CO11: Literacy scores by gender at age 10

Definitions and methodology

This indicator is based on two student assessment processes: the Progress in International Reading Literacy Study (PIRLS) and the Trends in Mathematics and Science Study (TIMSS). PIRLS defines reading literacy as "the ability to understand and use written language forms required by society and/or valued by the individual" (PIRLS 2006 Assessment Frameworks). The mathematics and science evaluations are examined around two dimensions: content and cognitive. The mathematics content dimension includes the following subjects: numbers, geometric shapes and measures, and data display. The science content domain includes: life science, earth science and physical science. The cognitive aspect of both tests evaluates the following thinking processes: knowing, applying and reasoning (TIMSS 2007 Assessment Frameworks).

Both PIRLS and TIMSS evaluations are conducted when students are enrolled in the fourth year of primary school. At the fourth year of formal schooling, most children have learned to read and are now starting to read in order to learn. In most countries, students begin formal schooling at age 6, thus children in PIRLS and TIMSS are around 10 years old (age range goes from 9.7 to 11.4 years old in both tests).

PRILS assessment has taken place in 2001 and 2006 and a third round of data collection is scheduled for 2011. TIMSS evaluations have been conducted every four years: 1995, 1999, 2003 and 2007. This indicator is based on PIRLS 2006 and TIMSS 2007.

Key findings

In 2006, PIRLS-scores presented small cross-country differences, with most OECD countries scoring above 500 points on a 700 point scale with a standard deviation of 25 (Chart CO11.1). The top performing countries included students in Canada, Italy, Hungary and Luxembourg (scores above 550 points)). By contrast, Norway and Turkey were the only OECD countries which participated in PIRLS that reported average reading scores for their country below 500 points.

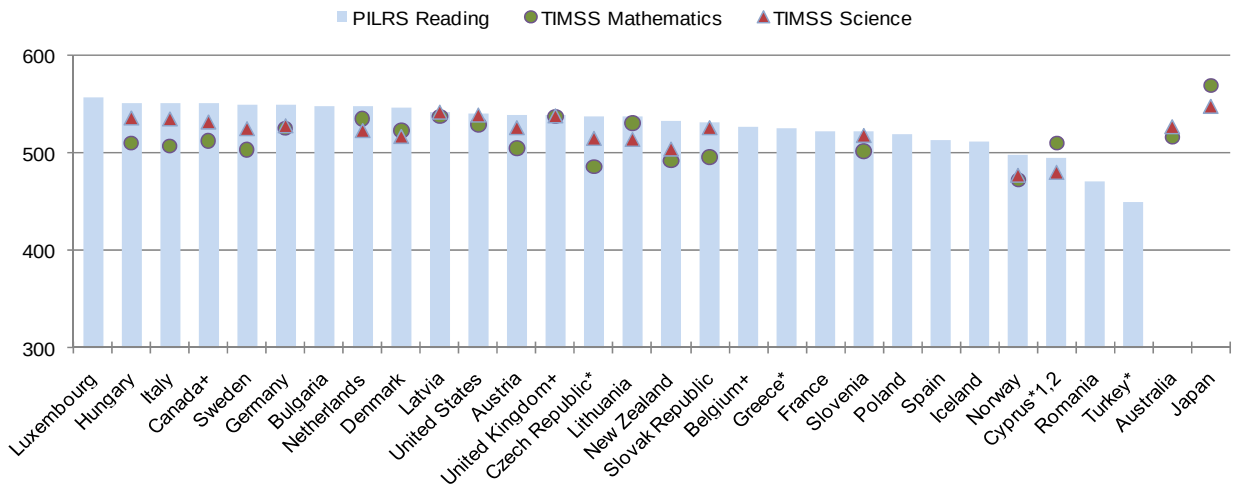
Chart CO11.1 also shows that cross-country differences in mathematics and science scores are not all that large. Among the OECD countries participating in TIMSS 2007, students in Japan, the Netherlands and the United Kingdom had the highest scores in mathematics (above 535 points), while students in the Czech Republic, Norway, New Zealand and the Slovak Republic fared less well with scores below 500 points. As for science scores, cross-country differences were smallest (a standard deviation of 18): the participating countries with the highest scores in 2007 included Japan, Hungary, the United Kingdom and the United States (scores above 535 points).

Chart CO11.2 presents gender differences in mean scores on the reading, mathematics and science literacy scales. Results show important gender differences among 10-year olds. On average, across OECD countries, girls perform better in reading literacy than their male peers, while boys perform better in mathematics. In science tests, boys do better than girls, but gender differences in scores are smaller (5 points in average), and there are 7 countries (out of 19) where girls on average score better than boys (see also CO12).

Other relevant indicators: CO9: Educational attainment by gender and average years spent in formal education; CO10: Gender choices in fields of study; CO12: Literacy scores at age 15; and, PF2: Public spending on education;

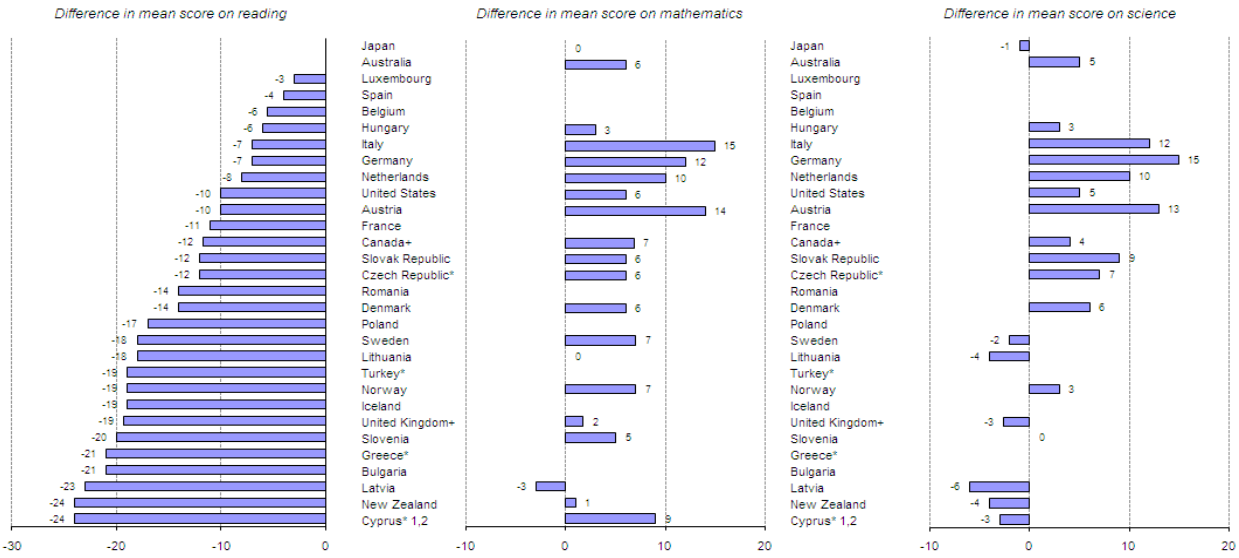
Last updated 17/06/2009

Chart CO11.1: Student performance in reading (PIRLS 2006), mathematics (TIMSS 2007) and science (TIMSS 2007).



Sources: PIRLS 2006 and TIMSS 2007.
Data is shown in descending order of reading achievement scores.
PIRLS data correspond to 2006 except for countries with * for which data belongs to 2001.
+ Data for Canada is based on five provinces (Alberta, British Columbia, Nova Scotia (not in TIMSS), Ontario and Québec), while results for the United Kingdom are based on data for England and Scotland. Data for Belgium was collected separately for the Flemish- and French-speaking communities. For these three countries, overall scores were estimated using a weighted average according to population of each province/country/community.
1) 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”.
2) 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.

Chart CO11.2: Gender differences (boys-girls) in reading, mathematics and science scores



Sources: PIRLS 2006 and TIMSS 2007.
Data is shown in increasing order of gender differences in reading achievement scores.
Not all countries in PIRLS partake in TIMSS (i.e., Belgium, Bulgaria, France, Greece, Romania, Poland, Spain and Turkey).
For notes on *, +, 1) and 2) see Chart CO11.1.

PIRLS scores vary according to background:

PIRLS and TIMSS collect information about educational resources at home to examine possible differences between children from different backgrounds. PIRLS, for example, has an index on home's educational resources (HER) based on parent's education, number of books, number of children's books, and the presence of four educational aids: a computer, a study desk, children's books and access to a daily newspaper. Chart CO11.3 presents the percentage of students classified as having high levels of the HER index (Panel A) as well as the average reading scores at each level of the HER index (Panel B).

The first panel of Chart CO11.3 shows substantial variation in the proportion of households with high educational resources. In the Nordic countries and the Netherlands, a high percentage of students was classified as living with high levels of the HER index. Furthermore, in these countries (and New Zealand) the number of students assigned to the low level of this index were too small (less than 50 cases) to be reported. By contrast, in Austria, Italy and Poland less than 10 % of students in fourth grade lived in homes with high levels of educational resources.

The second panel of Chart CO11.3 shows that the higher the level of educational resources, the better a student performs in reading literacy. Additionally, in countries with a high percentage of students with a high HER index (for example, the Nordic countries), differences in reading achievement by level of educational resources is relatively small. Conversely, in countries with a low percentage of students with a high HER index (for example, Austria, Italy and Poland), the gap in reading scores varies significantly by level of educational resources.

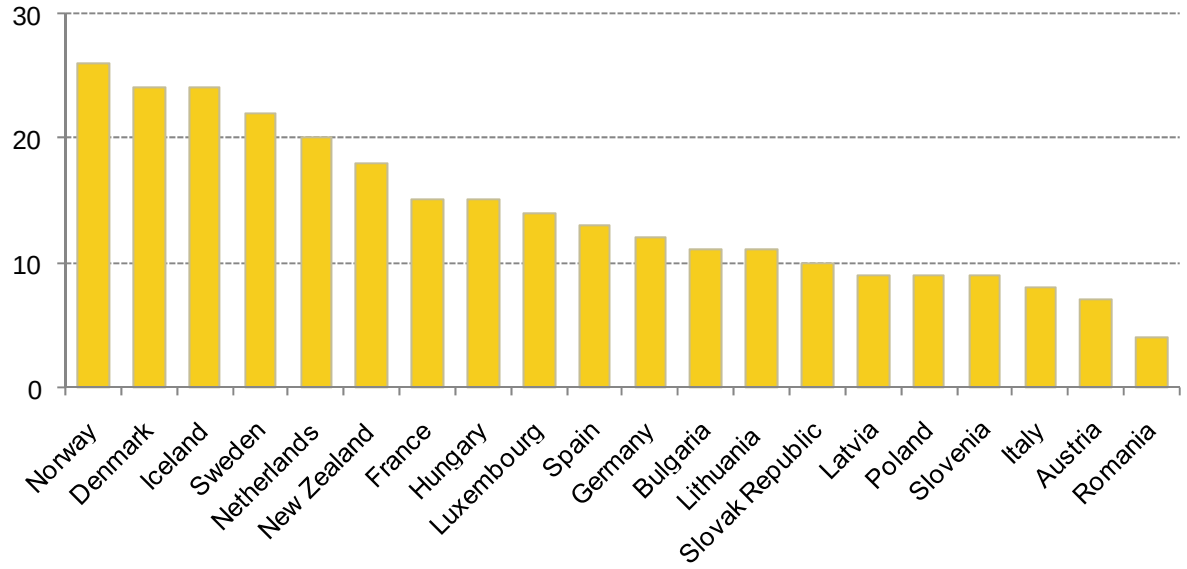
Comparability and data issues

PIRLS and TIMSS evaluations are conducted when students are enrolled in the fourth year of primary school. However, in some countries this is not the case. In New Zealand and the United Kingdom, where children start school at a very early age, students are tested at the fifth year of schooling.

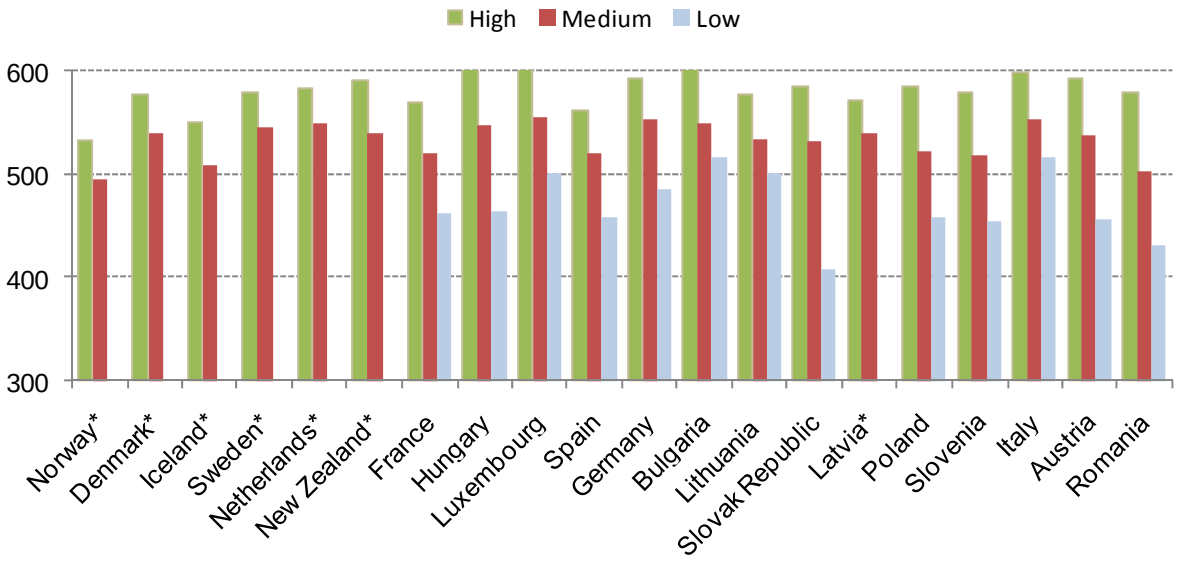
These comparatives studies take place in around 40 different countries, including Belgium with data for two communities (Flemish and French-speaking communities), Canada with five provinces (Alberta, British Columbia, Nova Scotia (not in TIMSS), Ontario and Québec), and England and Scotland for the United Kingdom. For Belgium, Canada and the United Kingdom, overall scores were estimated using a weighted average according to population of each the province/country/community involved.

Chart CO11.3: Scores on reading achievement relative to home's educational resources, PIRLS 2006

Panel A: Proportion of students with a high index of home educational resources[1]



Panel B: Mean reading scores of students at each level of HER[1]



Source: PIRLS 2006

Data is shown in descending order of home educational resources.

1. A high index of home educational resources consists of children living in homes where at least one parent finished university, with more than 100 books; more than 25 children's books and at least 3 educational aids. On the other hand, a low index consists of children in households where parents had not completed secondary education, with 25 or fewer books, 25 or fewer children's books, and no more than two of the four educational aids. The rest of students were assigned to the medium level.

* In these countries sample sizes were too small to provide robust estimates for students in the low index level.

Sources and further reading: PIRLS and TIMSS website http://timss.bc.edu/index.html has all information relating to the programme including an interactive database, copies of the questionnaires and all associated publications and reports, including the PIRLS 2006 Assessment Frameworks and TIMSS 2007 Assessment Frameworks.