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Who are the best online readers?

- The top-performing country in the PISA assessment of digital reading was Singapore, followed by Korea, Hong Kong-China, Japan, Canada and Shanghai-China.
- Students in Australia, Canada, Ireland, Korea, Singapore and the United States show the most advanced web-browsing skills. More often than students elsewhere, they carefully select links to follow before clicking on them, and follow relevant links for as long as is needed to answer a question.
- There is a strong association between countries' digital reading performance and the quality of students' navigation across digital texts.

If you can read on paper, you can read on line, right? Yes, but…In that last three-letter word lies an important difference between the two skills. To be able to read well on line, you also have to be able to navigate through and among pages/screens of text, while filtering out relevant and trustworthy sources from a seemingly infinite amount of information. As online media and other Internet-based services offer new opportunities to enrich our private and professional lives, individuals must be familiar with digital texts and master the specific evaluation and navigation skills that they require in order to benefit fully from these opportunities.

The secret to reading well on line…

PISA 2012 set out to discover how well students are able to read, navigate and understand online texts. A simulated browser environment, with websites, tabs and hyperlinks, provided a controlled setting in which students' reading performance, but also their browsing behaviour, could be observed.

The top-performing countries/economies in the PISA assessment of online reading were Singapore, Korea, Hong Kong-China, Japan, Canada and Shanghai-China. To a large extent, this ranking mirrors print-reading performance, confirming that it is not possible for students to excel in online reading without being able to understand and draw correct inferences from print texts too. But there are important differences between the two rankings, and they are mainly related to a skill that is unique to digital reading: students' ability to navigate on line.

Students in Korea and Singapore, for instance, perform significantly better in the digital medium than students in other countries with similar performance in print reading. So do students in Australia, Canada, Hong Kong-China, Japan and the United States, among others.

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Performance in digital and print reading in 2012

	Digital reading		Print reading	
	Mean score	Range of ranks	Mean score	Range of ranks
Singapore	567	1 - 1	542	2 - 4
Korea	555	2 - 3	536	3 - 5
Hong Kong-China	550	2 - 4	545	2 - 4
Japan	545	3 - 4	538	2 - 5
Canada	532	5 - 6	523	6 - 9
Shanghai-China	531	5 - 6	570	1 - 1
Estonia	523	7 - 10	516	9 - 11
Australia	521	7 - 10	512	10 - 12
Ireland	520	7 - 11	523	6 - 9
Chinese Taipei	519	7 - 11	523	6 - 9
Macao-China	515	10 - 12	509	12 - 14
United States	511	10 - 15	498	15 - 19
France	511	10 - 14	505	12 - 16
Italy	504	12 - 17	487	17 - 25
Belgium	502	14 - 17	509	11 - 15
Norway	500	14 - 18	504	12 - 16
Sweden	498	14 - 18	483	19 - 25
Denmark	495	16 - 19	496	15 - 18
Portugal	486	18 - 21	488	17 - 24
Austria	480	19 - 22	490	17 - 23
Poland	477	19 - 23	518	7 - 11
Slovak Republic	474	20 - 24	463	27 - 27
Slovenia	471	22 - 24	481	23 - 25
Spain	466	22 - 26	486	19 - 25
Russian Federation	466	23 - 26	475	25 - 26
Israel	461	24 - 28	486	18 - 26
Chile	452	26 - 28	441	28 - 29
Hungary	450	26 - 28	488	18 - 24
Brazil	436	29 - 29	413	30 - 30
United Arab Emirates	407	30 - 30	442	28 - 29
Colombia	396	31 - 31	403	31 - 31

Notes: Only countries/economies that participated in both the print and digital reading assessments in 2012 are shown. OECD countries are shown in black.
Because the mean score is based on a sample, it is not possible to determine a country's precise rank among the participating countries/economies. The range of ranks reflects the uncertainty associated with the mean score.
Countries and economies are ranked in descending order of their mean performance in digital reading.
Source: OECD, PISA 2012 Database.

In contrast, students in Poland and Shanghai-China – both strong performers in print reading – have greater difficulty in transferring their print-reading skills to an online environment.

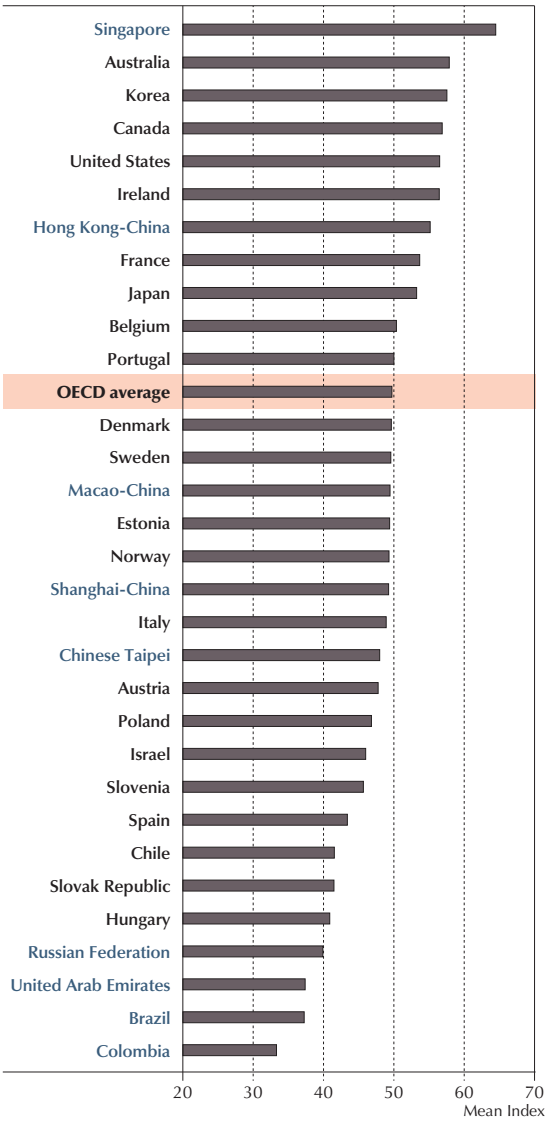
An analysis of students' navigation behaviour in the digital reading test sheds light on what lies behind the comparative edge in digital reading for students in the former group of countries and economies.

…is to be able to navigate easily and thoughtfully in digital environments.

On average, students in Singapore, followed by students in Australia, Korea, Canada, the United States and Ireland, rank the highest for the quality of their web-browsing behaviour. Students in these countries tend to be the most selective when navigating on line. They carefully assess which links to follow before clicking on them, and follow relevant links for as long as is needed to solve the task. As a result, in all of these countries, performance in digital reading is better than would be expected based solely on print-reading performance.

Meanwhile, students in East Asian countries/economies have the longest navigation sequences of all when they browse through the pages of the digital reading assessment. In Hong Kong-China, Japan, Korea and Singapore, these sequences are generally of good quality too. But in Macao-China, Shanghai-China and Chinese Taipei, as many as one in five students visits more task-irrelevant pages than task-relevant ones. These students may be persistent in their efforts, but they are digitally adrift.

Task-oriented browsing in the digital reading assessment



Notes: To compute the *index of task-oriented browsing*, students are ranked according to the quality of their navigation behaviour.
The country values in this chart correspond to the average percentile rank of students in the international comparison of students taking the same test form. High values on this index reflect long navigation sequences that contain a high number of task-relevant steps and few or no missteps or task-irrelevant steps.
Countries and economies are ranked in descending order of the index of task-oriented browsing.
Source: OECD, PISA 2012 Database.
StatLink http://dx.doi.org/10.1787/888933253082

Describing students' navigation behaviour

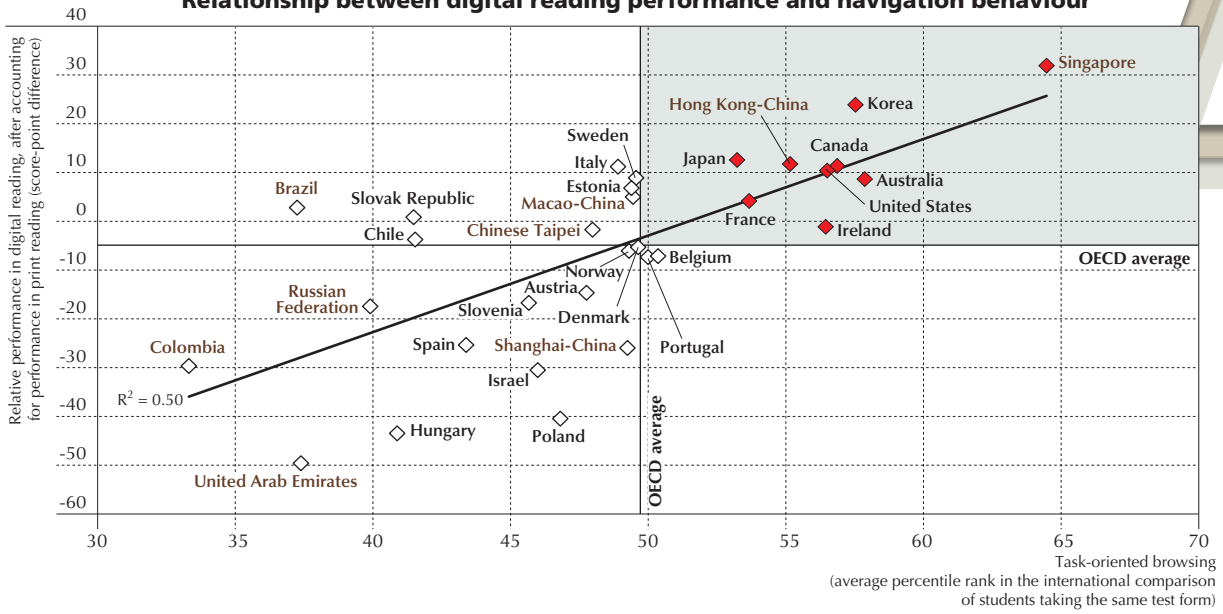
To describe the navigation behaviour of students in the digital reading test, students' complete browsing sequences were divided into elementary sequences ("steps"), with an origin and a destination page. Two indices were derived from step counts.

A first index measures the quantity of navigation steps. To make this comparable across students who took different test forms, the *index of overall browsing activity* is computed as a percentile rank on the distribution of all students who were administered the same questions. A student with a value of, say, 73 on this index can be said to have browsed more pages than 73% of the students who took the same test form.

A second index relates to the quality of navigation steps. Not all pages available for browsing in the digital reading tests led students to information that was helpful or necessary for the specific task given to them. The *index of task-oriented browsing* measures how well students' navigation sequences conform to expectations, given the demands of the task. High values on this index correspond to long navigation sequences that contain a high number of task-relevant steps (steps from a relevant page to another relevant page) and few or no missteps or task-irrelevant steps (steps leading to non-relevant pages).

One in ten students in OECD countries had only limited or no web-browsing activity, signalling a lack of basic computer skills, a lack of familiarity with web browsing or a lack of motivation. There are very few such students in East Asian countries/economies. In contrast, in Brazil, Colombia, Hungary, Israel, Poland and the United Arab Emirates, more than one in six students belong to this group and contribute to these countries' lower-than-expected performance in digital reading.

Relationship between digital reading performance and navigation behaviour



Notes: The relative performance of countries/economies in digital reading is the average difference between students' observed and expected performance.
Each student's expected performance is estimated, using a regression model, as the predicted performance in digital reading, given his or her score in print reading.
Each diamond represents the mean values of a country/economy.
Source: OECD, PISA 2012 Database.
StatLink http://dx.doi.org/10.1787/888933253123

The bottom line: To be proficient in online reading, students must be able to plan and execute a search, evaluate the usefulness of information, and assess the credibility of sources. Most students cannot develop these skills through casual practice alone; they need explicit guidance from teachers and high-quality educational resources to master these increasingly important skills.

For more information

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See OECD (2015), *Students, Computers and Learning: Making the Connection*, PISA, OECD Publishing, Paris.

You can see – and try – some of the tasks used in the digital reading assessment at the website of the Australian Council for Educational Research: http://cbasq.acer.edu.au/index.php?cmd=toEra2012 (accessed 16 July 2015).

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