2

Viewing Education in Korea Through the Prism of PISA

Ever since the first PISA assessment was launched in 2000, Korea has remained at or near the top of international assessments of student learning. This chapter reviews Korean students' performance in PISA 2009. It also examines some of the key issues that PISA results demonstrate, such as spending on education, the relationship between socio-economic background and performance, equity in learning opportunities, students' attitudes towards learning, digital literacy and the learning environment.

Korea has been at or near the top of the PISA assessments since the first survey in 2000. The country's education system rests on a deep commitment to children, strong family support, and the belief that effort, not innate ability, is what leads to success. In addition to providing an in-depth description of this system, this chapter reviews the performance of Korean students in PISA 2009 and examines trends in performance since 2000. The chapter also discusses some of the key features of the Korean education system: how the system is organised, how much is spent on education, how equitable the system is with respect to learning opportunities and learning outcomes, and the attitudes Korean students have towards learning.

CONSISTENTLY HIGH MEAN PERFORMANCE AMONG 15-YEAR-OLDS

Ever since the first PISA assessment was launched in 2000, Korea has remained at or near the top of international assessments of student learning. Korea's performance in the 2009 PISA was as impressive as it was in the first PISA assessment in 2000 (Table 2.1).

Table 2.1 Korea's mean score in PISA reading, mathematics and science

	PISA 2000	PISA 2003	PISA 2006	PISA 2009
	Mean score	Mean score	Mean score	Mean score
Reading	525	534	556	539
Mathematics		542	547	546
Science			522	538

Source: Tables V.2.1, V.3.1 and V.3.4 in OECD, 2010 *PISA 2009 Results: Learning Trends*.

In the PISA 2009 assessment of 15-year-olds, Korea is the top-performing OECD country in reading (rank 1[1]) and mathematics (rank 1[2]) and among the top-performing OECD countries in science (rank 3[3]) (see Figures I.2.15, I.3.10 and I.3.21 in OECD, 2010a). In reading, Finland and Hong Kong-China perform at the same level as Korea; in mathematics, Finland, Liechtenstein, Hong Kong-China and Chinese Taipei show performance levels similar to that of Korea; and in science, Japan, New Zealand and Singapore perform at the same level as Korea.

The gender gap in reading is smaller in Korea than the OECD average: Korean girls outperform boys in reading by an average of 35 points, while across the OECD this figure is 39 points (Table I.2.3 in OECD, 2010a). However, Korean boys and girls tend to perform at similarly high levels in science and mathematics (Tables I.3.3 and I.3.6 in OECD, 2010a).

Table 2.2 Comparing countries' performance in reading

Statistically significantly above *the OECD average*

Mean	Comparison country	Countries whose mean score is NOT statistically significantly different from that of the comparison country
556	Shanghai-China	
539	**Korea**	Finland, Hong Kong-China
536	Finland	Korea, Hong Kong-China
533	Hong Kong-China	Korea, Finland
526	Singapore	Canada, New Zealand, Japan
524	Canada	Singapore, New Zealand, Japan
521	New Zealand	Singapore, Canada, Japan, Australia
520	Japan	Singapore, Canada, New Zealand, Australia, Netherlands
515	Australia	New Zealand, Japan, Netherlands
508	Netherlands	Japan, Australia, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany
506	Belgium	Netherlands, Norway, Estonia, Switzerland, Poland, United States, Liechtenstein
503	Norway	Netherlands, Belgium, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France
501	Estonia	Netherlands, Belgium, Norway, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
501	Switzerland	Netherlands, Belgium, Norway, Estonia, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
500	Poland	Netherlands, Belgium, Norway, Estonia, Switzerland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
500	Iceland	Netherlands, Norway, Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Hungary
500	United States	Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
499	Liechtenstein	Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, United States, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
503	Denmark	Iceland, Slovenia, Norway, France, Slovak Republic
501	Slovenia	Denmark, Norway, France, Slovak Republic, Austria

Note: The table shows country comparisons only for those countries that performed above the OECD average in reading in 2009. Figure I.2.15 in OECD, 2010a shows comparisons for all countries that took part in PISA 2009.

Source: OECD, (2010a).

Table 2.3 Comparing countries' performance in mathematics

Statistically significantly above *the OECD average*

Mean	Comparison country	Countries whose mean score is NOT statistically significantly different from that of the comparison country
600	Shanghai-China	
562	Singapore	
555	Hong Kong-China	Korea
546	**Korea**	Hong Kong-China, Chinese Taipei, Finland, Liechtenstein
543	Chinese Taipei	Korea, Finland, Liechtenstein, Switzerland
541	Finland	Korea, Chinese Taipei, Liechtenstein, Switzerland
536	Liechtenstein	Korea, Chinese Taipei, Finland, Switzerland, Japan, Netherlands
534	Switzerland	Chinese Taipei, Finland, Liechtenstein, Japan, Canada, Netherlands
529	Japan	Liechtenstein, Switzerland, Canada, Netherlands, Macao-China
527	Canada	Switzerland, Japan, Netherlands, Macao-China
526	Netherlands	Liechtenstein, Switzerland, Japan, Canada, Macao-China, New Zealand
525	Macao-China	Japan, Canada, Netherlands
519	New Zealand	Netherlands, Belgium, Australia, Germany
515	Belgium	New Zealand, Australia, Germany, Estonia
514	Australia	New Zealand, Belgium, Germany, Estonia
513	Germany	New Zealand, Belgium, Australia, Estonia, Iceland
512	Estonia	Belgium, Australia, Germany, Iceland
507	Iceland	Germany, Estonia, Denmark
503	Denmark	Iceland, Slovenia, Norway, France, Slovak Republic
501	Slovenia	Denmark, Norway, France, Slovak Republic, Austria

Note: The table shows country comparisons only for those countries that performed above the OECD average in mathematics in 2009. Figure I.3.10 in OECD, 2010a shows comparisons for all countries that took part in PISA 2009.

Source: OECD, (2010a).

Table 2.4 Comparing countries' performance in science

Statistically significantly above *the OECD average*

Mean	Comparison country	Countries whose mean score is NOT statistically significantly different from that of the comparison country
575	Shanghai-China	
554	Finland	Hong Kong-China
549	Hong Kong-China	Finland
542	Singapore	Japan, Korea
539	Japan	Singapore, Korea, New Zealand
538	**Korea**	Singapore, Japan, New Zealand
532	New Zealand	Japan, Korea, Canada, Estonia, Australia, Netherlands
529	Canada	New Zealand, Estonia, Australia, Netherlands
528	Estonia	New Zealand, Canada, Australia, Netherlands, Germany, Liechtenstein
527	Australia	New Zealand, Canada, Estonia, Netherlands, Chinese Taipei, Germany, Liechtenstein
522	Netherlands	New Zealand, Canada, Estonia, Australia, Chinese Taipei, Germany, Liechtenstein, Switzerland, United Kingdom, Slovenia
520	Chinese Taipei	Australia, Netherlands, Germany, Liechtenstein, Switzerland, United Kingdom
520	Germany	Estonia, Australia, Netherlands, Chinese Taipei, Liechtenstein, Switzerland, United Kingdom
520	Liechtenstein	Estonia, Australia, Netherlands, Chinese Taipei, Germany, Switzerland, United Kingdom
517	Switzerland	Netherlands, Chinese Taipei, Germany, Liechtenstein, United Kingdom, Slovenia, Macao-China
514	United Kingdom	Netherlands, Chinese Taipei, Germany, Liechtenstein, Switzerland, Slovenia, Macao-China, Poland, Ireland
512	Slovenia	Netherlands, Switzerland, United Kingdom, Macao-China, Poland, Ireland, Belgium
511	Macao-China	Switzerland, United Kingdom, Slovenia, Poland, Ireland, Belgium
508	Poland	United Kingdom, Slovenia, Macao-China, Ireland, Belgium, Hungary, United States
508	Ireland	United Kingdom, Slovenia, Macao-China, Poland, Belgium, Hungary, United States, Czech Republic, Norway
507	Belgium	Slovenia, Macao-China, Poland, Ireland, Hungary, United States, Czech Republic, Norway, France

Note: The table shows country comparisons only for those countries that performed above the OECD average in science in 2009. Figure I.3.21 in OECD, 2010a shows comparisons for all countries that took part in PISA 2009.

Source: OECD, (2010a).

Despite major financial investments in education in the past decade, the OECD's average reading performance has remained largely unchanged since 2000 among the 26 OECD countries that had comparable results in the 2000 and 2009 assessments. However, the 2009 PISA assessment revealed remarkable improvements in the reading performance of 15-year-olds in Korea. In 2000, with an average PISA reading performance of 525 score points (Table V.2.1 in OECD, 2010b), Korea was already performing above the OECD average. At that time, several countries had similar or even higher performance levels, including Australia, Canada, Ireland, Japan, New Zealand and Finland, the highest-performing country that year. Nine years later, Finland retained its top performance level, but Korea outperformed all of the other abovementioned countries. Korea's experience demonstrates that even at the highest performance level, further improvements are possible (Figure 2.1).

At the turn of the new millennium Korean policy makers considered that students' skills needed further improvement to meet the changing demands of an internationally competitive labour market. One approach was to shift the focus of the Korean Language Arts Curriculum from proficiency in grammar and literature to skills and strategies needed for creativity and critical understanding and representation, similar to the approach underlying PISA (OECD, 2010). Diverse teaching methods and materials were developed that reflected those changes, and investments were made in related digital and Internet infrastructure.

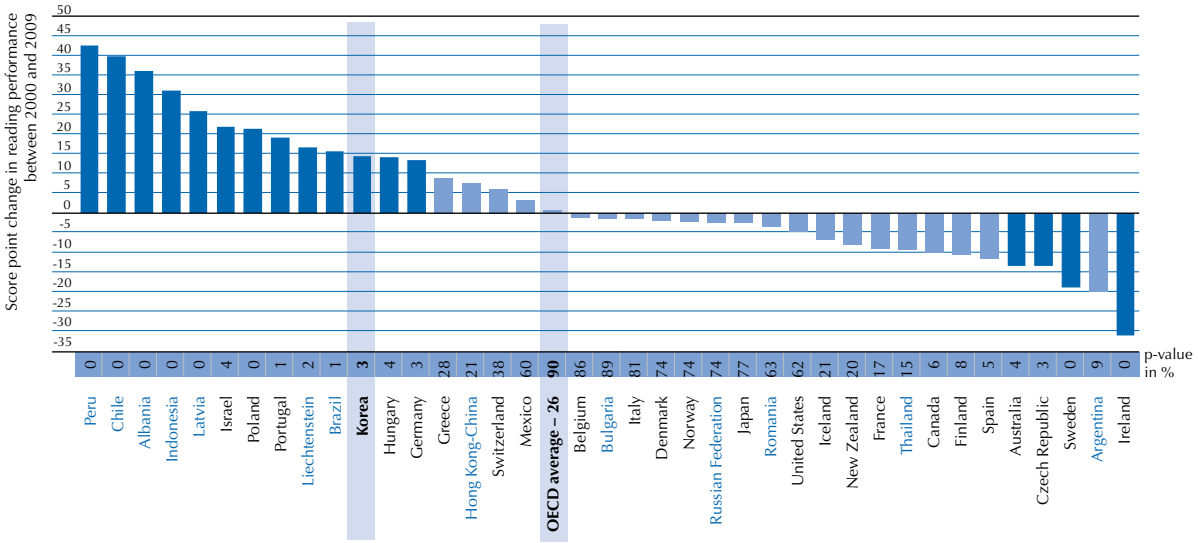
The Korean government also recognised that reading is a key competence for the 21st century, and it consequently developed and implemented reading-related policies. Training programmes for reading teachers were developed and distributed. Parents were encouraged to participate more in school activities. They were also given information on how to support their children's schoolwork. In addition, socio-economically disadvantaged students were given support through various after-school reading, writing and mathematics courses that had been put in place at the end of the 1990s.

The new "National Human Resources Development Strategies for Korea" defined policy objectives and implementation strategies. As part of these strategies, and following Korea's experiences with PISA and other instruments, the government established the National Diagnostic Assessment of Basic Competency (NDABC) and strengthened the National Assessment of Educational Achievement (NAEA) as measurement tools for monitoring the quality of students' educational achievement. These instruments were used to ensure that all students had attained basic competencies. The NDABC was implemented as a diagnostic tool in 2002 to measure basic competency in reading, writing and mathematics among third-grade students. These tools are now used locally to diagnose the progress of elementary and middle-school students across different subjects. The NAEA programme was introduced in 1998. Following changes in education policy in 2003, the programme expanded its subject and grade coverage. Since 2008, NAEA became a CENSUS data and assesses educational achievement and trends for 6th-, 9th- and 11th-grade students in Korean Language Arts, social studies, mathematics, science and English, but changed to 9th- and 11th-grade students in Korean Language Arts, mathematics, and English from 2013 abolishing the test for 6th-grade.

The gender gap in reading widened by 21 score points in Korea (OECD, 2010b), mainly because of a marked improvement in girls' performance that was not matched by a similar trend among boys. The improvement in girls' reading performance was mirrored by the improvement of girls in other assessment areas covered by PISA and other international and national studies. While the gender gap in mathematics and science (in favour of boys) has been narrowing for a number of years in Korea because of improvements among girls, PISA 2009 results show that the gender gap in reading has become even wider, again, because of large improvements among girls. National assessments show that the number of girls performing at the highest levels has been gradually increasing since 2002 (Figure 2.2).

■ Figure 2.1 ■

Change in reading performance between 2000 and 2009



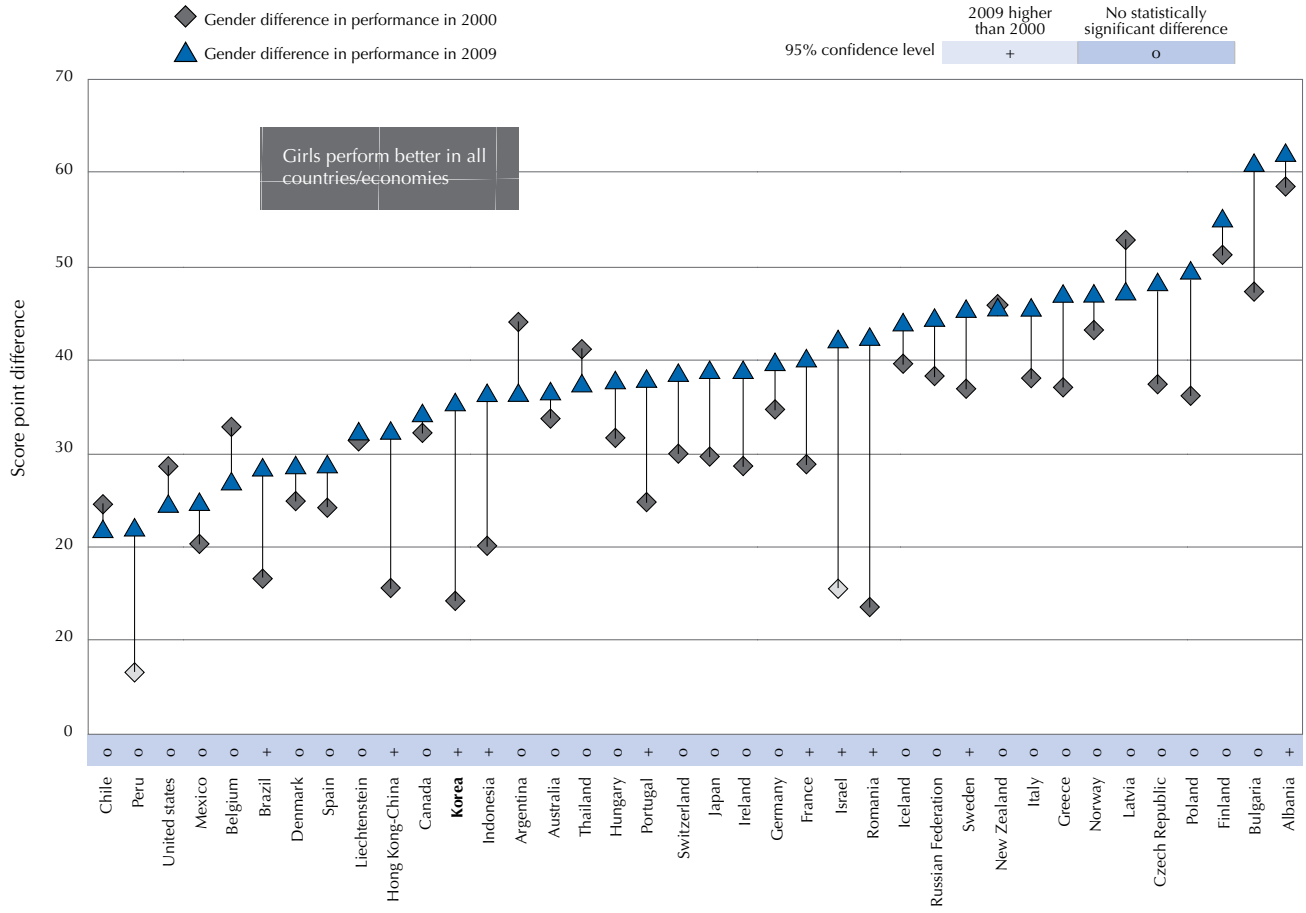
Note: Statistically significant score point changes are marked in a darker tone.

Countries are ranked in descending order of the score point change in reading performance between 2000 and 2009.

Source: OECD, PISA 2009 Database.

■ Figure 2.2 ■

Comparison of gender differences in reading between 2000 and 2009



Notes: All gender differences in PISA 2009 are significant. Gender differences in 2000 that are statistically significant are marked in a darker tone.
Countries are ranked in ascending order of gender differences (girls - boys) in 2009.
Source: OECD, PISA 2009 Database, Table V.2.4

RELATIVE SHARES OF TOP-PERFORMING STUDENTS: ABOVE THE OECD AVERAGE AND, IN READING, AN INCREASE OVER TIME

In 2009 students in Korea did well at the very highest levels of proficiency (Levels 5 and 6) in reading and, to a lesser extent, in science. Around 12.9% of students in Korea are top performers in reading (the OECD average is 7.6%); 25.6% are top performers in mathematics (the OECD average is 12.7%); and 11.6% are top performers in science, compared with the OECD average of 8.5% (Figures 2.3, 2.4 and 2.5).

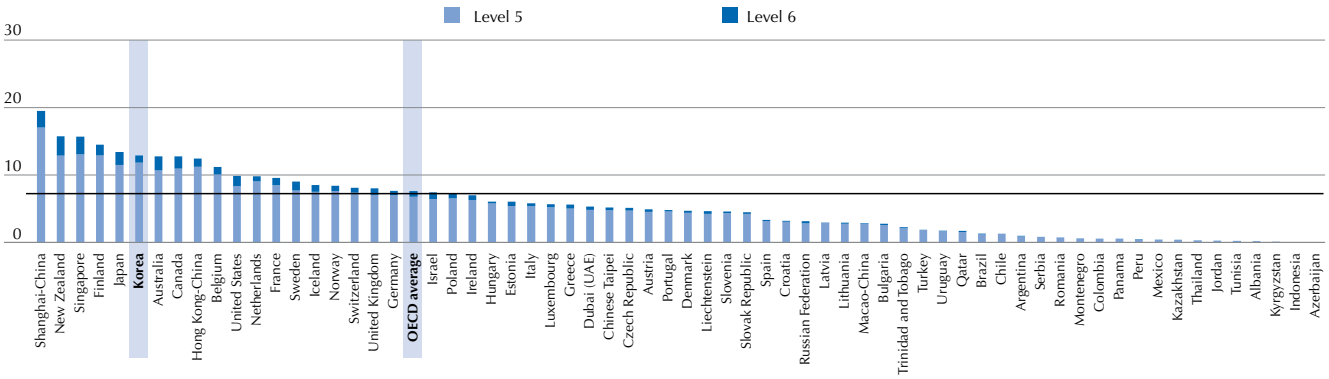
Top performers combine a capacity to absorb new information and evaluate it – a mix that is greatly valued in knowledge economies that depend on innovation and nuanced decision-making that draw on all available evidence. In 2000, despite a very high mean performance in reading, only a small proportion of Korea's students were top performers compared to other high-performing countries such as Australia, Canada, Finland and New Zealand. Between 2000 and 2009 the proportion of top performers in reading increased dramatically in Korea while it declined in Australia, Canada, Finland and New Zealand. In 2000 only 5.7% of students in Korea performed at Level 5 or above in the PISA reading scale, compared to 18.7% in New Zealand, 18.5% in Finland, 17.6% in Australia and 16.8% in Canada. By 2009 this proportion had grown by around seven percentage points in Korea. The only other country with a similar, but weaker trend, was Japan, whose proportion of top performers grew by around three percentage points during the same period (see Table V.2.2 of OECD, 2010b).

The remarkable increase in the proportion of Korean 15-year-olds who can achieve the highest levels of reading proficiency can be traced to specific policies implemented to ensure that Korean youth are well-equipped to compete in the global, knowledge-based marketplace. One such policy introduced higher standards and the demand for language literacy. Korean Language Arts have been

■ Figure 2.3 ■

What percentage of students are high performers in reading?

Percentage of students at Proficiency Levels 5 and 6



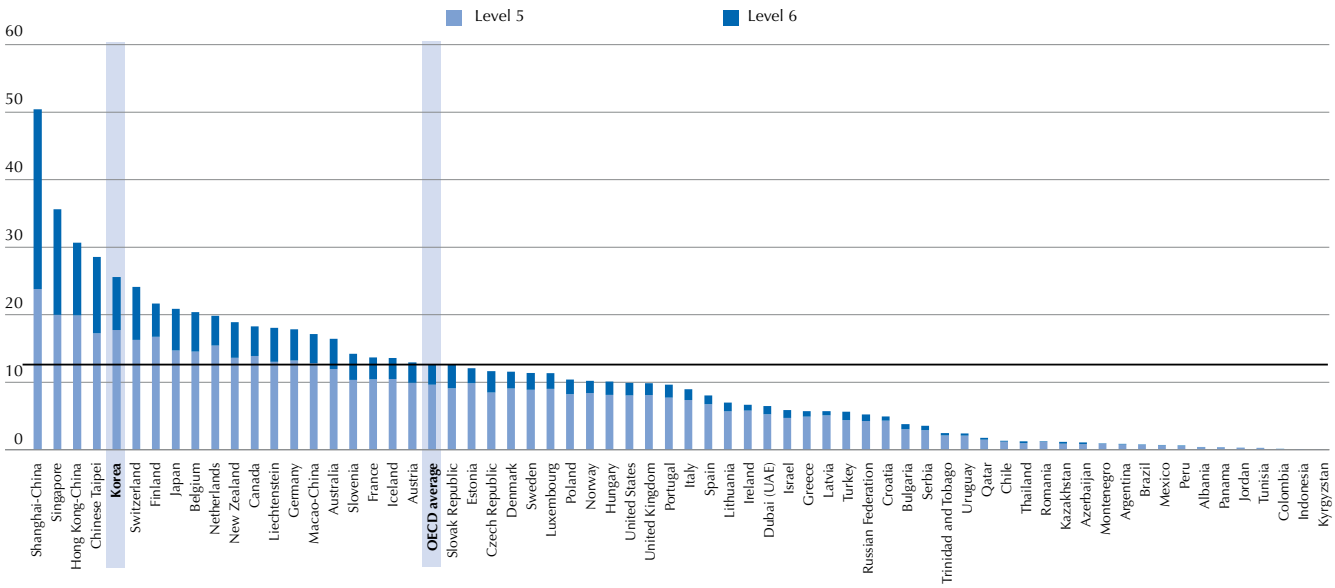
Note: Countries are ranked in descending order of the percentage of students at Levels 5 and 6.

Source: OECD, PISA 2009 Database, Table I.2.1.

■ Figure 2.4 ■

What percentage of students are high performers in mathematics?

Percentage of students at Proficiency Levels 5 and 6



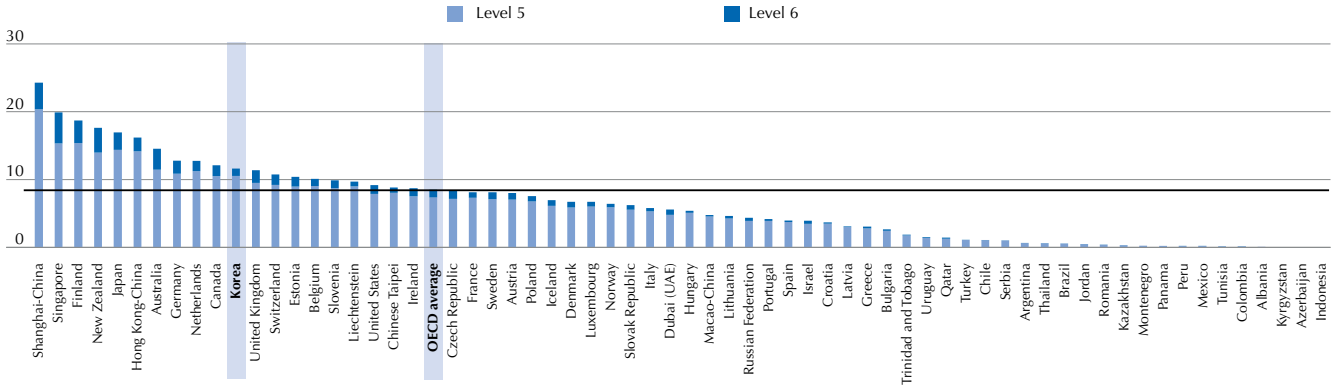
Note: Countries are ranked in descending order of the percentage of students at Levels 5 and 6.

Source: OECD, PISA 2009 Database, Table I.3.1.

■ Figure 2.5 ■

What percentage of students are high performers in science?

Percentage of students at Proficiency Levels 5 and 6



Note: Countries are ranked in descending order of the percentage of students at Levels 5 and 6.

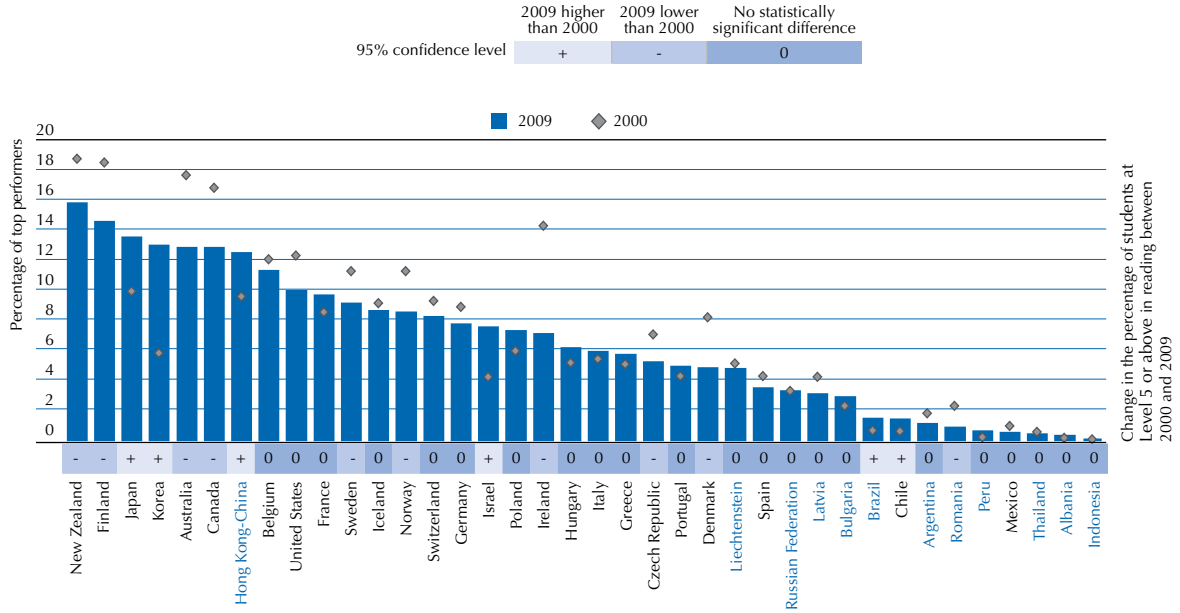
Source: OECD, PISA 2009 Database, Table I.3.4.

strengthened in the College Scholastic Ability Test (CSAT), which students must take to be admitted to university. Depending on what subjects they intend to study at university and in their future careers, students generally select five to seven subjects on the assessment. However, almost all top-ranking universities focus on Korean Language Arts, mathematics and English. The reading domain of Korean Language Arts, in particular, is the largest and most important part of this assessment, while NAEA/NDABC tend to evaluate the five domains of the Korean Language Arts Curriculum – listening, reading, writing, literature, and grammar – equally. This provides additional incentives for high-achieving students in Korea to spend more time studying the language arts and also mathematics and science.

The increase in the proportion of top-performers in reading was seen among both boys and girls; however it was particularly steep among girls, thus widening the gender gap in reading among the highest achievers (see Table V.2.2. in OECD, 2010b). The

■ Figure 2.6 ■

Percentage of top performers in reading in 2000 and 2009

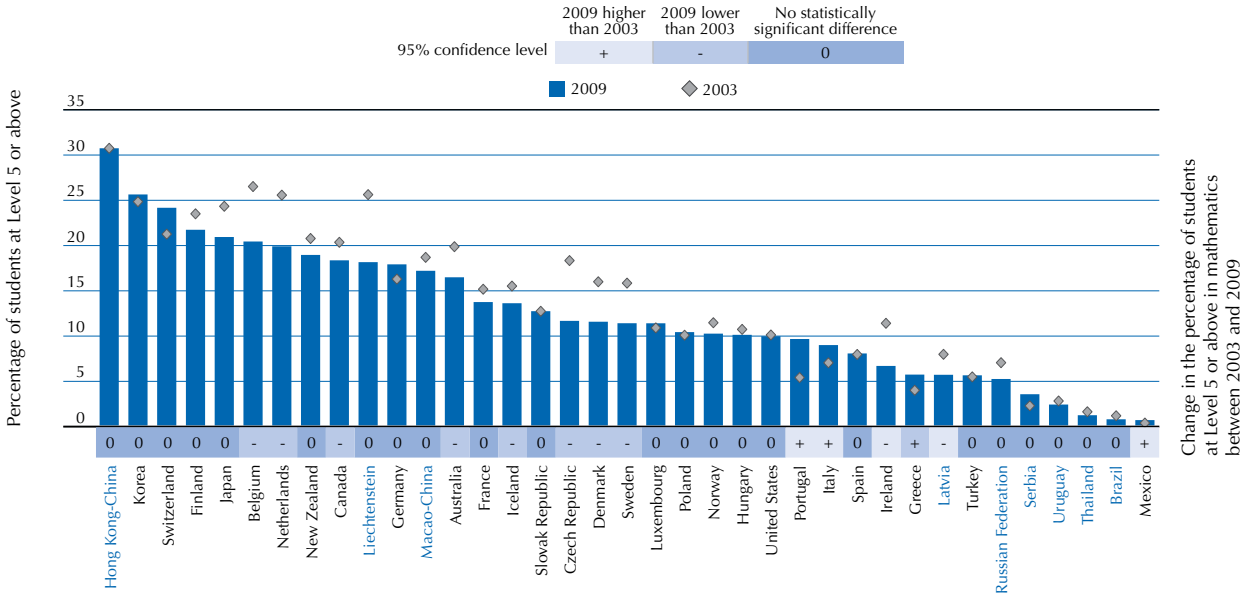


Note: Countries are ranked in descending order of top performers in reading in 2009.

Source: OECD, PISA 2009 Database, Table V.2.2.

■ Figure 2.7 ■

Percentage of top performers in mathematics in 2003 and 2009



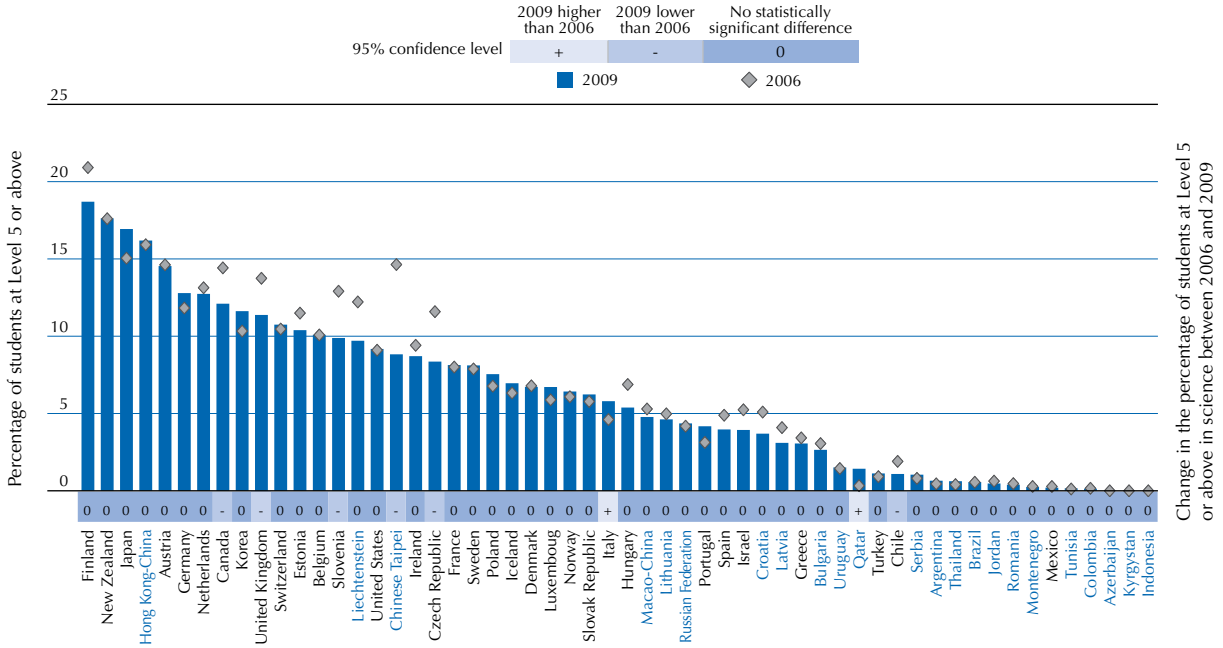
Note: Countries are ranked in descending order of students at proficiency Level 5 or 6 in mathematics in 2009.

Source: OECD, PISA 2009 Database, Table V.3.2

percentage of top performers among girls increased by more than nine percentage points, while among boys it rose by slightly less than five percentage points. Several changes could be associated with the more positive trend among girls. A more girl-friendly science and mathematics curriculum has been gradually introduced in Korea. For instance, women who were scientists or engineers were promoted and thus became good role models for girls. In addition, a more gender-neutral language was adopted in textbooks, and learning materials that were considered to be more interesting for girls were introduced in science teaching.

■ Figure 2.8 ■

Percentage of top performers in science in 2006 and 2009



Note: Countries are ranked in descending order of students at Level 5 or above in science in 2009.

Source: OECD, PISA 2009 Database, Table V.3.5.

The trend may also be explained partly by changes in a society. Over the past few years, the family structure in Korea has changed as the number of children per household decreased and the number of single-child families increased. While traditionally girls from larger families were unlikely to get a good education, sociologists note that parents in Korea today tend to value educating their children a great deal, regardless of gender. Smaller families, together with new opportunities and incentives for learning, may also explain this trend (OECD, 2011a).

LOW PROPORTION OF POOR-PERFORMING STUDENTS: CONSISTENTLY AMONG THE LOWEST IN THE OECD (WITH A DECLINE IN SCIENCE)

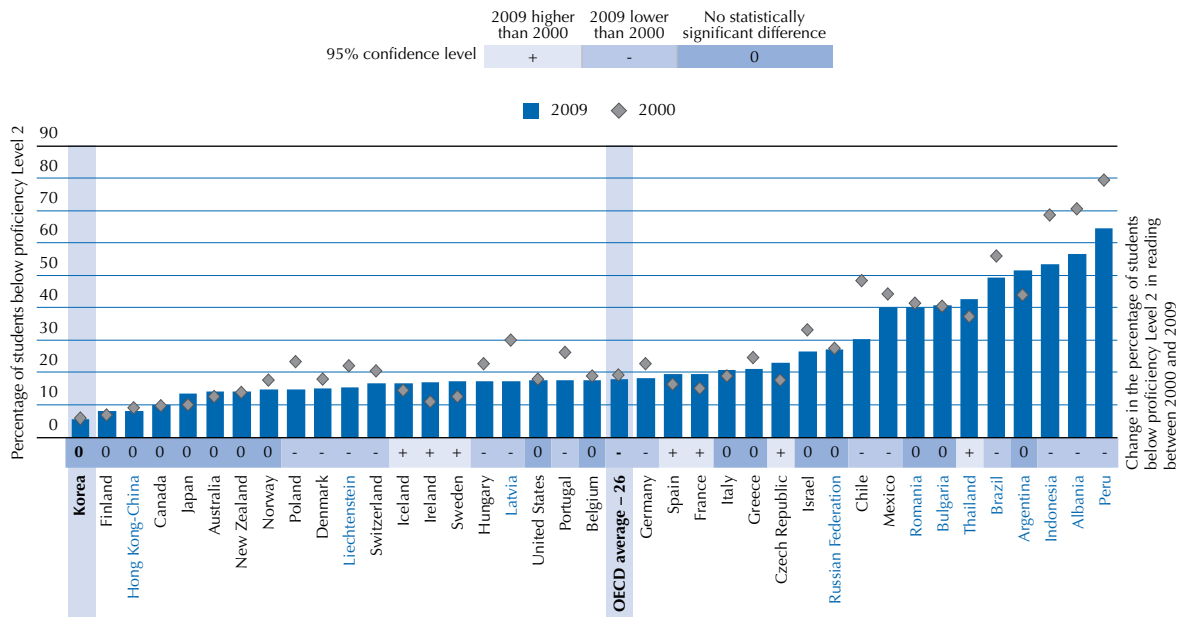
In 2009, in Korea, fewer than 6% of 15-year-olds did not reach the PISA baseline Level 2 of reading proficiency, the lowest proportion among OECD countries, where, on average, around 19% of students failed to reach baseline proficiency. Only in Shanghai-China was the proportion of 15-year-olds who perform poorly in reading lower than in Korea. Similarly, in 2009, only 8% of students in Korea did not reach the baseline proficiency Level 2 in mathematics and 6% did not reach that level in science, the second lowest percentage among OECD countries (after Finland) and third lowest among PISA 2009 participating countries and economies (after Finland and Shanghai-China) (Figures 2.9, 2.10 and 2.11).

No longitudinal data are available showing the outcomes of poor-performing and top-performing students in PISA. However, such data are available for Canada and results based on longitudinal data from Canada help to identify the risks faced by poor-performing students when they leave compulsory schooling. A follow-up of students who were assessed by PISA in 2000 as part of the Canadian Youth in Transitions Survey shows that students scoring below Level 2 face a disproportionately higher risk of poor post-secondary participation or low labour-market outcomes at age 19, and even more so at age 21, the latest age for which data are currently available. For example, the odds that Canadian students who had reached PISA Level 5 in reading at age 15 would make a successful transition to post-secondary education by age 21 were 20 times higher than for those who had not achieved baseline proficiency Level 2, even after adjusting for socio-economic differences (OECD, 2010c).[5] Similarly, of the Canadian students who performed below Level 2 in 2000, over 60% had not gone on to any post-compulsory education by the age of 21.

In 2006, Korea was already one of the countries with a below-average proportion of students who performed below Level 2 in science; in 2009, only Poland and Korea, among countries with a below-average proportion of poor-performing students, succeeded in reducing this proportion further, by four and five percentage points, respectively. Poland reduced the percentage of lowest performers from 17% to 13%, while Korea reduced it from 11% to 6%.

■ Figure 2.9 ■

Percentage of poor performers in reading in 2000 and 2009

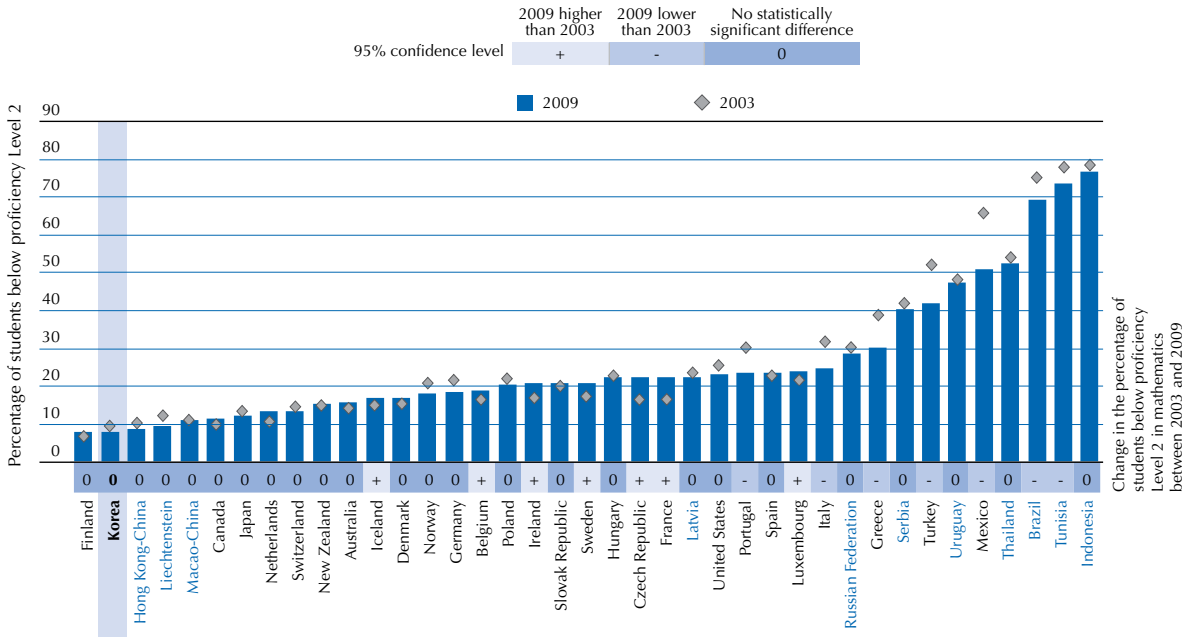


Note: Countries are ranked in ascending order of the percentage of students below proficiency Level 2 in reading in 2009.

Source: OECD, PISA 2009 Database, Table V.2.2.

■ Figure 2.10 ■

Percentage of poor performers in mathematics in 2003 and 2009



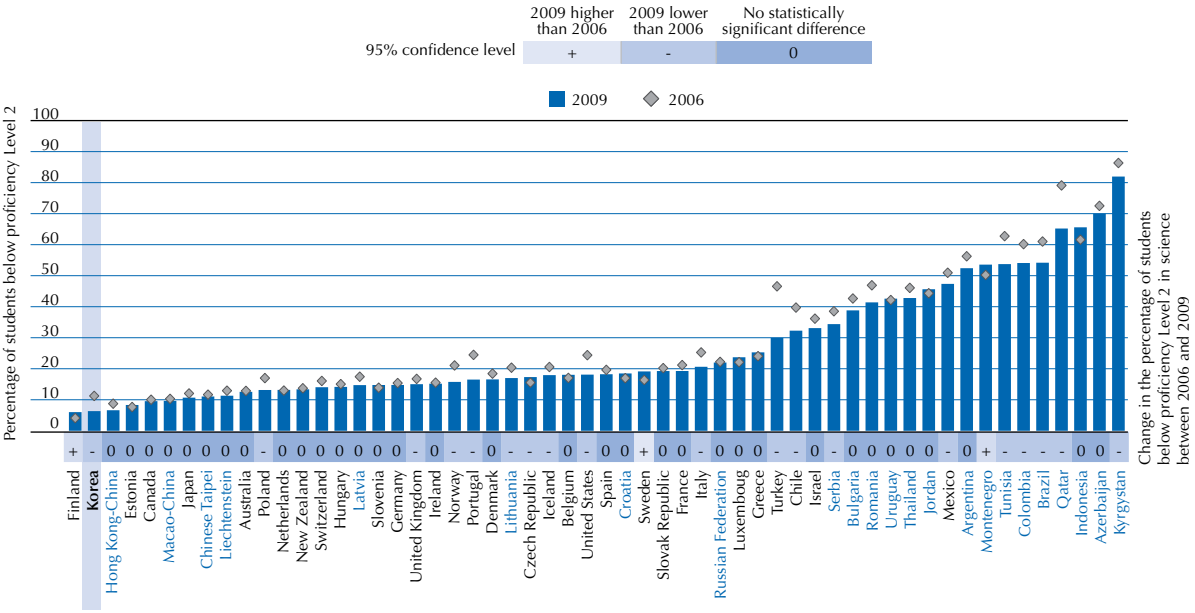
Note: Countries are ranked in ascending order of the percentage of students below proficiency Level 2 in mathematics in 2009.

Source: OECD, PISA 2009 Database, Table V.3.2

While the proportion of top-performing students in reading grew dramatically between 2000 and 2009, the proportion of poor-performing students in science declined in Korea between 2006 and 2009. This improvement in skills was not matched by an increase in the proportion of top-performers in science. The 2006 PISA science assessment indicated a somewhat poorer performance in science compared to the 2003 assessment, which prompted policy makers in Korea to reinforce the modern science in school programmes. Although the number of Korean students who performed below Level 2 in both mathematics and science was very small compared to that of other countries, Korean officials considered the overall level of science performance to be relatively low compared to other high-performing countries, and recognised the importance of investing in science skills.

■ Figure 2.11 ■

Percentage of poor performers in science in 2006 and 2009



Note: Countries are ranked in ascending order of the percentage of students below proficiency Level 2 in science in 2009.

Source: OECD, PISA 2009 Database, Table V.3.5

In 2007, the Korean government decided to merge the Ministry of Science and Technology and the Ministry of Education, and to improve and strengthen science education in order to enhance creativity and problem-solving skills. Measures that have been undertaken involve different activities, including providing new mathematics and science textbooks that are more comprehensible and more interesting for students, and using teaching methods that encourage experimenting and inquiry-oriented science education. Recent improvements in science performance, especially among the lowest-performing students, could be associated with these latest policy changes. Nevertheless, greater improvements are expected at all performance levels once the new policy is fully implemented.

KOREA: A FAVOURABLE CONTEXT FOR STUDENT ACHIEVEMENT

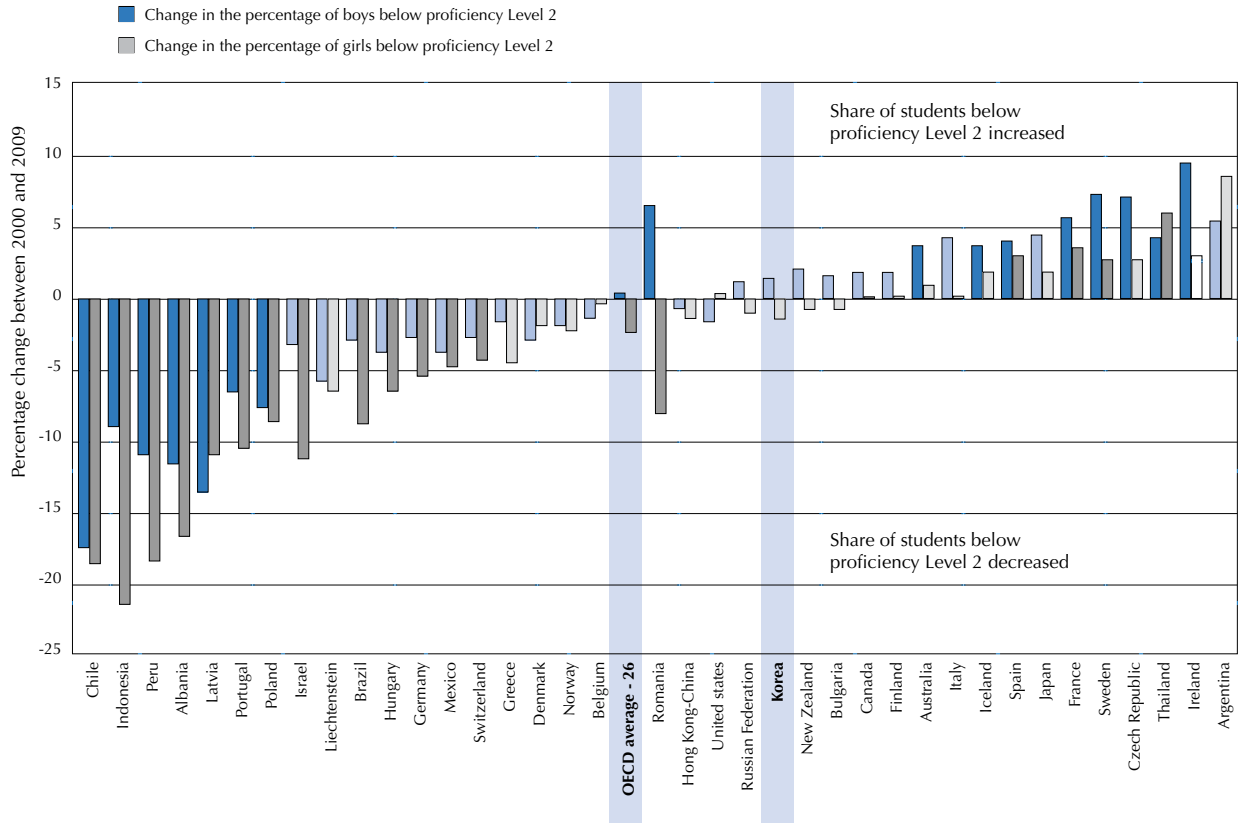
Countries vary greatly in their demographic, social and economic contexts. These differences need to be taken into account when interpreting Korea's performance against that of other countries.

In terms of national income level, Korea ranks 22nd of the 34 OECD countries on GDP per capita (Table I.2.20 and Figure I.2.1 in OECD, 2010a) but performs significantly better in reading, mathematics and science than that would be expected given its level of GDP per capita. This is because only 6% of the variation among OECD countries' mean scores is predicted by their GDP per capita. While GDP per capita reflects the potential resources available for education in each country, it does not directly measure the financial resources actually invested in education.

Results from PISA suggest that the Korean education system has produced strong results, and that overall expenditures on educational institutions as a percentage of GDP increased sharply between 2000 and 2009. While GDP rose over the period, absolute expenditures increased even more dramatically, resulting in an overall increase in expenditures as a percentage of GDP. In Korea, expenditure on primary, secondary and post-secondary non-tertiary students by educational institutions increased by 89% between 2000 and 2009, which is remarkable given that student enrolment declined by 6% over the same period. These two trends resulted in an increase of 102% in expenditure per student over the 2000-09 period, the 4th largest increase among 29 countries with available data.

■ Figure 2.12 ■

Percentage of poor performing boys and girls in reading in 2000 and 2009



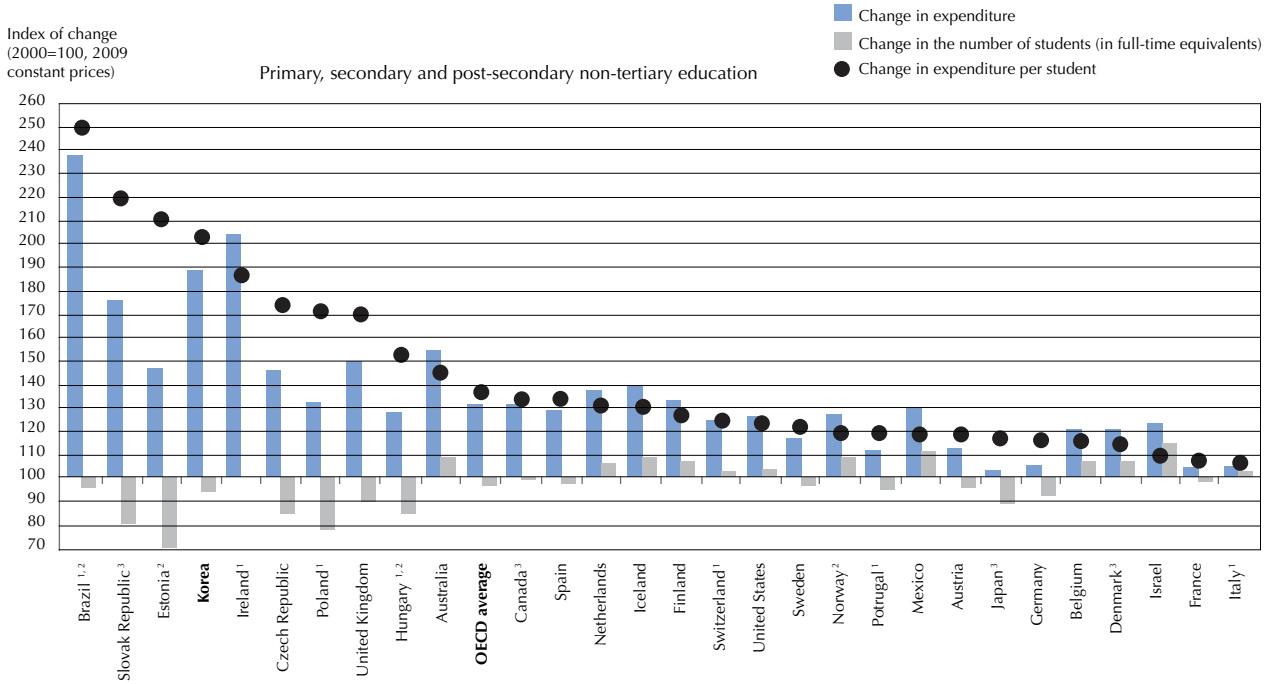
Note: Changes in the share of students below proficiency Level 2 that are statistically significant are marked in a darker tone. Countries are ranked in ascending order of change in the percentage of all students below Level 2 on the reading scale between 2000 and 2009.

Source: OECD, PISA 2009 Database, Table V.2.2, Table V.2.5 and Table V.2.6

■ Figure 2.13 ■

Changes in the number of students and changes in expenditures per student

Changes in the number of students and changes in expenditure per student by educational institutions, by level of education (2000, 2009)



1. Public institutions only.
2. Public expenditure only.
3. Some levels of education are included with others. Refer to «x» code in Table B1.1a for details.

Note: Countries are ranked in descending order of change in expenditure per student by educational institutions.

Source: OECD, 2012. Tables B1.5a and B1.5b. See Annex 3 for notes (*www.oecd.org/edu/eag2012*).

In a comparison of countries' average actual spending per student from the age of 6 to the age of 15, Korea ranks 22nd of the 34 OECD countries. However, expenditure per student explains only around 9% of the variation between OECD countries in PISA mean performance (Figures 2.19 and 2.20). Korea's deviation upwards from the trend line suggests that it performs better than would be expected from its spending on education per student.

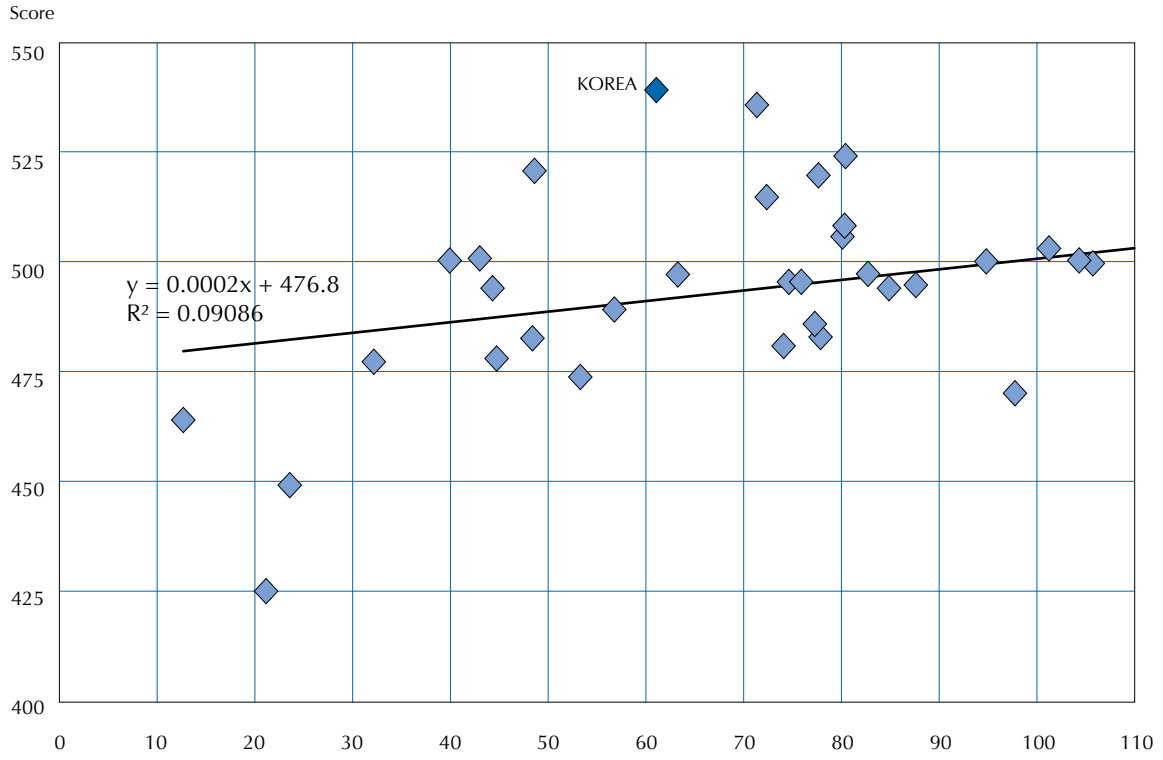
Private funding for education is substantial in Korea and has been growing over the years, partially fuelled by economic and demographic changes. In the context of this report private funding reflects the definition taken in Education at a Glance 2012 (OECD, 2012a). Families have fewer children and they enjoy better living standards because of the rapid pace of economic growth in the country. These two factors have meant that families are increasingly willing to invest in their children's education and to ensure that they have the best educational opportunities to help them to gain access to the country's highly competitive tertiary institutions – which are also associated with better labour-market prospects and overall life chances.

Between 2000 and 2009, the share of private funding for primary and lower secondary education in Korea increased by 4.6 percentage points to reach 23.8%. This is the largest percentage among OECD countries and stands 15 percentage points above the OECD average. On the other hand, the proportion of public funding for primary and lower secondary education is smaller than the OECD average (76% as compared with the OECD average of 91%). While Korea increased its public expenditure on primary and lower secondary education by 78%, private funding increased by 134% between 2000 and 2009.

In general, PISA shows that it is not just the volume of resources that matters but how those resources are invested, and how well countries succeed in **directing the money where it can make the most difference**. Korea is one of 16 OECD countries in which socio-economically disadvantaged schools have more favourable student-teacher ratios than advantaged schools, which implies that students from disadvantaged backgrounds may benefit from considerably more spending per student than the Korean average[6].

■ Figure 2.14 ■

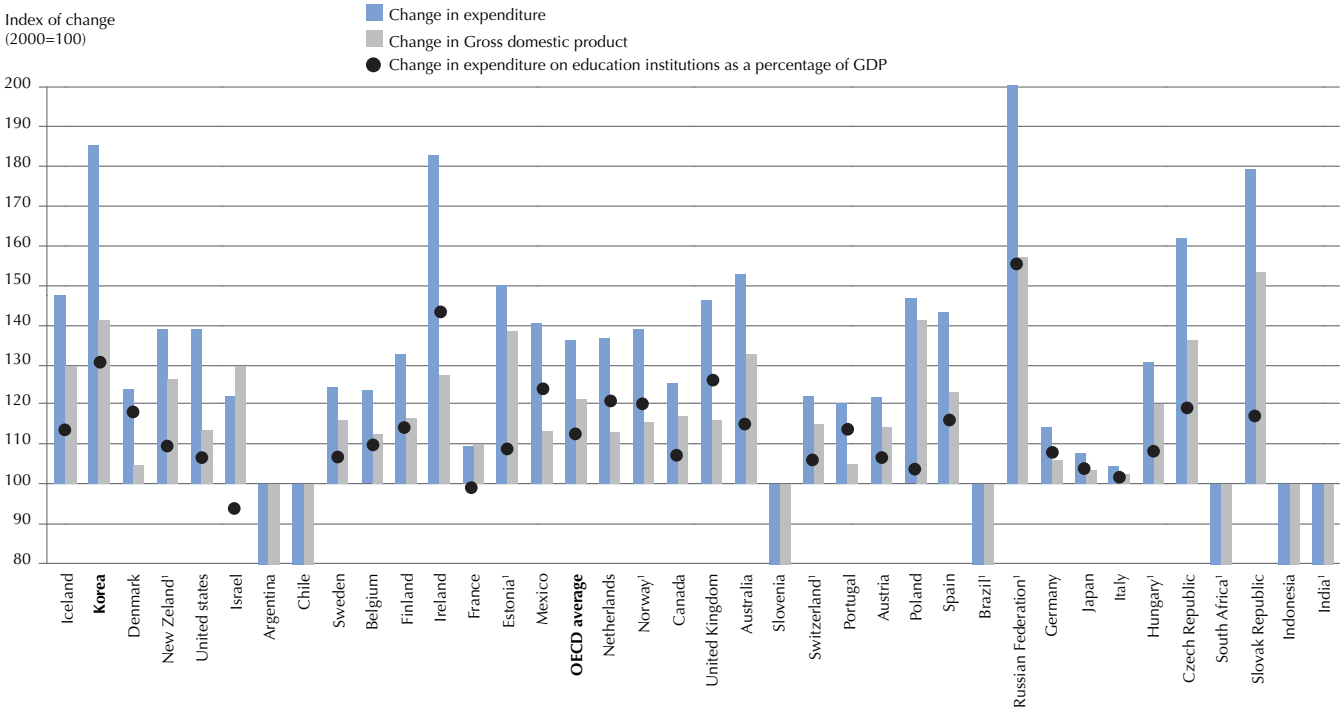
Reading performance and spending on education



Source: OECD, PISA 2009 Database, Table I.2.20.

■ Figure 2.15 ■

Educational spending in 2009 and change since 2000, by level of education and sector



1. Public expenditure only (for Switzerland, in tertiary education only; for Norway, in primary, secondary and post-secondary non-tertiary education only; for Estonia, New Zealand and the Russian Federation, for 2000 only).

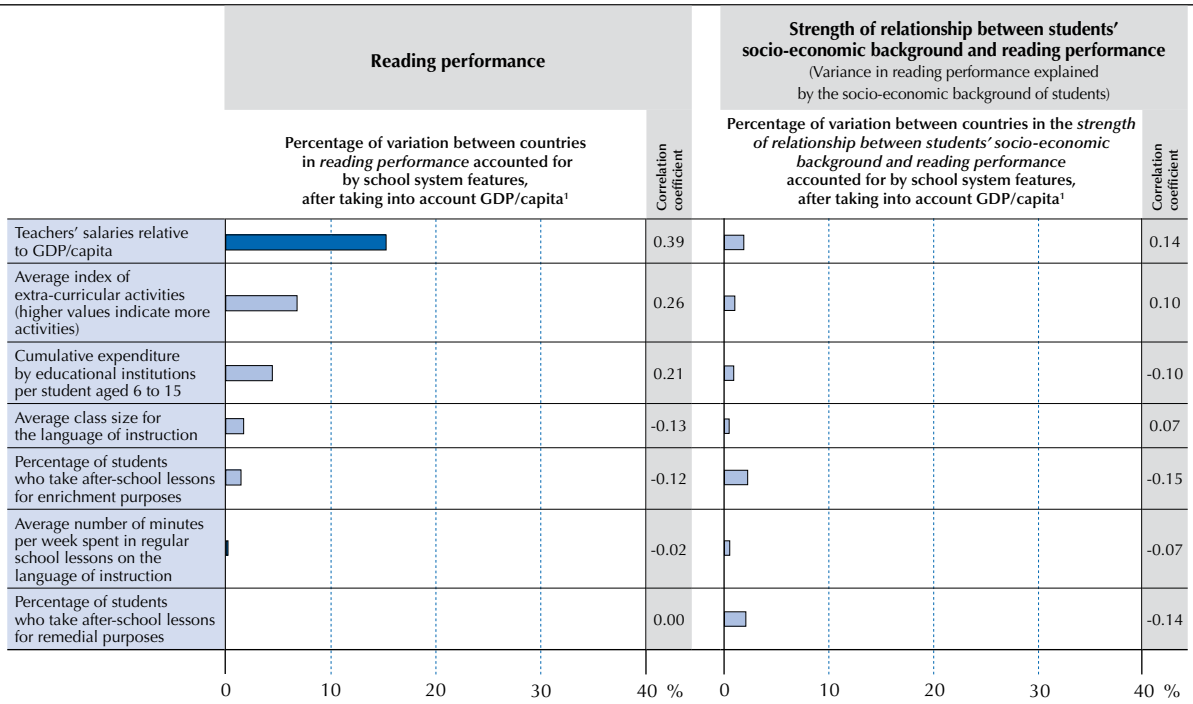
Countries are ranked in descending order of expenditure from both public and private sources on education institutions in 2009.

Source: OECD. Argentina, India, Indonesia: UNESCO Institute for Statistics (World Education Indicators programme). South Africa: UNESCO Institute for Statistics. Tables B2.1 and B2.5 (availbale on line). See Annex 3 for notes (*www.oecd.org/edu/eag2012*).

PISA suggests that systems prioritising higher teachers' salaries over smaller classes tend to perform better, and Korea is one of the countries that matches this pattern. Traditionally Korea has tended to prioritise the quality of teachers over smaller classes (Figure 2.21). Research usually shows a weak relationship between education resources and student performance, with more variation explained by the quality of human resources (i.e. teachers and school principals) than by material and financial resources, particularly among industrialised nations. The generally weak relationship between resources and performance observed in past research is also seen in PISA. At the level of the education system, and net of the level of national income, the only type of resource that PISA shows to be correlated with student performance is the level of teachers' salaries relative to national income. Teachers' salaries are related to class size in that if spending levels are similar, school systems often make trade-offs between smaller classes and higher salaries for teachers. Korea has not only invested in teacher salaries, but also in pre-service teacher education and in identifying an effective hiring system for teaching professionals, so as to maximise the use of human capital.

■ Figure 2.16 ■

How school systems' resources are related to educational outcomes



Note: Correlations that are statistically significant at the 5% level ($p<0.05$) are marked in a darker tone.

1. The percentage is obtained by squaring the correlation coefficient and then multiplying it by 100.

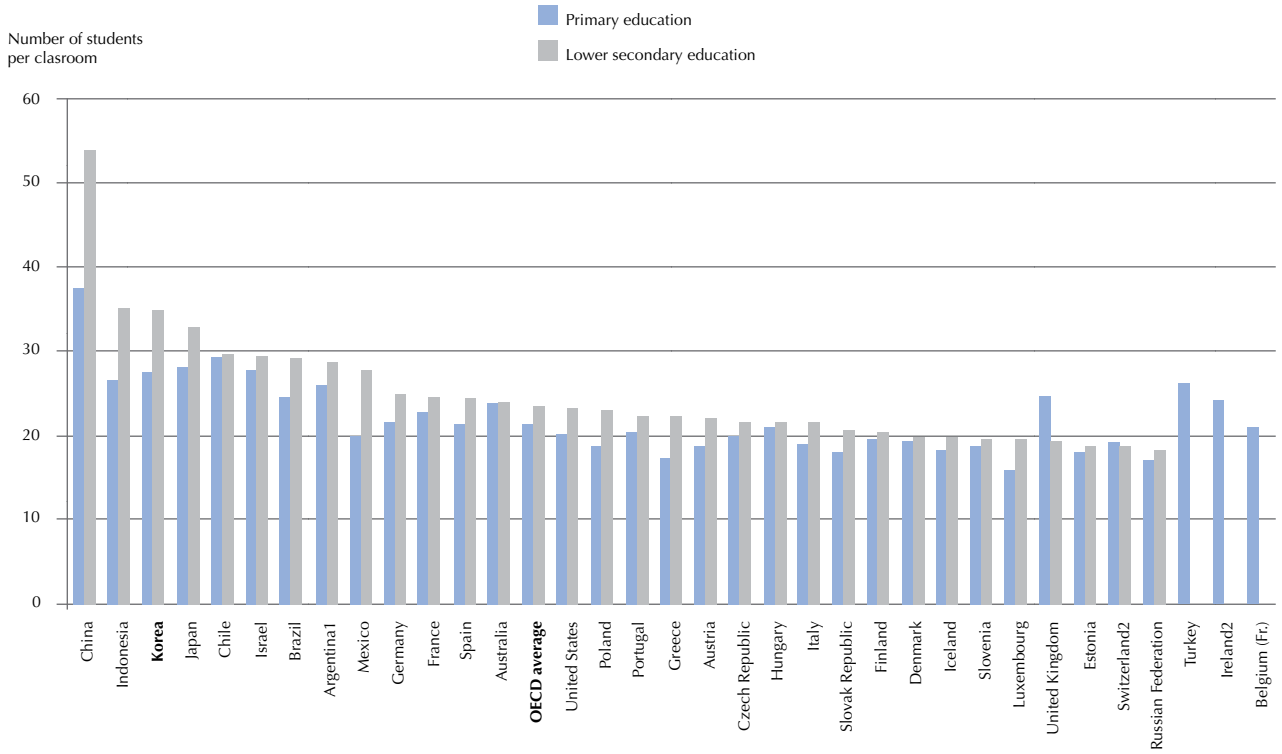
Source: OECD, PISA 2009 Database, Table IV.2.1.

Korea's major increase in expenditure on educational institutions between 2000 and 2010 has been directed to reducing class sizes. The average primary school class in Korea had 27.5 students in 2010, more than the OECD average of 21.2 students per class. At the lower secondary level, the average class in public institutions is 34.7 students, much larger than the OECD average of 23.4 students. Although classes are still comparatively large, between 2000 and 2010 Korea greatly reduced average class size: by nine students in primary classes and four students in lower secondary classes.

Parents in Korea are better educated than those in most other countries. Given the close inter-relationship between a student's performance and his or her parents' level of education (OECD, 2010d), it is also important to bear in mind the educational attainment of adult populations when comparing the performance of OECD countries, since countries with more highly educated adults are at an advantage over countries in which parents have less education. The percentage of 35-44 year-olds who have attained tertiary levels of education, which roughly corresponds to the age group of parents of the 15-year-olds assessed in PISA, is 43% in Korea, which ranks 6th after Canada, Japan, Israel, Finland and the United States in this comparison among the 34 OECD countries (Table I.2.20 in OECD, 2010a).

■ Figure 2.17 ■

Average class size in primary education and in lower secondary education (2000, 2010)



1. Public expenditure only (for Switzerland, in tertiary education only; for Norway, in primary, secondary and post-secondary non-tertiary education only; for Estonia, New Zealand and the Russian Federation, for 2000 only).

Countries are ranked in descending order of expenditure from both public and private sources on education institutions in 2009.

Source: OECD. Argentina, India, Indonesia: UNESCO Institute for Statistics (World Education Indicators programme). South Africa: UNESCO Institute for Statistics. Tables B2.1 and B2.5 (availbale on line). See Annex 3 for notes (www.oecd.org/edu/eag2012).

Among OECD countries, Korea has the smallest proportion of students with an immigrant background. On average across OECD countries, 10% of students have an immigrant background, while in 14 OECD countries, more than 10% of students have such a background (Table II.4.1 in OECD, 2010d). However, the share of students with an immigrant background explains just 1% of the performance variation between countries (Figure I.2.5 in OECD, 2010a). The PISA performance of these students can only be partially attributed to the education system of their host country. Much of the performance difference between these students and native students stems from socio-economic background, the language spoken at home, and prior education in their country of origin.

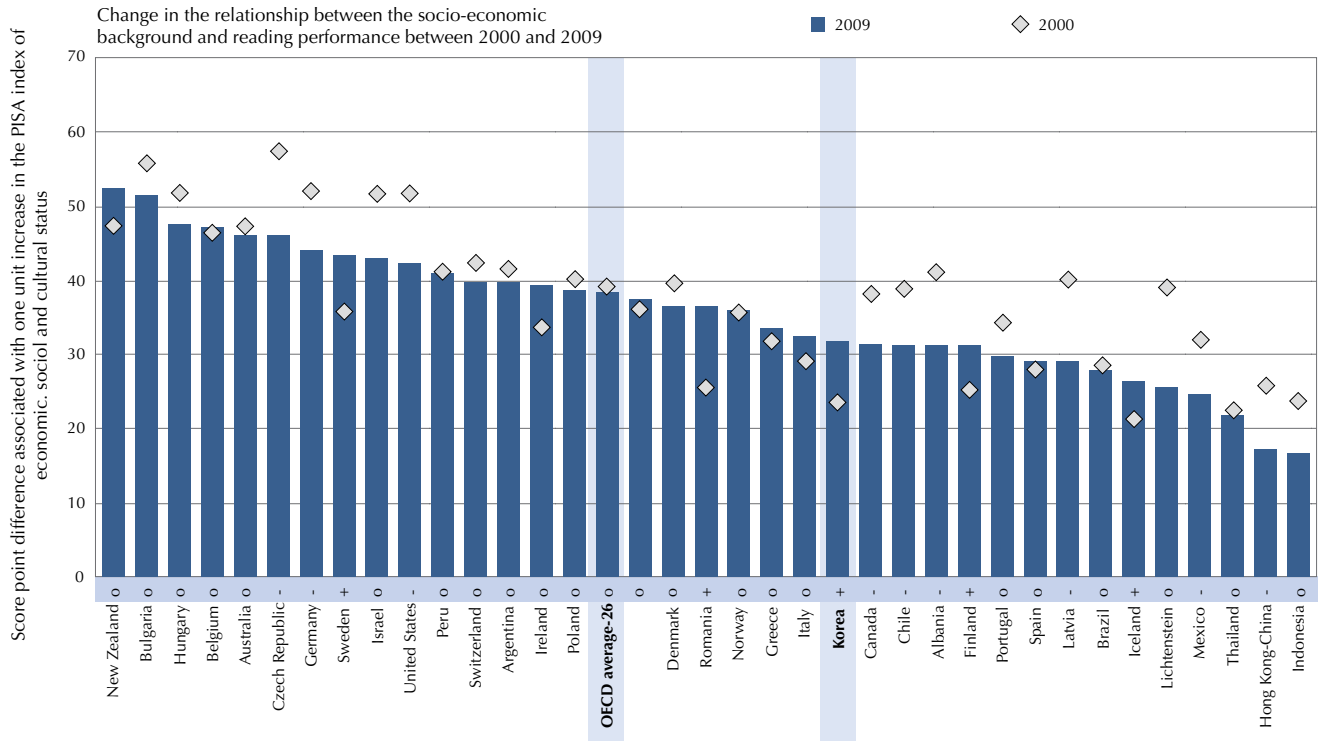
EQUITY IN THE DISTRIBUTION OF LEARNING OPPORTUNITIES

Korea strives to distribute resources equitably among all schools by providing extra support to disadvantaged schools and students. However, PISA results indicate that socio-economically disadvantaged students fare less well, on average, than advantaged students, and Korea is not an exception. However, PISA suggests that while socio-economic background is not as great an obstacle to overcome for students in Korea as it is in other OECD countries, socio-economic inequalities in performance became more pronounced over the past decade. In Korea, around 11% of the variation in student performance is explained by students' socio-economic background, compared with the OECD average of 14% (see OECD, 2010c, Table II.1.2); but the relationship between students' socio-economic background and their reading performance strengthened between 2000 and 2009. The greater economic well-being and prosperity brought about by a decade of economic growth and the large investments in education did not translate into better outcomes for all. Rather, advantaged students were in a better position to make the most of the country's economic development (see Table V.4.3 OECD, 2010b).

PISA defines an education system as successful not only in terms of overall performance levels, but also in the extent to which all students are able to fully enjoy educational opportunities provided by the system. When approaching equity issues in education, PISA asks three crucial questions: Do the learning outcomes of students and schools differ? Do students and schools of different socio-economic backgrounds have access to similar educational resources, both in terms of quantity and quality? What is the impact of students' family background and school location on learning outcomes?

■ Figure 2.18 ■

Relationship between students' socio-economic background and their reading performance in 2000 and 2009



Note: Countries are ranked in descending order of the overall association of the socio-economic background in 2009.

Source: OECD PISA database 2009, Table V.4.3

CHANGES IN PERFORMANCE DIFFERENCES

Across OECD countries, the average variation in student reading performance decreased by 3%. However, there were marked differences across countries, with some recording sharp declines and others showing large increases in the variation in reading performance between 2000 and 2009. While variation in student performance is smaller in Korea than in other countries, Korea was among the group of countries where variation in performance increased. Indeed, performance variation increased the most in Korea and Japan. In Iceland, Italy, Spain and Sweden, the increase in performance variation was moderate – below 15%; but in Korea and Japan, variation increased by 30% or more (see Table V.4.1 in OECD, 2010b). The increase was a result of the fact that while high-achieving students improved their performance, poor-performing students did not, thus widening the performance gap between students. Most other countries that recorded an improvement in average reading performance between 2000 and 2009 on the other hand saw a decline in performance variation, mostly because the increase in average performance was achieved by improving performance among low-performing students rather than among high-performing students, thus narrowing the gap between high and low achievers.

Performance variation can result from variation in student performance between schools and within schools. A large variation between schools occurs when two students, picked at random, who attend different schools can be expected to differ greatly in their performance. Countries with highly structured education pathways that select students into vocationally oriented and academically oriented tracks tend to have large between-school variations, while countries with more comprehensive approaches to education tend to have low levels of between-school variation. On the other hand, large variations within schools occur when two students, picked at random, who attend the same school can be expected to differ in their performance. Large within-school variations thus signal that high- and low-performing students can be expected to attend the same schools.

The increase in student variation in performance in Korea between 2000 and 2009 resulted in an increase in the within-school performance variation, indicating that the increase in the proportion of top-performing students was distributed equally across schools (OECD, 2010b), and that students from all schools witness improvements in performance.

■ Figure 2.19 ■

Change in variation and change in reading performance between 2000 and 2009

Note: Countries in which both the change in variation and score point change in reading are statistically significant are marked in a darker tone.

Source: OECD, PISA 2009 Database, Tables V.2.1 and V.4.1

ACCESS TO RESOURCES AND SOCIO-ECONOMIC BACKGROUND

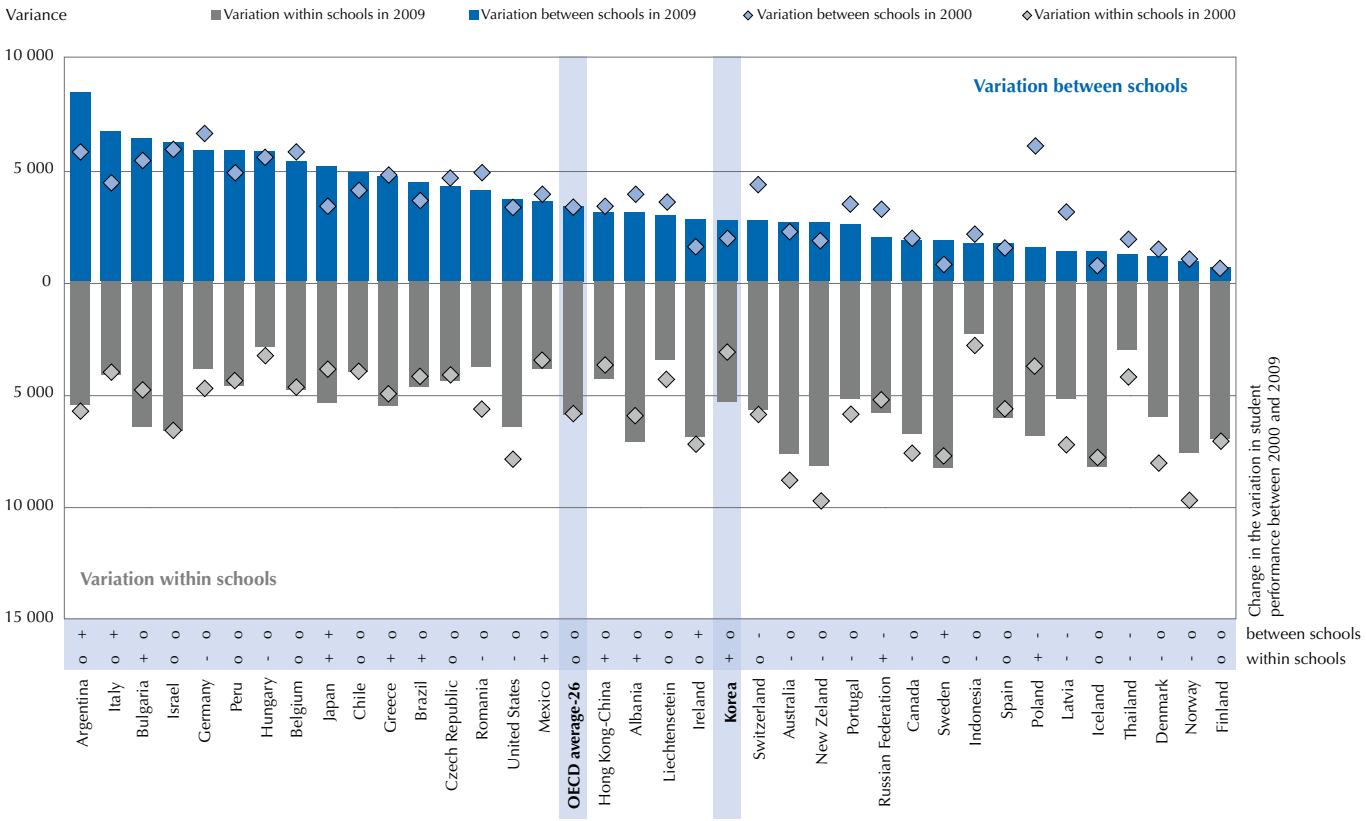
In a school system characterised by an equitable distribution of educational resources, the quality or quantity of school resources would not be related to a school's average socio-economic background, as all schools would enjoy similar resources. Therefore, if there is a positive relationship between the socio-economic background of students and schools and the quantity or quality of resources, this signals that more advantaged schools enjoy more or better resources. A negative relationship implies that more or better resources are devoted to disadvantaged schools. No relationship implies that resources are distributed similarly among schools attended by socio-economically advantaged and disadvantaged students.

Korea guarantees that students in all schools enjoy similar resources. Advantaged and disadvantaged schools in Korea have similar proportions of full-time teachers, face similar problems with respect to teacher shortages, and have the same percentage of qualified teachers and of teachers with university-level degrees among all full-time teachers. In around half of OECD countries, disadvantaged schools tend to have more teachers per student. Korea is one of these countries (Table II.2.3 in OECD, 2010c). This positive relationship is also particularly pronounced in Belgium, Estonia, Ireland, Italy, the Netherlands, Portugal and Spain. This important measure of resource allocation indicates that these countries use the student-teacher ratio to reduce disadvantage. Among OECD countries, only Austria, Israel, Slovenia and Turkey favour socio-economically advantaged students and schools with access to more teachers.

The ratio of computers to students is also higher in disadvantaged schools in Korea than in many other countries, suggesting that Korea is attempting to develop an infrastructure that will ensure that socio-economic disadvantage does not translate in fewer opportunities to learn and that schools actively try to reduce the effect of social inequalities on academic achievement. These findings suggest that Korea ensures an equitable distribution of human resources, both in the quantity of resources and in their quality.

■ Figure 2.20 ■

Variation in reading performance between and within schools in 2000 and 2009



Note: Countries are ranked in descending order of the variance between schools in 2009..

Source: OECD, PISA Database 2009, Table V.4.1

BELOW-AVERAGE IMPACT OF SOCIO-ECONOMIC BACKGROUND ON LEARNING OUTCOMES

In Korea, about 11% of the variation in student performance is explained by students' socio-economic background while the OECD average is 14%. Other OECD countries where students' socio-economic backgrounds have a below-average impact on their performance are Canada, Estonia, Finland, Iceland, Italy, Japan and Norway. Korea along with these countries has less impact of socio-economic differences among students on learning outcomes than the OECD average. In contrast, Belgium, Chile, France, Germany, Hungary, Luxembourg, New Zealand, Turkey and the United States all show an above-average impact of socio-economic background on reading performance. In other words, in these latter countries, two students from different socio-economic backgrounds vary much more in their learning outcomes than is normally the case in OECD countries. It is important to emphasise that these countries do not necessarily have a greater proportion of socio-economically disadvantaged students than other countries, but rather, that socio-economic differences among students in these countries have a particularly strong impact on learning outcomes.

If inequalities in societies were always closely linked to the impact of socio-economic disadvantage on learning outcomes, the ability of public policy to improve equity in access to learning opportunities would be limited, at least in the short term. However, there is almost no relationship between income inequalities in countries and the impact of socio-economic background on learning outcomes (Figure 2.21). Put another way, some countries succeed even under difficult conditions to mitigate the impact of socio-economic background on success in education.

In general, the accuracy with which socio-economic background predicts student performance varies considerably across countries. Most of the students who perform poorly in PISA come from disadvantaged backgrounds, and yet some of their peers from similar backgrounds excel in PISA and beat the odds against them. These "resilient" students show that overcoming socio-economic barriers to achievement is possible. While the prevalence of resilience is not the same across educational systems, it is possible to identify substantial numbers of resilient students in practically all OECD countries.[7] In Korea, 14% of students can be considered resilient, in that they are among the 25% most disadvantaged students in the country, yet perform much better

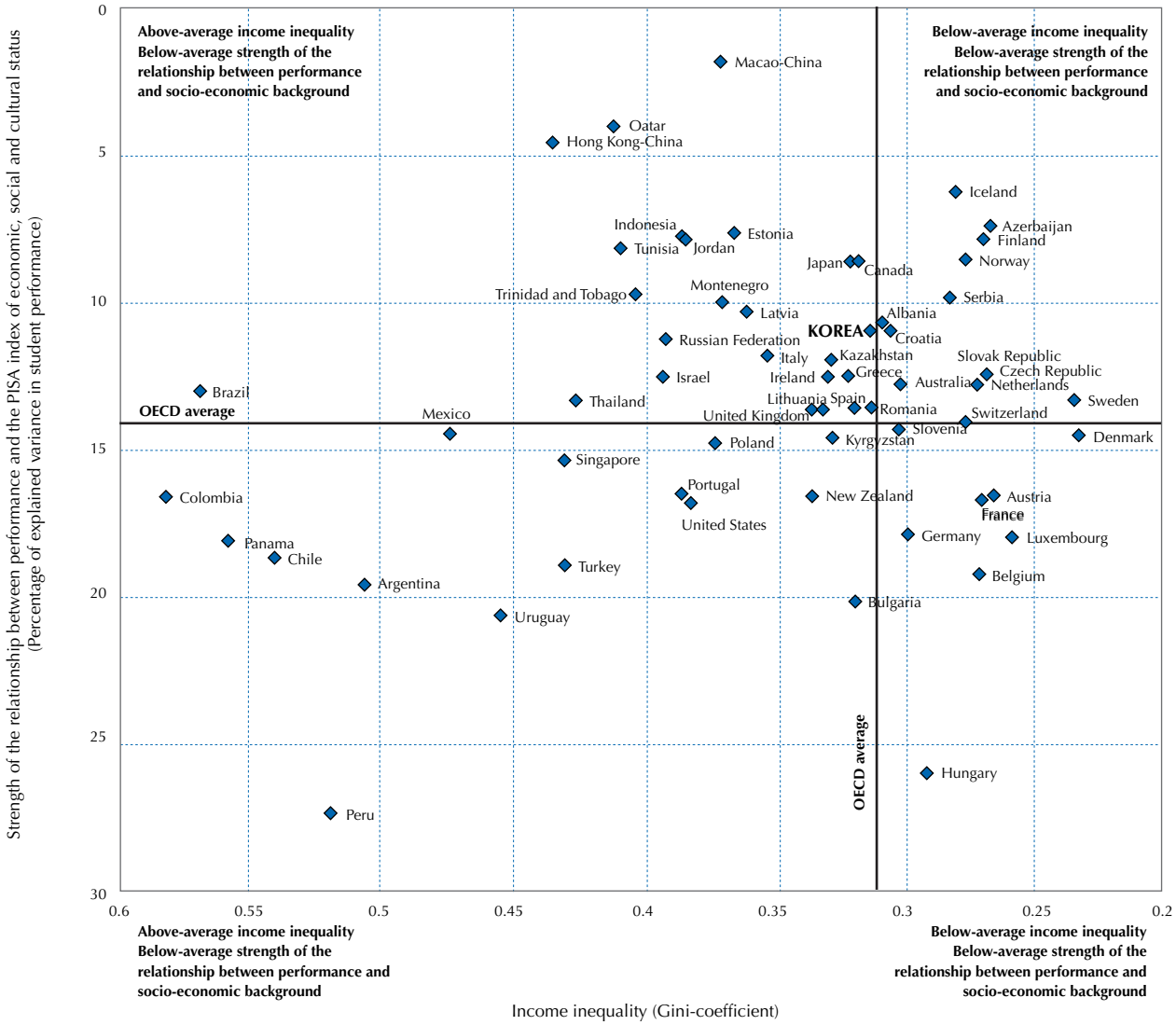
than would be predicted based on their background (see Table II.3.3 in OECD, 2010c). Across the OECD, an average of 8% of students are resilient. These results confirm that, in Korea, policies to improve performance should not just focus on disadvantaged students, but also on those who perform poorly because of other factors, such as family composition and concentration of social disadvantage in the school, as many socio-economically disadvantaged students perform at high levels of proficiency.

OTHER FACTORS RELATED TO POOR STUDENT PERFORMANCE THAT EMERGE FROM PISA

Family composition: Korea has the 6th smallest proportion of students who live in single-parent families (13% of 15-year-olds come from single-parent families compared with an average of 17% across OECD countries). However, Korean students from these families face a much higher risk of poor performance than is the case across OECD countries. This difference stems from the fact that students who come from single-parent families are more socio-economically disadvantaged than students who live in other types of families (Table II.2.5 in OECD, 2010c).

■ Figure 2.21 ■

Income inequality in the population and strength of the relationship between socio-economic background and performance



Note: The Gini coefficient measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. The Gini index measures the area between the Lorenz curve and the hypothetical line of absolute equality, expressed as a proportion of the maximum area under the line. A Gini index of zero represents perfect equality and 1, perfect inequality

Source: OECD, PISA 2009 Database, Table II.1.2.

Concentration of socio-economic disadvantage in schools: Around 29% of students in Korea attend schools with a socio-economically disadvantaged intake, where 58% of students are disadvantaged themselves (i.e. they are grossly overrepresented); 25% of students are in socio-economically privileged schools, where only 6% of students are disadvantaged themselves. Disadvantaged students in Korea tend to perform worse than expected when they attend disadvantaged schools, and such differences in reading performance are somewhat greater than in many other OECD countries (an average difference of 23 score points in Korea compared with the OECD average difference of 18 points). Advantaged students also tend to perform worse than expected when enrolled in disadvantaged schools, and this difference is slightly greater in Korea than in other OECD countries. In contrast, advantaged students in Korea tend to perform better than expected when attending advantaged schools, and by a smaller margin than the OECD average, while disadvantaged students tend to perform better than expected in these schools, but again by a smaller-than-average margin. In schools with a mixed socio-economic intake, disadvantaged students tend to do better than expected while advantaged students tend to perform as expected (Table II.5.10 in OECD, 2010c).

WHAT ARE THE BROADER EFFECTS OF A DEMANDING EDUCATION SYSTEM?

The PISA study indicates that Korean 15-year-olds are among the most proficient students in the world and that, through concerted policy reforms, the performance of some groups of students has improved significantly between 2000 and 2009. Does academic excellence come at the expense of students' perceptions of school, their attitudes towards specific academic subjects, and towards learning more generally? Do Korean students "pay a price" in terms of their broader well-being?

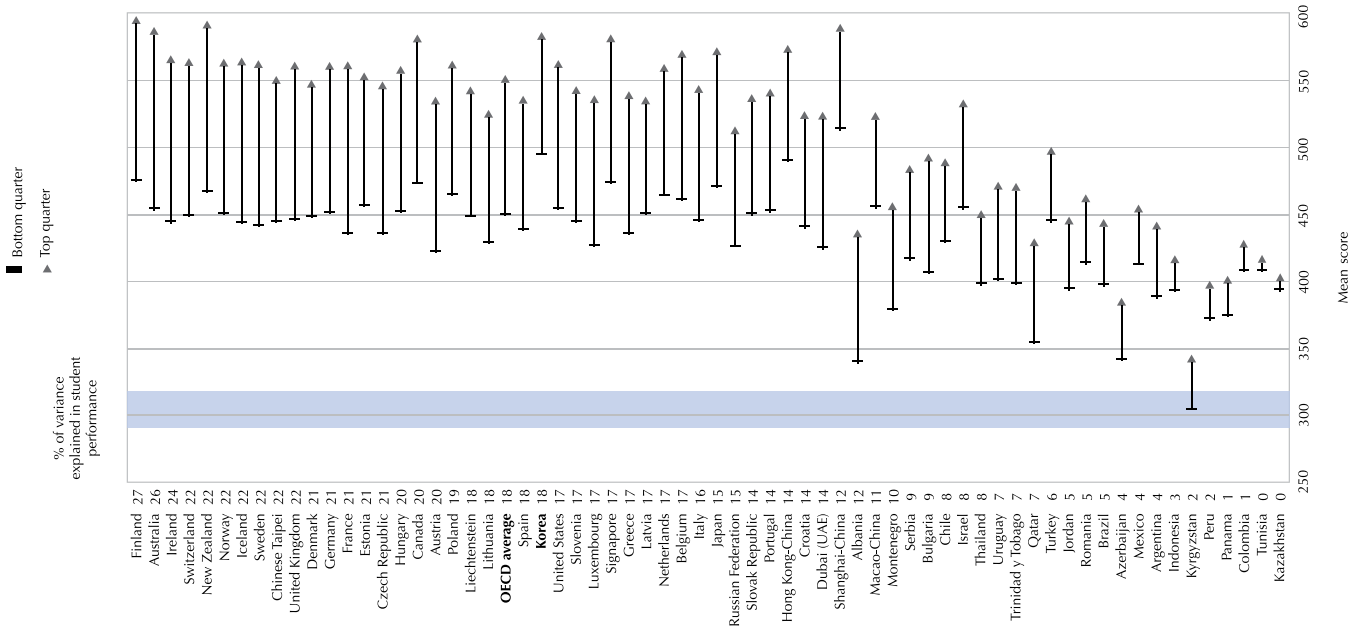
OTHER LEARNING OUTCOMES: STUDENT ENGAGEMENT, STRATEGIES AND PRACTICES

To become effective learners, students need to be able to figure out what they need to learn and how to achieve their learning goals. They also need to master a wide repertoire of cognitive and meta-cognitive information-processing strategies to be able to develop efficient ways of learning. At the same time, fostering effective ways of learning, including goal-setting, strategy selection and controlling and evaluating the learning process, should not come at the expense of students' enjoyment of reading and learning, since proficiency is the result of sustained practice and dedication, both of which go hand-in-hand with high levels of motivation to read and learn.

Volume III of PISA 2009 Results (OECD, 2010d) shows that in all OECD countries, students who enjoy reading the most perform significantly better than students who enjoy reading the least (see Figure 2.27). On average, Korean students have reading patterns that are similar to students in other OECD countries, however roughly the same proportion of boys (60%) and girls (63%) in Korea reads for enjoyment, while across the OECD, only 52% of boys but 73% of girls read daily for enjoyment. Korea is the only

■ Figure 2.22 ■

Relationship between enjoying reading and performance in reading

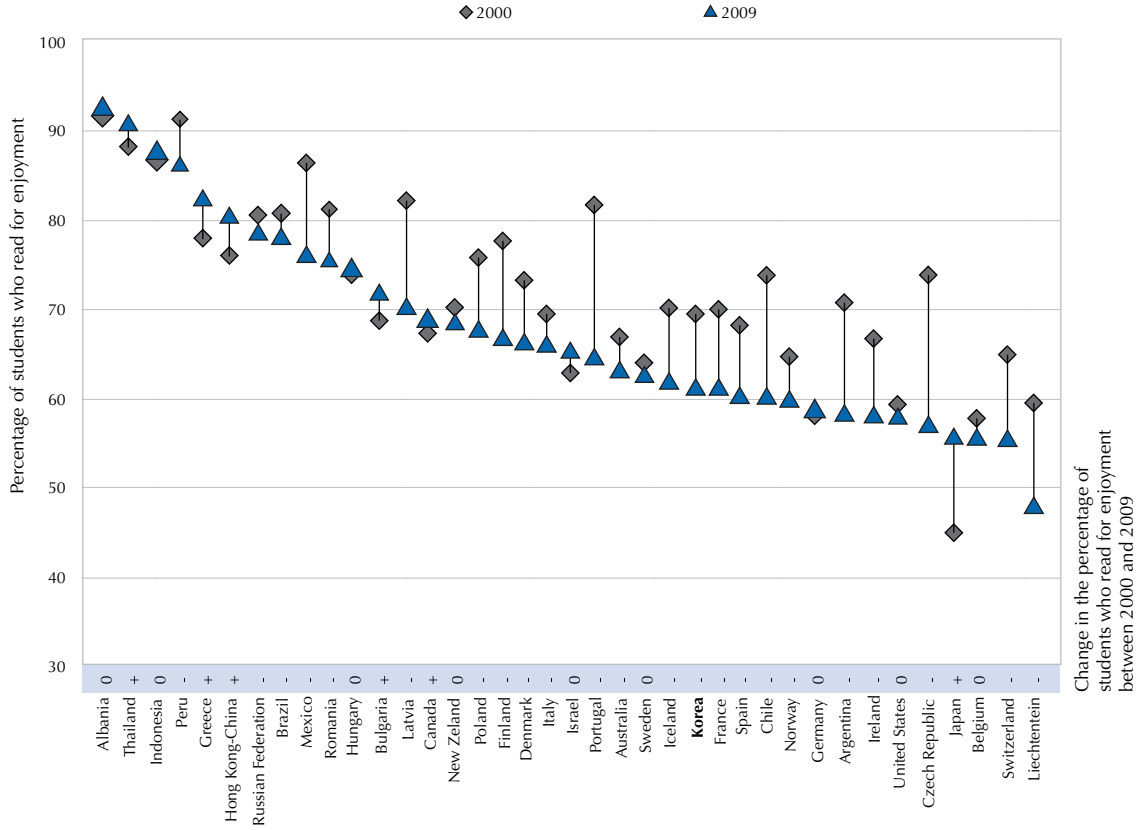


Note: Countries are ranked in descending order of the percentage of explained variance in student performance.

Source: OECD PISA 2009 Database, Table III.1.1 *Source:* OECD, PISA 2009 Database, Table III.1.1

■ Figure 2.23 ■

Percentage of students who read for enjoyment in 2000 and 2009



Note: Countries are ranked in descending order of percentage of students who read for enjoyment in 2009.

Source: OECD, PISA 2009 Database, Table V.5.1

OECD country where similar proportions of boys and girls read for enjoyment. However, both Korean boys and girls have grown progressively less likely to read for enjoyment: while in 2000 70% of girls read for enjoyment daily and 69% of boys did, in 2009 these proportions decreased by 8 percentage points. Moreover, while there was a similar decline in many countries, that in Korea was larger than average across OECD countries, where readership declined by three percentage points among girls and by six percentage points among boys (see Figure 2.23).

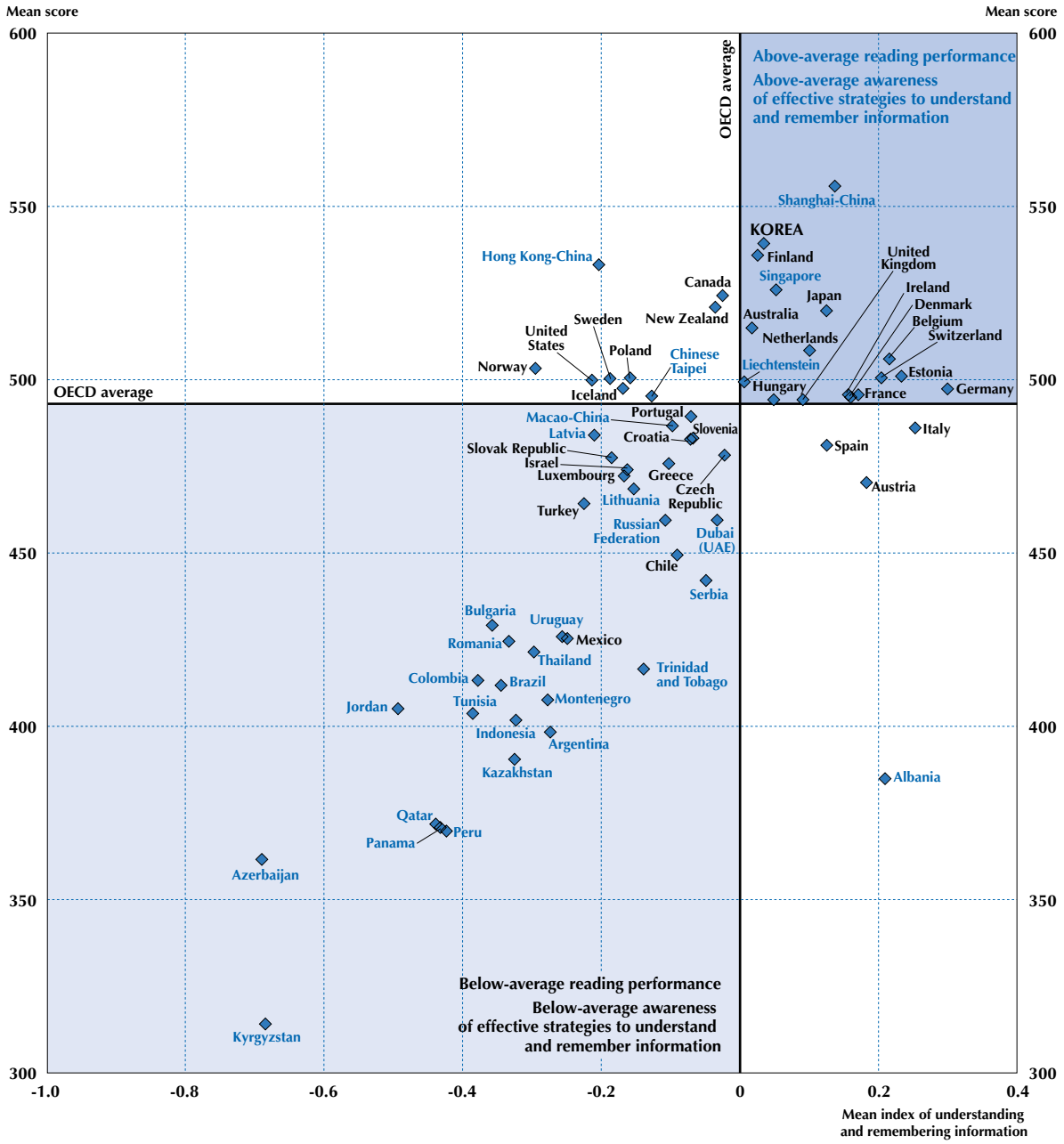
Korean students' motivation for reading has generally improved since 2000. Compared with students' reports in 2000, fewer students find it hard to finish books (a 10 percentage-point improvement); more students like talking about books with other people (an 8 percentage-point improvement); fewer students cannot sit still and read for more than a few minutes (a 2 percentage-point improvement); fewer students read only to get the information they need (a 9 percentage-point improvement); more students report that reading is one of their favourite hobbies (a 5 percentage-point improvement); and fewer students feel that reading is a waste of time (a 3 percentage-point improvement; OECD, 2010b).

While in 2000 Korean students lagged behind their counterparts in many OECD countries with respect to motivation to read, **by 2009 students in Korea reported similar levels of motivation to read in some domains as their counterparts and reported better motivation for reading in other domains than students in many other OECD countries.** Some 40% of students in Korea reported that reading is one of their favourite hobbies (compared with the OECD average of 33%); 55% reported that they feel happy when they receive a book as a present (compared with the OECD average of 46%); 9% consider reading a waste of time (compared with the OECD average of 23%); 31% reported that they read only to get the information they need (compared with the OECD average of 45%); and 16% reported that that they cannot sit still and read for more than a few minutes (compared with the OECD average of 25%).

There has been considerable debate about what types of reading may be most effective in fostering reading skills and improving reading performance. Across OECD countries, students who read fiction regularly – at least several times a month – because they want to, tend to perform better in reading in all OECD countries except Mexico and Turkey. In most countries, students who regularly read magazines, non-fiction books or newspapers because they want to, tend to perform better in reading. In contrast,

■ Figure 2.24 ■

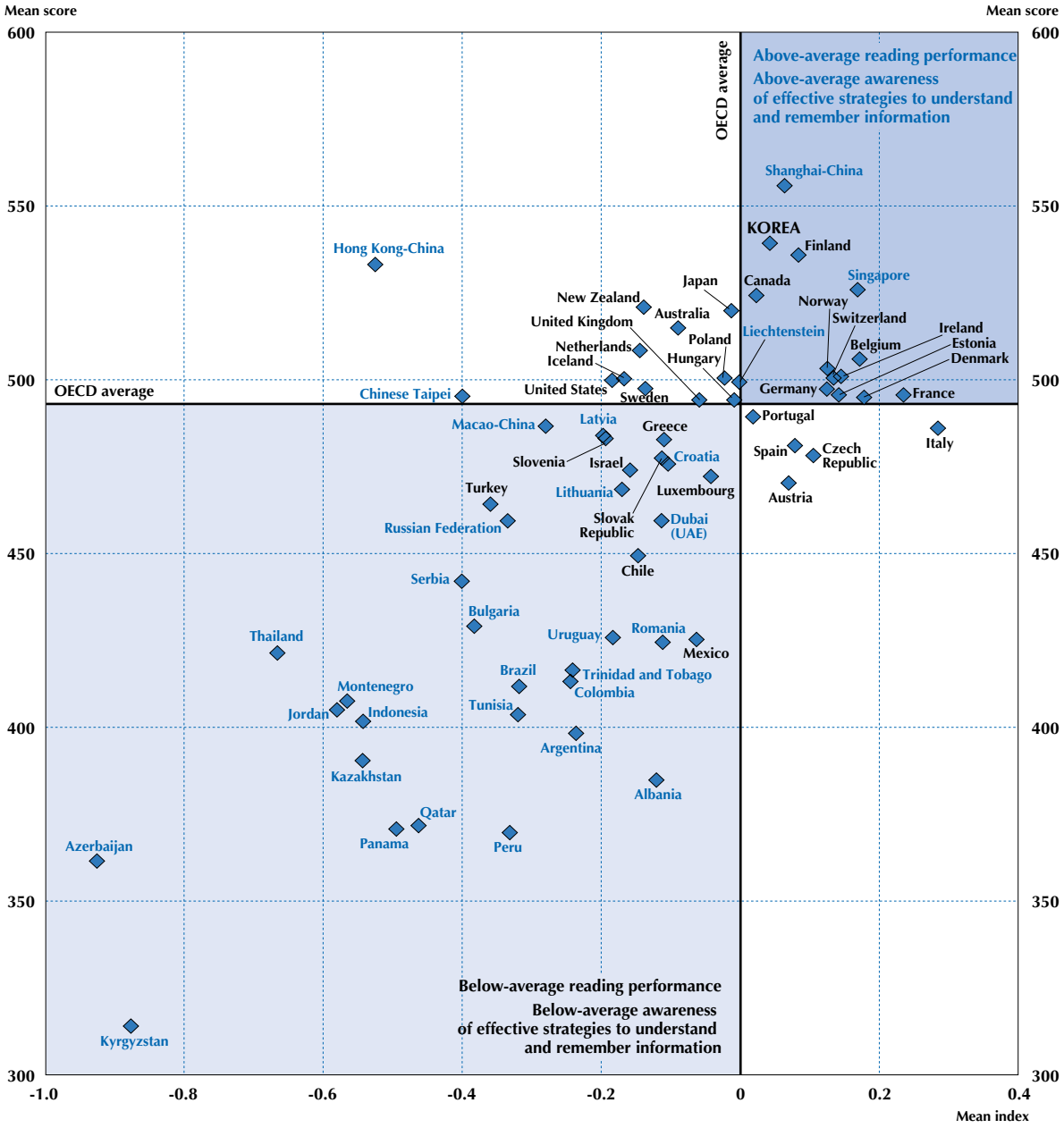
Association between awareness of effective strategies to understand and remember information and performance in reading



Source: OECD, PISA 2009 Database, Tables III.1.14 and I.2.3.

■ Figure 2.25 ■

Association between awareness of effective strategies to summarise information and performance in reading



Source: OECD, PISA 2009 Database, Tables III.1.16 and I.2.3.

reading comic books regularly is associated with little performance advantage in some countries, but it is associated with poorer performance in other countries. **In Korea, students who read fiction tend to perform much better in reading, while students who read non-fiction books or newspapers regularly also tend to perform better in reading, but to a lesser extent.** There is no performance difference between Korean students who read comics regularly and those who do not, and between Korean students who read magazines regularly and those who do not.

In Korea, 40% of students read comics regularly (the OECD average is 22%), 21% of students read magazines regularly (the OECD average is 58%), 45% of students read newspapers regularly (the OECD average is 62%), 47% of students read fiction regularly (the OECD average is 31%), and 30% of students read non-fiction books regularly (the OECD average is 19%). Boys tend to read comics more regularly than girls (the gender gap in Korea is 20 percentage points, compared to the OECD average of 10 percentage points), and are as likely as girls to read newspapers (no gender gap in Korea compared to the OECD average gap of 7 percentage points). In contrast, more girls tend to read fiction regularly (the gender gap in Korea is 12 percentage points compared with the OECD average of 19 percentage points), and girls tend to read magazines and non-fiction books more than boys (the gender gap in Korea is 8 percentage points and 6 percentage points, respectively, compared with the OECD average of 14 percentage points and 1 percentage point, respectively).

Since 2000, the percentage of Korean students who read fiction regularly increased sharply, by 12 percentage points, compared with an OECD average increase of only 3 percentage points. During the same period, the share of students who read magazines, newspapers and comic books decreased by 18 percentage points, 25 percentage points and 22 percentage points, respectively. There was also a 7 percentage-point increase in the proportion of Korean students who read non-fiction books regularly.

Although students who read fiction are more likely to achieve high scores, students who read a wide variety of materials perform particularly well in reading. In Korea, students who read fiction tend to perform better; but if they also read non-fiction books and/or newspapers, their scores are even higher (see Table III.1.9 OECD, 2010d).

USING EFFECTIVE LEARNING STRATEGIES

PISA measures approaches to learning in two ways: by examining the extent to which students reported employing certain strategies, and by looking at students' awareness of which strategies work best. The latter indicator, new to PISA 2009, is a more robust measure because it also provides for an external validation of students' knowledge of what works, rather than just their preferences. Across countries, students who are better-informed about what will help them learn tend to have substantially higher reading proficiency (Figures 2.24 and 2.25). This applies both to an awareness of strategies to understand and remember information and to strategies to summarise information. **Korean students tend to have average levels of awareness of strategies to understand and remember information.** The reported use of strategies to control one's learning is also associated with higher student performance in every country, although, on average, this association is not as strong as an awareness of effective learning strategies.

Table 2.5 Similarities and differences between digital and print reading assessments in PISA 2009

	Digital reading	Print reading
Mode of delivery and data collection	Computer-based delivery system	Pencil and paper
Number of countries participating in the assessment	A subset of 19 (16 OECD countries and 3 partner countries/economies)	65 (34 OECD countries and 31 partner countries/economies)
Required number of students per country	1 500	4 500
Actual average number of students per country that administered the assessment	OECD countries: 1 944 Partner countries/economies: 1 820	OECD countries: 8 800 Partner countries/economies: 5 700
Average number of students per school that administered the assessment	10	30
Number of items	29	131
Number of score points	38	140
Average test administration time per student	40 minutes	65 minutes
Average number of score points yielded per student	25	33
Scale construction	Single digital reading scale	Single print reading scale and subscales based on aspects and text formats

Source: OECD, PISA 2009 Database.

STUDYING IN A DIGITAL AGE: DIGITAL READING PERFORMANCE AND USE OF DIGITAL RESOURCES

Information and communication technologies revolutionise not only the speed at which information can be transmitted, but also how information is conveyed and received. Technological innovations have a profound effect on the types of skills that are demanded in today's labour markets and the types of jobs that have the greatest potential for growth. Most of these jobs now require some familiarity with, if not mastery of, navigating through digital material where readers determine the structure of what they read rather than follow the pre-established order of text as presented in a book.

The advent of information and communication technologies (ICT) has sparked a revolution in the design and dissemination of texts. Online reading is becoming increasingly important in information societies. Even though the core principles of textuality and the core processes of reading and understanding texts are similar across media, there are good reasons to believe that the specific features of digital texts call for specific text-processing skills. **The PISA 2009 digital reading assessment was designed to ascertain students' proficiency at tasks that require accessing, understanding, evaluating and integrating digital texts across a wide range of reading contexts and tasks.**

In recent years education systems throughout the world have begun to use electronic technologies for many purposes, including communicating among schools, parents and students; allowing students to submit material to teachers; presenting concepts to students; encouraging students to use information available on the Internet; reporting results to students; and delivering assessments. Many governments have emphasised using ICT in the classroom as a policy priority, with the assumption that greater use of ICT among students, both in and outside class, will help to develop the kinds of complex communication skills needed in a global, knowledge-based economy.

The PISA 2009 digital reading assessment describes the extent to which computers are used in education, how they are used, and where they are used – at home, at school, or both.

Of the 74 countries and partner economies that participated in PISA 2009, 19 took part in the assessment of digital reading: 16 OECD countries, including Korea, and 3 partner economies. The texts selected as the basis of the digital reading assessment were restricted to hypertext, but within that constraint, many kinds of texts were included in order to represent the medium as fully as possible. The characteristics of digital texts in PISA are specified in terms of environment, format and type. The range of difficulty of digital reading tasks allows for four levels of reading proficiency to be described: lower, middle, upper middle and high. Table 2.6 provides details of the nature of the skills, knowledge and understanding required at each level of the digital reading scale.

Table 2.6 Summary descriptions of the four levels of proficiency in digital reading

Level	Lower score limit	Percentage of students able to perform tasks at this level or above		Characteristics of tasks
		OECD average	Korea	
5 or above	626	7.8%	19.2%	Tasks at this level typically require the reader to locate, analyse and critically evaluate information, related to an unfamiliar context, in the presence of ambiguity. They require the generation of criteria to evaluate the text. Tasks may require navigation across multiple sites without explicit direction, and detailed interrogation of texts in a variety of formats.
4	553	30.3%	61.2%	Tasks at this level may require the reader to evaluate information from several sources, navigating across several sites comprising texts in a variety of formats, and generating criteria for evaluation in relation to a familiar, personal or practical context. Other tasks at this level demand that the reader construe complex information according to well-defined criteria in a scientific or technical context.
3	480	60.7%	89.9%	Tasks at this level require that the reader integrate information, either by navigating across several sites to find well-defined target information, or by generating simple categories when the task is not explicitly stated. Where evaluation is called for, only the information that is most directly accessible or only part of the available information is required.
2	407	83.1%	98.2%	Tasks at this level typically require the reader to locate and interpret information that is well-defined, usually relating to familiar contexts. They may require navigation across a limited number of sites and the application of web-based tools such as dropdown menus, where explicit directions are provided or only low-level inference is called for. Tasks may require integrating information presented in different formats, recognising examples that fit clearly defined categories.

Source: OECD PISA 2009 database, Figure VI.2.18.

Relatively high proficiency in digital reading

Of the 19 countries and economies that participated in the assessment, Korea is ranked as the highest-performing country by a significant margin, with a mean score of 568. This indicates that, on average, 15-year-olds in Korea are performing at the top in digital reading. New Zealand and Australia are in second and third positions, both at 537. Japan and Hong Kong-China (515) are in the next rank, together with Iceland (512) and Sweden (510). Two European countries have mean scores significantly higher than the OECD average: Ireland (509) and Belgium (507) (Table 2.7).

Table 2.7 Where countries rank in digital reading performance

Statistically significantly **above** the OECD average
Not statistically significantly different from the OECD average
Statistically significantly **below** the OECD average

	Digital reading scale					
			Range of rank			
			OECD countries		All countries/economies	
	Mean score	S.E.	Upper rank	Lower rank	Upper rank	Lower rank
Korea	568	(3.0)	1	1	1	1
New Zealand	537	(2.3)	2	3	2	3
Australia	537	(2.8)	2	3	2	3
Japan	519	(2.4)	4	4	4	5
Hong Kong-China	515	(2.6)			4	7
Iceland	512	(1.4)	5	7	5	8
Sweden	510	(3.3)	5	8	5	9
Ireland	509	(2.8)	5	8	6	9
Belgium	507	(2.1)	6	8	7	9
Norway	500	(2.8)	9	10	10	11
France	494	(5.2)	9	11	10	13
Macao-China	492	(0.7)			11	13
Denmark	489	(2.6)	10	11	11	13
Spain	475	(3.8)	12	13	14	15
Hungary	468	(4.2)	12	14	14	16
Poland	464	(3.1)	13	15	15	17
Austria	459	(3.9)	14	15	16	17
Chile	435	(3.6)	16	16	18	18
Colombia	368	(3.4)			19	19

Note: See Annex A3 of OECD (2011b).

Source: OECD, *PISA 2009 Database*.

Across the 16 OECD countries that participated in the digital reading assessment in 2009, 8% of students performed at the high level (scores higher than 626) and can be regarded as "top performers" in digital reading. In Korea, as many as 19% of students were top performers in digital reading. There is considerable variation across countries. Some 17% of students in Australia and New Zealand are top performers in digital reading, while in Austria, Chile and Poland fewer than 3% are. Colombia and Macao-China also had fewer-than-average students performing at the high level (Figure 2.26). Korea recently developed a "Smart Education" policy that includes digitalising all textbooks and assessments by 2015, building or improving school infrastructure so that it accommodates new technologies, and training teachers in the use of these technologies.

Differences in print versus digital reading

Although, on average, student performance in digital reading is closely related to performance in print reading, in some countries, such as Australia and Korea, students score significantly higher in digital reading than in print reading, while in other countries, notably Hungary, Poland and Colombia, students are better in print reading than in digital reading. On average, 7.8% of OECD students in the participating countries perform at the high level on the digital reading scale, while a slightly higher percentage – 8.5% – perform at Level 5 or 6 in print reading. Korea **has the third highest percentage of students performing at Level 5 or 6 in print reading (12.8%), and the highest percentage of top performers in digital reading.**

On average across the 16 participating OECD countries, 16.9% of students perform below the lower level in digital reading, while a similar percentage – 17.4% – performs below the baseline Level 2 on the print reading scale. While there is wide variation across countries, within most of them about the same percentages of students are proficient below the baseline level in digital and print reading. In Korea 5.8% of students do not reach the baseline proficiency level in print reading while only 1.8% of students fail to reach the same level of proficiency in digital reading. This suggests that, in 2009, Korean students who had low levels of reading proficiency were likely to perform better in a digital environment than in a print environment.

Gender and digital reading

The 2009 PISA assessment revealed some interesting differences between the skills of girls and boys in the digital domain. While girls outperform boys in both print and digital reading, the gender gap tends to be narrower in digital reading. On average, among the 16 OECD countries that took part in both assessments, girls outperformed boys by 38 points – the equivalent of one year of formal schooling – in print reading, but by 24 points in digital reading. Girls have outperformed boys in reading in every OECD and partner country and economy since PISA's first reading assessment was administered in 2000. Japan, Denmark, France and Macao-China show girls performing worse in digital reading than in print reading, while boys performed better.

These differences are seen most clearly at the extremes of the proficiency scale, that is, among poor performers and top performers. In Korea, as well as in Australia, Iceland, Ireland, Japan, and New Zealand, fewer girls performed poorly in digital reading than in print reading. The opposite was seen among boys. In Korea, as well as in Australia, Belgium, France, Iceland, Ireland, Japan,

Sweden and Macao-China, there were far fewer low-performing boys in digital reading than in print reading. As for top performers, In Korea, as well as in Australia, and New Zealand, more girls were top performers in digital reading than in print reading. Regardless of the country, the increase in the percentage of top performers in digital reading over print reading was always greater among boys than among girls, as was the reduction in the percentage of poor performers.

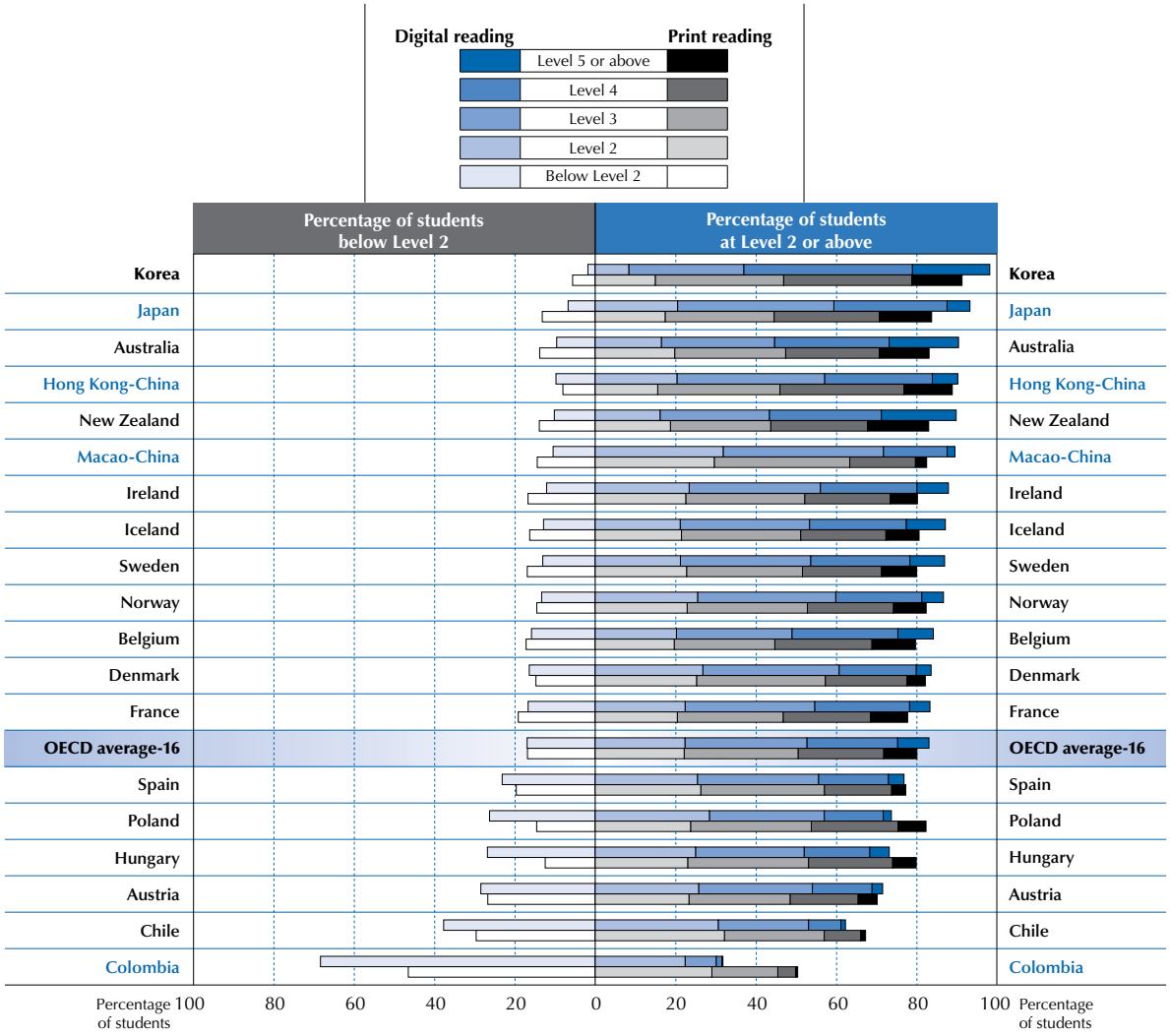
Interestingly, when comparing girls and boys who were similarly proficient in print reading, boys scored an average of six points higher in digital reading. Among these students, boys outperformed girls in digital reading by between 5 and 22 score points in Korea as well as in Australia, Austria, Denmark, Hungary, Iceland, Poland, Spain, Sweden, Hong Kong-China and Macao-China. Only in Belgium did girls outperform boys. What could account for this difference? One explanation is that boys and girls do not share the same degree of ease in selecting and organising – or navigating – pieces of information found in hypertexts and that boys' greater ease could be used to entice them to read more by exploiting boys' greater proficiency with digital texts (see Figure 2.29).

Online reading practices

In addition to the question about what kinds of print material they read, the PISA 2009 student questionnaire asked students to indicate how often they were involved in the following reading activities on line: reading e-mail messages, chatting on line, reading online news, using an online dictionary or encyclopaedia, searching online information to learn about a particular topic, taking part in online group discussions or forums, and searching for practical information on line. PISA found that students who

■ Figure 2.26 ■

Percentage of students at each proficiency level on the digital print reading scales

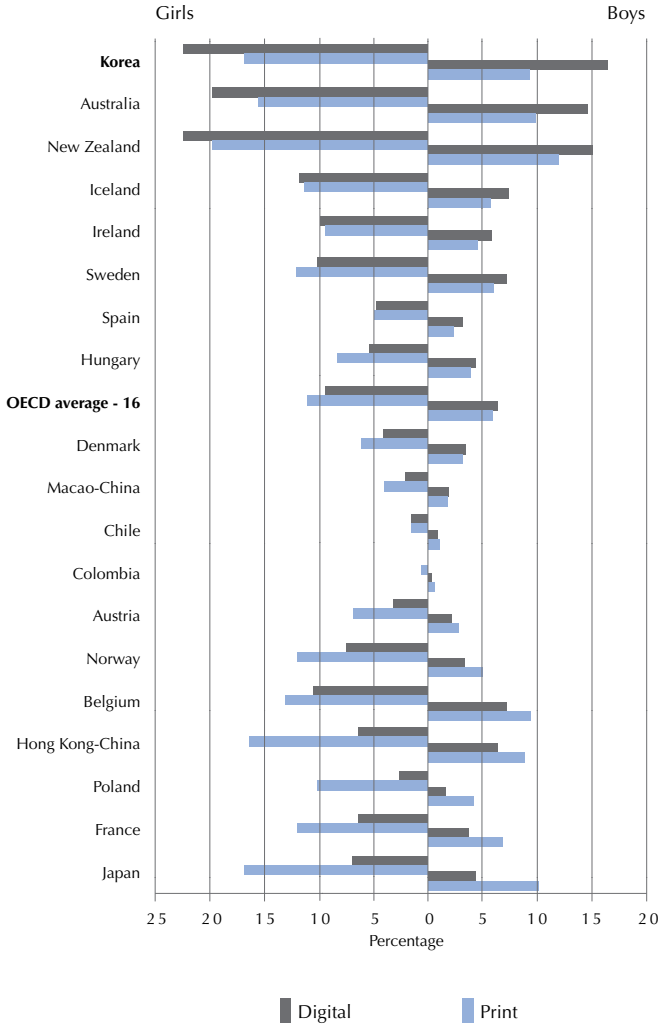


Note: Countries are ranked in descending order of the percentage of students at Level 2 or above in digital reading.

Source: OECD, PISA 2009 Database, Table VI.2.1.

■ Figure 2.27 ■

Percentage of top-performing boys and girls in digital and print reading



Notes: Countries are ranked by decreasing percentage-point difference between the proportion of boys who are top performers in digital reading and the proportion of boys who are top performers in print reading.

Percentage-point differences between the proportion of girls/boys who are top performers in digital reading and the proportion of girls/boys who are top performers in print reading that are not statistically significant are shown in a lighter colour.

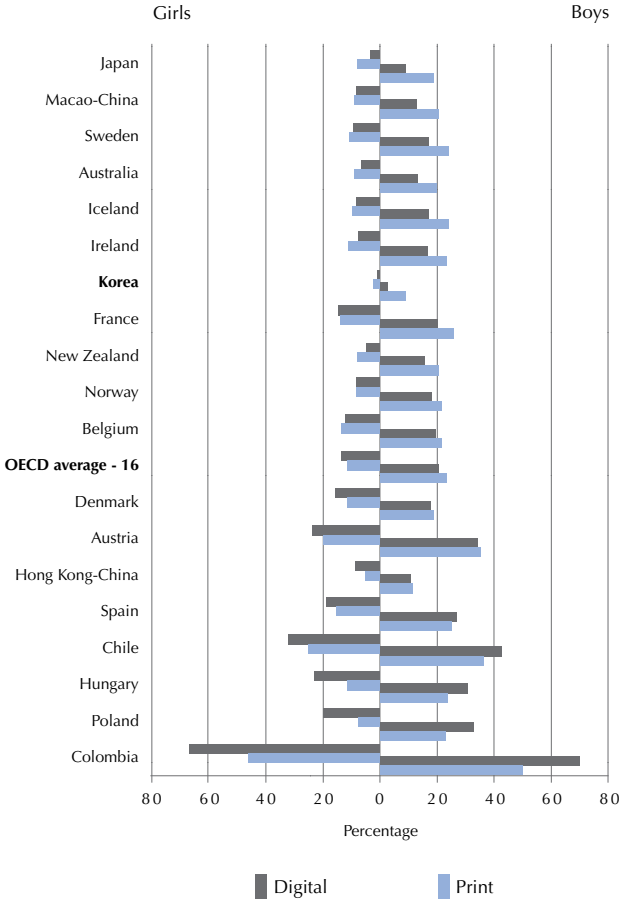
are engaged in these online reading activities are generally more proficient print readers than students who do little online reading. In Korea, the performance difference between students who are more engaged in online reading activities and those who are less engaged is smaller than in many other OECD countries: while this difference is 37 score points across OECD countries, it is only 20 points in Korea (Figure 2.30). Korean students tend to engage in online reading activities less frequently than students in other OECD countries; and contrary to findings in many other OECD countries, girls in Korea tend to engage more in online reading activities than boys (although both engage less than the average boy and girl across OECD countries).

In each of the 19 countries that took part in the digital reading option, searching for information online is related to better performance on the digital reading scale. On average, online reading practices explain around 7% of the variation in how well different student read digital texts. Similarly, around 6% of this variation is explained by the extent to which students read a variety of printed reading materials – such as fiction and non-fiction books, newspapers, magazines and comic books. However, the extent to which students enjoy reading explains to a much greater extent performance differences between students: on average across OECD countries, 14% of the total variation in digital reading performance can be explain by how much students enjoy reading.

Korean students, and those in Chile, Ireland, Japan, New Zealand and Colombia, also reported below-average online social activities. This is in contrast to students in Austria, Belgium, Denmark, Hungary, Iceland and Norway, who reported frequent and

■ Figure 2.28 ■

Percentage of low-performing boys and girls in digital and print reading



Notes: Countries are ranked by increasing percentage-point difference between the proportion of boys who are low performers in digital reading and the proportion of boys who are low performers in print reading.

Percentage-point differences between the proportion of girls/boys who are low performers in digital reading and the proportion of girls/boys who are low performers in print reading that are not statistically significant are shown in a lighter colour.

above-average online social activities. In most of the participating countries, online social activities are weakly related to digital reading proficiency: the average amount of variation in the digital score explained by online socialising is only 1%. Nevertheless, students among the quarter of those least-engaged in online social activities are 1.35 times more likely to perform poorly (in the bottom quarter of the national distribution) than students who are in the most-engaged quarter.

Using computers and the Internet

The proportion of students who use a computer at home is greater, and varies less across countries than that of students who use a computer at school. On average across the OECD area, 93% of students reported that they use a computer at home. Korean students tend to use computers at home and at school less than their counterparts in OECD countries. **Among OECD countries, Japan shows one of the lowest proportions of 15-year-olds who use a computer at home (76%), along with Chile (73%) and Turkey (60%).** This is in contrast to the 95% or more of students in 16 OECD countries, Liechtenstein, Macao-China and Hong Kong-China who reported that they use a computer at home (Figure 2.31). Around 63% of Korean students reported that they use a computer at school, so the socio-economic digital divide in the use of computers at home does not appear to be bridged by access to computers at school.

PISA 2009 also sought to determine whether students use the Internet. While students may use a computer, many ICT tasks – such as searching for information, e-mailing and engaging in a social network – require connection to the Internet. Students were asked

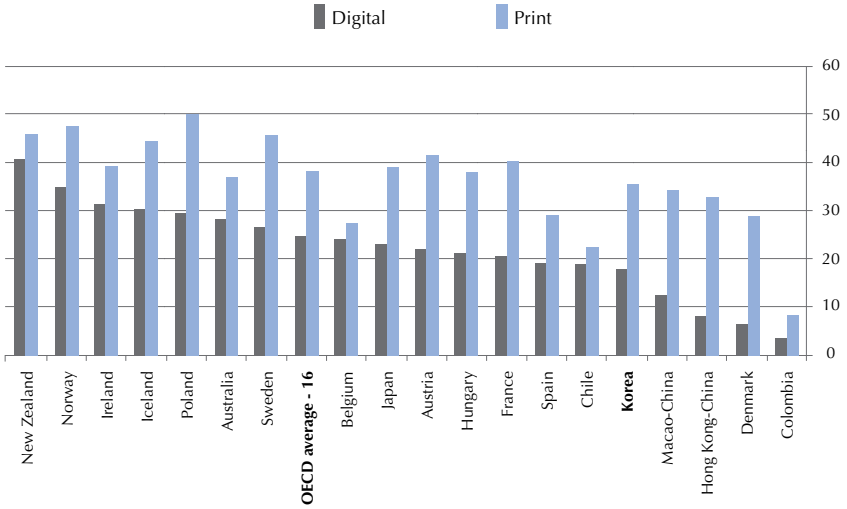
whether they have an Internet connection available, and use it, at home and at school. Across the vast majority of countries, the proportion of students who reported that they use the Internet at home was greater than that of students who reported using the Internet at school. Across OECD countries, an average of 71% of students reported that they use the Internet at school. In the Australia, Denmark, Finland, the Netherlands, Norway, Sweden and Liechtenstein, 88% or more of students reported using the Internet at school. **In Korea 65% of students reported using the Internet at school, while almost all students – 96% - reported using the Internet at home.**

For the assessment of digital reading, students were asked to report how frequently computers were used as a teaching tool at school. There is substantial variation between countries and economies in how frequently students use computers in the classroom (see Table VI.5.18 in OECD, 2011b). Around 27% of students reported using computers in the classroom in language-of-instruction lessons, which is in line with the OECD average. On the other hand, students in Korea reported below-average use of computers in mathematics lessons: only 8% of students reported using computers in their regular mathematics lessons compared to the OECD average of 16%. Computer use in science lessons is more prevalent across OECD countries – 25% of students reported using them in science classes – and even more so in Korea, where 31% of students reported the same.

The use of laptops in school may help to integrate ICT into classrooms, as it obviates the need for a dedicated computer lab in school. **In Korea, 20% of students reported using laptops in school, above the OECD average of 18.5%, and below levels (73%) found in Denmark and Norway (Table 2.8).**

■ Figure 2.29 ■

Comparison of gender gaps (in favour of girls) in digital and print reading



Notes: Countries are ranked according to the size of the gender gap in digital reading.

Score-point differences between girls and boys in digital reading (gender gap in digital reading) and between girls and boys in print reading (gender gap in print reading) that are not statistically significant are shown in a lighter colour.

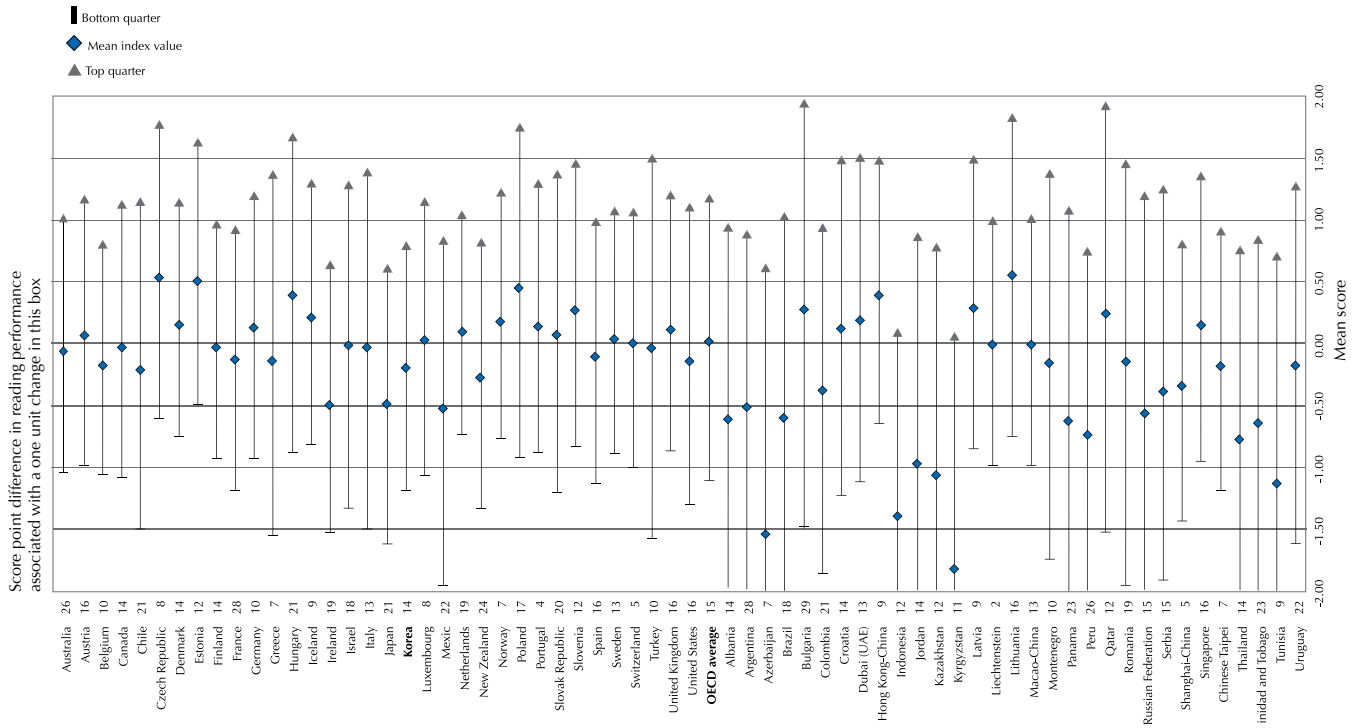
THE LEARNING ENVIRONMENT IN KOREA

The learning environment is also shaped by parents and school principals. Parents who are interested in their children's education are more likely to support their school's efforts and participate in school activities, thus adding to available resources. These parents also tend to have an advantaged socio-economic background. Meanwhile, school principals can define their schools' educational objectives and guide their schools towards them. PISA shows that school principals' perceptions of parents' pressure to adopt high academic standards and raise student achievement tend to be positively related to higher school performance in 19 OECD countries, but after accounting for students' and schools' socio-economic backgrounds, they are positively related to performance in only four OECD countries.

PISA also shows that the socio-economic backgrounds of students and schools and key features of the learning environment are closely inter-related, and that both are linked to performance in important ways. This is perhaps because students from socio-economically advantaged backgrounds bring with them a higher level of discipline and more positive perceptions of school values,

■ Figure 2.30 ■

The index of online reading activities



Source: OECD PISA 2009 Database, Table III.1.12

or perhaps because parental expectations of good classroom discipline and strong teacher commitment are higher in schools with a socio-economically advantaged intake. Conversely, disadvantaged schools may be subject to less parental pressure to reinforce effective disciplinary practices or ensure that absent or unmotivated teachers are replaced.

Positive student-teacher relations are crucial for establishing an environment that is conducive to learning. Research finds that students, particularly socio-economically disadvantaged students, learn more and have fewer disciplinary problems when they feel that their teachers take them seriously (Gamoran, 1993) and when they have strong bonds with their teachers (Crosnoe et al., 2004). One explanation is that positive student-teacher relations help transmit social capital, create communal learning environments, and promote and strengthen adherence to norms that are conducive to learning (Birch and Ladd, 1998).

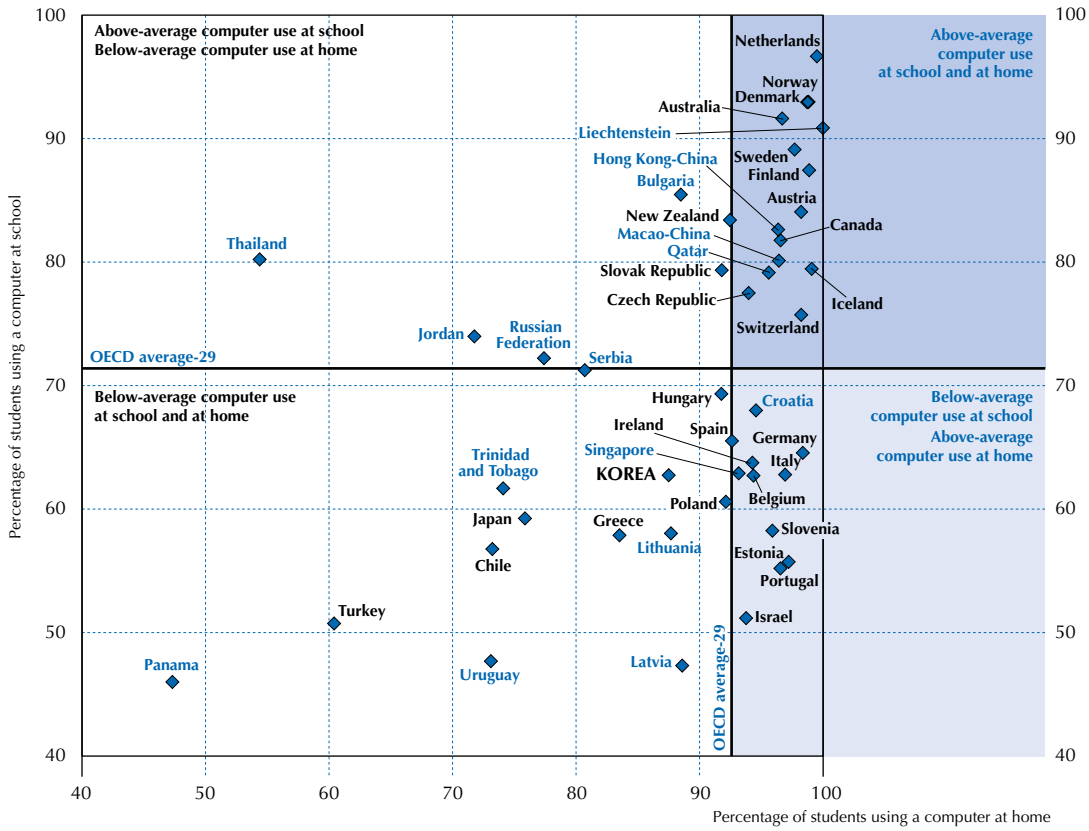
PISA 2009 asked students to agree or disagree with several statements regarding their relationships with their teachers in school. These statements included whether they got along with their teachers, whether teachers were interested in their personal well-being, whether teachers took the students seriously, whether teachers were a source of support if the students needed extra help, and whether teachers treated the student fairly. Similar questions were asked in 2000, so student-teacher relations could be compared across time.

Results from PISA 2009 suggest that students in the OECD area are generally satisfied with the quality of student-teacher relations (see Chapter 2 of OECD, 2010e). The difference between responses in 2000 and 2009 suggests that the quality of student-teacher relations actually improved during the period (Figure 2.32). For example, across the 26 OECD countries with comparable data, 74% of students in 2000 agreed or strongly agreed with the statements, "If I need extra help, I will receive it from my teachers" or "Most of my teachers treat me fairly", while 79% of students agreed or strongly agreed with those statements in PISA 2009 – an increase of five percentage points. In 2000, 65% of students agreed or strongly agreed that "most of my teachers really listen to what I have to say" and by 2009 this proportion had increased to almost 68%, an increase of three percentage points.

In 2009 only 57% of students in Korea agreed or strongly agreed that their teachers really listen to what they have to say, while the average across the OECD area was 67%. However, Korean students are at or above the OECD average with respect to whether they feel that their teachers will help them if they needed it (83% of students in Korea feel that way while the OECD average is 79%) and that their teachers treat them fairly (75% of students in Korea feel that way compared with the OECD average of 79%). There is a positive relationship between student-teacher relations and student performance in Korea. For example, the quarter of

■ Figure 2.31 ■

Percentage of students who reported using a computer at home and at school



Source: OECD, PISA 2009 Database, Table VI.5.10a.

students in Korea who reported the poorest student-teacher relations is significantly more likely to be among the quarter of the poorest-performing students.[8] Differences in student-reported teacher interest in their well-being may reflect either different student expectations of their teachers' level of involvement, or different roles that teachers assume with respect to their students. A low percentage of agreement with these statements suggests a possible mismatch between student expectations and what teachers are actually doing.

These self-reported items show some important changes since PISA 2000, when students were asked similar questions. For example, in 2000, 41% of students in Korea agreed or strongly agreed that most of their teachers really listen to what the student has to say, and that proportion increased by 16 percentage points, to 57%, in 2009. Since 2000, the percentage of students who agreed or strongly agreed that most teachers treat them fairly also increased by 9 percentage points, and the percentage of students who reported that they receive extra help from their teachers when they needed it increased by 7 percentage points.

Classrooms and schools with more disciplinary problems are less conducive to learning, since teachers have to spend more time creating an orderly environment before instruction can begin. More interruptions within the classroom disrupt students' engagement in and concentration on their lessons. PISA asked students to describe the frequency with which interruptions occur in reading lessons. The disciplinary climate is indicated in PISA by the frequency of certain events: students don't listen to the teacher in language-of-instruction class; there is noise and disorder; the teacher has to wait a long time for students to quieten down; students cannot work well; and students don't start working for a long time after the lesson begins.

The majority of students in OECD countries enjoy orderly classrooms in their language-of-instruction classes, and especially so in Korea. **Korean students reported the second highest level of positive disciplinary climate among students in all other OECD countries** (see Table IV.4.2 in OECD, 2010e). Some 88% of Korean students reported that their teacher never or only in some lessons has to wait a long time before students settle down (the OECD average is 72%); 90% reported that they never or only in some lessons feel that students don't listen (the OECD average is 71%); 87% reported that they never or only in some lessons feel that students don't start working for a long time after the lesson begins (the OECD average is 75%); 77% reported that noise or

disorder never or only in some lessons affects learning (the OECD average is 68%); and 90% of students reported that they can work well most of the time (the OECD average is 81%).

On average across OECD countries, the percentage of students who reported that their teacher never or almost never has to wait a long time for them to quieten down increased by six percentage points – up to 73% in 2009 from 67% in 2000 (Figure 2.33). Improvements on this indicator of disciplinary climate occurred in 25 countries; in the remaining 13 countries there was no change. The increase in the percentage of students who reported that their teacher never or almost never has to wait a long time for them to quieten down was particularly large – more than 10 percentage points – in Germany, Israel, Italy, Spain, Sweden, the partner country Indonesia and the partner economy Hong Kong-China. The largest improvements mostly occurred among countries with poorer conditions as, for example, in Italy and Indonesia, where only half of the students in 2000 reported that their teacher did not need to wait a long time for them to quieten down.

The disciplinary climate in Korean classrooms has improved since 2000. The percentage of students who reported that they never or only in some lessons feel that students don't listen to what the teacher says, that they never or only in some lessons feel that students don't start working for a long time after the lesson begins, that they feel they can work well, that noise or disorder never or only in some lessons affects learning, increased by around eight percentage points or more since 2000. The percentage of students who reported that their teacher never or only in some lessons has to wait a long time before students settle down increased by two percentage points since 2000.

Table 2.8 Percentage of students who reported using laptops at school

		Percentage of students who use laptops at school	
		%	S.E.
OECD	Australia	37.5	(2.0)
	Austria	12.1	(1.3)
	Belgium	9.7	(1.1)
	Canada	19.9	(1.0)
	Chile	5.9	(0.4)
	Czech Republic	4.8	(0.7)
	Denmark	73.2	(2.0)
	Estonia	8.8	(0.6)
	Finland	17.4	(1.8)
	Germany	14.3	(1.2)
	Greece	9.1	(0.7)
	Hungary	4.1	(0.4)
	Iceland	27.9	(0.5)
	Ireland	10.0	(1.1)
	Israel	8.3	(0.6)
	Italy	5.3	(0.3)
	Japan	12.1	(1.2)
	Korea	20.1	(1.3)
	Netherlands	26.5	(2.2)
	New Zealand	15.3	(1.3)
	Norway	73.5	(2.2)
	Poland	5.5	(0.5)
	Portugal	24.7	(1.1)
	Slovak Republic	14.1	(1.9)
	Slovenia	8.1	(0.4)
	Spain	10.2	(0.9)
	Sweden	24.0	(2.6)
	Switzerland	28.4	(1.7)
	Turkey	7.0	(0.6)
	OECD average-29	18.5	(0.2)
Partners	Bulgaria	18.9	(1.3)
	Croatia	8.9	(0.6)
	Hong Kong-China	7.4	(0.9)
	Jordan	12.1	(0.6)
	Latvia	5.5	(0.4)
	Liechtenstein	2.2	(0.8)
	Lithuania	6.2	(0.5)
	Macao-China	2.8	(0.2)
	Panama	11.4	(1.1)
	Qatar	19.2	(0.3)
	Russian Federation	20.6	(1.1)
	Serbia	5.7	(0.4)
	Singapore	17.0	(0.4)
	Thailand	13.1	(0.6)
	Trinidad and Tobago	16.9	(0.6)
	Uruguay	5.0	(0.4)

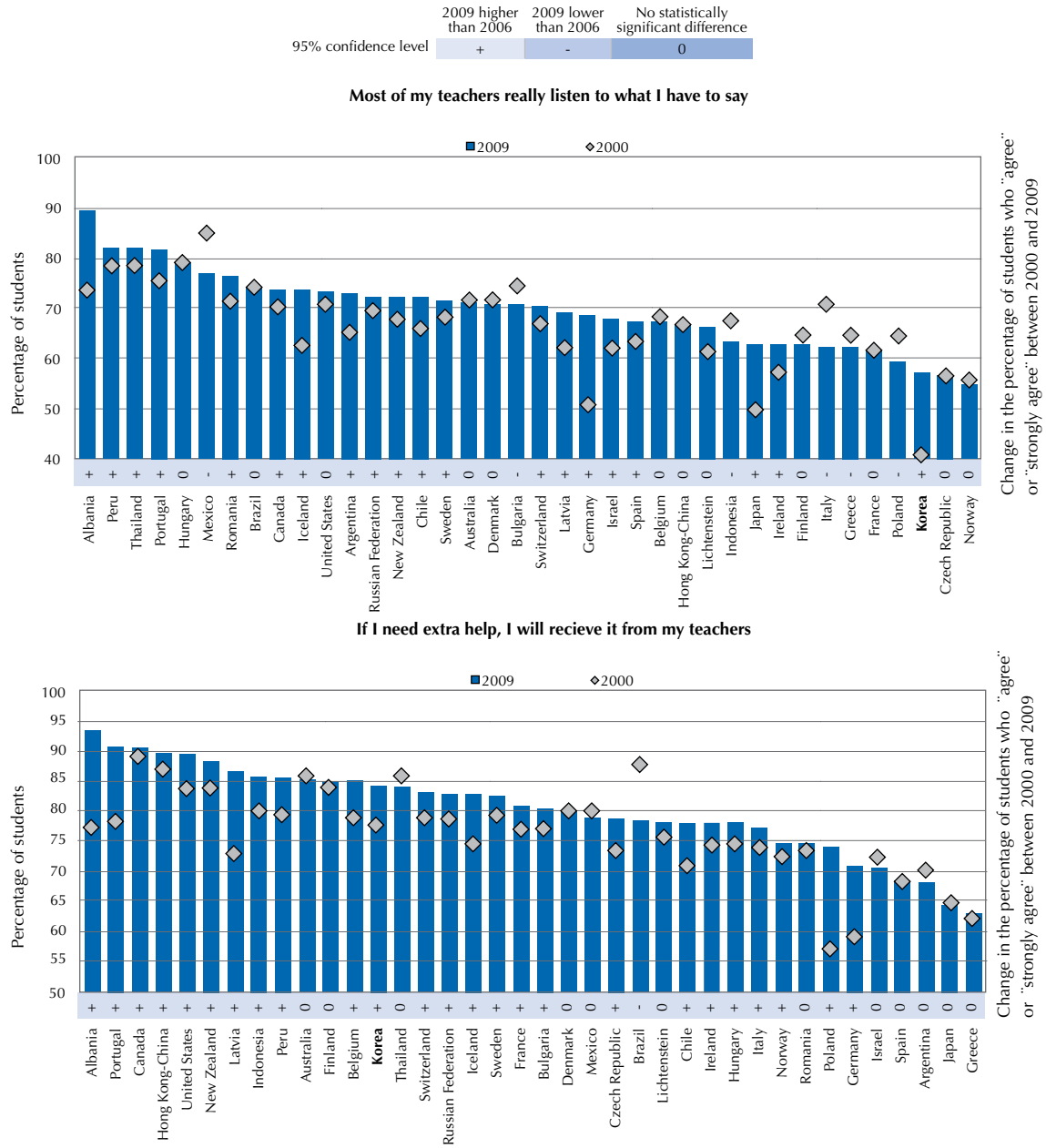
Source: OECD *PISA 2009 database*, Table VI.5.21.

To determine the extent to which teachers' behaviour influences student learning, PISA asked school principals to report whether they perceived learning in their schools to be hindered by such factors as teachers' low expectations of students, poor student-teacher relations, absenteeism among teachers, staff resistance to change, teachers not meeting individual students' needs, teachers being too strict with students, and students not being encouraged to achieve their full potential. Korea is slightly below the OECD average on these measures, and the reports from school principals highlight a number of challenges. Some 17% of students in Korea are enrolled in schools whose principals reported that learning is hindered to some extent or a lot because students are not being encouraged to achieve their full potential (the OECD average is 23%); 34% are enrolled in schools whose principals reported that this is the case because staff resist change (the OECD average is 28%); 33% are in schools where, according to principals, teachers do not meet individual students' needs (the OECD average is 28%); and 34% are in schools where teachers' low expectations of students hinder learning (in contrast, in Finland that proportion is just 6% and the OECD average is 22%). But only 1% of school principals see teachers' absenteeism as a problem (the OECD average is 17%) (see Figure IV.4.5 in OECD, 2010e).

■ Figure 2.32 ■

Teacher-student relations in Pisa 2000 and 2009

Percentage of students agreeing or strongly agreeing with the following statements



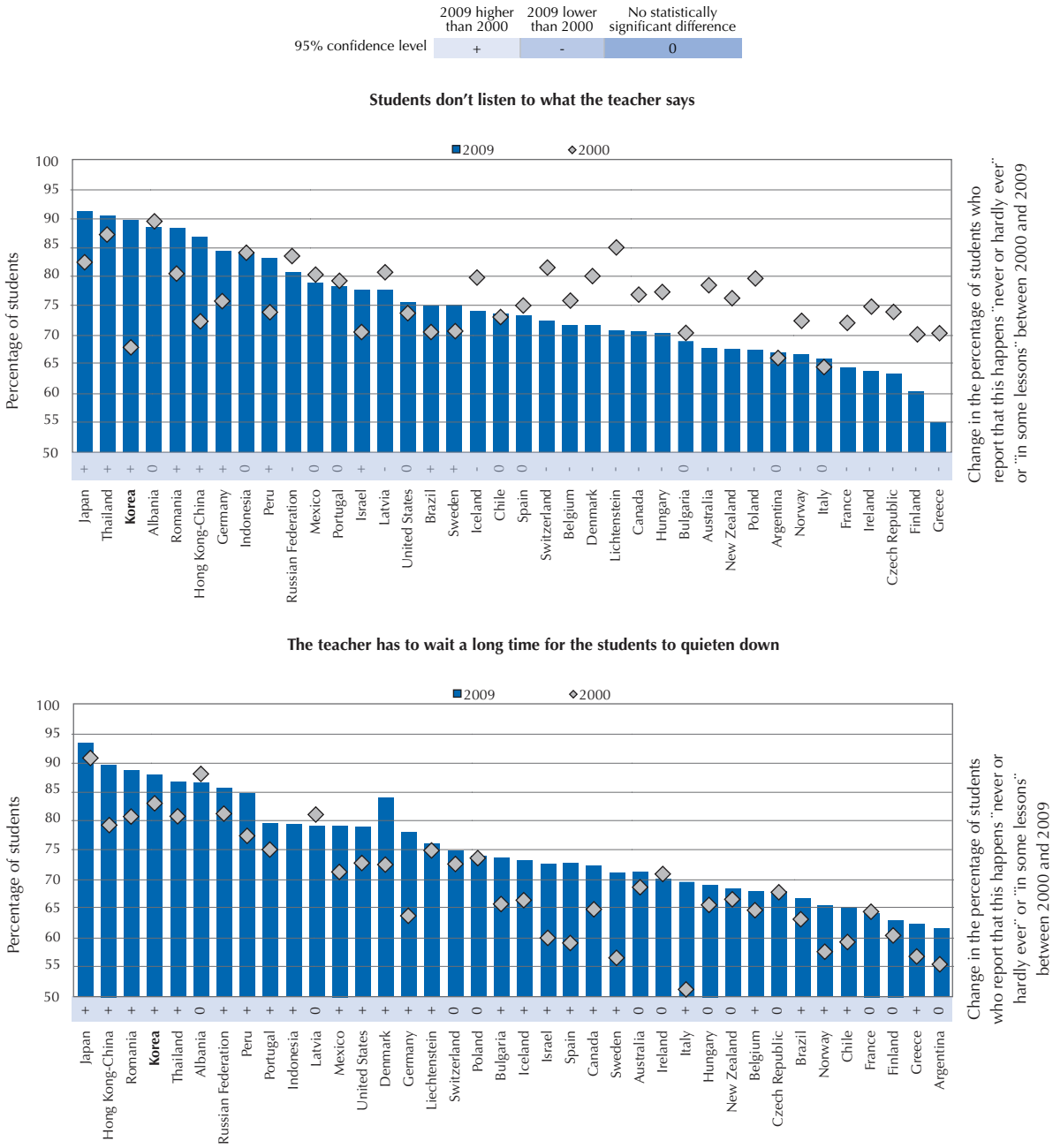
Note: Countries are ranked in descending order of the percentage of students on the items in 2009.

Source: OECD, PISA 2009 Database, Table V.5.11.

■ Figure 2.33 ■

Disciplinary climate in PISA 2000 and 2009

Percentage of students reporting that the following things happen «never or hardly ever» or «in some lessons»



Note: Countries are ranked in descending order of the percentage of students on the items in 2009.

Source: OECD, PISA 2009 Database, Table V.5.12.

THE KOREAN EDUCATION SYSTEM AND EDUCATION POLICIES THAT MAKE A DIFFERENCE

Participation in early childhood education with a reliance on private institutions and funding

Whether and how long students are enrolled in pre-primary education is also an important policy consideration. Many of the inequalities that exist within school systems are already present once students enter formal schooling and persist as students' progress through school. Earlier entrance into the school system may reduce these inequities. On average across OECD countries, 72% of students reported in PISA 2009 that they had attended pre-primary education for more than one year. **Attendance of more than one year in pre-primary education was practically universal (94%) in Korea.**

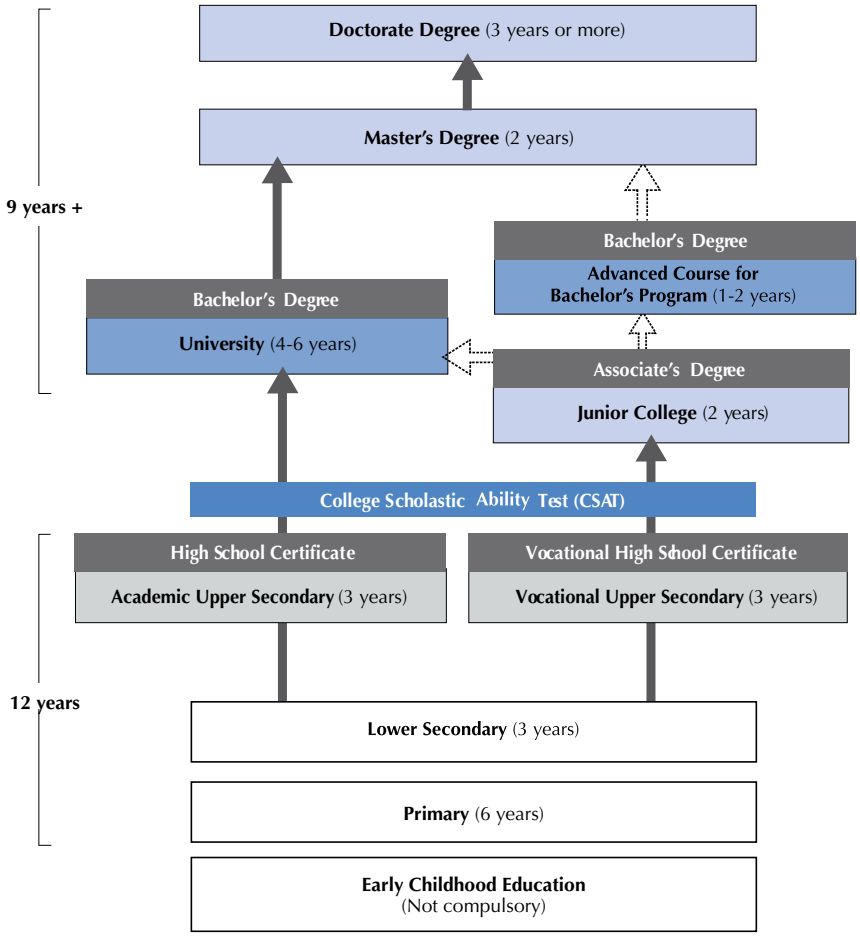
PISA 2009 results show that, in general, students who had attended pre-primary education perform better in reading at the age of 15 than students who had not. In 32 OECD countries, students who had attended pre-primary education for more than one year outperformed students who had not attended pre-primary education at all – in many countries, by the equivalent of well over a school year. This finding holds in most countries even after accounting for students' socio-economic backgrounds. However, across countries, there is considerable variation in the impact of participating in pre-primary education on reading performance when students are 15 years old. In Korea, students who had attended pre-primary education for one year or more scored an average of 16 points higher on the PISA reading scale – the equivalent of a little less than half a year of schooling – than those who had not. However, after accounting for students' socio-economic background, there is no performance difference between students who attended pre-primary education and those who did not. Estonia, Finland and the United States are other OECD countries with no marked difference in reading scores between those who attended pre-primary school for more than one year and those who did not attend at all, after accounting for students' socio-economic background. On the other hand, among OECD countries, students in Belgium, France, Israel and Italy who attended pre-primary education for more than one year scored at least 64 points higher in reading than those who did not, the equivalent of roughly one-and-a-half school years. This was the case even after accounting for students' socio-economic background.

One factor that may explain the variation in the impact of pre-primary education on later school performance is the quality of that education. This hypothesis is supported by the fact that the impact tends to be greater in education systems where pre-primary education is of longer duration, has smaller pupil-to-teacher ratios, or benefits from higher public expenditure per pupil (Table 2.9). When comparing this impact in relation to socio-economic background, in most OECD countries, there is no significant difference in the impact on later school performance between students from socio-economically disadvantaged backgrounds and those from advantaged backgrounds.

Korea used to spend much less on child care and education for three- and five-year-olds, spend little on family benefits in cash or through tax measures, and have few paternity leave entitlements in place. Expenditures are expected to rise as, from March 2012,

■ Figure 2.34 ■

Korean's education system



subsidies will be provided to all five-year-olds to attend early childhood education, and subsidies will be expected to cover all three- and four-year-olds from March 2013 (OECD, 2012b).

Korea's pupil-to-staff ratio for staff working with children up to the age of three is the same as the OECD's average. However, the pupil-to-staff ratio for staff working in pre-school or with three-to-six-year-old children is below the OECD average, indicating that, in Korea, staff members generally have responsibility for a relatively larger number of children than they do in other OECD countries. In Korea, kindergarten teachers (staff in teaching positions) and child-care staff are generally well-educated, however on average, child-care staff tend to have lower levels of qualifications than kindergarten teachers (OECD, 2012b).

Korea has different curricula in place for different types of early childhood care and education but is working towards providing more continuous child development activities. Korea has a standardised child-care curriculum, which covers all children up to five years old in child care. In parallel, there is a national kindergarten curriculum for three- and four-year-old children attending kindergarten. Aiming to provide children with better continuous development and learning, Korea recently set out a national, common curriculum for all five-year-olds in early childcare and education: the *Nuri Curriculum*. The government has announced its intention to extend the common curriculum to ages three and four.

In addition to the values and principles its frameworks are built upon, Korea's curricula include activities designed by staff members, which are, in turn, shaped by anticipated student outcomes. As do most other OECD countries, Korea combines academic subjects with the activities to develop soft skills in its early education frameworks, including topics related to reading, Korean language, science, arts, play and practical skills. It is one of the few countries that teaches young children about ICT.

Table 2.9 Relationship between pre-primary school attendance and performance, by quality of pre-primary school education

	Regression coefficients							
	Attendance quality indicator*		Attendance		Socio-economic background of students		Socio-economic background of schools	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Percentage of students attended pre-primary school	**4.73**	(0.62)	**-27.13**	(5.52)	**17.82**	(0.26)	**59.04**	(0.98)
Average duration of pre-primary schools	**9.93**	(1.53)	**-9.13**	(3.56)	**17.81**	(0.27)	**59.34**	(1.01)
Average pupils-to-teacher ratio in pre-primary schools	**-1.13**	(0.19)	**29.98**	(3.09)	**17.27**	(0.29)	**58.48**	(1.01)
Public expenditure on pre-primary school per student (ppp)	**1.27**	(0.56)	**7.91**	(2.97)	**17.76**	(0.28)	**59.87**	(1.09)

Notes: Values that are statistically significant are indicated in bold.

The model is run only for the OECD countries where the data are available.

This is a regression model with country fixed effects and interactions between individual pre-primary school attendance and one of the system-level quality indicators.

Variables included in the model are: escs, xescs, attendance, attendance*quality indicator, country fixed effect.

escs= PISA index of economic, social and cultural status (student-level variable)

xescs=school average of escs (school-level variable)

immig: 0=native student, 1=student with an immigrant background (student-level variable)

attendance: 0=not attended pre-primary school, 1=attended pre-primary school (student-level variable)

*Quality indicators are:

Percentage of students attended pre-primary school (system-level variable)

Average duration of pre-primary school (system-level variable)

Pupils-to-teacher ratio in pre-primary schools (system-level variable)

Public expenditure on pre-primary school per student (ppp) (system-level variable)

Source: OECD, *PISA 2009 Database*, Table II.5.6.

COMPETITION AS A POWERFUL SOURCE OF INNOVATION

Students in some school systems are encouraged or even obliged to attend their neighbourhood school. However, in many countries, reforms over the past decades have tended to give more authority to parents and students to choose schools that meet their educational needs or preferences best. The assumption has been that if students and parents have sound information and choose schools based on academic criteria, this will foster competition among schools and create incentives for institutions to organise programmes and teaching in ways that better respond to diverse student requirements and interests, thus reducing the cost

of failure and mismatches. In some school systems, schools not only compete for student enrolment, but also for funding. Direct public funding of independently managed institutions, based on student enrolments or student credit-hours, is one model for this. Giving money to students and their families through, for example, scholarships or vouchers, to spend in the public or private educational institutions of their choice is another method (Figure 2.36).

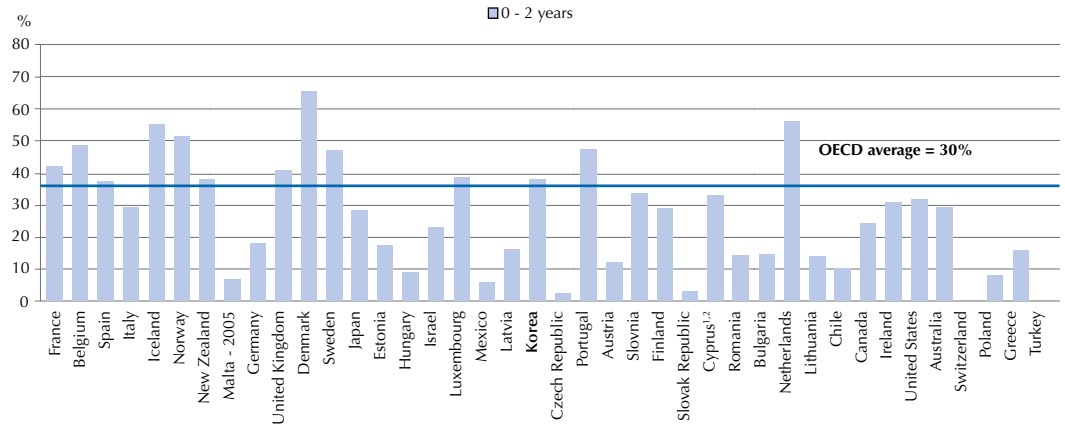
According to the responses of school principals, across OECD countries, 76% of students attend schools that compete with at least one other school for enrolment. Only in Norway, Slovenia and Switzerland do fewer than 50% of students attend schools that compete with other schools for enrolment. In contrast, in Australia, Belgium, Japan, the Netherlands and the Slovak Republic, over 90% of students attend schools that compete with other schools for enrolment.

Some 13 OECD countries and 5 partner countries and economies allow parents and students to choose public schools and also incorporate vouchers or tax credits in their school-choice arrangements; Korea is among this group of countries. Eleven OECD countries and seven partner countries and economies offer a choice of public schools, but do not offer vouchers or tax credits;

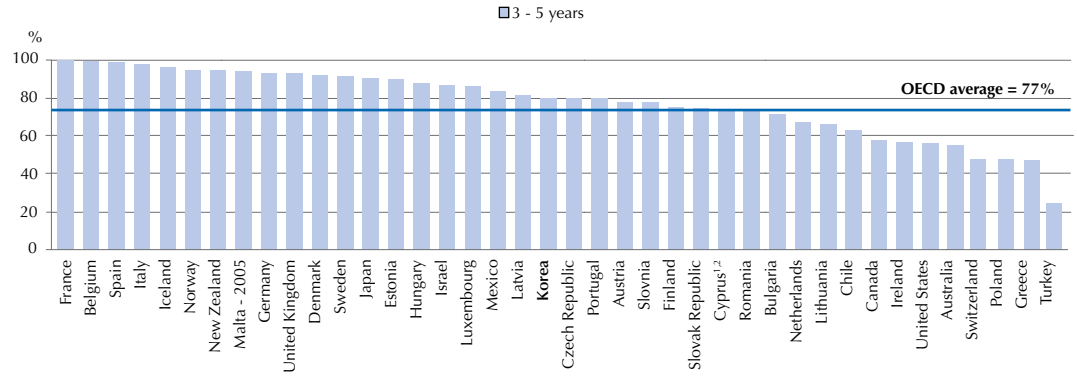
■ Figure 2.35 ■

Enrolment rates of children under six in childcare and early education services, 2008

Panel A: Average enrolment rate of children aged under three years of age in formal childcare (2008)



Panel B: Average enrolment rate of children aged to five years of age in pre-school educational programmes (2008)



Notes: Countries are ranked in descending order of 3 to 5 year old enrolment rates

Source: OECD, PISA 2009 Database, Table V.5.12.

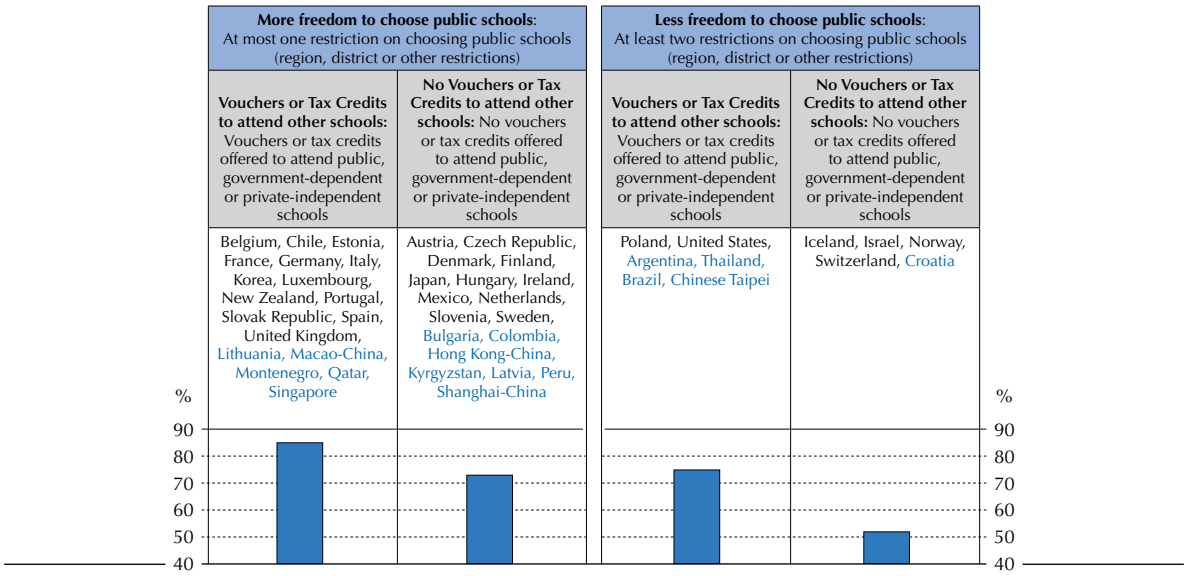
1. Data for children aged 0-2 concern 2006-07
2. Data for children aged 0-2 concern 2009
3. Data for children aged 0-2 concern 2005.
4. Footnote by Turkey: The information in this document with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
5. Footnote by all the European Union Member States of the OECD and the European Commission: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: OECD, Education Database; Canada, National Longitudinal Survey of Children and Youth (2006); Korea, Korean Institute of Childcare and Education; Eurostat (2008) for non-OECD countries.

■ Figure 2.36 ■

Countries in which parents can choose schools for their children

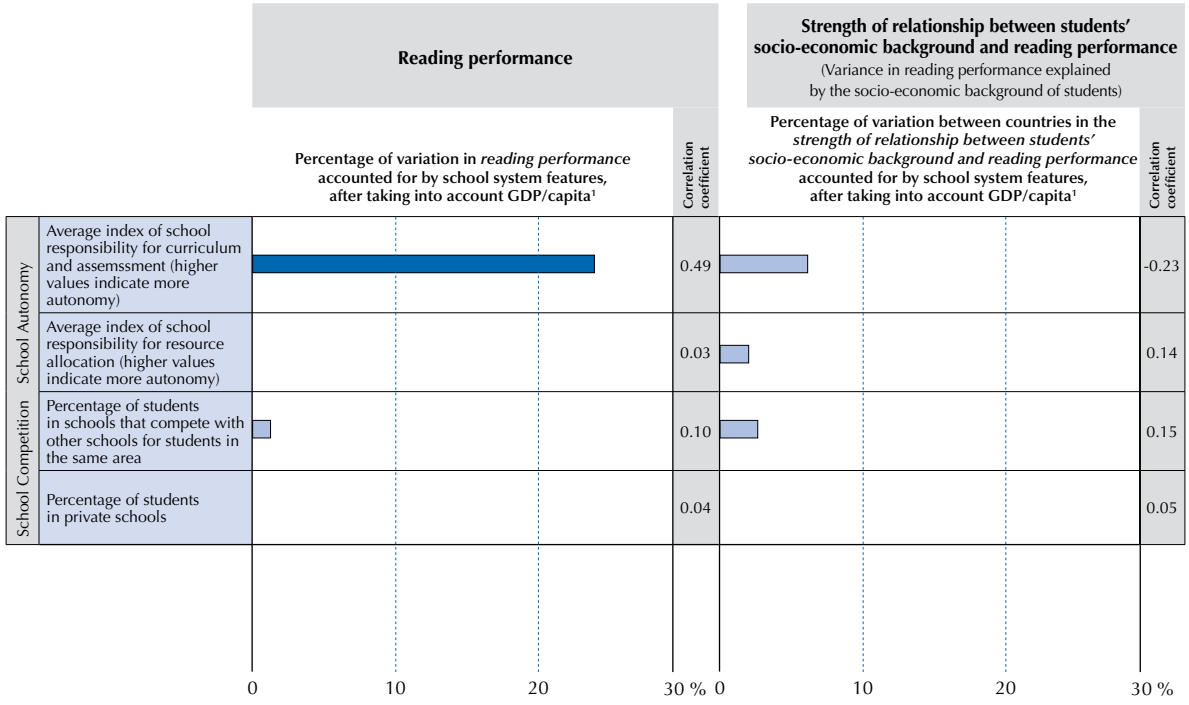
Prevalence of school competition by school choice arrangements



Note: Bars represent the average percentages of school competition in OECD countries, by four categories of school choice arrangements.
Source: OECD, *PISA 2009 Database*, Tables IV.3.7 and IV.3.8a.

■ Figure 2.37 ■

How the governance of school systems is related to education outcomes



Note: Correlations that are statistically significant at the 5% level ($p < 0.05$) are marked in a darker tone.

1. The percentage is obtained by squaring the correlation coefficient and then multiplying it by 100.

Source: OECD, *PISA 2009 Database*, Table IV.2.1.

two OECD countries and four partner countries and economies restrict parents and students in the choice of public schools, but offer tax or voucher credits to attend other schools; and in four OECD countries and one partner country, parents and students must attend the public school nearest to where they live and they are not offered any kind of subsidy to attend other schools (Figure 2.36).

Among schools within a country, competition and performance do seem related; but once the socio-economic profile of students and schools are taken into consideration, the relationship weakens, since privileged students are more likely to attend schools that compete for enrolment. This may reflect the fact that socio-economically advantaged students, who tend to achieve higher scores, are also more likely to attend schools that compete for enrolment, even after accounting for location and attendance in private schools. **In Korea, school competition is negatively related to performance, after accounting for the socio-economic and demographic backgrounds of students and schools (see Figure 2.38).**

■ Figure 2.38 ■

Countries in which school governance is related to reading performance

School governance (the model includes all of these features of school governance)		Without accounting for the socio-economic and demographic background of students and schools		With accounting for the socio-economic and demographic background of students and schools	
		Negative relationship	Positive relationship	Negative relationship	Positive relationship
Index of school responsibility for resource allocation (higher values indicate more autonomy)	OECD	Estonia, Switzerland	Chile, Germany, Greece, Korea, Luxembourg, Spain	Switzerland	Chile, Greece, Korea
		OECD Average change in score: 10.8		OECD Average change in score: 5.8	
	Partner	Albania, Azerbaijan, Croatia	Argentina, Peru, Singapore	Colombia, Croatia, Kyrgyzstan, Thailand	Peru
Index of school responsibility for curriculum and assessment (higher values indicate more autonomy)	OECD	Austria, Germany	Luxembourg, Portugal, Switzerland	Italy, Luxembourg	Belgium, Netherlands, Switzerland
		OECD Average change in score: 1.6		OECD Average change in score: -1.0	
	Partner	Argentina, Bulgaria, Kazakhstan, Panama, Peru, Serbia, Shanghai-China	Dubai (UAE)	Argentina, Brazil, Colombia, Macao'China, Chinedo Taipei	Dubai (UAE), Lithuania
School competes with other schools for students in the same area	OECD	The United Kingdom	Australia, Austria, Canada, Chile, Czech Republic, Estonia, Hungary, Ireland, Mexico, New Zealand, Poland, Slovenia, Spain, Sweden, United Kingdom, United States	Australia, Denmark, Korea	Germany, Turkey
		OECD Average change in score: 14.9		OECD Average change in score: 0.9	
	Partner		Bulgaria, Hong Kong-China, Kyrgyzstan, Peru, Trinidad and Tobago	Argentina, Brazil, Colombia, Macao-China, Chinese Taipei	
Private school	OECD	Luxembourg	Australia, Austria, Canada, Chile, Czech Republic, Estonia, Hungary, Ireland, Mexico, New Zealand, Poland, Slovenia, Spain, Sweden, United Kingdom, United States	Japan, United Kingdom	Canada, Ireland, Slovenia
		OECD Average change in score: 26.6		OECD Average change in score: 3.4	
	Partner	Indonesia, Trinidad and Tobago, Tunisia	Albania, Argentina, Brazil, Colombia, Jordan, Kyrgyzstan, Panama, Peru, Qatar, Uruguay	Hong Kong-China, Kazakhstan, Chinese Taipei, Tunisia	Argentina, Colombia, Kyrgyzstan, Qatar

Note: Only those school systems where there is a statistically significant relationship between school governance and reading performance are listed. OECD averages in bold denote that the estimate is statistically significant at the 5% level ($p < 0.05$).

Source: OECD PISA 2009 database, Table IV.2.4b and Table IV.2.4c.

Why are socio-economically advantaged students more likely to attend schools of their choice? To understand differences in how parents choose schools for their children, PISA asked a series of questions regarding school choice in the questionnaire for parents that was distributed in Korea and seven other OECD countries. In Korea, while 21% of parents from socio-economically disadvantaged backgrounds reported that they considered "low expenses" and "financial aid" to be very important determining factors in choosing a school, only 10% of parents from socio-economically advantaged households reported the same, a difference of 11 percentage points. Similarly, the availability of financial aid was cited by 27% of parents with a disadvantaged background as a reason for choosing a school for their children, while only 13% of parents from advantaged backgrounds cited financial aid. **While parents from all backgrounds cite academic achievement as an important consideration when choosing a school for their children, in Korea, socio-economically advantaged parents are 28 percentage points more likely than disadvantaged parents to cite that consideration as "very important".** It is possible that this difference in thinking reflects the fact that advantaged parents already have access to schools that promote academic achievement. Still, this difference suggests that disadvantaged parents consider that their choice of schools for their children is limited by financial constraints. If children from these backgrounds cannot attend high-performing schools because of school fees, then school systems that offer parents more choice of schools for their children will necessarily be less effective in improving the performance of all students (OECD, 2010e).

Governance structures: Little school-level autonomy in resource allocation, high levels of autonomy in curricular decisions and assessment practices.

Many countries have shifted public and government concern away from control over the resources and content of education to focus on outcomes. This becomes apparent when the distribution of decision-making responsibilities in education is reviewed across successive PISA assessments. In addition, some countries have made greater efforts to devolve responsibility to the frontline, encouraging responsiveness to local needs and strengthening accountability. PISA shows a clear relationship between the relative autonomy of schools in managing instructional policies and practices, and outcomes across systems when autonomy is coupled with accountability.

Korea shows below-average school autonomy in resource allocation (Figure 2.39). However, the centralisation of resources in Korea does not have a negative impact on student outcomes. Evidence from PISA shows that devolving some aspects of teaching directly to schools has a favourable impact on student learning, which appears to be the case in Korea. Students must meet high standards, but teachers are given broad latitude in how to instruct so that their students meet those standards.

The degree to which students and parents can choose schools, and the degree to which schools are considered autonomous entities that make organisational decisions independent of district, regional, or national entities, can affect student performance. Results from PISA suggest that school autonomy in defining curricula and assessments relates positively to the systems' overall performance (Figure 2.37). For example, school systems that provide schools with greater discretion in making decisions regarding student-assessment policies, the courses offered, course content and the textbooks used, tend to be school systems that perform at higher levels.

PISA results show that Korea grants significant school autonomy over curricular and assessment policies and less autonomy over resource allocation. Some 92% of students in Korea are in schools whose principals reported that only principals and/or teachers have considerable responsibly in establishing student-assessment policies (the OECD average is 66%); 79% are in schools whose principals reported that only principals and/or teachers have considerable responsibility in deciding which courses are offered (the OECD average is 50%); 89% are in schools whose principals reported that only principals and/or teachers have considerable responsibility in determining course content (the OECD average is 45%); and 96% are in schools whose principals reported that only principals and/or teachers have considerable responsibility in choosing which textbooks are used (the OECD average is 78%) (Figure 2.40).

Data from PISA also show that in school systems where most schools post achievement data publicly, schools with greater discretion in managing their resources tend to show higher levels of performance. In school systems where schools do not post achievement data publicly, a student who attends a school with greater autonomy in resource management than the average OECD school tends to perform 3.2 score points lower in reading than a student attending a school with an average level of autonomy. In contrast, in school systems where schools do post achievement data publicly, a student who attends a school with above-average autonomy scores 2.6 points higher in reading than a student attending a school with an average level of autonomy (see OECD, 2010 Table IV.2.5.).

PISA classifies OECD countries into four groups that have similar profiles in the way that they allow schools and parents to make decisions that affect their children's education. The grouping is based on levels of school autonomy and school competition. Two categories are identified for each dimension, and the interplay between these dimensions results in three groups: school systems that offer high levels of autonomy to schools in designing and using curricula and assessments and encourage more competition between schools; school systems that offer low levels of autonomy to schools and limit competition between schools; school systems that offer high levels of autonomy to schools, but with limited competition between schools; and school systems that offer low levels of autonomy to schools, but encourage more competition between schools.

- Six other OECD countries offer high levels of autonomy and choice, either in the form of a high prevalence of private schools or competition among schools for enrolment. In these school systems, schools have the freedom to choose teaching methods to meet learning objectives, and parents and students can choose among a variety of schools for enrolment. **Korea falls into this category.**
- Across OECD countries, the most common configuration is the one that gives **schools the freedom to make curricular decisions, yet restricts competition for enrolment** among schools. These school systems have relatively limited choice for parents and students, and there is little competition for enrolment among schools. Private schools are not widely available in these countries. **Twenty-two OECD countries fall into this category.**
- School systems that offer relatively low levels of autonomy to schools and low levels of choice to parents are also fairly common across OECD countries: four OECD countries and 11 partner countries and economies share this configuration.

■ Figure 2.39 ■

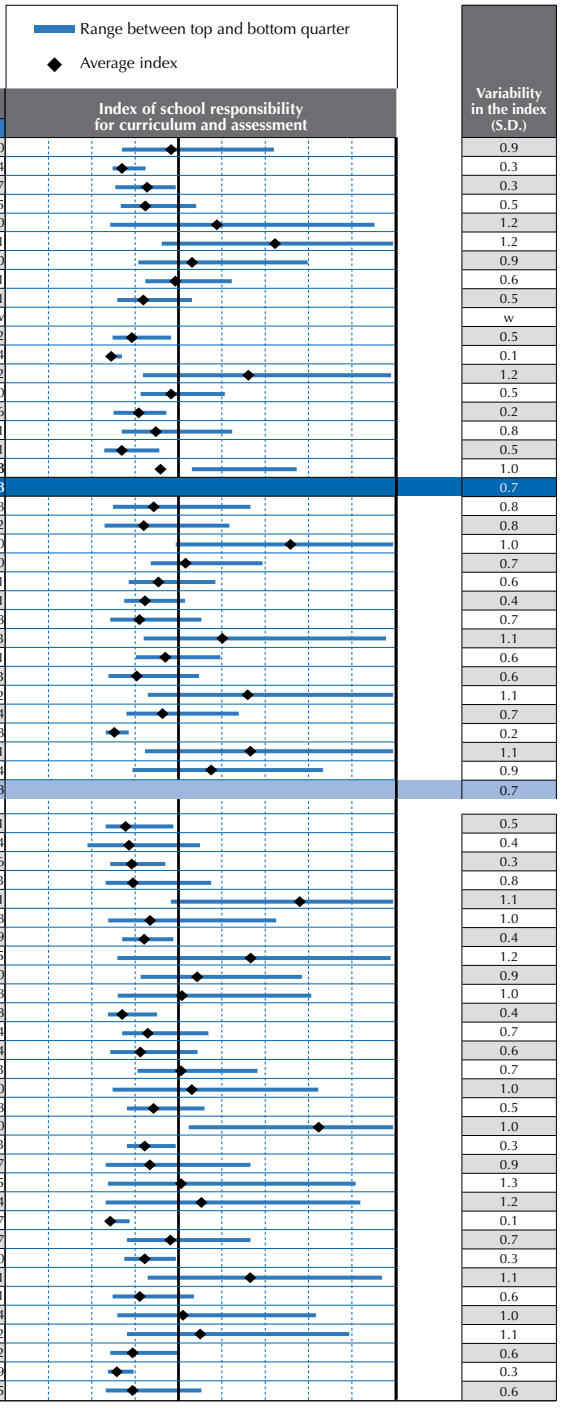
How much autonomy individual schools have over resource allocation

Percentage of students in schools whose principals reported that only «principals and/or teachers», only «regional and/or national education authority», or both «principals and/or teachers» and «regional and/or national education authority» have a considerable responsibility for the following tasks

A Selecting teachers for hire
B Dismissing teachers
C Establishing teachers' starting salaries
D Deciding which courses are offered
E Formulating the school budget
F Deciding on budget allocations within the school

1 Only "principals and/or teachers"
2 Both "principals and/or teachers" and "regional and/or national education authority"
3 Only "regional and/or national education authority"

		A			B			C			D			E			F			Index of school responsibility for curriculum and assessment	Variability in the index (S.D.)
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
OECD	Australia	61	20	19	43	12	45	12	5	84	13	6	81	68	16	16	93	6	0		0.9
	Austria	13	35	52	5	26	68	1	0	99	1	0	99	11	9	80	84	12	4		0.3
	Belgium	75	13	12	63	21	17	0	1	99	0	1	99	56	18	26	63	19	17		0.3
	Canada	54	39	7	17	35	48	3	5	92	4	6	91	25	30	45	76	19	5		0.5
	Chile	69	8	23	59	3	38	37	1	62	37	1	62	55	9	36	71	9	20		1.2
	Czech Republic	100	0	0	99	1	0	77	15	8	65	25	11	55	36	9	75	24	1		1.2
	Denmark	97	2	0	69	15	16	20	10	70	16	14	70	80	13	8	98	2	0		0.9
	Estonia	98	2	0	95	5	0	7	20	73	12	33	55	37	54	9	85	15	1		0.6
	Finland	32	43	25	18	19	63	8	7	84	5	15	80	36	41	23	92	6	1		0.5
	France	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w		w
	Germany	29	36	34	7	14	79	3	0	97	4	15	81	29	4	67	97	2	2		0.5
	Greece	0	1	99	0	2	98	0	0	100	0	0	100	34	7	59	59	7	34		0.1
	Hungary	99	1	0	97	2	1	49	7	44	56	7	37	73	15	12	92	5	2		1.2
	Iceland	94	6	0	93	7	0	7	13	80	4	16	80	57	30	13	77	22	0		0.5
	Ireland	61	25	14	36	14	50	0	2	98	1	0	99	60	13	27	89	5	6		0.2
	Israel	67	30	3	49	38	13	9	4	87	13	6	80	15	26	59	66	24	11		0.8
	Italy	9	10	82	9	6	84	3	0	97	3	0	96	7	7	86	69	11	21		0.5
	Japan	**25**	**2**	**73**	**22**	**1**	**77**	**13**	**0**	**87**	**16**	**3**	**80**	**28**	**4**	**69**	**89**	**3**	**8**		1.0
	Korea	**32**	**6**	**62**	**23**	**4**	**74**	**8**	**0**	**92**	**6**	**0**	**94**	**29**	**12**	**58**	**86**	**6**	**8**		0.7
	Luxembourg	21	41	38	19	36	45	6	0	94	6	0	94	31	57	12	78	14	8		0.8
	Mexico	34	5	61	22	4	73	8	0	92	6	0	94	46	6	48	71	7	22		0.8
	Netherlands	100	0	0	99	1	0	72	8	20	55	12	33	99	1	0	100	0	0		1.0
	New Zealand	100	0	0	89	7	4	9	3	88	15	21	64	95	4	1	99	1	0		0.7
	Norway	72	21	6	44	22	34	8	4	88	6	13	81	55	28	17	88	12	1		0.6
	Poland	87	12	1	90	10	0	9	20	71	4	20	77	7	42	51	26	43	31		0.4
	Portugal	13	57	30	14	0	86	5	0	94	5	0	94	63	10	27	89	3	8		0.7
	Slovak Republic	98	2	0	98	2	0	39	27	34	32	33	35	45	40	15	70	27	3		1.1
	Slovenia	96	4	1	88	10	1	7	11	82	13	31	56	26	49	26	78	21	1		0.6
	Spain	31	3	66	32	1	67	3	2	95	3	2	95	63	4	33	93	4	3		0.6
	Sweden	96	4	0	63	17	20	57	16	27	69	22	9	64	20	16	93	5	2		1.1
	Switzerland	82	15	3	60	26	15	8	8	84	8	13	79	35	30	35	83	13	4		0.7
	Turkey	1	1	99	2	2	96	1	0	99	1	0	99	34	19	47	56	16	28		0.2
	United Kingdom	90	9	0	70	22	8	52	23	25	67	17	15	57	29	14	95	5	1		1.1
	United States	88	12	0	75	19	6	17	5	78	18	6	75	54	29	16	83	13	4		0.9
	OECD average	61	14	25	51	13	37	17	7	77	17	10	73	46	22	32	81	12	8		0.7
Partners	Albania	8	14	78	7	14	79	3	0	97	3	1	96	33	12	55	61	8	31		0.5
	Argentina	44	5	51	27	3	70	2	1	97	1	4	96	22	5	73	64	12	24		0.4
	Azerbaijan	40	22	38	61	17	22	35	6	59	13	3	84	5	6	89	20	4	76		0.3
	Brazil	17	7	76	14	8	78	8	1	91	7	1	92	14	5	80	21	6	73		0.8
	Bulgaria	93	5	2	97	2	1	66	20	14	84	12	4	73	22	5	92	7	1		1.1
	Colombia	21	5	75	21	1	78	14	0	86	13	1	86	58	5	36	87	5	8		1.0
	Croatia	90	10	0	84	11	5	1	1	98	2	1	97	26	34	40	68	23	9		0.4
	Dubai (UAE)	65	12	23	67	9	24	62	3	34	68	1	31	75	2	22	92	3	5		1.2
	Hong Kong-China	83	15	2	79	17	4	18	24	58	15	12	74	84	15	2	91	9	0		0.9
	Indonesia	29	12	59	26	11	63	20	9	70	23	11	66	83	11	5	78	14	8		1.0
	Jordan	6	1	93	4	1	95	1	1	98	2	0	98	83	1	17	70	2	28		0.4
	Kazakhstan	88	10	2	95	4	2	17	10	73	8	10	82	8	13	79	17	19	64		0.7
	Kyrgyzstan	74	14	11	68	13	19	18	4	77	13	3	84	12	7	81	19	7	74		0.6
	Latvia	94	4	2	96	4	0	10	15	75	18	25	57	62	25	12	81	16	3		0.7
	Liechtenstein	41	0	59	37	0	63	6	0	94	39	17	45	37	0	63	100	0	0		1.0
	Lithuania	96	4	0	99	1	0	11	7	81	6	8	86	25	27	48	42	29	28		0.5
	Macao-China	92	4	4	91	5	4	91	4	5	90	4	5	95	5	0	84	16	0		1.0
	Montenegro	89	11	0	82	18	0	0	5	95	10	11	78	12	21	68	65	22	13		0.3
	Panama	22	3	76	20	8	72	14	5	81	14	8	79	70	15	15	43	10	47		0.9
	Peru	38	15	47	30	9	61	22	2	76	22	2	77	60	9	31	79	6	15		1.3
	Qatar	52	3	44	54	5	41	47	3	50	47	4	50	43	4	53	52	4	44		1.2
	Romania	1	9	91	4	11	86	0	2	97	1	4	95	7	25	68	40	13	47		0.1
	Russian Federation	95	4	1	95	5	0	35	15	50	29	20	51	8	30	63	46	28	27		0.7
	Serbia	72	28	1	64	30	7	1	8	90	16	19	65	9	27	64	74	16	10		0.3
	Shanghai-China	98	2	0	99	1	0	36	5	59	43	6	51	91	2	6	98	1	1		1.1
	Singapore	14	38	48	14	24	62	4	3	93	7	17	75	49	22	29	91	8	1		0.6
	Chinese Taipei	73	13	14	74	14	12	18	7	75	23	7	70	50	13	37	78	8	14		1.0
	Thailand	30	20	50	59	12	28	29	14	56	72	24	5	70	20	10	90	7	2		1.1
	Trinidad and Tobago	17	14	69	6	4	90	2	1	96	6	5	89	46	28	26	75	12	12		0.6
	Tunisia	2	0	98	1	0	99	1	1	99	1	0	99	10	18	72	78	13	9		0.3
	Uruguay	17	5	78	13	1	86	3	1	96	2	1	96	13	12	75	49	16	35		0.6



Source: OECD, PISA 2009 Database, Table IV.3.6.

■ Figure 2.40 ■

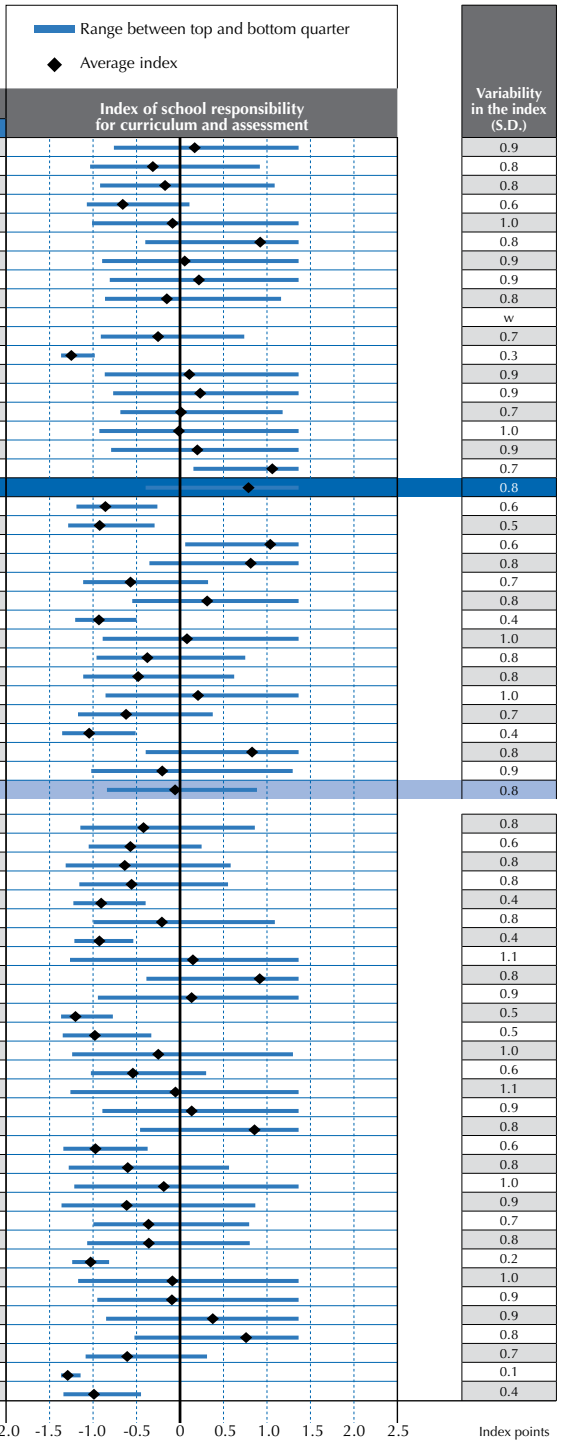
How much autonomy individual schools have over curricula and assessments

Percentage of students in schools whose principals reported that only "principals and/or teachers", only "regional and/or national education authority" or both "principals and/or teachers" and "regional and/or national education authority" have a considerable responsibility for the following tasks

A Establishing student assessment policies
B Choosing which textbooks are used
C Determining course content
D Deciding which courses are offered

1 Only "principals and/or teachers"
2 Both "principals and/or teachers" and "regional and/or national education authority"
3 Only "regional and/or national education authority"

		A			B			C			D			Index of school responsibility for curriculum and assessment	Variability in the index (S.D.)
		1	2	3	1	2	3	1	2	3	1	2	3		
OECD	Australia	65	33	2	92	8	0	46	40	14	75	24	1		0.9
	Austria	57	27	15	94	5	1	37	40	23	32	40	29		0.8
	Belgium	78	19	4	94	4	1	32	42	26	40	46	13		0.8
	Canada	28	62	10	40	49	11	12	51	38	44	54	3		0.6
	Chile	72	21	6	73	20	7	43	22	35	64	20	16		1.0
	Czech Republic	95	5	0	89	11	1	83	16	1	88	11	1		0.8
	Denmark	61	28	11	100	0	0	56	32	12	47	39	14		0.9
	Estonia	63	33	3	66	32	2	66	30	4	79	20	2		0.9
	Finland	50	43	7	98	2	0	32	52	16	55	39	6		0.8
	France	w	w	w	w	w	w	w	w	w	w	w	w		w
	Germany	71	21	9	84	13	3	21	47	32	80	18	2		0.7
	Greece	20	12	68	7	8	85	1	3	96	6	5	88		0.3
	Hungary	94	6	0	98	2	0	49	36	15	43	28	29		0.9
	Iceland	92	8	1	93	4	3	61	26	13	48	42	10		0.9
	Ireland	87	13	0	97	3	0	29	37	34	78	21	1		0.7
	Israel	80	20	0	53	43	4	52	44	5	44	50	6		1.0
	Italy	91	8	1	99	1	0	59	27	14	49	25	27		0.9
	Japan	**98**	**2**	**0**	**89**	**8**	**3**	**93**	**6**	**1**	**94**	**5**	**2**		0.7
	Korea	**92**	**6**	**2**	**96**	**4**	**0**	**89**	**8**	**2**	**79**	**17**	**4**		0.8
	Luxembourg	9	33	58	13	80	7	9	72	20	18	61	21		0.6
	Mexico	56	15	29	63	11	26	14	7	79	5	5	91		0.5
	Netherlands	99	1	0	100	0	0	87	12	1	89	10	1		0.6
	New Zealand	81	17	2	99	1	0	79	20	1	92	8	0		0.8
	Norway	38	36	27	97	2	1	30	40	30	23	33	44		0.7
	Poland	92	8	0	92	8	0	93	7	0	40	31	29		0.8
	Portugal	35	37	28	98	2	0	5	3	92	10	5	86		0.4
	Slovak Republic	76	21	3	56	39	5	48	47	5	52	48	1		1.0
	Slovenia	46	48	5	72	27	1	34	59	6	28	52	20		0.8
	Spain	44	34	23	95	5	0	32	31	37	30	31	39		0.8
	Sweden	66	30	3	99	1	0	66	26	8	53	25	22		1.0
	Switzerland	57	27	16	40	40	20	21	41	38	24	50	27		0.7
	Turkey	42	29	30	14	18	68	9	15	76	14	21	65		0.4
	United Kingdom	88	12	0	98	2	0	77	20	2	86	14	0		0.8
	United States	46	40	13	62	28	10	36	46	18	58	37	4		0.9
	OECD average	66	23	11	78	15	8	45	31	24	50	28	21		0.8
Partners	Albania	51	16	33	91	8	1	35	7	57	35	12	53		0.8
	Argentina	74	20	6	81	16	3	28	43	29	8	30	61		0.6
	Azerbaijan	54	8	38	50	6	43	27	9	64	37	5	58		0.8
	Brazil	47	27	26	88	9	2	35	25	40	18	17	65		0.8
	Bulgaria	25	37	38	88	12	1	10	26	65	10	15	75		0.4
	Colombia	39	21	39	92	3	4	69	23	8	64	14	23		0.8
	Croatia	26	36	38	63	34	3	11	50	39	2	25	72		0.4
	Dubai (UAE)	77	10	13	55	17	27	62	13	26	59	16	25		1.1
	Hong Kong-China	93	7	0	93	7	0	81	17	2	87	13	0		0.8
	Indonesia	67	28	6	80	13	7	75	18	7	49	23	28		0.9
	Jordan	27	4	70	4	1	95	7	1	93	7	1	92		0.5
	Kazakhstan	31	22	47	16	14	70	11	18	71	40	22	37		0.5
	Kyrgyzstan	65	8	26	68	8	23	59	10	31	44	7	49		1.0
	Latvia	56	40	4	71	27	2	19	46	36	30	42	28		0.6
	Liechtenstein	69	25	6	54	5	40	41	0	59	53	9	38		1.1
	Lithuania	75	20	5	89	11	1	50	35	15	75	20	5		0.9
	Macao-China	95	0	5	100	0	0	94	6	0	81	14	4		0.8
	Montenegro	40	32	28	5	30	65	5	34	61	20	36	44		0.6
	Panama	41	25	34	52	26	22	41	23	36	26	23	51		0.8
	Peru	75	15	10	52	12	37	53	23	24	45	18	37		1.0
	Qatar	45	18	37	37	16	47	31	9	60	35	17	48		0.9
	Romania	42	36	22	86	13	1	46	33	20	31	41	29		0.7
	Russian Federation	63	25	12	65	27	8	21	40	39	71	22	7		0.8
	Serbia	49	44	7	19	59	23	2	41	57	0	12	87		0.2
	Shanghai-China	86	9	5	49	17	34	45	22	33	52	28	20		1.0
	Singapore	57	41	2	72	24	3	44	38	18	66	31	4		0.9
	Chinese Taipei	74	17	8	92	8	0	81	16	3	68	25	7		0.9
	Thailand	79	18	2	89	10	1	89	11	0	91	8	1		0.8
	Trinidad and Tobago	50	45	5	29	62	10	21	40	39	34	51	15		0.7
	Tunisia	11	11	78	0	1	99	3	14	83	4	9	87		0.1
	Uruguay	23	30	47	31	36	33	3	26	71	21	19	59		0.4



Source: OECD, PISA 2009 Database, Table IV.3.6.

SETTING STANDARDS AND ACCOUNTABILITY ARRANGEMENTS

As discussed in the 2009 edition of *Education at a Glance* (OECD, 2009), over the past decade, assessments of student performance have become common in many OECD countries – and the results are often widely reported and used in both public and more specialised debate. However, the rationale for assessments and the nature of the instruments used vary greatly within and across countries. Methods employed in OECD countries include different forms of external assessment, external evaluation or inspection, and schools' own quality-assurance and self-evaluation efforts.

Standards-based external examinations are used in some accountability systems (see OECD, 2010e page 75 for a description of standards-based external examinations, Table IV.3.10 in OECD, 2010e for a description of countries with and without standards-based external examinations and the note to Table IV.3.10 for a description of the data collection). These are examinations that focus on a specific school subject and assess a major portion of what students who are studying this subject are expected to know or be able to do. Essentially, they define performance relative to an external standard, not relative to other students in the classroom or school. These examinations usually have a direct impact on students' education – and even on their futures – and may thus motivate students to work harder. Other standardised tests, which may be voluntary and conducted by schools, often have only indirect consequences for students. For teachers, standardised assessments can provide information on students' learning needs and can be used to tailor their instruction accordingly. In some countries, such as Brazil, Hungary, Italy, Malaysia, Mexico, Poland and the Slovak Republic, such tests are also used to determine teachers' salaries or guide professional development (for data, see OECD, 2009). At the school level, information from standardised tests can be used to determine the allocation of additional resources, and what interventions are required to establish performance targets and monitor progress.

Table 2.10 Ratio of schools posting achievement data publicly and the relationship between school autonomy in allocating resources and reading performance

	Model for prevalence of schools' posting achievement data publicly (OLS regression estimates)			
	Gross model		Net model	
	Coef.	S.E.	Coef.	S.E.
School autonomy for resource allocation	**6.72**	(2.21)	**-3.24**	(1.45)
× Percentage of students in schools that post achievement data publicly (additional 10%)	-1.30	(4.34)	**0.58**	(0.28)
School autonomy for curriculum and assessment			0.04	(0.59)
Private school			-0.48	(1.49)
PISA index of economic, social and cultural status of student (ESCS)			**17.98**	(0.26)
PISA index of economic, social and cultural status of student (ESCS squared)			**2.06**	(0.22)
Student is a female			**36.23**	(0.51)
Student's language at home is the same as the language of assessment			**17.02**	(1.23)
Student without an immigrant background			**11.64**	(1.20)
School average PISA index of economic, social and cultural status			**58.13**	(0.97)
School in a city (100 000 or more people)			**-2.36**	(1.21)
School in a small town or village (15 000 or less people)			**2.93**	(1.14)
School size (100 students)			**1.61**	(0.13)
School size (100 students, squared)			**-0.01**	(0.00)
Number of observations	267 425		267 425	

Note: Estimates significant at the 5% level ($p < 0.05$) are in bold. Both net and gross models include country fixed effects, estimate no intercept, are run for OECD countries only and use BRR weights to account for the sampling design. All countries are weighted equally.

Source: OECD, *PISA 2009 Database*, Table IV.2.5

Across OECD countries, students in school systems that require **standards-based external examinations** perform, on average, over 16 points higher than those in school systems that do not use such examinations (Figure 2.36). **There are standards-based external examinations for secondary school students in Korea,** the Czech Republic, Denmark, Estonia, Finland, France, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Poland, the Slovak Republic, Slovenia, Turkey and the United Kingdom. In Australia, these examinations cover 81% of secondary students, in Canada 51%, and in Germany 35%. In Austria, Belgium, Chile, Greece, Mexico, Portugal, Spain, Sweden and Switzerland, such examinations do not exist or are found in only some parts of the system.

In PISA 2009, school principals were asked to report on the types and frequency of assessment used: standardised tests, teacher-developed tests, teachers' judgemental ratings, student portfolios or student assignments. Some 76% of students in OECD countries are enrolled in schools that use standardised tests. Standardised tests are relatively uncommon in Austria, Belgium, Germany, Slovenia and Spain, where fewer than half of 15-year-olds attend schools that assess students through standardised tests. In contrast,

the use of standardised tests is practically universal in Korea, where 98% of students attend schools that use standardised tests, and in Denmark, Finland, Luxembourg, Norway, Poland, Sweden and the United States, where over 95% of students attend schools that use this assessment at least once a year (OECD, 2010e).

Standards are typically reflected in accountability frameworks and mechanisms. The purposes of assessments vary greatly across countries. At the school level, these assessments can be used by schools to compare themselves to other schools, to monitor progress, or to make decisions about instruction. Some 59% of students across OECD countries are in schools that use achievement data to compare their students' achievement levels with those in other schools or with regional/national benchmarks. This practice is most common in New Zealand, the United Kingdom and the United States, where over 90% of students attend schools that use achievement data for comparative purposes, but is also widely used in Korea, where 78% of students attend such schools. In many OECD countries, these data are used to make decisions about students' retention or promotion: on average across OECD countries, 78% of students attend schools that do so. In Belgium, Luxembourg, Poland and Spain, over 98% of students are in schools that use achievement data to decide on grade retention or promotion, but in Korea, fewer than 37% of students are in such schools. Achievement data are much more likely to be used to monitor a Korean school's progress from year to year and to identify aspects of instruction or aspects of the curriculum that could be improved – 83% and 88% of Korean students, respectively, attend such schools (see OECD, 2010e Table IV.3.12).

PISA does not show that the prevalence of standardised tests is systematically related to performance. This may be partly because the content and use of standardised tests vary considerably across schools and systems. However, education systems with a higher prevalence of standardised tests tend to show smaller socio-economic inequities between schools and consequently show a smaller impact of a school's socio-economic background on performance. The same holds for the use of assessment data to identify aspects of instruction or the curriculum that could be improved and the high proportions of schools whose achievement data is tracked over time by administrative authorities.

PISA 2009 collected data on the nature of accountability systems and the ways in which the resulting information was used. Some school systems publicise achievement data to make stakeholders aware of the comparative performance of schools and, where school-choice programmes are available, to make parents aware of the choices available to them. **In Korea, 33% of students attend schools that make achievement data available to the public;** this proportion is similar to the OECD average**.** In Austria, Belgium, Finland, Japan, Spain and Switzerland, fewer than 10% of students attend such schools, while in the United Kingdom and the United States, more than 80% of students attend schools that make student achievement data publicly available. In seven OECD countries and nine partner countries and economies, schools whose principals reported that student achievement data are posted publicly perform better than schools that do not post such information, before accounting for the socio-economic and demographic backgrounds of students and schools. In Korea, however, **no relationship is seen between reporting student achievement data and student performance** (see Table IV.2.9b and Table IV.2.9c in OECD, 2010e), and this association is not apparent in any country, except Turkey, after controlling for the socio-economic background of students and schools. This is because, in most countries, the schools that post achievement data publicly tend to be socio-economically advantaged schools.

Across OECD countries, some 33% of students attend schools that use achievement data to determine how resources are distributed. In Korea, 39% of students attend such schools, while in Chile, Israel and the United States, more than 70% of students attend schools whose principal reported that instructional resources are allocated according to the school's achievement data. **The practice of using achievement data to determine how resources are distributed is least common in** the Czech Republic, Finland, Greece, Iceland, and Japan, where fewer than 10% of students attend schools that use achievement data this way.

Some school systems make achievement data available to parents in the form of report cards and by sending teacher-formulated assessments home. Some school systems also provide information on the students' academic standing compared with other students in the country or region or within the school. Across OECD countries, an average of 52% of students attends schools that use achievement data relative to national or regional benchmarks and/or as a group relative to students in the same grade in other schools. **In Korea, 84% of students attend schools that provide information regarding the academic standing of the students in one or other of these ways.** Other countries where this practice is particularly widespread are Chile, Norway, Sweden, Turkey and the United States, where more than 80% of students attend schools that provide parents with achievement data comparing their students with national or regional student populations (see Table IV.3.14 in OECD, 2010e).

An average of 59% of students across OECD countries attends schools whose student achievement data are used to monitor teacher practices (see Table IV.3.15 in OECD, 2010e). **In Korea, 77% of students attend schools that use achievement data to monitor teacher practices.** In Austria, Israel, Mexico, Poland, Turkey, the United Kingdom and the United States, over 80% of students attend such schools, while 30% or fewer of students in Finland, Greece, Sweden and Switzerland attend such schools. Many schools across OECD countries complement this information with qualitative assessments, such as teacher peer reviews, assessments by school principals or senior staff, or observations by inspectors or other people external to the school. Most schools across OECD countries use either student-derived, direct observations or reviews to monitor teachers. In Korea, 77% of students

attend schools that use student assessments to monitor teachers; 62% of students attend schools that use observations of lessons by the principal or senior staff to monitor teacher practices; 88% of students attend schools that use teacher peer review to monitor teacher practices; and 89% of students attend schools that monitor teacher practices using observations of classes by inspectors or other people external to the school. In contrast, school principals in high-performing Finland reported that they rarely use any of these tools to monitor teacher practices. Some 18% of students in Finland attend schools that use student assessments to monitor teachers; around 20% of students attend schools that use more qualitative and direct methods to monitor teacher practices; and only 2% of students attend schools that monitor teacher practices using observations of classes by inspectors or other people external to the school.

DEALING WITH DIVERSITY IN THE STUDENT POPULATION: LOW LEVELS OF VERTICAL DIFFERENTIATION AND MEDIUM LEVELS OF HORIZONTAL DIFFERENTIATION

PISA classifies school systems into 12 groups, according to the differentiation policies and practices they adopt (Table 2.11):

- Thirteen OECD countries are characterised by relatively low levels of formal differentiation. In these school systems, students are not systematically streamed, schools are not selective in their admissions processes, and students usually do not repeat grades and are not transferred to other schools. As a result, classrooms tend to be heterogeneous.
- School systems in six other OECD countries stratify students into different programmes based on students' academic performance, usually before they are 15 years old. Grade repetition is not common in these school systems, nor is horizontal differentiation at the school level. **In Korea, all students enter primary school at the same age and there is no grade repetition, consequently there is no variation in the grade level among 15-year-olds. Korea is classified as having low levels of vertical differentiation** (see Table 2.11 for a detailed description and definition of how vertical and horizontal differentiations are defined). The first selection in the education system occurs at the age of 15 when there are two distinct education programmes available to students of that age (see Figure 2.34). Some 51% of students are in schools whose principals reported that students' record of academic performance and/or recommendations of feeder schools are always considered for student admittance. Korea is thus classified as using a medium level of horizontal differentiation at the system level. Some 6% of Korean students are in schools that are very likely to transfer difficult students to other schools (see Table IV.3.3a in OECD, 2010e), and 4% are in schools that group students by ability in all subjects (see Table IV.3.4 in OECD, 2010e). Thus Korea is classified as using low levels of horizontal differentiation at the school level.

Table 2.11 How school systems select and group students for schools, grades and programmes

		Low vertical differentiation		**High vertical differentiation**	
		Students who repeated one or more grades: 7% Students out of modal starting ages: 7%		Students who repeated one or more grades: 29% Students out of modal starting ages: 11%	
		Low horizontal differentiation at the school level	**High horizontal differentiation at the school level**	**Low horizontal differentiation at the school level**	**High horizontal differentiation at the school level**
		Schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs: 15%	Schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs: 33%	Schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs: 15%	Schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs: 33%
		Schools that group students by ability in all subjects: 8%	Schools that group students by ability in all subjects: 38%	Schools that group students by ability in all subjects: 8%	Schools that group students by ability in all subjects: 38%
Low horizontal differentiation at the system level	Number of school types or distinct educational programmes: 1.1 First age of selection: 15.8 Selective schools: 17%	Australia,[1] Canada,[2] Denmark, Estonia,[2] Finland,[2] Greece, Iceland,[2] New Zealand,[1] Norway,[2] Poland,[1] Sweden, United States, United Kingdom, Kazakhstan, Latvia, Lithuania, Russian Federation	Jordan	Spain, Argentina, Brazil, Tunisia, Uruguay	Chile, Colombia, Peru
Medium horizontal differentiation at the system level	Number of school types or distinct educational programmes: 3.0 First age of selection: 14.5 Selective schools: 42%	Ireland, Israel, Italy, **Japan,**[2] Korea,[2] Slovenia, Albania, Azerbaijan, Dubai (UAE), Hong Kong-China,[2] Montenegro, Shanghai-China,[1] Thailand	Indonesia, Kyrgyzstan, Qatar, Romania, Chinese Taipei	Mexico, Portugal	Luxembourg, Macao-China, Panama
High horizontal differentiation at the system level	Number of school types or distinct educational programmes: 4.3 First age of selection: 11.2 Selective schools: 61%	Austria, Czech Republic, Hungary, Slovak Republic, Croatia, Liechtenstein, Singapore[1]	Turkey, Bulgaria, Serbia	Belgium,[1] Germany, Trinidad and Tobago	Netherlands,[1] Switzerland[1]

Note: The estimates in the grey cells indicate the average values of the variables used in latent profile analysis in each group. See Annex A5 of OECD (2010f) for technical details.

1. Perform higher than the OECD average in reading.
2. Perform higher than the OECD average in reading and where the relationship between students' socio-economic background and reading performance is weaker than the OECD average.

Source: OECD, PISA 2009 Database.

- In four OECD countries, horizontal differentiation is also applied at the system level. These school systems stream and select students early in their schooling into programmes based on students' academic performance; but generally, they do not use grade repetition or school-level differentiation.
- Among the countries whose school systems use vertical differentiation to create homogeneous learning environments, the Netherlands and Switzerland also apply high levels of horizontal differentiation at the school level and at the level of the school system.

THE BALANCE BETWEEN PUBLIC AND PRIVATE EDUCATION

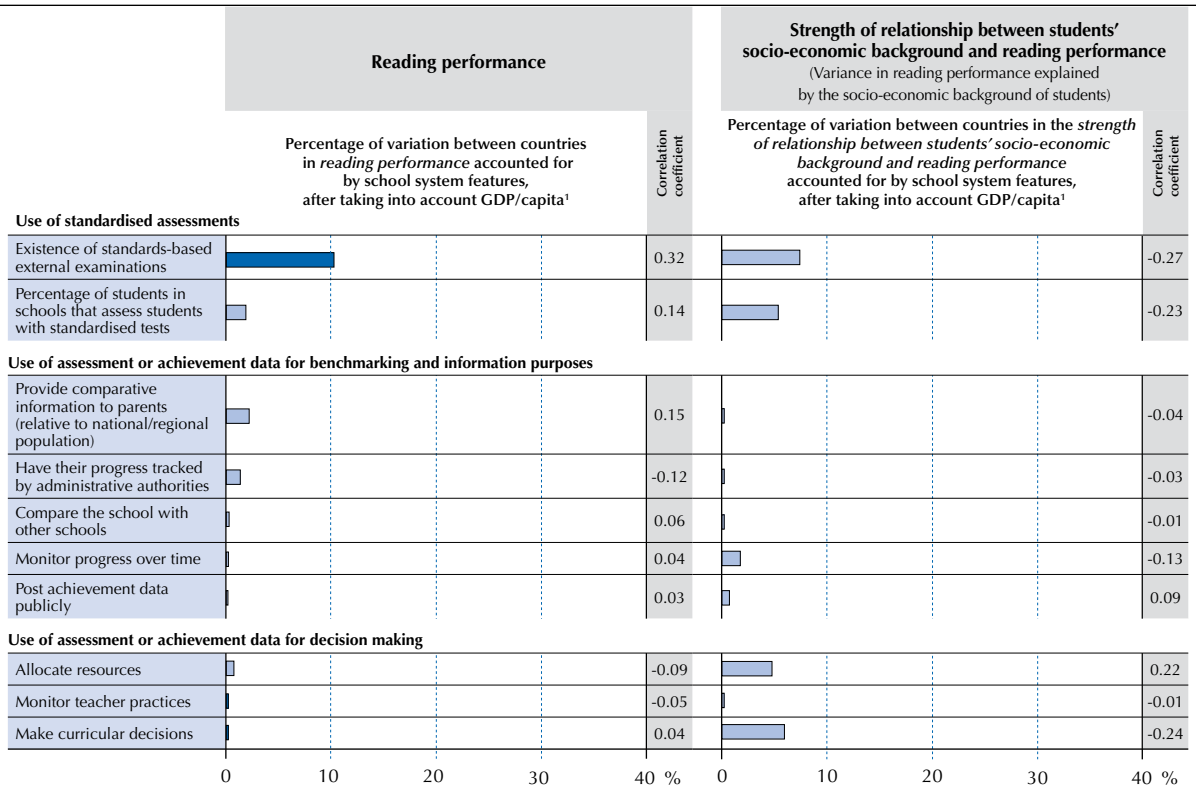
School education takes place mainly in public schools, defined by PISA as schools managed directly or indirectly by a public education authority, government agency, or governing board appointed by government or elected by public franchise. Nevertheless, with an increasing variety of educational opportunities, programmes and providers, governments are forging new partnerships to mobilise resources for education and to design new policies that allow all stakeholders to participate more fully and share the costs and benefits more equitably. Private education is not only a way of mobilising resources from a wider range of funding sources, but it is sometimes also considered a way of making education more cost-effective. Publicly financed schools are not necessarily also managed publicly. Governments can transfer funds to public and private educational institutions according to various allocation mechanisms (see section on school choice) (OECD, 2007).

Across OECD countries, 15% of students are enrolled in schools that are privately managed, that is, managed directly or indirectly by a non-governmental organisation, e.g a church, trade union, business or other private institution (Figure 2.42). In Korea, 35% of students are in these schools, as compared with Chile, Ireland and the Netherlands where more than 50% of students are. In contrast, in Iceland, Norway and Turkey, more than 98% of students attend schools that are managed publicly.

For parents, private schools may offer a particular kind of instruction that is not available in public schools. If private schools also attract higher-performing students and better teachers than public schools, parents will also feel that they are securing the best possible education for their child. Some school systems also promote private schools because, with the flexibility that accompanies

■ Figure 2.41 ■

How school systems' assessment and accountability policies are related to educational outcomes



Note: Correlations that are statistically significant at the 10% level ($p<0.10$) are marked in a darker tone.

1. The percentage is obtained by squaring the correlation coefficient and then multiplying it by 100.

Source: OECD, PISA 2009 Database, Table IV.2.1.

autonomy in designing curricula and allocating resources, private schools may be seen as stimulating innovation in the entire school system.

In 16 OECD countries and 10 partner countries and economies, the typical private school student outperforms the typical public school student. This private school "advantage" shows itself in PISA reading scores that are 30 points higher – the equivalent of three-quarters of a year's worth of formal schooling – among private school students than among public school students in the OECD area. In Korea, after accounting for the socio-economic background of students, students in private schools tend to score 15 points higher than students in public schools, and this advantage remains relatively stable, at 13 score points, after further accounting for the socio-economic make-up of private and public schools (see Table IV.3.9 in OECD, 2010e).

Around one-tenth of this private school advantage is the result of competition and the higher levels of autonomy in defining the curriculum and allocating resources that private schools enjoy. But more than three-quarters of that 30-point difference can be attributed to private schools' ability to attract socio-economically advantaged students. Schools that attract advantaged students are also more likely to attract better-performing students as well as greater resources. In fact, in most school systems, private schools have a more advantaged student population, more material resources, fewer teacher shortages and better disciplinary climates than the public schools in those systems.

Table 2.12 How school systems use student assessments

		Infrequent use of assessment or achievement data for benchmarking and information purposes	**Frequent use of assessment or achievement data for benchmarking and information purposes**
		Provide comparative information to parents: 32%	Provide comparative information to parents: 64%
		Compare the school with other schools: 38%	Compare the school with other schools: 73%
		Monitor progress over time: 57%	Monitor progress over time: 89%
		Post achievement data publicly: 20%	Post achievement data publicly: 47%
		Have their progress tracked by administrative authorities: 46%	Have their progress tracked by administrative authorities: 79%
Infrequent use of assessment or achievement data for decision making	Make curricular decisions: 60% Allocate resources: 21% Monitor teacher practices: 50%	Austria, Belgium,[1] Finland,[2] Germany, Greece, Ireland, Luxembourg, Netherlands,[1] Switzerland,[1] Liechtenstein	Hungary, Norway,[2] Turkey, Montenegro, Tunisia, Slovenia
Frequent use of assessment or achievement data for decision making	Making curricular decisions: 88% Allocating resources: 40% Monitor teacher practices: 65%	Denmark, Italy, Japan,[2] Spain, Argentina, Macao-China, Chinese Taipei, Uruguay	Australia,[1] Canada,[2] Chile, Czech Republic, Estonia,[2] Iceland,[2] Israel, Korea,[2] Mexico, New Zealand,[1] Poland,[1] Portugal, Slovak Republic, Sweden, United Kingdom, United States, Albania, Azerbaijan, Brazil, Bulgaria, Colombia, Croatia, Dubai (UAE), Hong Kong-China,[2] Indonesia, Jordan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Panama, Peru, Qatar, Romania, Russian Federation, Shanghai-China,[1] Singapore,[1] Thailand, Trinidad and Tobago, Serbia

Note: The estimates in the grey cells indicate the average values of the variables used in latent profile analysis in each group. See Annex A5 for technical details.

1. Perform higher than the OECD average in reading.
2. Perform higher than the OECD average in reading and where the relationship between students' socio-economic background and reading performance is weaker than the OECD average.

Source: OECD, PISA 2009 Database.

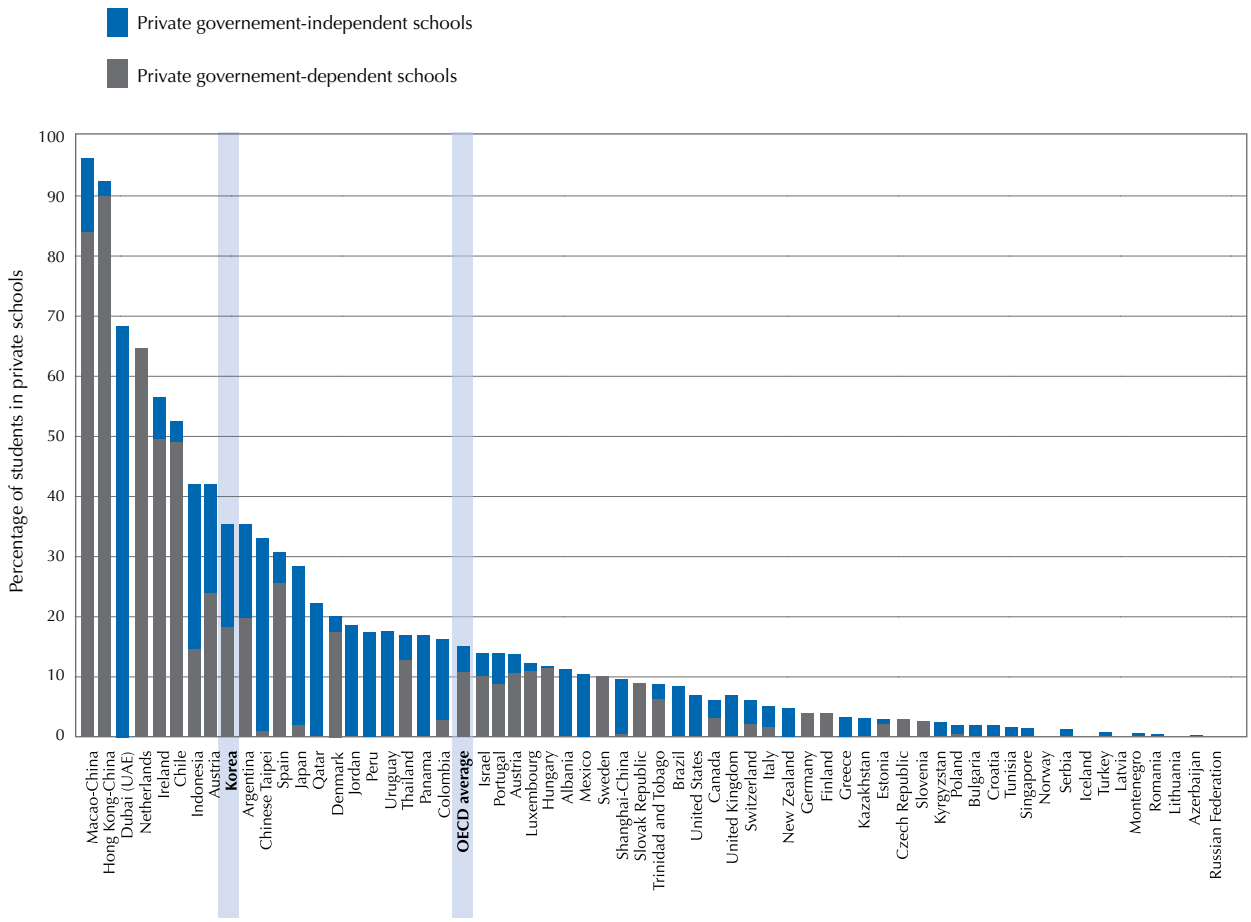
In other words, after taking into account the socio-economic backgrounds of the students who attend these schools, and the related material and instructional advantages that accrue to the schools, the small performance difference between public and private school students that remains is associated with higher levels of autonomy over curricula and resources among private schools. In fact, PISA has found that when public schools are given similar levels of autonomy as private schools, and when public schools attract a similar student population as private schools, the private school "advantage" is no longer apparent in 13 of the 16 OECD countries that showed this advantage.

When given a choice, parents choose what they think is the best-performing school for their children. School performance generally depends on the quality of instruction provided, the backgrounds of individual students and the composition of the student body in the school. Throughout the OECD area, and especially among partner countries and economies, schools – whether public or private – that serve advantaged students tend to have access to more resources for education and to suffer less from teacher shortages. In addition, advantaged students tend to have more positive attitudes towards education, so the disciplinary climate in classes populated by these students is generally more conducive to learning.

So when parents choose a private school over a public school for their child, they are selecting the greater probability that their child will attend classes with peers of similar or higher socio-economic status, that the resources devoted to those classes, in the

■ Figure 2.42 ■

Percentage of students attending private schools



Note: Countries are sorted by the total percentage of private schools

Source: OECD, PISA 2009 Results, Vol IV: What Makes a School Successful?, Table IV.3.9

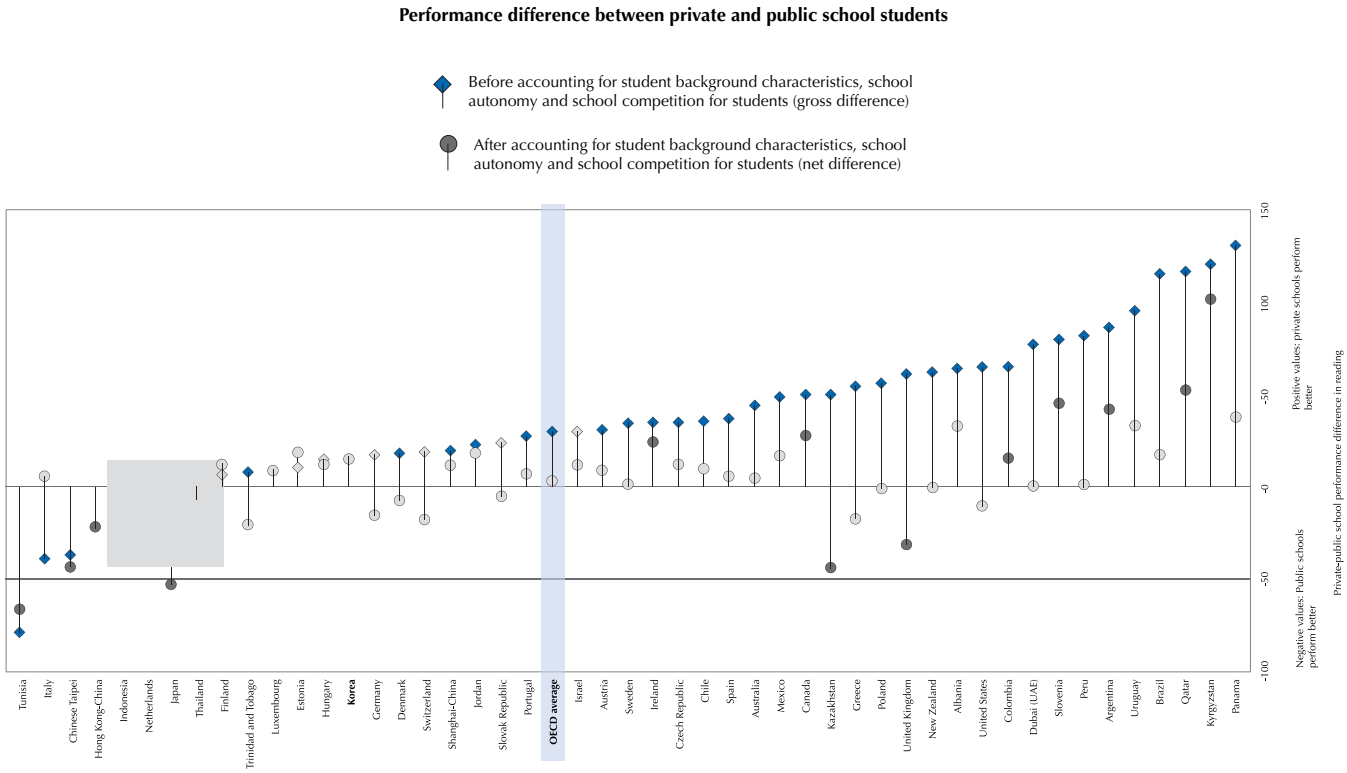
form of teachers and materials, will be of higher quality, and that those classes will be orderly and even inspiring. PISA shows, however, that public schools with comparable student populations offer the same advantages, even if the average public school, with a more diverse student body, generally does not. Since both public and private schools can compete for students and enjoy autonomy in matters of curricula and resources, and since the number of advantaged students – and their impact on the quality of educational opportunities in both public and private schools – is a constant in an education system, PISA finds no relationship between the percentage of private schools in a school system and system-level performance.

Families in Korea pay a substantial share of the total expenditure on education. At the very beginning of a child's education, families cover the costs of private nursery schools and kindergartens. On average across OECD countries, public expenditure on pre-primary education represents 0.47% of GDP, while private expenditure represents only 0.08% of GDP. Unlike all other OECD countries, in Korea, and, to a lesser extent, Japan, private expenditure represents a larger share of GDP devoted to pre-primary education than public expenditure, and overall levels of expenditures are low compared to other countries. In Korea, only 0.26% of GDP is spent on pre-primary education and public expenditures account for only 0.11% of the total, while 0.15% of the total is covered by private expenditures.

Spending on private institutions of higher education comes largely from Korean families. While Korean public expenditures on tertiary educational institutions are substantially below the OECD average, representing only 0.7% of GDP compared to the OECD average of 1.1%, overall expenditure greatly exceeds the OECD average because private expenditures – at 1.9% of GDP – are far above private expenditures on tertiary education in any other OECD country. The United States comes second after Korea, with private expenditures on tertiary educational institutions representing 1.6% of GDP.

■ Figure 2.43 ■

Private - public differences in reading performance



Note: Countries are sorted by the total percentage of private schools

Source: OECD, PISA 2009 Results, Vol IV: What Makes a School Successful?, Table IV.3.9

While most elementary schools and the majority of middle and high schools in Korea are public, large proportions of students are enrolled in private tutoring and out-of-school classes. Companies offering tutoring services are for-profit companies, and students routinely enrol in after-school classes, which may be expensive when not provided by public school. Participation in after-school classes is order to maximise the changes of excelling in the standardised tests that determine entrance in the most prestigious high schools and universities.

Such supplementary education may not help students to develop a good balance of different skills, as the focus of these courses is overwhelmingly academic and aimed at ensuring that students master the material on which university entrance exams are based. Moreover, private tutoring may reinforce socio-economic inequities as socio-economically advantaged families are better able to shoulder the financial burden of private tutoring classes.

Findings based on PISA 2006 results show that attending after-school classes led by a school teacher tends to reduce the impact of students' socio-economic background on their academic performance, while attending after-school classes led by a teacher who is not from the regular school tends to reinforce that impact. Some countries have implemented policy changes to reduce reliance on private, supplemental tutoring, such as modifying university entrance exams to include a broader portfolio of criteria rather than relying on a single test score, offering school-based, after-hours tutoring support, collaborating directly with tutoring firms to provide services more broadly at a lower cost, and stimulating online tutoring options.

Results from PISA 2006 also indicate that learning time spent in after-school lessons and individual study is negatively related to performance. Of course, this might be because students who attend after-school classes do so for remedial purposes, rather than to enhance their school studies. Still, across countries, findings show that students tend to perform better if a high percentage of their total learning time – which includes regular school lessons, after-school lessons, and individual study – is spent during normal school hours in a classroom – and, most important, if the instruction offered in those classrooms is of high quality.

■ Figure 2.44 ■

Difference in school characteristics between private and public schools in OECD countries

	Average PISA index of social, cultural and economic status *(positive signs indicate higher socio-economic status)*	Average index of disciplinary climate *(positive signs indicate better disciplinary climate)*	Average index of material resources for instruction *(positive signs indicate better resources)*	Average index of teacher shortage *(positive signs indicate more teacher shortage)*
Australia	+	+	+	-
Austria	+			-
Canada	+	+	+	
Chile	+	+	+	
Czech Republic	+			
Denmark	+			-
Estonia				
Finland				
Germany				
Greece	+	+		-
Hungary	+			
Ireland	+			
Israel		+		-
Italy	+	-	+	-
Japan	+	-	+	
Korea		+		+
Luxembourg			+	-
Mexico	+		+	-
Netherlands				
New Zealand	+	+	+	-
Poland	+			-
Portugal	+	+	+	
Slovak Republic		+		
Slovenia	+	+	+	+
Spain	+	+		
Sweden	+	+		
Switzerland	+			-
United Kingdom	+	+		-
United States	+	+		

Notes: Only countries and economies with sufficient data are considered

Positive (negative) signs indicate a positive (negative) and statistically significant difference between private and public schools. No sign indicates that differences between public and private schools are not statistically significant.

Source: OECD, PISA 2009 Database.

■ Figure 2.45 ■

Difference in school characteristics between private and public schools in partner countries and economies

	Average PISA index of social, cultural and economic status *(positive signs indicate higher socio-economic status)*	Average index of disciplinary climate *(positive signs indicate better disciplinary climate)*	Average index of material resources for instruction *(positive signs indicate better resources)*	Average index of teacher shortage *(positive signs indicate more teacher shortage)*
Albania	+		+	-
Argentina	+		+	-
Brazil	+	+	+	-
Colombia	+		+	-
Dubai (UAE)	+	+	+	-
Hong Kong-China				
Indonesia				+
Jordan	+			
Kazakhstan	+		+	-
Kyrgyzstan	+		+	+
Liechtenstein			-	+
Macao-China	+		+	-
Panama	+		+	-
Peru	+		+	-
Qatar	+	+	+	-
Shanghai-China				
Chinese Taipei		-		
Thailand	+		+	-
Trinidad and Tobago	+	-	+	-
Tunisia	+			
Uruguay	+	+	+	-

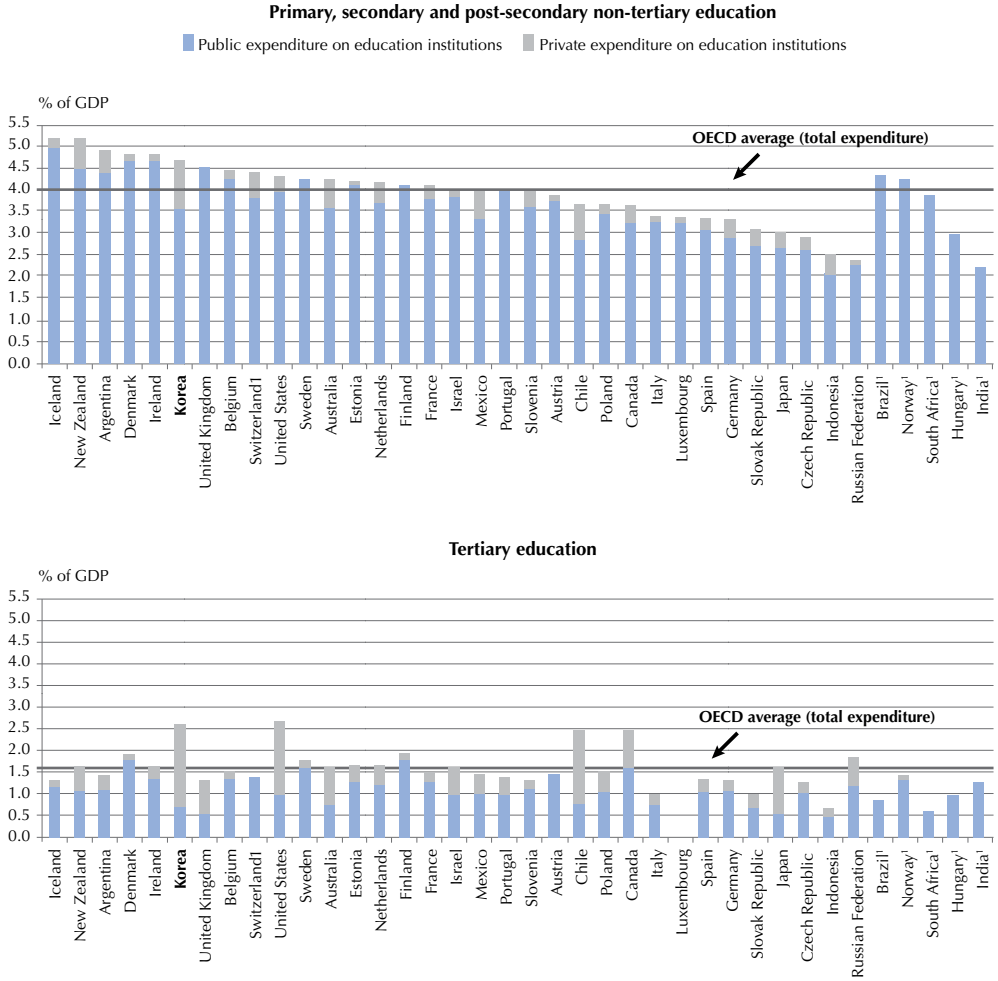
Notes: Only countries and economies with sufficient data are considered

Positive (negative) signs indicate a positive (negative) and statistically significant difference between private and public schools. No sign indicates that differences between public and private schools are not statistically significant.

Source: OECD, PISA 2009 Database.

■ Figure 2.46 ■

Expenditure on educational institutions as a percentage of GDP (2009)



Notes: Countries are ranked in descending order of expenditure from both public and private sources on education institutions in primary, secondary and post-secondary non-tertiary education.

1. Public expenditure only (for Switzerland, in tertiary education only; for Norway,in primary, secondary and post-secondary non-tertiary education only).

Source: OECD. Argentina, India; Indonesia: UNESCO Institute for Statistics (World Education Indicators programme); South Africa: UNESCO Institute for Statistics, Table B2.3. See Annex 3 for notes (*www.oecd.org/edu/eag2012*).

Notes

1. Though rank 1 is the best estimate, due to sampling and measurement error the rank could be between 1 and 2.
2. Though rank 1 is the best estimate, due to sampling and measurement error the rank could be between 1 and 2.
3. Though rank 3 is the best estimate, due to sampling and measurement error the rank could be between 2 and 4.
4. Summary descriptions for the levels of proficiency can be found in the Figure I.2.12, I.3.8 and I.3.19, OECD (2009), *PISA 2009 Results: What Students Know and Can Do*, Volume 1.
5. No such data are available for Korea.
6. See OECD, 2010c, Table II.2.3
7. Resilient students are those who come from a socio-economically disadvantaged background and perform much better than would be predicted by their background. To identify these students, first, the relationship between performance and socio-economic background across all students participating in the PISA 2009 assessment is established. Then the actual performance of each disadvantaged student is compared with the performance predicted by the average relationship among students from similar socio-economic backgrounds across countries. This difference is referred to as the student's residual performance. A disadvantaged student is classified as resilient if his or her residual performance is found to be among the top quarter of students' residual performance from all countries.
8. In Korea, one unit of the PISA index of teacher-student relations is positively associated with 11.4score points on the PISA reading scale (see Table IV.4.1 in OECD, 2010e).
9. Vertical differentiation refers to the ways in which students' progress through the education system as they become older. Even though the student population is differentiated into grade levels in practically all schools in PISA-participating countries, in some countries, all 15-year-old students attend the same grade level, while in other countries they are dispersed throughout various grade levels as a result of policies governing the age of entrance into the school system and/or grade repetition. Horizontal differentiation refers to differences in instruction within a grade or education level. It can be applied by the education system or by individual schools that group students according to their interests and/or performance. At the system level, horizontal differentiation can be applied by schools that select students on the basis of their academic records, by offering specific programmes (vocational or academic, for example), and by setting the age at which students are admitted into these programmes. Individual schools can apply horizontal differentiation by grouping students according to ability or transferring students out of the school because of low performance, behavioural problems or special needs.

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