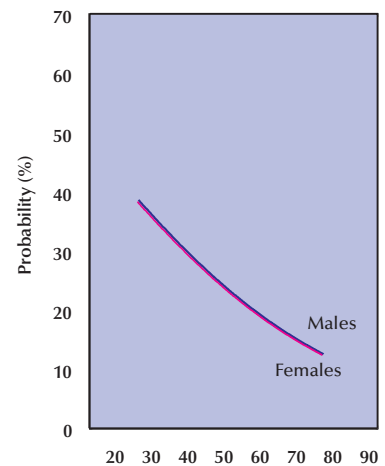
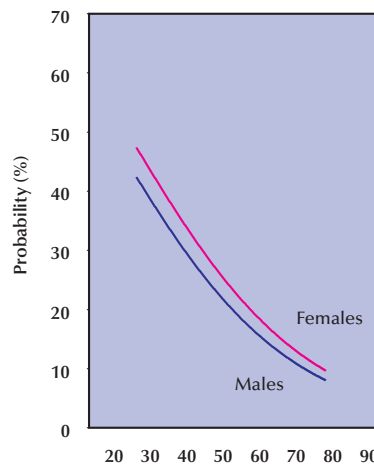
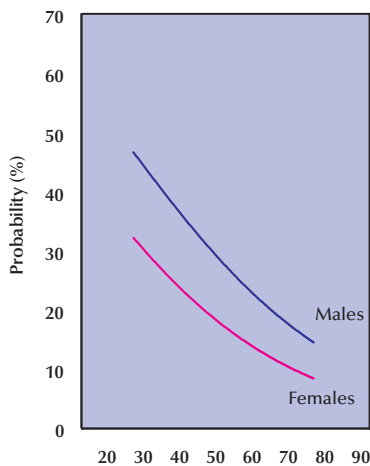
The flatter the line for a country, the less the difference in achievement between students from socioeconomically disadvantaged and socioeconomically advantaged backgrounds. The OECD considers that a country has been more successful in providing students with equal opportunities in education if its line on the graph is relatively flat, and if the range of scores between its lowest- and highest-scoring students is relatively small. From the chart, the most successful countries in achieving high outcomes in reading literacy in PISA 2000 as well as more equitable opportunities for their students were Korea and Finland. Australia's line on the graph is moderately steep, though not as steep as the United Kingdom's.

The chart above right shows that the relationship between SES and achievement in mathematical and scientific literacy in Australia was not as strong as the relationship for reading literacy (the lines on the graph are flatter). The results suggest that schools may play a larger role in the development of mathematical and science skills than they do in reading skills.



The differences in boys' and girls' reading results in Australia have been described on the previous page. The chart on the left below shows that SES compounds the difference. Boys from low SES backgrounds in Australia were found to be almost twice as likely to be in the lowest quarter of reading literacy results than girls from similar backgrounds. The charts for mathematics and science also show a relationship between SES and the likelihood of achieving a low score, but this is the same for both boys and girls in science and not large enough to be significantly different in mathematics.

The charts across the bottom show the likelihood of achieving in the lowest quarter of scores for males and females according to their socioeconomic background.



## Achievement differences in relation to other student characteristics (continued)

*The following results relate to the Australian PISA data, not to the international data.*

Just over 500 *Indigenous students* participated in PISA. Two hundred of these were part of the national random sample and 300 were sampled in addition to the main sample. In total, their mean score in reading literacy was a little more than one proficiency level lower than the mean achieved by the non-Indigenous students. Their performance as a group was also lower than the non-Indigenous students' performance in mathematical and scientific literacy (the difference in mean performance was about 80 scale points in each case). However, some Indigenous students performed very well, and 40 per cent reached at least proficiency Level 3 in reading, a result indicating that they are more than adequately equipped in reading skills for full participation in society as adults.

Students in Australia who came from a *non-English speaking home background* performed at an equivalent level in mathematical literacy to students whose home language was English, but at a lower level, by about 30 scale points, in reading and scientific literacy.

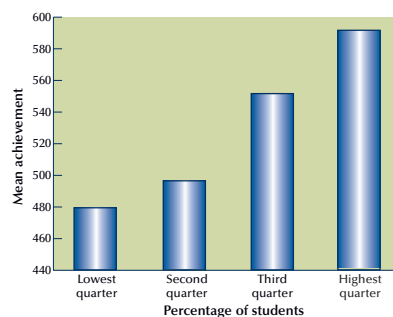
Students' results showed some differences according to the *location of their schools*.

Students in provincial cities performed as well as students in large cities and major urban areas, but students whose schools were in remote areas performed less well than other students in reading and scientific literacy. There was no difference in mathematical literacy results by location of school.

### *Other findings in Australia*

#### Students' attitudes

Australian students were at the same level as the OECD average in their *engagement with reading*. 'Engagement with reading' reflects how much they like reading, how much they enjoy talking about books, going to libraries, whether reading is a favourite hobby, and so on. As expected, girls scored significantly higher than boys in all countries on the engagement with reading index. A third of Australia's students said they never read for enjoyment. While this percentage was higher in a few other countries, the achievement difference in reading literacy between students who never read for enjoyment and those who read for an hour or two each day was greater in Australia than in any other country. The figure below shows the extent of relationship between reading literacy achievement and engagement with reading in Australia.

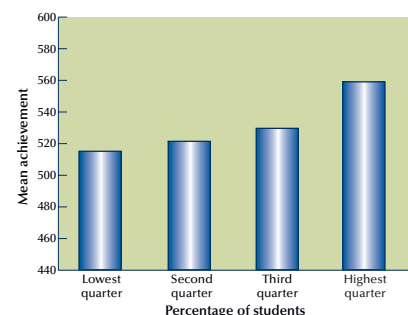


Australian students were no different from students in many countries in their attitude that school is a place where they do not want to go. Internationally, about a quarter of the PISA participants shared this belief. Australia's students on average were more negative about school than the OECD average.

On the other hand, Australian students were substantially above the OECD average in ratings they gave themselves for *ability in using computers and feeling comfortable about using them*. Students in the USA were higher than students in all other countries on this index. The five countries where students felt most comfortable with using computers were the United States, Canada, Australia, New Zealand and Belgium.

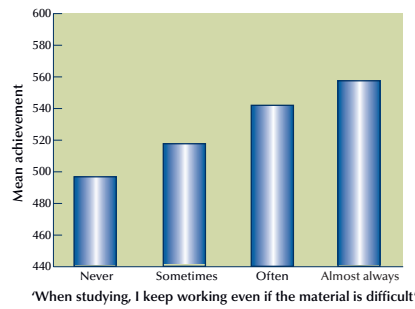
#### Students' study skills

PISA also collected data on how students managed their own learning, as an indication of how well they would be able to regulate their learning for themselves in the future. Three kinds of learning strategies were measured – the extent to which students *controlled* their learning, for example by setting goals and priorities; the extent to which they used *elaboration* strategies, for example by making the effort to integrate new learning with things they already knew; and the extent to which they learned by *memorising*. Each of these strategies was related to achievement in Australia, though relatively weakly. The Australian scores on the learning strategies scales were close to the OECD average except for memorising, which was substantially above the OECD average. The figure below shows the extent of relationship between use of control strategies in learning and reading achievement in Australia.



## Achievement differences in relation to other student characteristics (continued)

Some other questions asked students how much they persisted with their studies if they found them difficult. Preparedness to persevere was related to reading literacy achievement, as shown in the figure alongside.



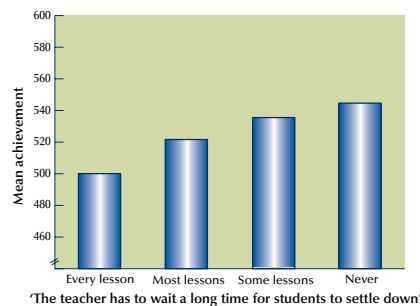
## Achievement differences in Australia in relation to school characteristics

The most important school factor related to achievement in Australia, as in most other countries, was the overall socioeconomic background of the student body.

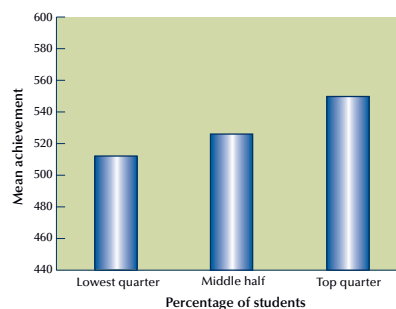
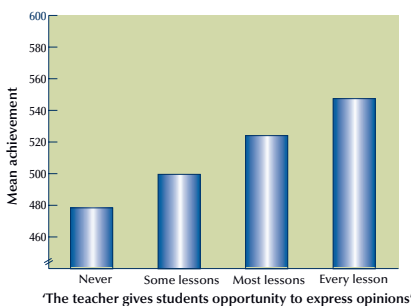
Some factors relating to instructional climate and practices at the schools were related to achievement, over and above the relationship of student-level variables and the SES of the school's student body. The graphs in this section illustrate the extent of relationship with reading achievement of some of the factors (without taking the school's average SES into account).

Internationally, Australia scored relatively high, together with the United Kingdom, on the index of teacher support, as perceived by students. One aspect of this index is shown in the figure below.

Australia's score on the positive disciplinary climate index was slightly below the OECD average. The relationship of reading achievement with one aspect of the index is illustrated in the figure below.



Almost all principals in Australia agreed or strongly agreed that teacher morale in their school was satisfactory to high. Australia's score on this index was at the OECD average. The figure below shows the relationship of positive teacher morale to reading achievement.



## Key findings internationally

- The association between family background and student performance differed a great deal from country to country. It was moderately strong in several countries, including Australia, less so in others. The relationship between family background and performance in reading literacy tended to be stronger than the corresponding relationship for mathematical literacy.
- Many students from disadvantaged backgrounds performed very well.
- Higher levels of parents' education and more social and cultural communication between students and their parents were associated with better student performance.
- Students from wealthier families tended to perform better than those from less wealthy families, but the relationship with possessions relating to classical culture was stronger.
- Living in a single-parent family tended to be associated with lower performance, but not in every country.
- Differences in performance between schools accounted for much of the variation in students' performance in some countries (for example, Austria), but for very little of the variation in others (for example, Australia, Finland, Iceland and Norway).
- The socioeconomic composition of a school's student population was a stronger predictor of student performance than individual home background in several countries (but not in Australia).
- Schools that were better resourced and had a more positive disciplinary climate tended to have students from more advantaged social backgrounds.
- Higher average spending per student tended to be associated with higher average performance at country level in the three areas of literacy, but this was not always the case. (Collection of data on per pupil expenditure was not within the scope of PISA in Australia; the OECD used its own data on expenditure per country for this analysis.)
- Students' use of school resources was more closely related to performance than was the physical infrastructure of the school.
- The ratio of students to teachers was associated with achievement in some countries, but not in others (including Australia).
- Teacher-related factors affecting school climate (for example, absenteeism), teacher morale and extent of school autonomy tended to be associated with better performance.
- As perceived by students, teacher-student relations, a positive disciplinary climate and pressure on students to achieve tended to be positively associated with student performance.
- Higher amounts of homework done were associated with higher achievement levels (including in Australia).

## Main policy messages from PISA for Australia

- While Australian students' results in PISA were good to excellent, there are some aspects that are cause for concern.
- The relationship between socioeconomic background and achievement in reading is higher in Australia than in the majority of countries. The continued provision of supplementary programs to improve the skills of students who are struggling, many of whom will have come from disadvantaged backgrounds, needs to be high on our educational agenda.



## Main policy messages from PISA for Australia (continued)

- The PISA reading results reinforce current concerns about the achievement of boys compared with girls in Australia, as elsewhere. Boys are substantially over-represented at the lowest reading proficiency levels and under-represented at the highest level in Australia. To raise Australia's achievement in reading, raising the performance of boys will be just as important as raising the performance of students from disadvantaged backgrounds.
- Boys' performance was particularly poor on assessment items associated with 'continuous' texts (for example, narrative texts). Boys do not read for pleasure as much as girls do, and they show a lesser engagement with reading in other ways as well, for example in their reading preferences. Attitudes towards reading were moderately strongly related to reading achievement in Australia. The challenge for Australian educators is to provide programs that are interesting and stimulating, to help students with poor attitudes to reading to begin to like reading and to want to engage in reading more than they currently do.
- Indigenous students as a group will continue to need extra support to raise the students' achievement levels, but PISA has shown that some Indigenous students perform well and many have more than adequate literacy skills for full participation in adult life.
- Higher amounts of homework done were associated with higher achievement in Australia, as in many countries. The PISA results indicate that schools and parents should be encouraging students to do their homework as a way of enhancing students' achievement.
- Apart from amount of homework, the most important school-level factors in Australia were found to be teacher morale (as perceived by principals), and disciplinary climate and teacher support (as perceived by students). Higher teacher morale, a more positive disciplinary climate and greater amounts of support offered by teachers to their students were all associated with higher levels of achievement in more than one domain. These are all factors that education systems and schools can do something about. Some are aspects of pedagogy, and suggest that it might be important to provide teachers with opportunities for refresher courses or other forms of professional development to help them keep their skills up-to-date. Allowing a little time away from the classroom would introduce an element of variety, and could help teachers maintain their enthusiasm and morale in both their own interests and the interests of their students.