



Juliette Mendelovits is the Research Director of ACER's Assessment and Reporting: Humanities and Social Sciences research program.



Reading in online environments

Juliette Mendelovits examines the results of an international assessment of 15-year-old students' ability to read digital texts.

In 2009 the Organisation for Economic Cooperation and Development (OECD) through the Programme for International Student Assessment (PISA) examined 15-year-old students' ability to read, understand and interact with digital texts. The assessment of digital reading, undertaken by around 25 000 students in 19 of the 67 countries and economies that participated in PISA 2009, represented the first large-scale international assessment of digital reading. ACER released the Australian report in 2012 and has since conducted further analysis of the results in order to answer questions such as how well young people deal with contradictory and unreliable information online.

PISA's digital reading assessment is an assessment of reading in the digital medium, as opposed to a computer-delivered assessment of reading in the print medium. While many of the skills needed to read a digital text are similar to those needed to read a print text, differences between print and electronic environments require readers to develop new skills. The nature, form and blurred boundaries of digital texts mean that readers typically construct their own path, choosing which fragments of the almost infinite number of texts should

be read – more so than with printed texts, which have a physical order and physical boundaries. Digital texts also offer different opportunities for readers to engage with the text by directly influencing the content: for example by responding to an email message or adding a comment to a blog.

Australian students' achievement

Results from the digital reading assessment revealed that Australian students ranked second among participating countries, outperformed only by Korea. New Zealand achieved a similar score to Australia, but all other countries or economies performed on average at a level significantly lower than Australia.

In almost all aspects of the assessment, Australia performed significantly better than the average for the 16 OECD countries and economies that participated in the digital reading assessment. For example, 17 per cent of Australian students were highly skilled digital readers compared to eight per cent of students across the OECD, while 10 per cent of Australian students were low performers compared to 17 per cent of students across the OECD.

On average, Australian males performed at a significantly lower level than females. This was the case in all participating countries except Colombia, although the gender difference in Australia was wider than the OECD average. Around 20 per cent of Australian girls and 15 per cent of Australian boys reached a very high level in digital reading literacy, compared to nine per cent and six per cent respectively across participating OECD countries.

The average digital reading literacy achievement of students in the independent school sector was significantly higher than that of students in the Catholic school sector, who in turn performed significantly higher than students in the government school sector. Students attending schools in metropolitan areas performed significantly higher than students in provincial or remote schools. Students in provincial schools also performed significantly higher than students attending schools in remote areas.

When examined according to students' responses to questions regarding where they and their parents were born, the average digital reading literacy performance of first-generation students was significantly higher than that of other Australian-born students and foreign-born students.

Differences between digital and print reading

The students sampled in the digital reading assessment were a subset of those who were administered the paper-based assessment, making it possible to compare performance in reading in the two media at the country level.

Australian students performed more strongly in digital reading literacy than in print reading literacy. This was generally the case in countries that were high performers in print reading literacy.

The gender gap in digital reading achievement was smaller than the gender gap found in print reading, both in Australia and internationally.

Across the different immigrant status and language background reporting groups within Australia, students performed significantly higher in digital reading literacy than print reading literacy, except for students who attended schools in remote areas, whose digital and print reading literacy performances were not significantly different.

The differences in the formats of the print and digital reading assessments provide some clues as to why Australian students on average performed better in digital reading than in print reading.

Approximately 60 per cent of the stimulus materials in the print reading assessment were continuous texts such as extracts from prose and poetry. The majority of the stimulus materials in the digital reading assessment were multiple format texts that used several smaller pieces of text. Results from the 2000 and 2009 cycles of PISA, in which reading was the main assessment domain, show that Australian students performed better on non-continuous texts than on continuous texts. The texts used in the digital reading assessment are more akin to non-continuous texts than continuous texts, as they are shorter in length and because the spatial arrangement of the texts is part of their meaning. It is therefore possible that the nature of the stimulus materials contributed to Australian students' achievement.

Another notable feature of Australian students' performance on the print and digital reading assessments relates to the format of the tasks. In both media, some of the tasks required the students to select a response (usually in the format of multiple choice questions), whereas others required the response to be constructed: students had to write a response (in

the paper-and-pen test) or input text (in the digital assessment).

Australian students' average percentage of correct answers on each of print multiple-choice items, print constructed-response tasks and digital multiple-choice items was around two or three percentage points higher than the OECD average; however, for digital constructed-response tasks, the difference was almost six percentage points higher. This helps explain why Australian students performed better in digital reading than in print reading, and significantly better than most other countries on the digital reading assessment. Moreover, this result suggests something about motivation: given that generating a constructed response requires more effort than selecting a multiple-choice option, it can be inferred that Australian students were relatively highly engaged by the digital reading assessment, as well as relatively proficient.

Reading in the 21st century demands proficiency in dealing with both print and digital texts. It is clear from PISA that, in Australia and around the world, boys' performance in print reading is cause for concern. There is a wide gap between boys' and girls' proficiency, and the gap appears to be widening. In the digital medium, girls are still performing relatively well as readers in comparison with boys, but the gap is narrower. Finding some way to harness the reading interests and strengths of boys would have great national benefits as well as for individuals' social, economic and personal lives.

Print and Digital Reading in PISA 2009: Comparison and Contrast, by Juliette Mendelovits, Dara Ramalingam and Dr Tom Lumley, is available from research.acer.edu.au/pisa/6/

See also: *Preparing Australian Students for the Digital World: Results from the PISA 2009 Digital Reading Literacy Assessment*, by Dr Sue Thomson and Lisa De Bortoli, available from research.acer.edu.au/ozpisa/10/ ■