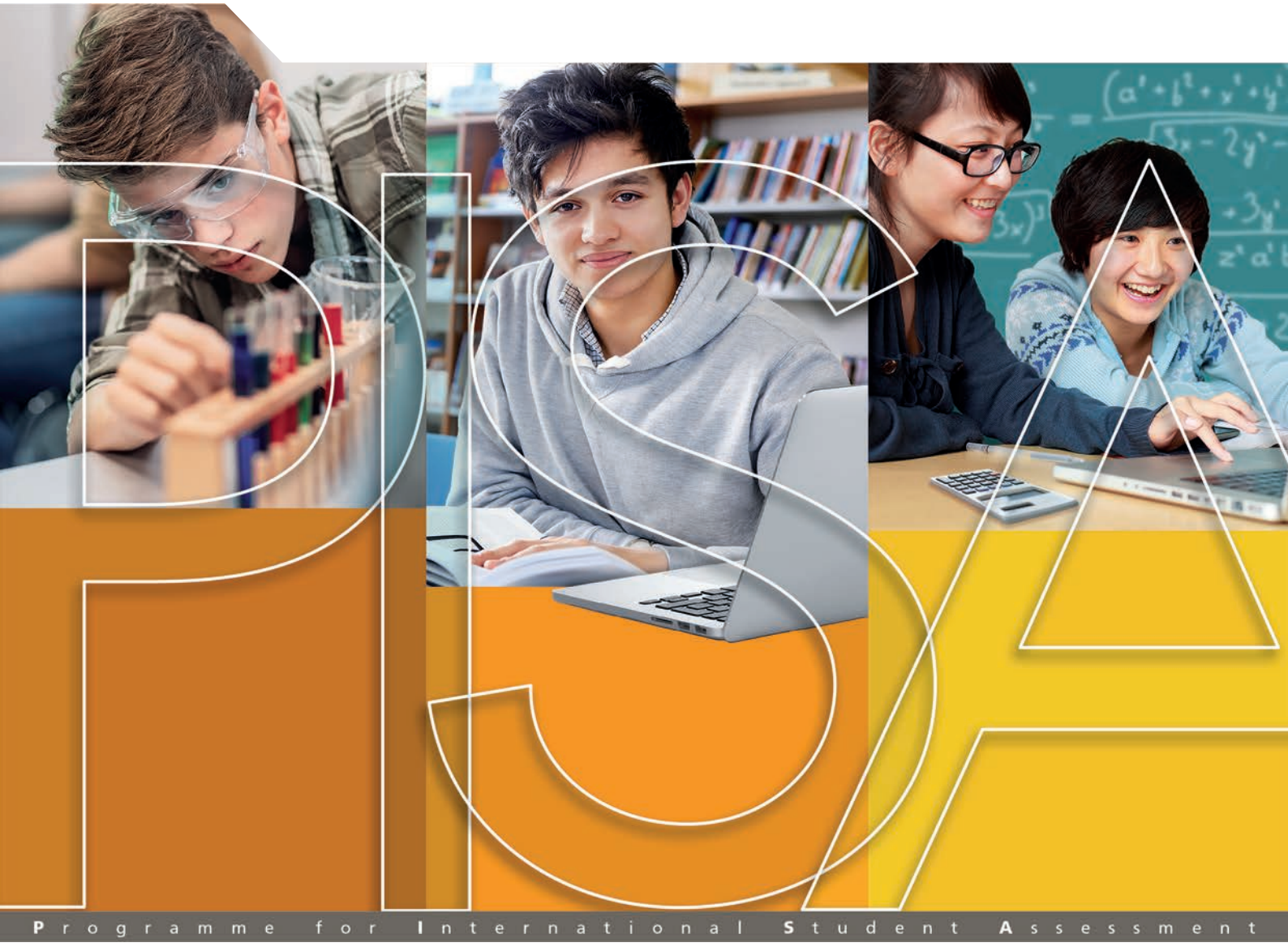
21st-Century Readers

DEVELOPING LITERACY SKILLS IN A DIGITAL WORLD



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21st-Century Readers

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Editorial
21st Century Readers

Globalisation and digitalisation have connected people, cities, countries and continents in ways that vastly increase our individual and collective potential. But the same forces have also made the world more volatile, more complex, more uncertain and more ambiguous. In this world, education is no longer just about teaching students something but about helping them develop a reliable compass and the tools to navigate ambiguity.

Literacy in the 20th century was about extracting and processing pre-coded and – for school students – usually carefully curated information; in the 21st century, it is about constructing and validating knowledge. In the past, teachers could tell students to look up information in an encyclopaedia and to rely on that information as accurate and true. Nowadays, Google presents them with millions of answers and nobody tells them what is right or wrong, and true or not true. The more knowledge technology allows us to search and access, the more important it is to develop deep understanding and the capacity to navigate ambiguity, triangulate viewpoints, and make sense out of content.

PISA 2018 results show that when students were confronted with literacy tasks that required them to understand implicit cues pertaining to the content or source of the information, an average of just 9% of 15-year-old students in OECD countries had enough of a reading proficiency level to be able to successfully distinguish facts from opinions. True, this figure is up from 7% in 2000 but, in the meantime, the demand for literacy skills has fundamentally changed.

The fact that advancements in literacy skills have fallen sharply behind the evolution of the nature of information has profound consequences in a world where virality seems sometimes privileged over quality in the distribution of information. In the "post-truth" climate in which we now find ourselves, assertions that "feel right" but have no basis in fact become accepted as fact. Algorithms that sort us into groups of like-minded individuals create social media echo chambers that amplify our views and leave us insulated from opposing arguments that may alter our beliefs. These virtual bubbles homogenise opinions and polarise our societies; and they can have a significant – and adverse – impact on democratic processes. Those algorithms are not a design flaw; they are how social media work. There is a scarcity of attention but an abundance of information. We are living in this digital bazaar where anything that is not built for the network age is cracking apart under its pressure.

The question is then: How can we live successfully in this new world of information? Do we approach the issue from a consumer protection or supply side angle? In modern societies, it seems impossible to treat knowledge in the same way we treat physical products; that is, by making sure they meet consumer protection regulations: requiring information to comply with "protective" standards would be perceived as an immediate threat to democratic principles.

The result is that the market for information remains unregulated. Can and should we place certain constraints on the behaviour and pronouncements of the influential and powerful? Can and should we introduce more robust standards for our gatekeepers, the journalists, who play such an important role in holding power to account? Has the time come to extend consumer protection to people as absorbers of information, who are – let us not forget – voters? And if we do so, how will this restrict freedom of speech and creativity in knowledge creation? Transparency in political advertising in the social media sphere also merits closer attention given its increasingly prevalent use. The degree and sophistication of targeting techniques being deployed are astounding and they are poorly understood by the majority of social media users.

The latest PISA report, *21st Century Readers: Developing literacy skills in a digital world*, takes a different and equally important perspective, which is to focus on the skills angle. It looks at ways to strengthen students' capacity to navigate the new world of information. It studies the ways in which students access digital technology, how skilled they are with complex digital reading tasks – and how this varies by geography, social background or gender. It also explores what teachers do to help students navigate ambiguity and manage complexity. The good news is education can make a difference. The report shows that education systems in which more students are taught digital skills have a higher percentage of students who can correctly distinguish facts from opinions in the PISA tasks. On average across OECD countries, 54% of students said they were trained at school to recognise whether information is biased or not. This proportion varies across countries. It is also interesting that the relationship between students' access to training on how to detect biased information and their capacity to actually distinguish fact from opinion plays out quite differently across countries. There seems to be room for countries and schools to learn from each other how to implement such training programmes most successfully.

The Covid-19 pandemic, which made digital technologies the lifeline for education, has increased the urgency with which this needs to be addressed. It has also increased momentum among children, teachers and policy makers to support 21st-century readers. To some schoolchildren and even teachers, disinformation in pre-pandemic times might have seemed a remote and political concern with little relevance in the schoolyard and staff room. Today, the infodemic and general unease and uncertainty it sows about basic scientific and health-related facts has captured the focus of 15-year-old students – and their desire for tools and solutions.

As international debate focuses on foreign trolls and conspiracy theorists, the moment is emerging to integrate a new digital literacy into learning and teaching that guarantees its independence from partisan and commercial influence. 21st-century literacy means stopping to look left and right before proceeding online. It means checking facts before basing opinions on them. It means asking questions about sources of information: Who wrote this? Who made this video? Is it a credible source? Does it even make sense? What are my biases? All this belongs in school and teacher-training curricula. It has applications far beyond detecting fake news and disinformation: to secure the act of making informed decisions is to secure the basis for functioning democracies.

The growing complexity of modern living for individuals, communities and societies suggests that the solutions to our problems will be ever more complex: in a structurally imbalanced world, the imperative of reconciling diverse perspectives and interests in local settings with sometimes global implications will require young people to become adept in handling tensions, dilemmas and trade-offs. Being able to strike a balance between competing demands – equity and freedom, autonomy and community, innovation and continuity, efficiency and democratic processes – all hinges on 21st-century literacy skills.

Last but not least, the report highlights how countries need to redouble their efforts to combat emerging digital divides. Disadvantaged students from OECD countries are increasingly losing the cultural capital of having books in their home-learning environments. And many of the most disadvantaged students can only access computers linked to the Internet at school.

The good news is that the strategies and tools to address these challenges and develop 21st-century literacy skills are ready. They are being tried and tested by teachers all around the world who have understood what it means to educate students for their future, rather than for our past.

Andreas Schleicher
Director for Education and Skills
Special Advisor on Education Policy
to the Secretary-General

Foreword

Literacy in the 21st century is about constructing and validating knowledge. Digital technologies have enabled the spread of all kinds of information, displacing traditional formats of usually more carefully curated information such as newspapers. The massive information flow of the digital era demands that readers be able to distinguish between fact and opinion. Readers must learn strategies to detect biased information and malicious content like fake news and phishing emails. The infodemic in which events like the Covid-19 pandemic has immersed us makes it harder to discern the accuracy of information when reaction time is crucial. It illustrates how essential it is to be a proficient reader in a digital world.

But the literacy landscape is not just about the quality and overload of information, it is also about how we spend an increasing amount of time online, and in the case of children, autonomously. With school closures, students have had to do their schooling at home and on their own. Though teachers have certainly tried their best to provide remote support, students have had to learn in a much less structured and guided home environment. And, for the most part, their learning has taken place almost exclusively through a computer and an online connection. This sudden autonomy highlights the need for students' basic digital literacy. What the PISA 21st-century readers report reveals is that students' access to digital technologies and training on how to use them greatly vary between countries and students' socio-economic profiles.

The Covid-19 pandemic made digital technologies the lifeline for not just education but work, information and leisure. Our unprecedented reliance on the digital world during this crisis has created momentum to harness its power for better learning opportunities. Digitalisation can respond to a greater variety of learning needs, scale and disseminate effective practice, achieve efficiency gains, and integrate learning and assessment better. At the same time, education stakeholders are beginning to understand that we must counter some of the disruptive effects of digitalisation in and for education: this starts with digital reading skills.

This report explores how 15-year-old students are developing reading skills to navigate the technology-rich 21st century. It sheds light on potential ways to strengthen students' capacity to navigate the new world of information. It highlights how countries need to redouble their efforts to combat emerging digital divides. It also explores what teachers can do to help students navigate ambiguity and manage complexity.

This report is the product of a collaborative effort between the countries and economies participating in PISA and the OECD Secretariat. The report was prepared by Javier Suarez-Alvarez with contributions from Giannina Rech. Qiwei He (Educational Testing Service (ETS)) analysed and drafted Chapter 3. Analytical and statistical support was provided by Pierre Gouëdard, Rodrigo Castaneda Valle and Filippo Besa. Clara Young edited the report. Andreas Schleicher, Yuri Belfali, Miyako Ikeda, Alfonso Echazarra and Francesco Avvisati provided valuable feedback at various stages of the report. This report also benefitted from the input and expertise of Dominique Lafontaine and Jean-François Rouet, members of the PISA 2018 reading expert group that guided the preparation of the PISA 2018 reading assessment framework and instruments. For Chapter 3, Irwin Kirsch, Claudia Tamassia, Eugenio Gonzalez, and Frederic Robin of the Center for Global Assessment at ETS provided valuable input at various stages of the development. Michael Wagner, Mathew Kandathil, Lokesh Kapur and Shuwen Zhang at ETS prepared the log files used in this report. Production was co-ordinated by Alison Burke and Della Shin laid out the publication. Administrative support was provided by Thomas Marwood and Lesley O'Sullivan. The development of the report was steered by the PISA Governing Board, chaired by Michele Bruniges (Australia), with Peggy Carr (United States), Sukit Limpijumnong (Thailand) and Carmen Tovar Sánchez (Spain) as vice-chairs. ETS provided partial in-kind support for the preparation of Chapter 3. This report was prepared with the support of the Vodafone Germany Foundation.

PISA

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Executive Summary

Digital technologies revolutionised the written word in the 21st century. In the past, mass production of printed books made information widely available and incentivised people to develop reading skills. Still, the production of books remained in the hands of the few, not the many. With digital technologies, all that has changed. Everyone can become a journalist or a publisher. People now find millions of answers to their questions on the Internet at the click of a button. But what they have lost is the certainty of what is right or wrong, true or not true. Literacy in the 21st century is about constructing and validating knowledge. The more information there is, the more readers have to know how to navigate through ambiguity, and triangulate and validate viewpoints.

Reading in a digital world is even more challenging given the increasing production and consumption of media content. Sometimes, it seems that the speed of information dissemination comes before the quality of the information itself. This contributes to "fake news", misinformation and a "post-truth" climate. Social media algorithms are designed to channel the flow of likeminded people towards each other. This creates "echo chambers", which reinforce our thoughts and opinions rather than challenge them, fuelling people's confirmation bias. The digital divide exacerbates these challenges for the most disadvantaged. Many students do not have access to the Internet at home and must rely on schools to learn and practice their digital skills. With the Covid-19 pandemic and school closures, students have had to do their schooling at home and on their own. This crisis makes plain that it is urgent to develop autonomous and advanced reading skills to prepare young people for an increasingly volatile, uncertain, and ambiguous world.

Reading was the main subject assessed in PISA 2018, and the reading framework was devised to include essential reading skills in a digital world. This report provides important insights into how 15-year-old students are developing reading skills to navigate the technology-rich 21st century.

DEVELOPING READING SKILLS IN A DIGITAL WORLD: MAIN FINDINGS

Digital divide

- On average across OECD countries, some 88% of students had both a connection to the Internet at home and a computer they could use for schoolwork in PISA 2018 (OECD average-31: 89%) – 28 percentage points more than in PISA 2003 (OECD average-31).
- Half or less of students had access to both a connection to the Internet at home and a computer they could use for schoolwork in the Dominican Republic, Indonesia, Malaysia, Mexico, Morocco, Peru, the Philippines, Thailand, and Viet Nam. This percentage was lower than 20% in rural areas of Indonesia, Mexico, Morocco and the Philippines.
- Four in five disadvantaged students in Malaysia, Mexico, Morocco, Peru, the Philippines and Viet Nam do not have access to the Internet at home but at school only.

Opportunity to learn

- On average across OECD countries, some 54% of students reported being trained at school on how to recognise whether information is biased.
- Students were asked to click on the link of an e-mail from a well-known mobile operator and fill out a form with their data to win a smartphone, also known as phishing e-mails. Approximately 40% of students on average across OECD countries responded that clicking on the link was somewhat appropriate or very appropriate.
- Education systems with a higher proportion of students who were taught how detect biased information in school and who have digital access at home were more likely to distinguish fact from opinion in the PISA reading assessment, even after accounting for country per capita GDP.

Navigating digital environments

- More than half of the students in B-S-J-Z (China), Hong Kong (China), Korea, Singapore and Chinese Taipei followed instructions in the PISA reading assessment by carefully selecting pages relevant to the tasks, limiting visits to irrelevant pages (strictly focused navigation), and actively navigating both single- and multiple-source items (actively explorative navigation). These navigation behaviours were strongly correlated with knowledge of effective reading strategies and reading performance.

- On average across OECD countries, the index of knowledge of effective reading strategies for assessing the credibility of sources is the most strongly associated with reading performance after accounting for students' and schools' socio-economic status. The other two reading strategies (i.e. the indices of student knowledge of reading strategies for understanding and memorising a text and summarising information) are also associated with reading performance.

Strategies to tackle inequality and gender gaps

- Disadvantaged students perceived the PISA reading assessment as more difficult than advantaged students even after accounting for students' reading scores in 70 countries and economies that participated in PISA 2018.
- Boys reported they felt the PISA reading test was easier than girls did even though boys scored 25 points lower than girls in reading after accounting for students' socio-economic backgrounds.
- Almost two-thirds of the association between gender and reading performance can be accounted for by the difference between boys' and girls' knowledge of effective reading strategies. Almost 30% of the association between socio-economic background and reading performance can be accounted for by the difference between socio-economically advantaged and disadvantaged students' reported self-perception of reading competence.

Print reading in a digital world

- Students who reported reading books more often in paper than digital format perform better in reading and spend more time reading for enjoyment in all participating countries/economies in PISA 2018.
- Compared to students who rarely or never read books, digital-book readers across OECD countries read for enjoyment about 3 hours more a week, print-book readers about 4, and those who balance both formats about 5 hours or more a week after accounting for students' and schools' socio-economic background and gender.

Teachers' practices

- Disadvantaged students and boys – who typically have a lower reading performance – perceived less stimulating reading activities from their teachers in the 49 countries/economies participating in PISA 2018.
- Reading fiction and long texts for school more frequently was positively associated with reading performance in most countries/economies after accounting for students' and schools' socio-economic profiles.
- The relationship between reading performance and time spent using digital devices for schoolwork was negative in 36 countries and economies after accounting for students' and schools' socio-economic status. However, this relationship was positive in Australia, Denmark, Korea, New Zealand, and the United States.

Reader's Guide

Data underlying the figures

The data referred to in this report are presented in Annex B and, in greater detail, including additional tables, on the PISA website (www.oecd.org/pisa).

Three symbols are used to denote missing data:

c There were too few observations to provide reliable estimates (i.e. there were fewer than 30 students or fewer than 5 schools with valid data).

m Data are not available. There was no observation in the sample; these data were not collected by the country; or these data were collected but subsequently removed from the publication for technical reasons.

w Results were withdrawn at the request of the country concerned.

Country coverage

This publication features data on 79 countries and economies, including all OECD countries (indicated in black in the figures) and more than 40 partner countries and economies (indicated in blue in the figures).

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Two notes apply to the statistical data related to Cyprus:

- **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 recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
- **Footnote by all the European Union Member States of the OECD and the European Union:** The Republic of Cyprus is recognised 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.

B-S-J-Z (China) refers to the four regions in China that participated in PISA 2018: Beijing, Shanghai, Jiangsu and Zhejiang.

Hong Kong (China), the Netherlands, Portugal and the United States: Data did not meet the PISA technical standards but were accepted as largely comparable (see Annexes A2 and A4 from (OECD, 2019[1])).

In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see Annex A9 from (OECD, 2019[1])), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

International averages

The OECD average corresponds to the arithmetic mean of the respective country estimates. It was calculated for most indicators presented in this report.

The OECD total takes the OECD countries as a single entity, to which each country contributes in proportion to the number of 15-year-olds enrolled in its schools. It can be used to assess how a country compares with the OECD area as a whole.

In this publication, the OECD average is generally used when the focus is on comparing performance across education systems. In the case of some countries, data may not be available for specific indicators, or specific categories may not apply. Readers should, therefore, keep in mind that the terms "OECD average" and "OECD total" refer to the OECD countries included in the respective comparisons. In cases where data are not available or do not apply for all sub-categories of a given population or indicator, the "OECD average" is not necessarily computed on a consistent set of countries across all columns of a table.

In analyses involving data from multiple years, the OECD average is always reported on consistent sets of OECD countries, and several averages may be reported in the same table. For instance, the «OECD average-37» refers to the average across all 37 OECD countries, and is reported as missing if fewer than 37 OECD countries have comparable data; the "OECD average-30" includes only 30 OECD countries that have non-missing values across all the assessments for which this average itself is non-missing. This restriction allows for valid comparisons of the OECD average over time.

The number in the label used in figures and tables indicates the number of countries included in the average:

- **OECD average-37/OECD average**: Arithmetic mean across all OECD countries.
- **OECD average-31 (Chapter 2)**: Arithmetic mean across all OECD countries, excluding Chile, Colombia, Estonia, Israel, Lithuania and Slovenia.
- **OECD average-31 (Chapter 4)**: Arithmetic mean across all OECD countries, excluding Colombia, Estonia, Lithuania, the Slovak Republic, Slovenia and Turkey.
- **OECD average-25 (Chapter 1)**: Arithmetic mean across all OECD countries, excluding Canada, Colombia, France, Germany, Lithuania, Luxembourg, the Netherlands, Norway, Portugal, Turkey, the United Kingdom and the United States.

The overall average corresponds to the arithmetic mean of the respective country/economy estimates. It was calculated for some indicators presented in this report.

Rounding figures

Because of rounding, some figures in tables may not add up exactly to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

All standard errors in this publication have been rounded to one or two decimal places. Where the value 0.0 or 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05 or 0.005, respectively.

Reporting student data

The report uses "15-year-olds" as shorthand for the PISA target population. PISA covers students who are aged between 15 years 3 months and 16 years 2 months at the time of assessment and who are enrolled in school and have completed at least 6 years of formal schooling, regardless of the type of institution in which they are enrolled, and whether they are in full-time or part-time education, whether they attend academic or vocational programmes, and whether they attend public or private schools or foreign schools within the country.

Reporting school data

The principals of the schools in which students were assessed provided information on their schools' characteristics by completing a school questionnaire. Where responses from school principals are presented in this publication, they are weighted so that they are proportionate to the number of 15-year-olds enrolled in the school.

Focusing on statistically significant differences

This report discusses only statistically significant differences or changes. These are denoted in darker colours in figures and in bold font in tables. Unless otherwise specified, the significance level is set to 5%. See Annex A2 for further information.

Abbreviations used in this report

% dif.	Percentage-point difference
Corr.	Correlation coefficient
Dif.	Difference
ESCS	PISA index of economic, social and cultural status
ICT	Information and communications technology
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
Score dif.	Score-point difference
S.D.	Standard deviation
S.E.	Standard error
STEM	Science, technology, engineering and mathematics

List of country codes - the following country codes are used in some figures of chapter 3

OECD countries	ISO code	OECD countries	ISO code	OECD countries	ISO code
Australia	AUS	**Hungary**	HUN	**New Zealand**	NZL
Austria	AUT	**Iceland**	ISL	**Norway**	NOR
Belgium	BEL	**Ireland**	IRL	**Poland**	POL
Canada	CAN	**Israel**	ISR	**Portugal**	PRT
Chile	CHL	**Italy**	ITA	**Slovak Republic**	SVK
Colombia	COL	**Japan**	JPN	**Slovenia**	SVN
Czech Republic	CZE	**Korea**	KOR	**Spain**	ESP
Denmark	DNK	**Latvia**	LVA	**Sweden**	SWE
Estonia	EST	**Lithuania**	LTU	**Switzerland**	CHE
Finland	FIN	**Luxembourg**	LUX	**Turkey**	TUR
France	FRA	**Mexico**	MEX	**United Kingdom**	GBR
Germany	DEU	**Netherlands**	NLD	**United States**	USA
Greece	GRC				

Partner countries and economies	ISO code	Partner countries and economies	ISO code	Partner countries and economies	ISO code
Albania	ALB	**Georgia**	GEO	**Peru**	PER
Baku (Azerbaijan)	QAZ	**Hong Kong (China)**	HKG	**Philippines**	PHL
Belarus	BLR	**Indonesia**	IDN	**Qatar**	QAT
Bosnia and Herzegovina	BIH	**Kazakhstan**	KAZ	**Russia**	RUS
Brazil	BRA	**Kosovo**	KSV	**Serbia**	SRB
Brunei Darussalam	BRN	**Macao (China)**	MAC	**Singapore**	SGP
B-S-J-Z (China)	QCI	**Malaysia**	MYS	**Chinese Taipei**	TAP
Bulgaria	BGR	**Malta**	MLT	**Thailand**	THA
Costa Rica	CRI	**Montenegro**	MNE	**United Arab Emirates**	ARE
Croatia	HRV	**Morocco**	MAR	**Uruguay**	URY
Dominican Republic	DOM	**Panama**	PAN		

Further documentation

For further information on the PISA assessment instruments and the methods used in PISA, see the *PISA 2018 Technical Report* (OECD, forthcoming[1]).

StatLink

This report has *StatLinks* at the bottom of tables and graphs. To download the matching Excel® spreadsheet, just type the link into your Internet browser, starting with the *https://doi.org* prefix, or click on the link from the e-book version.

References

OECD (2019), *PISA 2018 Results (Volume I): What Students Know and Can Do*, PISA, OECD Publishing, Paris, https://dx.doi.org/10.1787/5f07c754-en. [2]

OECD (Forthcoming), *PISA 2018 Technical Report,* OECD publishing, Paris. [1]

PISA

1

Digital literacy in the 21st century

This chapter discusses why reading is key for citizens and societies in the technology-rich 21st century and how PISA 2018 defined and measured reading literacy. The chapter highlights how the PISA 2018 reading framework was revised and expanded to include essential reading skills in the digital world.

What the data tell us

- The average amount of time 15-year-olds in OECD countries reported spending on the Internet increased from 21 to 35 hours per week between PISA 2012 and PISA 2018. Of the total time students spent on the Internet per week, around 77% was outside of school in 2018.
- Students in Japan and Korea reported spending 23 and 22 hours per week connected to the Internet – which is 4 and 8 hours more than in 2015. In contrast, Denmark and Sweden's students reported more than 45 hours per week online – which is 10 and 8 hours more than in 2015.

WHY IS READING KEY TO 21ST-CENTURY CITIZENS AND SOCIETIES?

In 2012, PISA asked 15-year-olds how much time they spent on the Internet. In 2018, PISA asked the same question. The data reveal that Internet use in that age group has rocketed by 66% – almost the equivalent to the average adult workweek across OECD countries (Box 1.1). The increasing share of Internet users worldwide is changing not only how people interact with others but also how they interact with texts. People now access information more through digital devices where they once did so in print or by talking to other people. The rise of digital technology means that people need to be more selective in what they read due to the vast quantities of information available at the click of a button.

Reading is increasingly embedded into a faster-paced digital- and screen-based culture. News is in real-time 24/7 and social media reactions spread across the globe in a matter of seconds. At the same time, disinformation and fake news are jeopardising democracies that function poorly when citizens are not well informed or worse, misled. Disinformation is not unique to digital technologies but the Internet spreads and amplifies its impact. Students need to learn how to think critically, assess the accuracy of information on the Internet, and solve problems on their own more than ever.

The ability to think critically is valued and emphasised in many countries and learning areas, suggesting that these skills are highly transferable across most learning areas. For example, recent analyses from OECD Future of Education and Skills 2030 (hereafter Education 2030) suggest that critical thinking and problem-solving skills are mapped in over 60% of the curriculum on average across countries participating in the Curriculum Content Mapping carried out in this study (OECD, 2020[2]). In addition to critical thinking and problem-solving skills, students increasingly need to develop meta-cognitive skills and acquire knowledge of effective reading strategies to navigate the Internet. Students need to be able to identify online risks like phishing emails. They should be able to distinguish between fact and opinion when reading a piece of text on the Internet. Meta-cognitive skills, however, are included in curricula to a lesser extent (OECD, 2020[2]).

Box 1.1. How has Internet use changed between 2012 and 2018?

In 1997, when the first PISA framework for reading began to be discussed, just 1.7% of the world's population used the Internet. By 2019, the number had grown to a global penetration rate of 53.6%, representing 4.1 billion people (International Telecommunication Union, 2019[1]).

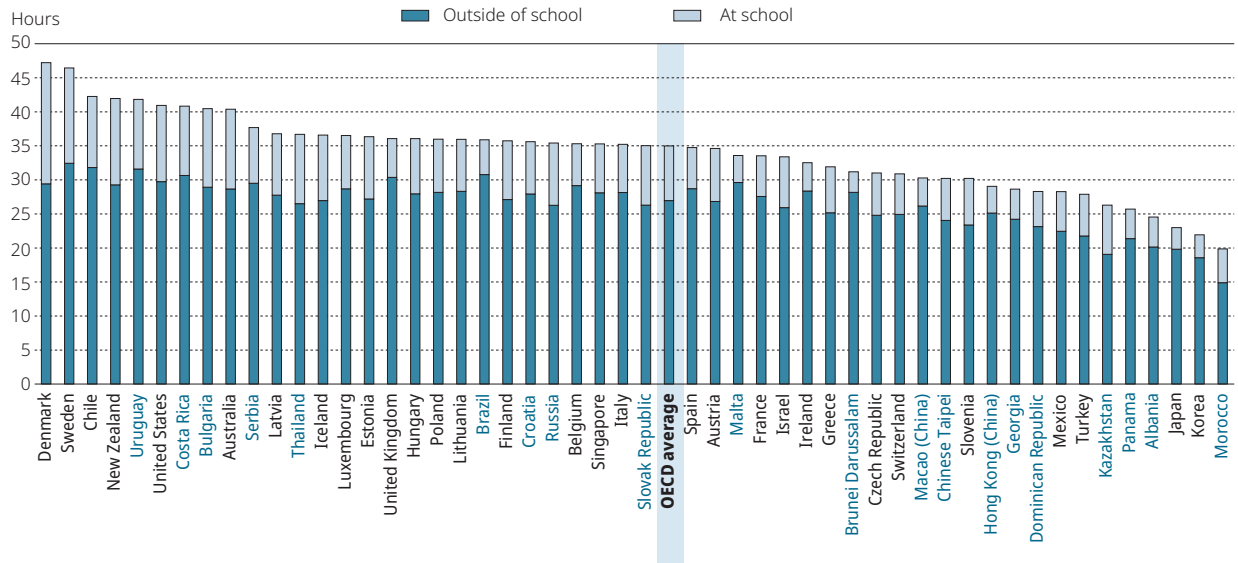
Since 2012, PISA has been asking students how frequently they use the Internet, both at school and outside of school. On average across all countries and economies that distributed the optional ICT familiarity questionnaire between 2012 and 2015, the time that 15-year-olds reported spending on the Internet increased from 21 to 29 hours per week. In PISA 2018, the total amount of time spent on the Internet increased to 35 hours per week (Figure 1.2). In other words, this represents a 66% increase in just 6 years and almost as much time as a typical adult workweek. Of the total time students spent on the Internet per week, around 77% was outside of school in 2018, even though the amount of time spent on the Internet at school has increased from 13% to 23% of total time on the Internet from 2012 to 2018. (Figure 1.2, Tables B.1.1 and B.1.2).

Despite the clear trend, there were still substantial differences across countries in student use of the Internet in 2018. In Japan and Korea, for instance, students reported spending 23 and 22 hours per week connected to the Internet – which is 4 and 8 hours more than in 2015 respectively. By contrast, Denmark and Sweden's students reported more than 45 hours per week online – which is 10 and 8 hours more than in 2015 (Figure 1.2 and Table B.1.3).

However, at the same time, students in Denmark and Sweden reported that between 38% and 30%, respectively, of the total time spent on the Internet was at school while in Japan and Korea these percentages were 14% and 15% respectively (Tables B.1.2 and B.1.3).

Figure 1.1 **Time spent on the Internet**

Number of hours per week spent using the Internet



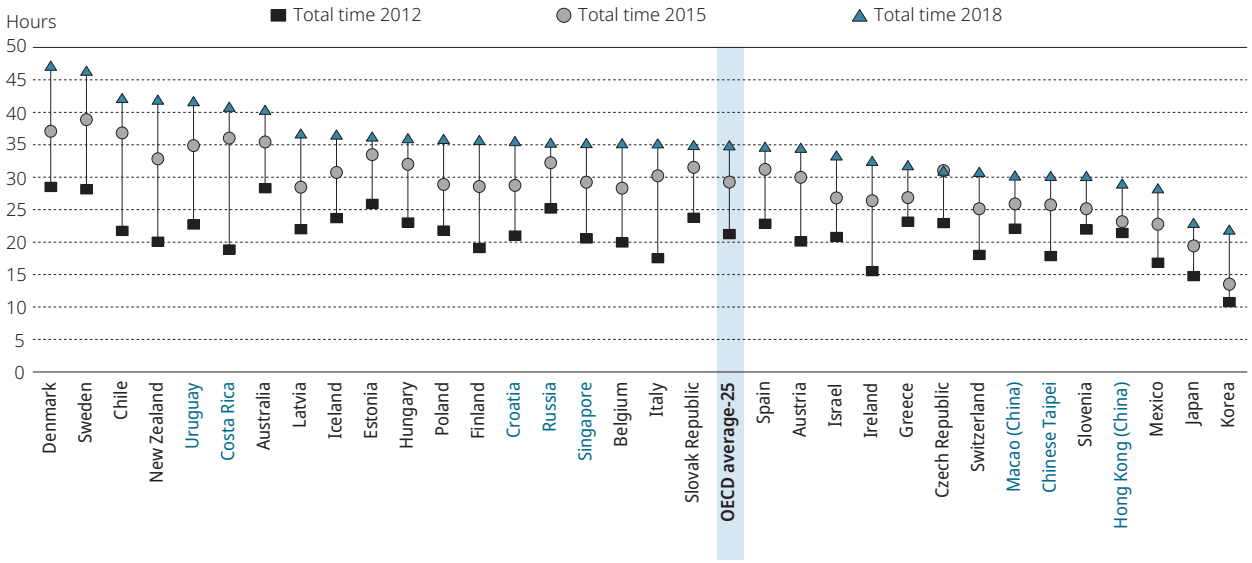
Countries and economies are ranked in descending order of the total number of hours per week spent using the Internet.

Source: OECD, PISA 2018 Database, Tables B.1.1 and B.1.2.

StatLink https://doi.org/10.1787/888934239306

Figure 1.2 **Time spent on the Internet in 2012, 2015, 2018**

Number of hours per week spent using the Internet



Notes: All countries and economies that participated from PISA 2012 to PISA 2018, and with available data, are shown.

All differences between PISA 2018 and previous cycles are statistically significant, except the change between PISA 2015 and PISA 2018 for Czech Republic.

OECD average-25 is the arithmetic mean across all OECD countries, excluding Canada, Colombia, France, Germany, Lithuania, Luxembourg, the Netherlands, Norway, Portugal, Turkey, the United Kingdom and the United States.

Countries and economies are ranked in descending order of the total number of hours per week spent using the Internet in PISA 2018.

Source: OECD, PISA 2018 Database, Table B.1.3.

StatLink https://doi.org/10.1787/888934239325

Reading is key to the growing and changing needs of an interconnected world. PISA 2018 showed that global competence – the ability to easily move between local and global spheres – is strongly correlated with reading performance[1] (OECD, 2020[3]). This is not surprising as both reading and global competence require weighing the reliability and relevance of information, reasoning with evidence and describing and explaining complex situations and problems. However, Education 2030 shows that global competency is only explicitly articulated in 28% of the curriculum in the countries participating in the Curriculum Content Mapping of this study (OECD, 2020[4]).

Digital literacy, on the other hand, has a stronger presence in the Education 2030 Curriculum Content Mapping (on average, 40% of content items). Estonia stands out with nearly 70% of its curriculum linked to digital literacy, followed by Korea and Kazakhstan (just below 60%) (OECD, 2020[4]). Several countries have introduced (or are planning to introduce) one or more new ICT-related subjects in the curriculum (OECD, 2020[2]). For example, Australia, Ireland, New Zealand, Portugal, India, Kazakhstan and Viet Nam proposed computer science, technology or information technology as a separate subject. Australia, Chile, Estonia, Hungary, Ireland, Japan, the Netherlands, New Zealand, Scotland (United Kingdom) and Wales (United Kingdom), Brazil, and Kazakhstan reported the introduction of ICT as crosscutting content across multiple subjects or the entire curriculum.

Are students who had the opportunity to learn digital skills in school more likely to distinguish facts from opinions in the PISA reading test? Which navigational skills are more strongly related to reading multiple-source items in the PISA reading test? Do 15-year-olds spend more time reading for enjoyment on paper or digital devices? And who reads proficiently? What reading strategies are effective in tackling inequality and gender gaps in reading performance? How is reading performance associated with the kinds of texts and the length of texts used in school? How are schools enhancing teaching and learning in digital environments? This report aims to answer these questions to understand better how 15-year-olds are developing reading skills to navigate the technology-rich 21st century. Before introducing the results, the following section shows how the PISA reading framework has been updated in 2018 to reflect recent changes in the nature of reading (OECD, 2019[5]).

How does PISA 2018 assess reading?

The OECD Programme for International Student Assessment (PISA) is a survey that assesses student's skills and what they can do with their skills. PISA 2018 focused on the assessment of reading. Reading was also the major domain in 2000 and 2009. Although reading is part of all PISA cycles, the reading assessment and analytical framework receive a thorough revision when it is the major domain. PISA allows trend comparisons in students' reading proficiency across countries, while revisions in the PISA reading framework reflect how the nature of reading has changed over the last two decades.

Readers generate meaning in response to a text by using previous knowledge, processes, and strategies, and these processes and strategies vary with context and purpose (Britt and Rouet, 2012[6]). For example, students may use different processes and strategies to interpret extended pieces of continuous text such as novels or essays than when they navigate through information on the Internet in search of facts. Even textbooks that have traditionally been examples of extended pieces of continuous texts are being transformed into a repository of documents with many inserted tasks and less linearity (Weisberg, 2011[7]). Digitalisation is also profoundly transforming social media and the transmission of (mis)information (Allcott, Gentzkow and Yu, 2019[8]). Increasingly, reading requires evaluating the quality and validity of different sources, navigating through ambiguity, distinguishing between fact and opinion, and constructing knowledge. The PISA 2018 assessment and analytical framework reflect the information-processing strategies involved in digital reading. Box 1.2 summarises the major changes in the reading assessment between PISA 2009 and PISA 2018, while the rest of the chapter describes the PISA 2018 reading literacy framework more thoroughly.

Box 1.2. **Changes between 2009 and 2018 in the PISA assessment of reading literacy**

The PISA 2018 reading literacy framework (OECD, 2019[5]) is similar in many respects to the PISA 2009 reading literacy framework, which with some adjustments (e.g. delivery mode) was also used in PISA 2012 and 2015. The PISA 2018 reading framework was also designed so that the former print and digital reading assessments (PISA 2009) could be fully integrated. As a result, there is no longer a strict delineation of tasks typical of print or digital environment. The major differences between the 2009 and 2018 assessments are:

- A greater emphasis on multiple-source texts, i.e. texts composed of several units of text, created separately by different authors (Rouet, Britt and Potocki, 2019[9]). These types of text are more prevalent in the information-rich digital world, and the digital delivery of the PISA reading assessment made it possible to present them to students. While the availability of multiple sources does not necessarily imply greater difficulty, including multiple-source units helped to expand the range of higher-level reading processes and strategies measured by PISA. In 2018, these included searching

for information across multiple documents, integrating across texts to generate inferences, assessing the credibility of sources, and handling conflicting information (List and Alexander, 2018[10]; Barzilai, Zohar and Mor-Hagani, 2018[11]; Magliano et al., 2017[12]; Van Meter et al., 2020[13]; Salmerón et al., 2018[14]).

- The use of adaptive testing, whereby the electronic test form that a student saw depended on his or her answers to earlier questions.
- The digital, on-screen delivery of text, which facilitated the first and second changes listed above. The 2009 assessment was conducted on paper while the 2018 assessment was conducted (by default) on computer[2]. Students had to use navigational tools to move between passages of text, as there was often too much text to fit onto one screen.
- The explicit assessment of reading fluency, defined as the ease and efficiency with which students can read text.

While a few countries/economies may have been affected more than others by these changes, the analysis in Box I.8.1 of PISA 2018 Results (Volume I) - What Students Know and Can Do (OECD, 2019[15]) shows that effects on country mean scores were not widespread. The difference in the single- and multiple-source subscales in PISA 2018 is not correlated with the change in reading performance between PISA 2015 and PISA 2018. Similarly, there was no correlation between the change in countries and economies' average reading performance between 2015 and 2018 and the estimated accuracy in answering reading-fluency items. Therefore, it is possible to conclude that the greater emphasis on multiple-source texts in PISA 2018 had a limited impact on changes in reading performance.

THE PISA 2018 READING ASSESSMENT FRAMEWORK

Definition

PISA 2018 defines reading as understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential and to participate in society. Reading is not just the ability to decode written words, which is typically acquired during childhood, but a malleable set of skills that individuals build on throughout life. PISA definitions of reading have changed over time to reflect changes in the society, economy, culture and technology.

Since PISA 2000, the concept of reading has also changed to reflect the progress in the theoretical understanding of what it means to know how to read, which encompasses cognitive, metacognitive and affective-motivational dimensions of behaviour.

For instance, reading in a digital world requires continuously evaluating the quality and validity of differences sources, navigating through ambiguity, distinguishing between facts and opinions, and constructing knowledge. This increasingly requires individuals to acquire effective strategies – to think about, monitor and adjust their activity to reach a particular goal (also known as metacognitive reading strategies) and motivate themselves to persevere in the face of difficulties (also known as self-efficacy). Metacognitive strategies are crucial elements that can be developed as components of reading literacy. Moreover, teachers can enhance reading engagement and metacognition strategies through teaching and supportive classroom practices (Guthrie, Klauda and Ho, 2013[16]; Christenson, Reschly and Wylie, 2012[17]).

PISA recognises from its very beginning that reading is a daily activity for most people and that education systems need to prepare students to be able to adapt to the variety of scenarios in which they will need to read as adults. These scenarios range from their own goals and development initiatives to their experiences in further and continuing education, and to their interactions at work, with public entities, in online communities and with society. It is not enough to be a proficient reader; students should also be motivated to read and be able to read for a variety of purposes (Britt, Rouet and Durik, 2017[18]; van den Broek, 2011[19]).

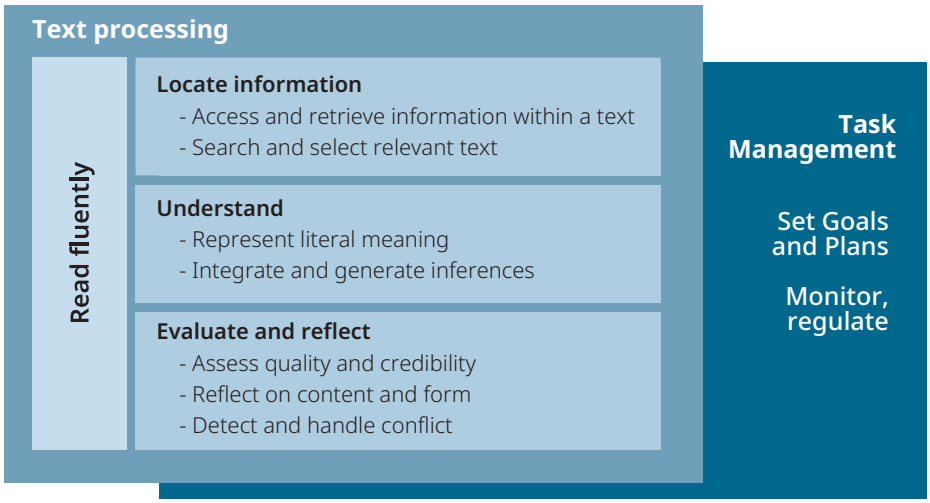
Organising the domain

The PISA 2018 reading literacy assessment (OECD, 2019[20]) is built on three major characteristics: cognitive processes – the approach that determines how readers engage with a text; text – the range of material that is read; and scenarios – the range of broad contexts or purposes for which reading takes place.

Cognitive processes

The PISA 2018 framework defines two broad categories of reading processes: text processing and task management (Figure 1.3). Three of the processes that readers activate when engaging with a piece of text were also identified in previous PISA cycles: "locating information", "understanding", and "evaluating and reflecting". 'Reading fluency' on the other hand, is new to the PISA 2018 assessment.

Figure 1.3 **PISA 2018 Reading framework processes**



PISA defines **reading fluency** as the ease and efficiency of reading texts for understanding. Reading fluency is an individual's ability to read words and text accurately and automatically and to phrase and process these words and texts in order to comprehend the overall meaning of the text (Kuhn and Stahl, 2003[21]). Students who read fluently activate higher-level comprehension processes that are associated with higher reading comprehension performance than those who have a weaker reading fluency (Cain and Oakhill, 2004[22]). PISA 2018 evaluated reading fluency by presenting students with a variety of sentences, one at a time, and asking them whether they made sense. These sentences were all relatively simple, and it was unambiguous whether they made sense or not. An example of these sentences includes: Six birds flew over the trees; the window sang the song loudly; the man drove the car to the store.

Daily readers most often use texts for purposes that require the location of specific information (White, Chen and Forsyth, 2010[23]). This is particularly the case for readers when using complex digital information such as search engines and websites. Readers must be able to judge the relevance, accuracy and credibility of passages, modulate their reading speed and skim through the text until they find the relevant information. The 2018 framework defines two processes related to '**locating information**' (known in previous frameworks as "accessing and retrieving"), and they can be found at all levels of difficulty:

a. **Accessing and retrieving information within a piece of text**: readers must be able to scan a single piece of text in order to retrieve target information composed of a few words, phrases or numerical values. It often requires comprehending the text at the phrase level through literal or close to the literal matching of elements in the question and the text. Other times, it requires finding several pieces of information and searching for embedded information.

b. **Searching for and selecting relevant text**: readers must be able to select information when faced with several pieces of text where the amount of available information often vastly exceeds the amount readers can process. In PISA 2018, text search and selection tasks involve the use of text descriptors such as headers, source information (e.g. author, medium, date), and embedded or explicit links such as search engine result pages.

A large number of reading activities involve the parsing and integration of extended passages of text in order to form an understanding or comprehension of the meaning conveyed in the passage. To understand a text the reader needs to construct a mental representation of the literal meaning of the text and integrate that construction with one's prior knowledge through inference processes (McNamara and Magliano, 2009[24]). The 2018 framework defines two processes related to '**understanding**' (known in previous frameworks as "integrating and interpreting"):

a. **Acquiring a representation of the literal meaning of a text**: readers must be able to comprehend sentences or short passages, often involving a direct or paraphrased match between the question and target information within the passage.

b. **Constructing an integrated text**: readers must be able to generate various types of inferences ranging from simple connecting inferences (such as the resolution of anaphora) to more complex coherence relationships (e.g. spatial, temporal, causal or claim-argument links). Inferences might link different portions of the text together or information located in different pieces of texts resulting in conflicting information.

Competent readers should be able to reason beyond the literal or inferred meaning of the text and reflect on the content and form of the text. For example, to distinguish between facts and opinions, readers must be able to assess the quality and validity of the information critically. These are defined in the PISA 2018 assessment framework as '**evaluating and reflecting**', and they are composed of the following processes:

a. **Assessing quality and credibility**: readers must be able to evaluate the quality and credibility of the information in a piece of text, often involving whether the information and the source are valid. Sometimes readers may need to look at who wrote it, when, and for what purposes to assess the quality and credibility of the text adequately.

b. **Reflecting on content and form**: readers must be able to reflect on the quality and style of the writing, often involving evaluating the author's purposes and viewpoints. In order to do so, they may need to use their prior knowledge and experience to be able to compare different perspectives.

c. **Detecting and handling conflict**: readers need to be aware and be able to deal with conflicts when facing multiple pieces of texts with contradictory information. Handling conflict typically requires readers to assign discrepant claims to their respective sources and to assess the soundness of the claims and/or the credibility of the sources.

Reading involves being able to adequately respond to the demands of a particular situation, set goals and strategies, monitor progress and self-regulate those goals and strategies (Winne and Hadwin, 1998[25]). In order to do so, readers need to use metacognitive strategies that enable the dynamic updating of goals throughout the activity. The PISA 2018 assessment framework highlights the importance of **Task management processes**, such as setting goals for reading (reading for pleasure, reading for information or reading for learning) or monitoring his/her comprehension. In the context of PISA, it is not possible to have a full evaluation of students' task management processes. Instead, PISA focuses on those goals that readers form upon receiving external prompts to accomplish a given task such as in school assignments. Chapter 3 of this report provides a detailed examination of these processes using process data such as response time, the number of actions and time spent to the first action.

Texts

The 2018 framework defines four dimensions of texts: source (single, multiple); organisational and navigational structure (static, dynamic); format (continuous, non-continuous, mixed); and type (description, narration, exposition, argumentation, instruction, interaction, transaction). The design of test materials that vary along these four dimensions ensure a broad coverage of the domain and representation of traditional as well as emerging reading practices.

a. **Source**: a source is a unit of text. Like in most traditional printed books, single-source texts are defined by having a definite author (or group of authors), time of writing or publication date, a reference title or number and are usually presented to the reader in isolation from other texts. Multiple-source items are defined by having different authors, or by being published at different times, or by bearing different titles or reference numbers.

b. **Organisational and navigational structure**: from a cell phone to multiple screen windows of information, the organisation and navigational structure in digital environments vary dramatically. PISA 2018 framework distinguishes static texts, with a simple organisation and low density of navigational tools (e.g. scroll bars and tabs), from dynamic texts that feature a more complex, non-linear organisation and a higher density of navigational devices (e.g. table of contents, hyperlinks to switch between segments of text or interactive tools such as in social networks).

c. **Format**: continuous texts are typically composed of sentences organised into paragraphs. These may fit into even larger structures such as sections, chapters and books. Non-continuous texts are most frequently organised in a matrix format, based on combinations of lists. Examples of non-continuous text objects are tables, graphs, diagrams and schedules. Mixed texts such as articles in magazines and reports may combine both continuous and non-continuous formats.

d. **Type**: The type of text refers to why the text was written and how it is organised. Examples of types of texts are descriptions, narration, exposition, argumentation, instruction or transaction.

While text format and type remained unchanged from PISA 2009, PISA 2018 computer-based assessment of reading presented all texts on screen. Therefore, the dimension of medium (print or electronic format) that appeared in previous frameworks is no longer relevant. On the other hand, the source dimension is related to the previous classification of environment (the text is composed by an author or group of authors alone, or in a collaborative manner with potential contribution of the reader).

Scenarios

PISA questions or tasks are arranged in units of one or multiple texts. In most traditional PISA reading units, students are presented with a series of unrelated passages on a range of general topics. Students answer a set of questions on each passage and then move on to the next unrelated passage. Multiple-text units were present in PISA since 2000 (see, e.g. the released unit Lake Chad), however, the category "multiple text unit" was dramatically expanded in PISA 2018 and special attention was placed on these units so that the student would feel engaged in a scenario as opposed to a mere series of questions. PISA 2018 strengthens the assessment scenarios in which students are provided with an overarching purpose for reading a collection of thematically related texts to complete a higher-level task (e.g. responding to some larger integrative question or writing a recommendation based on a set of texts), along with traditional standalone PISA reading units.

The use of scenarios with thematically related texts was introduced in PISA 2018 to help students better engage in the task. At the same time, it also allows assessing emergent aspects of reading, such as student's ability to search for information, evaluate different sources, read for comprehension and integrate across texts. Each scenario is made up of one or more tasks. In each task, students may be asked questions about the texts contained therein ranging from traditional comprehension items (locating information, generating an inference) to more complex tasks such as the synthesis and integration of multiple texts, evaluating web search results or corroborating information across multiple texts. Each task is designed to assess one or more of the processes identified in the framework. Table 1.1 presents a breakdown of the PISA 2018 reading literacy assessment by process assessed.

Tanle 1.1 **Approximate distribution of tasks by targeted process and text source**

2015 Framework		2018 Framework			
		Single text		Multiple text	
Accessing and retrieving	25%	Scanning and locating	15%	Searching for and selecting relevant text	10%
Intergrating and interpreting	50%	Literal Comprehension	15%	Multiple-text inferential Comprehension	15%
Reflecting and evaluating	25%	Inferential Comprehension	15%	Corroborating/handling conflict	10%
		Assessing quality and credibility Reflecting on content and form	20%		

Source: (OECD, 2019[20]).

In the PISA 2018 reading literacy assessment, a student might encounter an initial task in which he or she must locate a particular document based on a search result. In the second task, the student might have to answer a question about information that is stated explicitly in the text. Finally, in the third task, the student might need to determine if the author's point of view in the first text is the same as in a second text. In each case, these tasks are scaffolded so that if a student fails to find the correct document in the first task, he or she is then provided with the correct document in order to complete the second task.

Response formats

The form in which evidence of student ability is collected – the response format – varies depending on the kinds of evidence that are being collected, and according to the pragmatic constraints of a large-scale assessment. To ensure proper coverage of the ability ranges, to ensure fairness given the inter-country and gender differences observed and to ensure a valid assessment of the reflecting and evaluating process, both multiple choice and open constructed-response items continue to be used in PISA reading literacy assessments regardless of the change in delivery mode. About one-third of the 245 items solicited open-constructed responses marked by humans, and the rest were automatically marked selected-response questions (e.g. multiple-choice, true/false, yes/no).

Box 1.3. **What the literature says about digital reading compared to print reading**

Digital reading has some benefits compared to print reading, but not without nuances. For example, technology provides unique environments that interact in response to the actions of the learner and facilitate communication with other people (Committee on How People Learn II: The Science and Practice of Learning et al., 2018[26]). Electronic books are typically more cost-effective than paper books (Bando et al., 2016[27]), which facilitates the democratisation of knowledge.

And, the latest advances in screen technology are reducing eyestrain from reading digital texts even though books still retain a comparative advantage here (Rosenfield et al., 2015[28]).

On the other hand, the most comprehensive meta-analyses have shown that a) reading from paper yielded better reading comprehension compared to digital reading, especially when there is a time constraint (Delgado et al., 2018[29]), and b) reading from paper is more efficient than reading from screens considering that there is better performance reading from paper with similar time investments (Kong, Seo and Zhai, 2018[30]). Other studies have shown that while reading comprehension is similar between print books and e-books, e-books readers were not as efficient as print readers in ordering the events and locating them in the timeline in which they occurred (Mangen, Olivier and Velay, 2019[31]).

A recent meta-analysis synthesised experimental studies comparing students' reading performance who have read the same texts on screen and paper. The results showed that reading from screens is negatively associated with reading performance (g[3]= - .25). However, this may have been limited to expository texts[4] (g= - .32) as there was no association with narrative texts (g= - .04). At the same time, reading texts from screens did not show differences in reading time compared to reading from paper (g= .08) (Clinton, 2019[32]). The same study showed that text from screens caused less calibrated and more overconfident predictions of performance than reading from paper (g= .20). Related to students' perception of competence, readers have also shown weaker performance and metacognitive awareness of their performance on assessments based on reading from screens compared to paper (Ackerman and Lauterman, 2012[33]).

According to PISA data, strong readers perform well both in print and digital reading. The relationship between socio-economic status and performance on computer-based assessments mostly reflects differences observed in performance on paper-based assessments (OECD, 2015[34]). This implies that differences in reading performance, related to socio-economic status, in the computer-based assessment of reading do vastly stem from differences in reading proficiency and marginally from differences in navigation skills. The PISA 2018 reading framework aimed to capture every kind of contemporary reading, regardless of whether the text is printed or digital. This does not mean that traditional aspects of reading were cast aside but enhanced to cover new aspects of reading. In comparison to frameworks in previous cycles, the PISA 2018 framework was expanded to better account for processes that are typically involved in digital reading, such as searching and multiple source comprehension. Despite the changes in the assessment framework and the results mentioned above, the PISA 2018 reading assessment remains comparable to previous cycles. Analysis in PISA 2018 Results (Volume I) - What Students Know and Can Do (OECD, 2019[15]) showed changes in performance between 2015 and 2018 (e.g. see Box I.8.1 from Volume I). Yet, a few countries/economies might have been affected more than others. For example, countries and economies whose students were relatively weaker in reading multiple-source texts might be expected to have more negative trends between 2015 and 2018 than countries whose students were relatively stronger in reading such texts. Nevertheless, the effects on trends in country mean scores were not widespread (see Figure I.8.2 from Volume I).

Computer-based assessment and the use of log files

PISA 2018 was administered on a computer in the vast majority of the countries/economies that participated[5]. The deployment of computer-based assessment in PISA creates the opportunity to implement adaptive testing. Adaptive testing enables higher levels of measurement precision using fewer items per individual student. This is accomplished by presenting students with items that are aligned to their ability level. Unlike previous PISA assessments that targeted middle-performing students, the adaptive testing also allows a more refined differentiation of student ability at the higher and lower ends of student ability. That is particularly relevant when comparing high- and low- performing groups or students from advantaged families with students from disadvantaged families. At the same time, the testing experience for students is better since they do not need to answer items that are far too difficult for them.

The computerised administration of PISA 2018 also provides a better understanding of how students navigate through multiple text sources to search for and locate relevant information as well as how students evaluate the credibility of information sources. Navigation is a critical component of digital reading, as readers "construct" their text through navigation. Thus, navigational choices directly influence which text or portion of the text is eventually processed (OECD, 2011[35]). Chapter 3 of this report provides item-level analyses using process (or log) data to illustrate how students navigate through the emerging aspects of reading, such as multiple-source items.

Assessing students' reading motivation, reading practices and awareness of reading strategies

Interest in and enjoyment of reading together with intrinsic motivation fuel students' **reading engagement**. This acts as a possibly powerful lever in enhancing reading proficiency and decreasing gaps between groups of students. PISA data consistently shows that engagement in reading is strongly correlated with reading performance and is a mediator of gender or socio-economic status (measured by the PISA index of economic, social and cultural status [ESCS]; OECD, 2010[36]; OECD, 2002[37]). Namely, students' engagement in reading can mediate the effect of socio-economic status on reading performance. In PISA 2018, two other related motivational constructs were included in the assessment framework: **self-efficacy**, an individual's perceived capacity of performing specific tasks, and **self-concept**, an individual's own perceived abilities in a more general domain. Although previous cycles measured self-efficacy and self-concept in relation to mathematics and science, PISA measured these constructs in relation to reading for the first time in 2018.

PISA has traditionally evaluated reading practices through questionnaires by measuring how frequently students read different types of texts in various media, including in digital environments. In PISA 2018, those practices were extended to capture the emergent aspects of reading in digital environments. In addition to including emergent practices such as the use of e-books, online search, or social media, PISA 2018 continued expanding the assessment of students' awareness of reading strategies. PISA defines **metacognition** as an individual's ability to think about and control his or her reading and comprehension strategies. While some of the dimensions of metacognition (i.e. knowledge of strategies for summarising, understanding and remembering) remain unchanged from previous cycles, PISA 2018 assessed the students' awareness of digital reading strategies: a new scenario about the credibility of information was included.

Chapter 4 of this report focuses on students' openness to reading with digital devices, as well as their reading practices, motivation and attitudes towards reading. Chapter 5 focuses on the relationship between students' reading attitudes and strategies, socio-economic status, gender, and reading performance.

Teaching practices and classroom support for reading growth and engagement

Teacher's scaffolding and support for autonomy, competence, and ownership of their tasks improve students' reading proficiency, awareness of strategies, and engagement in reading (Guthrie, Klauda and Ho, 2013[16]; Christenson, Reschly and Wylie, 2012[17]). In PISA 2018, students, teachers and school principals provided information on teaching practices and classroom support to enhance reading skills. Some of these practices included teachers' stimulation of reading engagement, teaching practices about the type and length of text, and school practices for using digital devices. PISA 2018 also assessed students' opportunities to learn reading strategies that best support the development of students' reading skills in digital environments. This dimension is particularly relevant in contexts where the digital divide between students is significantly large.

Chapter 2 provides a snapshot of the magnitude of the digital divide between countries and its association with reading performance in PISA 2018. Chapter 6 focuses on teaching practices towards using digital technology for education and stimulating digital learning environments.

Notes

1. The global competence assessment was conducted in 27 countries and economies, while the global competence module was included in questionnaires distributed in 66 countries/economies and economies.

2. The PISA 2018 paper-based instruments were based on the PISA 2009 reading framework and the PISA 2006 science framework. Only the mathematics framework was common to both the paper- and computer-based tests in 2018. The paper-based form was used in nine countries: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

3. Hedges' g is an unbiased measure of effect size corrected by sample size. As a general rule of thumb, an effect size lower than 0.20 is a small effect, 0.5 is a medium effect, and 0.80 is a large effect.

4. In education, expository texts typically refer to fact-based educational reading materials while narrative texts include fiction and nonfiction reading materials such as novels. Narrative texts are generally easier to read than expository texts (Graesser and McNamara, 2011[38]). In a broader sense, expository texts encompass any text that provides a description or an explanation about something.

5. Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam assessed their students' knowledge and skills in PISA 2018 using paper-based instruments and no new items were developed for the paper-based test.

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2

Reading performance and the digital divide in PISA 2018

This chapter provides a snapshot of the magnitude of the digital divide between countries and economies and its association with reading performance in PISA 2018. This chapter also describes the relationship between the opportunity to learn digital skills at school and student responses to the reading item of distinguishing facts from opinions.

What the data tell us

- In PISA 2018, 88% of students on average across OECD countries had both a connection to the Internet at home and a computer that they could use for schoolwork. In Malaysia, Mexico, Morocco, Peru, the Philippines, and Viet Nam, half or less of students had access to both, and more than 80% of the most disadvantaged students had access to the Internet at school, but not at home.
- On average across OECD countries, 54% of students reported being trained at school on how to recognise whether information is biased or not. Among OECD countries, more than 70% of students reported receiving this training in Australia, Canada, Denmark, and the United States. However, less than 45% of students reported received this training in Israel, Latvia, the Slovak Republic, Slovenia, and Switzerland.
- PISA 2018 shows that two factors are associated with the estimated percentage correct in the item of distinguishing facts from opinions in the PISA reading assessment after accounting for per capita GDP: education systems with a higher proportion of students who reported being taught how to detect biased information in school (R=0.60, OECD average) and students' digital access at home (R=0.42, all countries/economies).

HOW DID COUNTRIES PERFORM IN READING IN PISA 2018?

PISA reports by country student proficiencies on a common scale that can be used to compare their results to students in other countries and to their own earlier assessment results. These data are then used to inform educators and policy makers concerning the strengths and weaknesses of their education systems. It is important to interpret PISA results taking contextual and methodological factors into account (see Box 2.1).

Box 2.1. **Some considerations when interpreting PISA results**

The use (and misuse) of International Large-Scale Assessment (ILSA's) has been extensively discussed (Klieme, 2020[1]). To avoid misuses and shortcut interpretations, PISA results should be interpreted in light of the following factors:

Population coverage differs across countries (see Chapter 3 of PISA 2018 Results (Volume I) - What Students Know and Can Do (OECD, 2019[2])). While the sampling standards ensured that PISA results are representative of the target population in all adjudicated countries/economies, they cannot be readily generalised to the entire population of 15-year-olds in countries where many young people of that age are not enrolled in lower or upper secondary school. Coverage Index 3 included in this report indicates the proportion of 15-year-olds who were covered by the PISA sample (see Figure I.3.1 of Volume I (OECD, 2019[3])).

Differences in performance between students within the same country are, in general, larger than between-country differences in performance (OECD, 2019[2]). For example, in every country and economy, the performance gap between the highest-scoring 5% of students and the lowest-scoring 5% of students in reading is larger than the difference in mean performance between the highest-performing country and the lowest-performing country.

Countries with higher national incomes tend to score higher in PISA to a certain threshold (see Figure I.4.3 of Volume I; (OECD, 2019[2]). Approximately 44% of the variation in countries and economies mean reading performance is related to per capita GDP. Higher-income countries are often more capable of spending more on education while a lower national income constrains other countries. This is particularly relevant when interpreting the performance of middle-income countries such as Colombia, the Republic of Moldova, Morocco and the Philippines. At the same time, more spending in education not always means better performance. Countries with higher spending per student tend to score higher in PISA but after a certain point spending is much less related to performance. For example, Estonia, which spends less than the OECD average per student, was one of the top-performing OECD countries in reading, mathematics, and science in PISA 2018.

The strength of the relationship between socio-economic background and student's performance varies across education systems (OECD, 2019[4]). Socio-economically advantaged students[1] usually perform better in PISA than disadvantaged students, but the gap in reading performance related to socio-economic status varies considerably across countries. In Baku (Azerbaijan), Kazakhstan, and Macao (China), the percentage of variance in reading performance explained by

student's socio-economic status was below 5%. In contrast, in Peru and Belarus it was of at least 20%. Not all education systems succeed in achieving both excellence and equity, and frequently they sacrifice one for the other. However, PISA consistently shows both things are not mutually exclusive. In 11 of the 25 countries and economies that scored above the OECD average in reading in PISA 2018, the strength of the relationship between student performance and socio-economic status was significantly below the OECD average. In Australia, Canada, Denmark, Estonia, Finland, Hong Kong (China), Japan, Korea, Macao (China), Norway and the United Kingdom, for example, average performance was higher than the OECD average while the relationship between socio-economic status and reading performance was weaker than the OECD average.

Whether students commonly speak the language of instruction at home is associated with how students read in that language (OECD, 2019[4]). In many countries, students with an immigrant background who speak the language of instruction at home scored higher in reading than those who do not. Therefore, not speaking the language of instruction represents an additional barrier to attaining high proficiency in reading. This is particularly relevant in countries such as Brunei Darussalam, Lebanon, Luxembourg, Malta, Morocco and the Philippines, where the proportion of students who speak a language other than the language of instruction at home is over 80%.

The performance in PISA is the result of a cumulative process. In addition to the quality of lower and upper secondary education, PISA results also reflect the quality of learning in earlier stages of education, and the cognitive, emotional and social competences students had acquired before they even entered school (OECD, 2020[5]). PISA results should also be interpreted in light of differences in how education is organised across grade levels, particularly in school systems where students progress through different types of educational institutions at the pre-primary, primary, lower secondary and upper secondary levels. In most cases, 15-year-old students have been in their current school for only two to three years. This means that much of their academic development took place earlier, in other schools, which may have little or no connection with the school in which they were enrolled when they sat the PISA test. Last but not least, different school systems stratification policies such as grade repetition would make PISA sampled students being from different grades (OECD, 2020[6]).

Among all participating countries and economies in PISA 2018, Beijing, Shanghai, Jiangsu and Zhejiang (China) (hereafter "B-S-J-Z [China]") (555 points) and Singapore (549 points) were the top performers in reading. Among OECD countries, Estonia (523 points), Canada (520 points), Finland (520 points), and Ireland (518) were the top performers in reading. The mean reading performance of Korea (514 points) was similar to top-performers such as Canada, Finland, and Ireland but significantly lower than Estonia. The mean reading performance of Poland was similar to Ireland but significantly lower than Estonia, Canada, and Finland (Table 2.1).

Table 2.1[2] shows each country's/economy's mean score, and indicates for which pairs of countries/economies the differences between the means are statistically significant. Small differences that are not statistically significant should not be overly emphasised. For each country/economy shown in the middle column, the countries/economies whose mean scores are not statistically significantly different are listed in the right column. For example, B-S-J-Z (China) and Singapore scored significantly higher in reading than all other countries/economies that participated in PISA 2018. However, the mean reading performance of B-S-J-Z (China) was not statistically significantly different from that of Singapore.

In Table 2.1 countries and economies are divided into three broad groups: those whose mean scores are statistically around the OECD mean (white), those whose mean scores are above the OECD mean (blue), and those whose mean scores are below the OECD mean (grey)[3].

The gap in reading performance between the highest- and lowest-performing OECD countries was 111 score points. In contrast, this gap was 216 score points between all education systems that took part in PISA 2018. This means that OECD countries represent a relatively homogeneous group compared to all participating countries. Nevertheless, differences within countries are typically larger than between countries. For example, the difference between the 95th and 5th percentile of performance was 327 points on average across OECD countries and 312 points on average in all countries and economies (Table B.2.1a).

Table 2.1[1/2] **Comparing countries' and economies' performance in reading**

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

Mean score	Comparison country/ economy	Countries and economies whose mean score is not statistically significantly different from the comparison country's/economy's score
555	B-S-J-Z (China)	Singapore
549	Singapore	B-S-J-Z (China)
525	Macao (China)	Hong Kong (China)[1], Estonia, Finland
524	Hong Kong (China)[1]	Macao (China), Estonia, Canada, Finland, Ireland
523	Estonia	Macao (China), Hong Kong (China)[1], Canada, Finland, Ireland
520	Canada	Hong Kong (China)[1], Estonia, Finland, Ireland, Korea
520	Finland	Macao (China), Hong Kong (China)[1], Estonia, Canada, Ireland, Korea
518	Ireland	Hong Kong (China)[1], Estonia, Canada, Finland, Korea, Poland
514	Korea	Canada, Finland, Ireland, Poland, Sweden, United States[1]
512	Poland	Ireland, Korea, Sweden, New Zealand, United States[1]
506	Sweden	Korea, Poland, New Zealand, United States[1], United Kingdom, Japan, Australia, Chinese Taipei, Denmark, Norway, Germany
506	New Zealand	Poland, Sweden, United States[1], United Kingdom, Japan, Australia, Chinese Taipei, Denmark
505	United States[1]	Korea, Poland, Sweden, New Zealand, United Kingdom, Japan, Australia, Chinese Taipei, Denmark, Norway, Germany
504	United Kingdom	Sweden, New Zealand, United States[1], Japan, Australia, Chinese Taipei, Denmark, Norway, Germany
504	Japan	Sweden, New Zealand, United States[1], United Kingdom, Australia, Chinese Taipei, Denmark, Norway, Germany
503	Australia	Sweden, New Zealand, United States[1], United Kingdom, Japan, Chinese Taipei, Denmark, Norway, Germany
503	Chinese Taipei	Sweden, New Zealand, United States[1], United Kingdom, Japan, Australia, Denmark, Norway, Germany
501	Denmark	Sweden, New Zealand, United States[1], United Kingdom, Japan, Australia, Chinese Taipei, Norway, Germany
499	Norway	Sweden, United States[1], United Kingdom, Japan, Australia, Chinese Taipei, Denmark, Germany, Slovenia
498	Germany	Sweden, United States[1], United Kingdom, Japan, Australia, Chinese Taipei, Denmark, Norway, Slovenia, Belgium, France, Portugal[1]
495	Slovenia	Norway, Germany, Belgium, France, Portugal[1], Czech Republic
493	Belgium	Germany, Slovenia, France, Portugal[1], Czech Republic
493	France	Germany, Slovenia, Belgium, Portugal[1], Czech Republic
492	Portugal[1]	Germany, Slovenia, Belgium, France, Czech Republic, Netherlands[1]
490	Czech Republic	Slovenia, Belgium, France, Portugal[1], Netherlands[1], Austria, Switzerland
485	Netherlands[1]	Portugal[1], Czech Republic, Austria, Switzerland, Croatia, Latvia, Russia
484	Austria	Czech Republic, Netherlands[1], Switzerland, Croatia, Latvia, Russia
484	Switzerland	Czech Republic, Netherlands[1], Austria, Croatia, Latvia, Russia, Italy
479	Croatia	Netherlands[1], Austria, Switzerland, Latvia, Russia, Spain, Italy, Hungary, Lithuania, Iceland, Belarus, Israel
479	Latvia	Netherlands[1], Austria, Switzerland, Croatia, Russia, Spain, Italy, Hungary, Lithuania, Belarus
479	Russia	Netherlands[1], Austria, Switzerland, Croatia, Latvia, Spain, Italy, Hungary, Lithuania, Iceland, Belarus, Israel
477	Spain*	Croatia, Latvia, Russia, Italy, Hungary, Lithuania, Iceland, Belarus, Israel
476	Italy	Switzerland, Croatia, Latvia, Russia, Spain, Hungary, Lithuania, Iceland, Belarus, Israel
476	Hungary	Croatia, Latvia, Russia, Spain, Italy, Lithuania, Iceland, Belarus, Israel
476	Lithuania	Croatia, Latvia, Russia, Spain, Italy, Hungary, Iceland, Belarus, Israel
474	Iceland	Croatia, Russia, Spain, Italy, Hungary, Lithuania, Belarus, Israel, Luxembourg
474	Belarus	Croatia, Latvia, Russia, Spain, Italy, Hungary, Lithuania, Iceland, Israel, Luxembourg, Ukraine
470	Israel	Croatia, Russia, Spain, Italy, Hungary, Lithuania, Iceland, Belarus, Luxembourg, Ukraine, Turkey
470	Luxembourg	Iceland, Belarus, Israel, Ukraine, Turkey

*For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

1. Data did not meet the PISA technical standards but were accepted as largely comparable (see *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annexes A2 and A4).

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239344

Table 2.1[2/2] **Comparing countries' and economies' performance in reading**

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

Mean score	Comparison country/ economy	Countries and economies whose mean score is not statistically significantly different from the comparison country's/economy's score
466	Ukraine	Belarus, Israel, Luxembourg, Turkey, Slovak Republic, Greece
458	Slovak Republic	Ukraine, Greece, Chile
457	Greece	Ukraine, Turkey, Slovak Republic, Chile
452	Chile	Slovak Republic, Greece, Malta
448	Malta	Chile
439	Serbia	United Arab Emirates, Romania
432	United Arab Emirates	Serbia, Romania, Uruguay, Costa Rica
428	Romania	Serbia, United Arab Emirates, Uruguay, Costa Rica, Cyprus, Moldova, Montenegro, Mexico, Bulgaria, Jordan
427	Uruguay	United Arab Emirates, Romania, Costa Rica, Cyprus, Moldova, Mexico, Bulgaria
426	Costa Rica	United Arab Emirates, Romania, Uruguay, Cyprus, Moldova, Montenegro, Mexico, Bulgaria, Jordan
424	Cyprus	Romania, Uruguay, Costa Rica, Moldova, Montenegro, Mexico, Bulgaria, Jordan
424	Moldova	Romania, Uruguay, Costa Rica, Cyprus, Montenegro, Mexico, Bulgaria, Jordan
421	Montenegro	Romania, Costa Rica, Cyprus, Moldova, Mexico, Bulgaria, Jordan
420	Mexico	Romania, Uruguay, Costa Rica, Cyprus, Moldova, Montenegro, Bulgaria, Jordan, Malaysia, Colombia
420	Bulgaria	Romania, Uruguay, Costa Rica, Cyprus, Moldova, Montenegro, Mexico, Jordan, Malaysia, Brazil, Colombia
419	Jordan	Romania, Costa Rica, Cyprus, Moldova, Montenegro, Mexico, Bulgaria, Malaysia, Brazil, Colombia
415	Malaysia	Mexico, Bulgaria, Jordan, Brazil, Colombia
413	Brazil	Bulgaria, Jordan, Malaysia, Colombia
412	Colombia	Mexico, Bulgaria, Jordan, Malaysia, Brazil, Brunei Darussalam, Qatar, Albania
408	Brunei Darussalam	Colombia, Qatar, Albania, Bosnia and Herzegovina
407	Qatar	Colombia, Brunei Darussalam, Albania, Bosnia and Herzegovina, Argentina
405	Albania	Colombia, Brunei Darussalam, Qatar, Bosnia and Herzegovina, Argentina, Peru, Saudi Arabia
403	Bosnia and Herzegovina	Brunei Darussalam, Qatar, Albania, Argentina, Peru, Saudi Arabia
402	Argentina	Qatar, Albania, Bosnia and Herzegovina, Peru, Saudi Arabia
401	Peru	Albania, Bosnia and Herzegovina, Argentina, Saudi Arabia, Thailand
399	Saudi Arabia	Albania, Bosnia and Herzegovina, Argentina, Peru, Thailand
393	Thailand	Peru, Saudi Arabia, North Macedonia, Baku (Azerbaijan), Kazakhstan
393	North Macedonia	Thailand, Baku (Azerbaijan)
389	Baku (Azerbaijan)	Thailand, North Macedonia, Kazakhstan
387	Kazakhstan	Thailand, Baku (Azerbaijan)
380	Georgia	Panama
377	Panama	Georgia, Indonesia
371	Indonesia	Panama
359	Morocco	Lebanon, Kosovo
353	Lebanon	Morocco, Kosovo
353	Kosovo	Morocco, Lebanon
342	Dominican Republic	Philippines
340	Philippines	Dominican Republic

*For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

1. Data did not meet the PISA technical standards but were accepted as largely comparable (see *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annexes A2 and A4).

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239344

Student's performance in single and multiple source reading subscales

Students increasingly access textual information through their digital devices where they once did so predominantly in print. Unlike in most traditional printed books, digital devices, especially those connected to the Internet, offer not only more information and for a broader range of purposes but from different sources. Reading in digital environments typically means navigating through multiple sources of text, selecting relevant information, and assessing the quality of information.

Each item in the PISA 2018 computer-based reading assessment was assigned to either the single-source or the multiple-source text category, depending on the number of sources required to construct the correct answer. Multiple-source items are defined by having different authors, or by being published at different times, or by bearing different titles or reference numbers.

In PISA 2018, some units required only a single source to construct the answer while in other units, all questions were multiple sources, such as in Rapa Nui (see Box 2.2). In other cases, the unit started with a single stimulus text, and after some initial questions, the scenario was updated to introduce a second text. It is important to have in mind that multiple source items in PISA are not intrinsically more difficult than items involving single texts of comparable length and complexity.

Table 2.2 shows the country/economy mean for the overall reading scale and for each of the text-source subscales. It also includes an indication of which differences along the (standardised[4]) subscale means are significant, through which a country's and economy's relative strengths and weaknesses can be inferred. Standardisation was particularly important for the single- and multiple-source subscales in order to assess a country/economy's strength and weakness between two scales relative to other countries/economies as in the large majority of countries/economies the multiple-source scores were higher than the single-source scores. A simple difference in the subscale scores would not show which education systems were relatively stronger in each subscale. Indeed, although the mean multiple-source subscale scores in Australia and Chinese Taipei were both five score points higher than the mean single-source subscale scores, students in neither Australia nor Chinese Taipei were deemed to be relatively stronger at multiple-source reading. Small differences that are not statistically significant or practically meaningful should not be overly emphasised.

In general, students who perform well in one aspect of reading also tend to perform well in others. The percentage of variance in single-source subscale explained by multiple source subscale ranged from 80% in Kazakhstan to 94% in Malta (Table 2.2).

On average, students in OECD countries were relatively stronger in multiple-source reading subscale compared to partner countries/economies. At the same time, higher-performing countries tend to be relatively stronger on multiple-source items. Indeed, of the countries above the OECD average in the overall reading assessment, only Hong Kong (China) and Singapore were relatively stronger on single-source. In contrast, the rest of the countries/economies either were not particularly stronger in any of the subscales – i.e. 11 countries/economies – or relatively stronger on the reading multiple-source texts subscale – i.e. 10 countries/economies. Of the countries below the OECD average, 16 countries/economies were relatively stronger on single-source text subscale, and 5 countries/economies were relatively stronger on multiple-source text subscale (Table 2.2).

HOW IS THE DIGITAL DIVIDE ASSOCIATED WITH EMERGENT ASPECTS OF READING PERFORMANCE?

It is undeniable that digital technologies offer great opportunities as to what, how, where, and when people learn. However, digital divides mirror prevailing economic gaps and often even amplify the disadvantages of students from less wealthy backgrounds, widening existing differences in learning and outcomes (Kuhl et al., 2019[7]; UNICEF, 2017[8]). Despite digital devices and the Internet increasingly becoming globally available, not all students have equal opportunities to access and use digital devices at home and in school. These digital divides are not only a question of having or not having physical access to a digital device but about the differences in how, when, and for what purposes technology is used (Dolan, 2015[9]; Echazarra, 2018[10]). The kind of scepticism that claims that technology is not needed in school, or even has negative side effects such as Internet addiction, often conflicts with evidence that shows that students who locate, browse, and access different information resources and who are knowledgeable about the context under which the information was created perform better both in overall grades and in academic competence (Leung and Lee, 2012[11]). Needless to say, technology use for education becomes crucial during periods of school closure such as summer holidays or pandemics.

In PISA 2018, 89% of students had a computer that they could use for schoolwork at home on average across OECD countries. More than 90% of students in about half of the countries/economies participating in PISA had a computer that they could use for schoolwork at home. However, at the same time, not even half of the students in the Dominican Republic, Indonesia, Morocco, the Philippines, and Viet Nam had a computer that they could use for schoolwork at home (Table B.2.2).

Table 2.2 [1/2] **Comparing countries and economies on the single- and multiple-source subscales**

	Mean performance in reading (overall reading scale)	Mean performance on each reading text-source subscale			Relative strengths in reading: Standardised mean performance on the reading ...[1]	
		Single text	Multiple text	Explained variance between single- and multiple-source (r-squared x 100)	**... single-source subscale is higher** than on the multiple-source texts subscale	**... multiple-source subscale is higher** than on the single-source text subscale
B-S-J-Z (China)	555	556	564	83.6		
Singapore	549	554	553	89.6		
Macao (China)	525	529	530	89.3		
Hong Kong (China)[2]	524	529	529	88.8		
Estonia	523	522	529	89.1		
Canada	520	521	522	83.4		
Finland	520	518	520	90.0		
Ireland	518	513	517	88.1		
Korea	514	518	525	87.9		
Poland	512	512	514	89.1		
Sweden	506	503	511	88.6		
New Zealand	506	504	509	90.1		
United States[2]	505	502	505	91.9		
United Kingdom	504	498	508	86.9		
Japan	504	499	506	88.3		
Australia	503	502	507	87.9		
Chinese Taipei	503	501	506	91.2		
Denmark	501	496	503	88.3		
Norway	499	498	502	89.5		
Germany	498	494	497	90.3		
Slovenia	495	495	497	87.6		
Belgium	493	491	500	88.2		
France	493	486	495	89.1		
Portugal[2]	492	487	494	89.9		
Czech Republic	490	484	494	89.7		
OECD average	487	485	490	88.5		
Netherlands[2]	485	488	495	85.2		
Austria	484	478	484	89.7		
Switzerland	484	477	489	88.6		
Croatia	479	475	478	89.6		
Latvia	479	479	483	87.6		
Russia	479	477	482	88.4		
Spain*	477	473	482	83.8		
Italy	476	474	481	84.6		
Hungary	476	474	480	89.1		
Lithuania	476	474	475	88.8		
Iceland	474	479	479	92.3		

*For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

1. Relative strengths that are statistically significant are highlighted; empty cells indicate cases where the standardised subscale score is not significantly higher compared to other subscales, including cases in which it is lower. A country/economy is relatively stronger in one subscale than another if its standardised score, as determined by the mean and standard deviation of student performance in that subscale across all participating countries/economies, is significantly higher in the first subscale than in the second subscale.

2. Data did not meet the PISA technical standards but were accepted as largely comparable (see *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annexes A2 and A4).

Notes: Only countries and economies where PISA 2018 was delivered on computer are shown.

Although the OECD mean is shown in this table, the standardisation of subscale scores was performed according to the mean and standard deviation of students across all PISA-participating countries/economies.

The standardised scores that were used to determine the relative strengths of each country/economy are not shown in this table.

Countries and economies are ranked in descending order of mean reading performance.

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239363

Table 2.2 [2/2] **Comparing countries and economies on the single- and multiple-source subscales**

	Mean performance in reading (overall reading scale)	Mean performance on each reading text-source subscale			Relative strengths in reading: Standardised mean performance on the reading ...[1]	
		Single text	Multiple text	Explained variance between single- and multiple-source (r-squared x 100)	**... single-source subscale is higher** than on the multiple-source texts subscale	**... multiple-source subscale is higher** than on the single-source text subscale
Belarus	474	474	478	86.2		
Israel	470	469	471	91.6		
Luxembourg	470	464	475	89.4		
Turkey	466	473	471	88.1		
Slovak Republic	458	453	465	88.2		
Greece	457	459	458	88.9		
Chile	452	449	451	88.3		
Malta	448	443	448	93.8		
Serbia	439	435	437	88.8		
United Arab Emirates	432	433	436	88.0		
Uruguay	427	424	431	88.9		
Costa Rica	426	424	427	87.4		
Cyprus	424	423	425	87.8		
Montenegro	421	417	416	86.7		
Mexico	420	419	419	88.2		
Bulgaria	420	413	417	90.9		
Malaysia	415	414	420	89.0		
Brazil	413	408	410	88.7		
Colombia	412	411	412	88.4		
Brunei Darussalam	408	408	415	91.7		
Qatar	407	406	410	88.6		
Albania	405	400	402	86.6		
Bosnia and Herzegovina	403	393	398	87.1		
Peru	401	406	409	88.8		
Thailand	393	395	401	87.1		
Baku (Azerbaijan)	389	380	386	82.5		
Kazakhstan	387	391	393	80.2		
Georgia	380	371	373	87.8		
Panama	377	370	371	89.0		
Indonesia	371	373	371	84.1		
Morocco	359	359	359	83.3		
Kosovo	353	347	352	83.9		
Dominican Republic	342	340	344	86.1		
Philippines	340	332	341	88.8		

*For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

1. Relative strengths that are statistically significant are highlighted; empty cells indicate cases where the standardised subscale score is not significantly higher compared to other subscales, including cases in which it is lower. A country/economy is relatively stronger in one subscale than another if its standardised score, as determined by the mean and standard deviation of student performance in that subscale across all participating countries/economies, is significantly higher in the first subscale than in the second subscale.

2. Data did not meet the PISA technical standards but were accepted as largely comparable (see *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annexes A2 and A4).

Notes: Only countries and economies where PISA 2018 was delivered on computer are shown.

Although the OECD mean is shown in this table, the standardisation of subscale scores was performed according to the mean and standard deviation of students across all PISA-participating countries/economies.

The standardised scores that were used to determine the relative strengths of each country/economy are not shown in this table.

Countries and economies are ranked in descending order of mean reading performance.

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239363

The biggest increased in access to a computer at home for schoolwork across OECD countries happened between 2003 and 2009, with an increase from 78% to 92%. For most OECD countries, the percentage of students with a computer that they could use for schoolwork at home remained consistently high over the last decade – except for Japan (61%) where this percentage was comparatively lower than the OECD average (89%) and was even 8 percentage points higher in 2009. In Albania (71%), Georgia (78%), Kazakhstan (74%), and the Republic of Moldova (84%), however, the rate of students with a computer that they could use for schoolwork at home has increased by more than 20 percentage points over the last 10 years (Table B.2.2).

Nevertheless, student's access to a computer at home for schoolwork is substantially lower than the percentage of students with a link to the Internet at home. In PISA 2018, on average across OECD countries, 96% of students had a connection to the Internet at home, which is nine percentage points higher than in PISA 2009 and 33 percentage points higher than in PISA 2003. Furthermore, Albania (81%), Jordan (84%), Kazakhstan (89%), and Thailand (82%) have practically doubled the percentage of students who had Internet at home over the last 10 years (Table B.2.2).

Remote learning, such as the one most students around the world experienced as a consequence of the COVID-19 global health crisis, often requires or benefits from having access to a computer linked to the Internet at home for schoolwork. Figure 2.1 shows the change between PISA 2018 and PISA 2003 in the percentage of students with a computer that can be used for schoolwork at home and access to the Internet. In PISA 2018, 88% of students had both a connection to the Internet at home and a computer that they could use for schoolwork. However, in the Dominican Republic, Indonesia, Malaysia, Mexico, Morocco, Peru, the Philippines, Thailand, and Viet Nam, half or less of students had access to both. Students' access to a computer linked to the Internet at home for schoolwork increased by more than 28 percentage points on average across OECD countries between PISA 2003 and PISA 2018. However, a comparatively small increase (about 3 percentage point) was observed between PISA 2009 and PISA 2018 (Table B.2.2). In Hong Kong (China), Japan, Luxembourg, Qatar, Singapore and Chinese Taipei, this percentage decreased between PISA 2009 and PISA 2018 by at least 5 percentage points. However, this is due to a decreased percentage of students who reported having a computer that they could use for schoolwork at home rather than a decrease in Internet access at home, which remained the same or increased (Table B.2.2). The same happened, although to a lesser extent, in Macao (China), Finland, Germany, Ireland, Korea, the United Kingdom, and Sweden. These results do not necessarily mean that access to digital devices is decreasing in those countries. But, they could mean that students are increasingly provided with other digital devices for schoolwork such as smartphones or tablets instead of computers. Nonetheless, not all digital devices are equally suitable for schoolwork activities. For example, digital devices with larger screens and a physical keyboard may help in navigating and organising content on the Internet more efficiently.

In Denmark, Iceland and Poland, 95% or more of students attending disadvantaged schools[5] reported that they had a computer linked to the Internet for doing schoolwork at home. In contrast, this percentage is lower than 20% in Indonesia, Mexico, Morocco, Panama, Peru, the Philippines, and Viet Nam (Figure 2.2). The largest digital divide between advantaged and disadvantaged schools is in Mexico and Peru, with a difference of more than 70 percentage points.

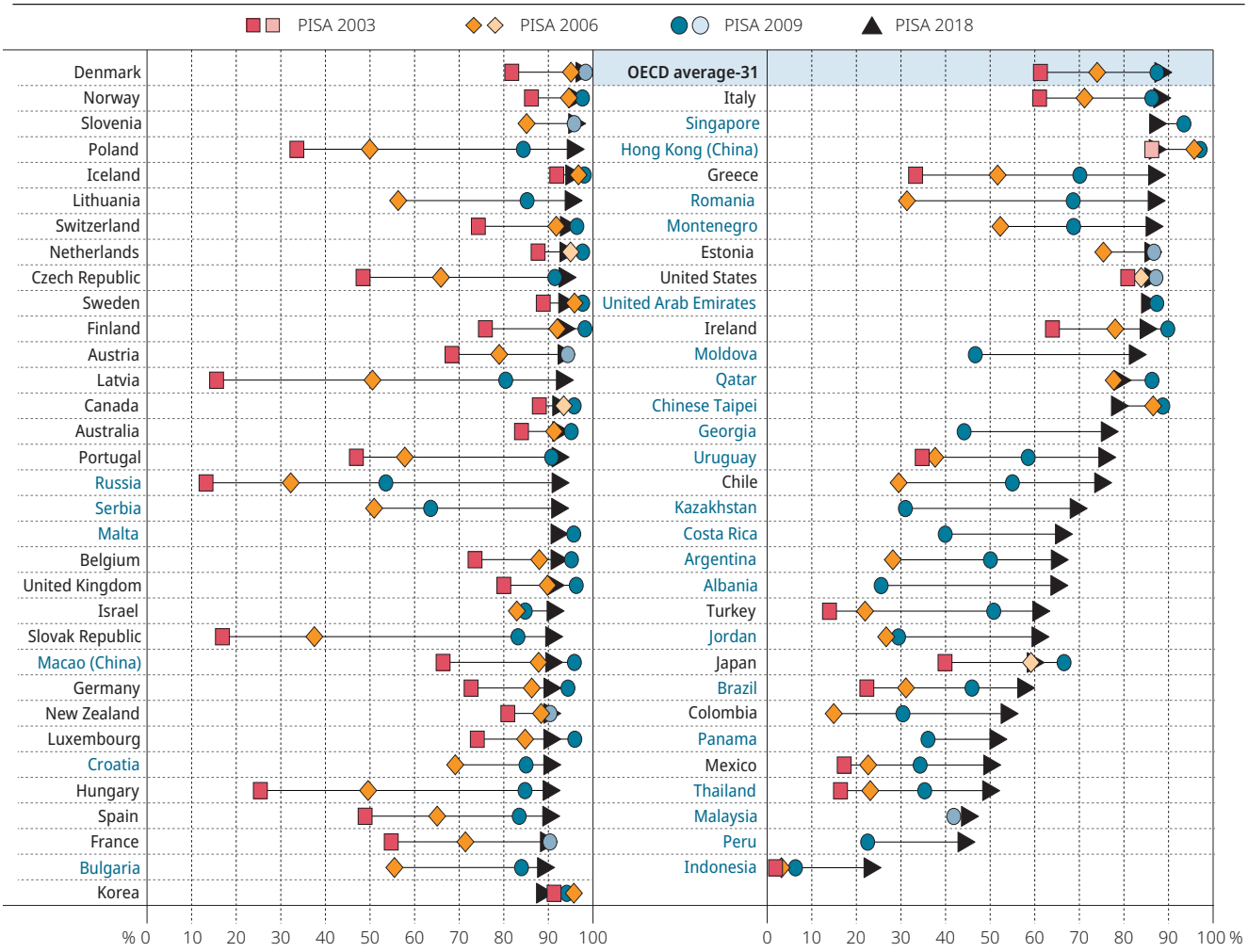
Similarly, more than 95% of students from rural areas in Austria, Denmark, Iceland, Malta, Poland and Switzerland reported having both a link to the Internet at home and a computer that could be used for schoolwork, but this percentage was lower than 20% in rural areas of Indonesia, Mexico, Morocco and the Philippines. The largest digital divide between rural and urban schools is, again, in Mexico and Peru, with a difference of 57 and 45 percentage points, respectively (Table B.2.3).

The digital divide between public and private schools is comparatively narrower than between schools from different socio-economic backgrounds or location. On average across OECD countries, about 92% of students from private schools reported having a computer linked to the Internet for doing schoolwork at home compared to 87% of students from public schools. However, in Colombia, Panama and Peru, students from private schools are almost twice as likely to have those resources at home compared to students from public schools (Table B.2.3).

For many of the most disadvantaged students, schools are the only way they have to access and use computers linked to the Internet (OECD, 2015[12]). In Malaysia, Mexico, Morocco, Peru, the Philippines and Viet Nam, in particular, more than 80% of the most disadvantaged students have access to the Internet at school, but not at home (Table B.2.4). This means that out of disadvantaged students who have access to the Internet, four in five students have access at school only.

As explained in Chapter 1, the PISA 2018 reading framework was designed to integrate print and digital reading assessments. As a result, there is no longer a strict delineation of tasks typical of print or digital environments. For example, the text source (i.e. single and multiple sources) is an important dimension in PISA reading literacy. Still, some single-source tasks were set in online environments, while some multiple-source tasks had little to do with digital reading. Another important dimension in PISA reading literacy is cognitive processes. In locating information, for example, some tasks included scanning a single piece of text. Conversely, other tasks involved searching for and selecting relevant text from several pieces of text, which is closer to how information is displayed in a digital environment. Therefore, studying the relationship between the digital divide and emergent aspects of reading would require looking at particular items of the PISA reading assessment.

Figure 2.1 **Change between 2009 and 2018 in access to a computer that they can use for schoolwork and a link to the Internet at home**



Notes: Statistically significant differences between PISA 2018 and earlier cycles are shown in darker tones.

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

OECD average-31 is the arithmetic mean across all OECD countries, excluding Chile, Colombia, Estonia, Israel, Lithuania and Slovenia.

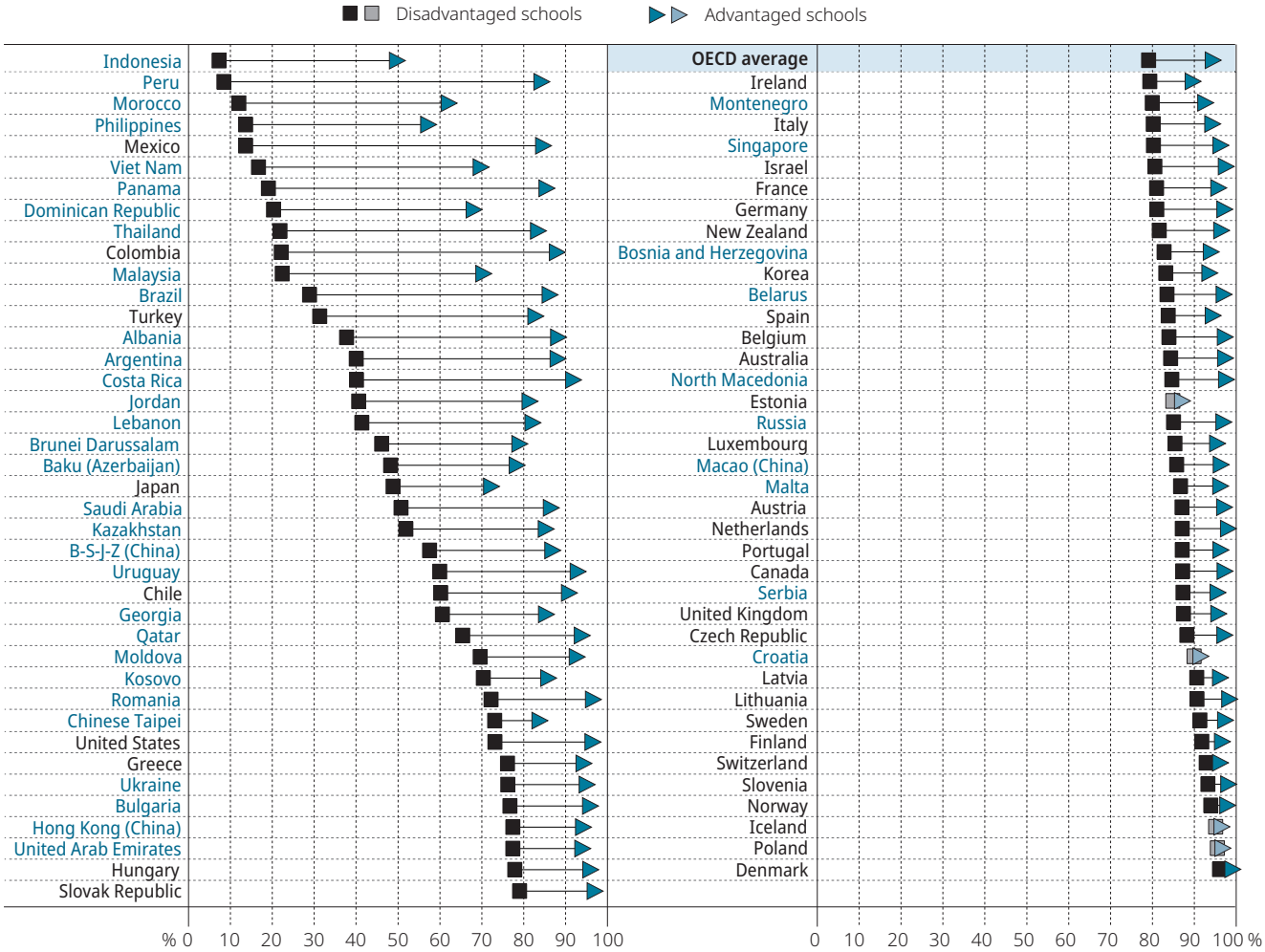
Countries and economies are ranked in descending order of the percentage of students who reported having access to the Internet and a computer that can use for schoolwork at home in 2018.

Source: OECD, PISA 2018 Database, Table B.2.4.

StatLink https://doi.org/10.1787/888934239382

Figure 2.2 **Access to a computer linked to the Internet at home for doing schoolwork, by school's socio-economic status**

Percentage of students in advantaged and disadvantaged schools[1]



1. A socio-economically disadvantaged (advantaged) school is a school whose socio-economic profile (i.e. the average socio-economic status of the students in the school) is in the bottom (top) quarter of the PISA index of economic, social and cultural status amongst all schools in the relevant country/economy.

Note: Statistically significant values are shown in a darker tone.

Countries and economies are ranked in ascending order of the percentage of students who reported having access to the Internet and a computer that can be used for schoolwork at home, in disadvantaged schools.

Source: OECD, PISA 2018 Database, Table B.2.5.

StatLink https://doi.org/10.1787/888934239401

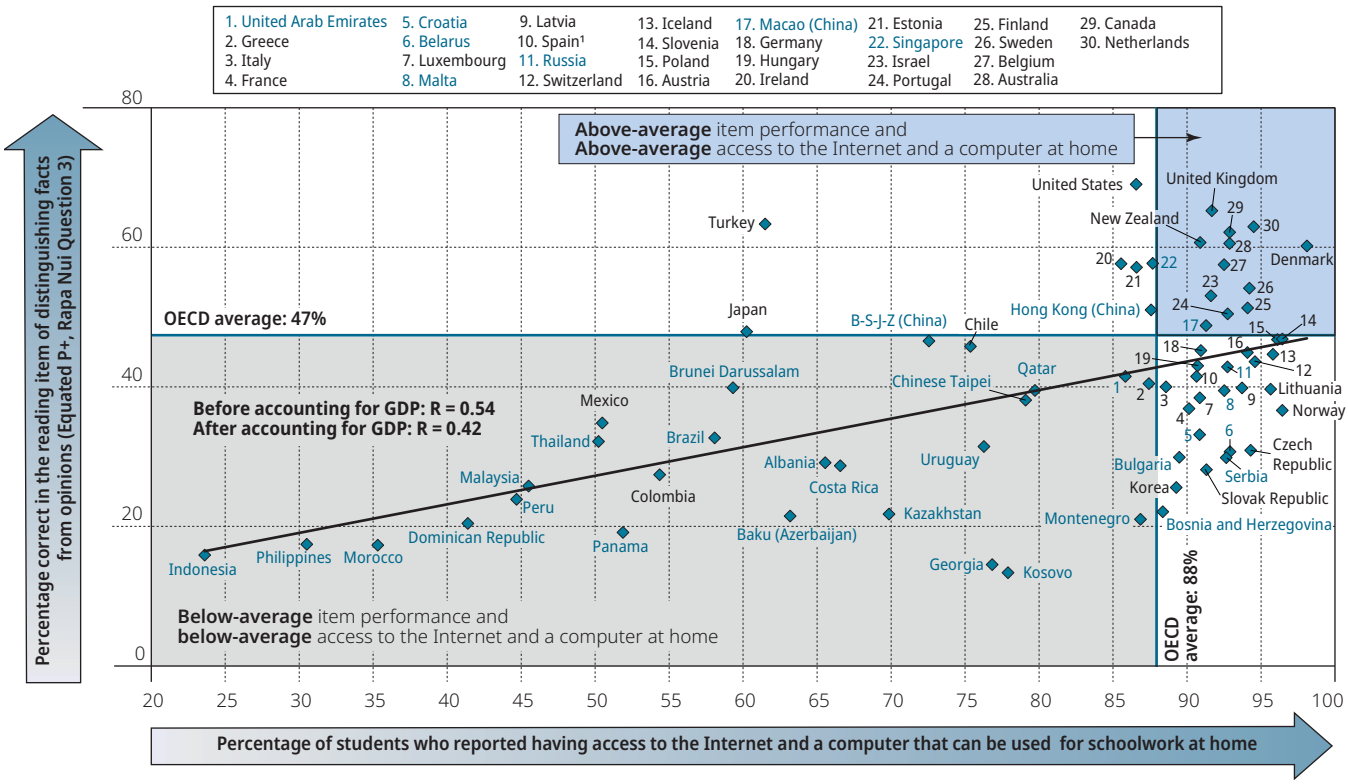
An average of around 8.7% of students in OECD countries were top performers in reading, meaning that they attained Level 5 or 6 in the PISA reading test. At these levels, students are able to comprehend lengthy texts, deal with concepts that are abstract or counterintuitive, and establish distinctions between fact and opinion based on implicit cues in the content or related to the source of the information. This chapter will go one step further in paying special attention to the estimated percentage correct in the PISA reading released item that focuses on distinguishing fact from opinion as one of the most emergent aspects of reading in digital environments. Although item-level analysis is not expected to be as robust for cross-cultural comparisons and to cover the full extent of a construct as full-scaled results, it can still provide meaningful insights into the relationships with students' outcomes.

The PISA 2018 reading assessment included one item-unit (i.e. Rapa Nui Question 3, CR551Q06) that tested whether students can distinguish between facts and opinions (Box 2.2). Figure 2.3 shows the system-level relationship between the estimated percentage correct in that item and the percentage of students who reported having access to a computer linked to the Internet at home. The PISA reading item that focuses on distinguishing fact from opinion was estimated to be 47% correct[6] on average across OECD countries. The estimated percentage correct of this item was higher than 60% in Australia, Canada, the

Netherlands, New Zealand, Turkey, the United Kingdom and the United States while lower than 20% in Georgia, Indonesia, Kosovo, Morocco, Panama, and the Philippines. Among OECD countries, the estimated percentage correct was lower than 30% in Colombia, Costa Rica, the Czech Republic, Korea, and the Slovak Republic. As pointed out before, 88% of students in PISA 2018 had both a connection to the Internet at home and a computer that they could use for schoolwork.

Most importantly, students' access to a computer linked to the Internet at home for schoolwork is associated with the estimated percentage correct in the item that focuses on distinguishing facts from opinions in the PISA reading assessment (R=0.54)[7]. The partial correlation[8] after accounting for per capita GDP was 0.42. Even after accounting for the country per capita GDP, access to digital resources at home is associated with the estimated percentage correct in the item of distinguishing facts from opinions in the PISA reading assessment.

Figure 2.3 **Relationship between access to digital resources at home and emergent aspects of reading**



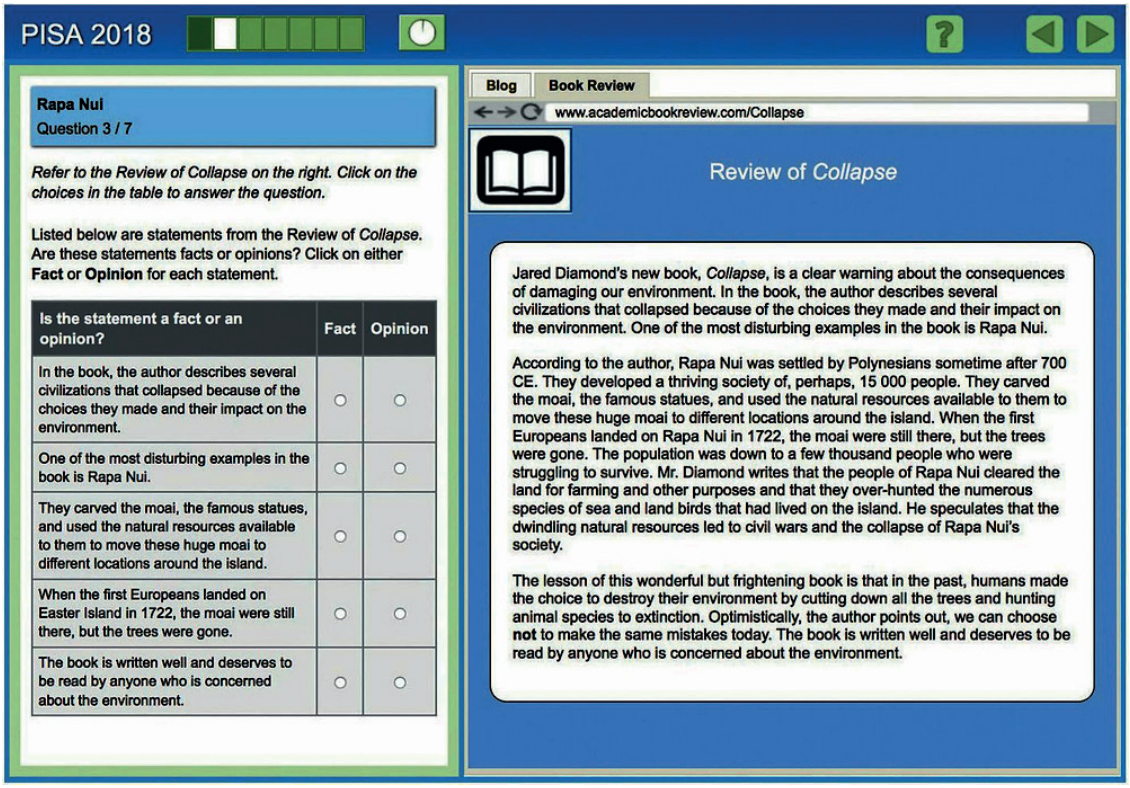
1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Source: OECD, PISA 2018 Database, Tables B.2.4 and B.2.8.

StatLink https://doi.org/10.1787/888934239420

Box 2.2. **Rapa Nui released item #3: facts versus opinion**

For this item (CR551Q06), the student is presented with the second text in the unit, a book review of Collapse, which was referenced in the blog post. The student must complete a table by selecting "Fact" or "Opinion" for each row. The question asks the student to identify whether each statement from the book review is a fact or an opinion. The student must first understand the literal meaning of each statement and then decide if the content was factual or represented the perspective of the author of the review. In this way, the student must focus on the content and how it is presented rather than just the meaning. To receive full credit for this item, the student was required to get all 5 rows correct. For partial credit, students were required to get 4 out of the 5 rows correct. If students got fewer than 4 rows correct, they received no credit. The correct answers are: Fact, Opinion, Fact, Fact, Opinion. For further information on this unit see https://www.oecd.org/pisa/test/.



Are students who had the opportunity to learn digital skills in school more likely to distinguish facts from opinions?

Students from more advantaged socio-economic backgrounds not only had greater access to digital devices connected to the Internet at age 15 but had comparatively earlier exposure to computers when they were six years or younger than students from lower socio-economic backgrounds (OECD, 2015[12]). Although these factors matter, providing students with digital devices connected to the Internet is not enough to ensure that they will become proficient in digital literacy and, at the same time, avoid online risks such as disinformation or breaches of privacy.

Adolescents' digital skills are positively associated with both online risks and opportunities (Rodríguez-de-Dios, van Oosten and Igartua, 2018[13]). Parents play an essential role in providing access and encouraging an appropriate use of digital devices at home – e.g. for social support or learning goals. However, they do not always succeed in maximising online opportunities while reducing the risks (Livingstone et al., 2017[14]). Providing equal opportunities to learn digital skills at school while reducing online risks is not only beneficial to all students but could also help to mitigate some of the learning gaps presented in the previous section as a result of the digital divide. PISA 2018 asked students whether during their entire school experience they were taught: a) how to decide whether to trust information from the Internet, b) how to compare different web pages and decide what information is more relevant for their schoolwork, c) to understand the consequences of making information publicly available online, d) how to detect phishing or spam emails, and e) how to detect whether the information is subjective or biased during their entire school experience.

On average across OECD countries, 54% of students reported being trained on how to recognise whether information is biased. Among OECD countries, more than 70% of students reported receiving this training in Australia, Canada, Denmark, and the United States. However, less than 45% of students reported received this training in Israel, Latvia, the Slovak Republic, Slovenia, and Switzerland (Table B.2.6).

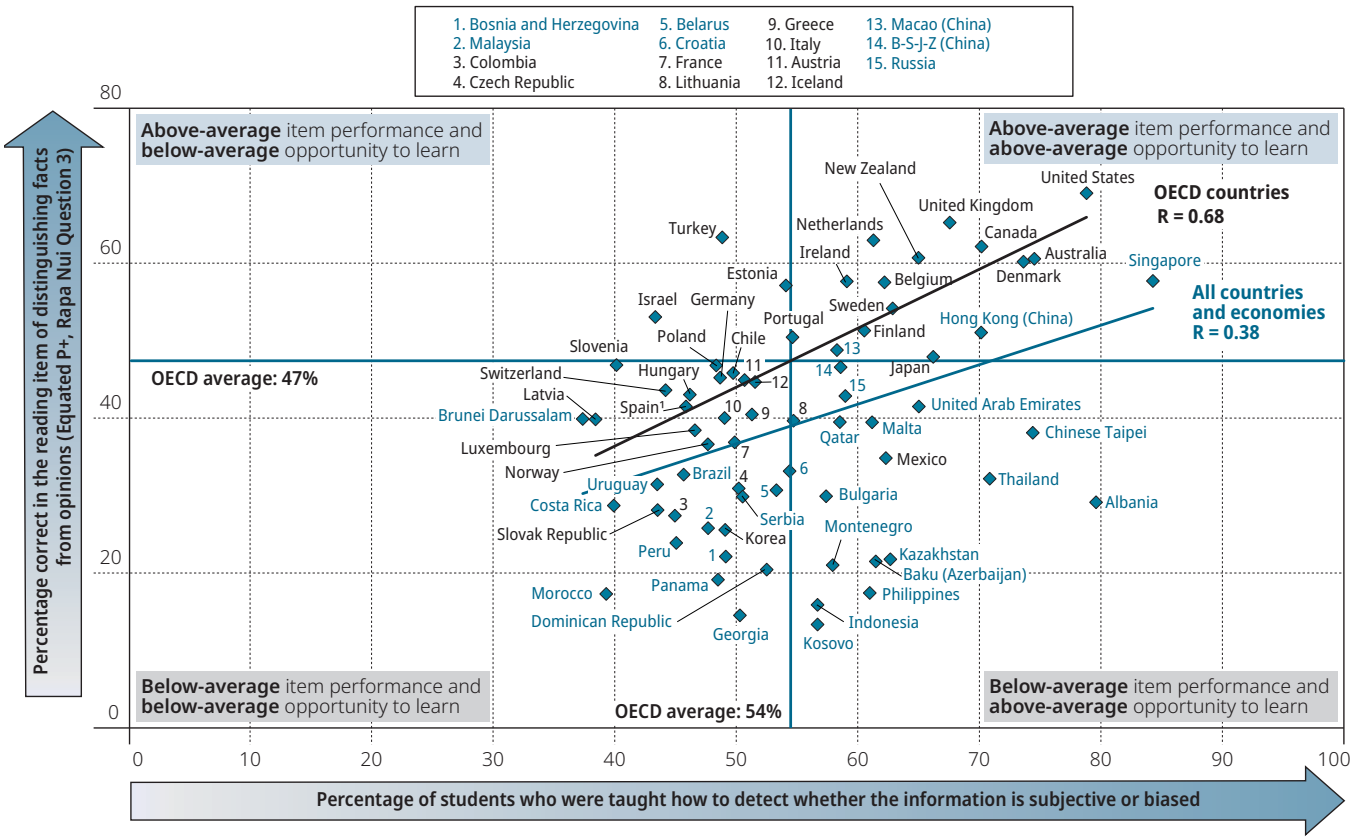
Not all students had equal access to learning digital skills at school. The percentage difference in students who were taught how to detect biased information on the Internet between students from advantaged and disadvantaged backgrounds across OECD countries was 8 percentage points in favour of advantaged students. In Belgium, Brunei Darussalam, Denmark, Germany, Luxembourg, Sweden, the United Kingdom and the United States, this difference is around 14 percentage points or higher (Table B.2.6).

As pointed out before, the PISA 2018 reading assessment included one item-unit (Rapa Nui Question 3, CR551Q06) that tested whether students can distinguish between facts and opinions (Box 2.2). The estimated percentage correct in this item is 47% on average across OECD countries, and higher than 60% in Australia, Canada, the Netherlands, New Zealand, Turkey, the United Kingdom and the United States. In contrast, this percentage is lower than 20% in Georgia, Indonesia, Kosovo, Morocco, Panama, and the Philippines. On the other hand, among OECD countries, more than 70% of students in Australia, Canada, Denmark, and the United States were taught how to detect whether the information is biased while less than 45% of students were taught this in Colombia, Israel, Latvia, the Slovak Republic, Slovenia, and Switzerland (Figure 2.4).

The opportunity for students to learn in school how to detect whether information is subjective or biased is strongly associated with the estimated percentage correct in the item that focuses on distinguishing facts from opinions in the PISA reading assessment among OECD countries (R=0.68), and moderately associated among all participating countries and economies in PISA 2018 (R=0.38)[9] (Figure 2.4). The partial correlation[10] after accounting for per capita GDP was 0.66 and 0.31. The partial correlations[11] after accounting for average reading performance were 0.60 and 0.32 respectively. Therefore, it is the access students have to education on how to detect biased information in school rather than overall reading performance that is driving a strong association with the estimated percentage correct in the item of distinguishing fact from opinion.

Figure 2.4 shows that the percentage of students in Hong Kong (China) and Singapore who had access to training in school on how to detect biased information as well as their estimated percentage correct in the distinguishing fact from opinion item is above the OECD average. However, students in other partner countries and economies fall below the OECD average in the estimated percentage correct in this item. Furthermore, students in Chinese Taipei scored below the OECD average in this item even though the proportion of students reporting that they were taught how to detect biased information in school was well above the OECD average.

Figure 2.4 **Reading item of distinguishing facts from opinions and access to training on how to detect biased information in school**



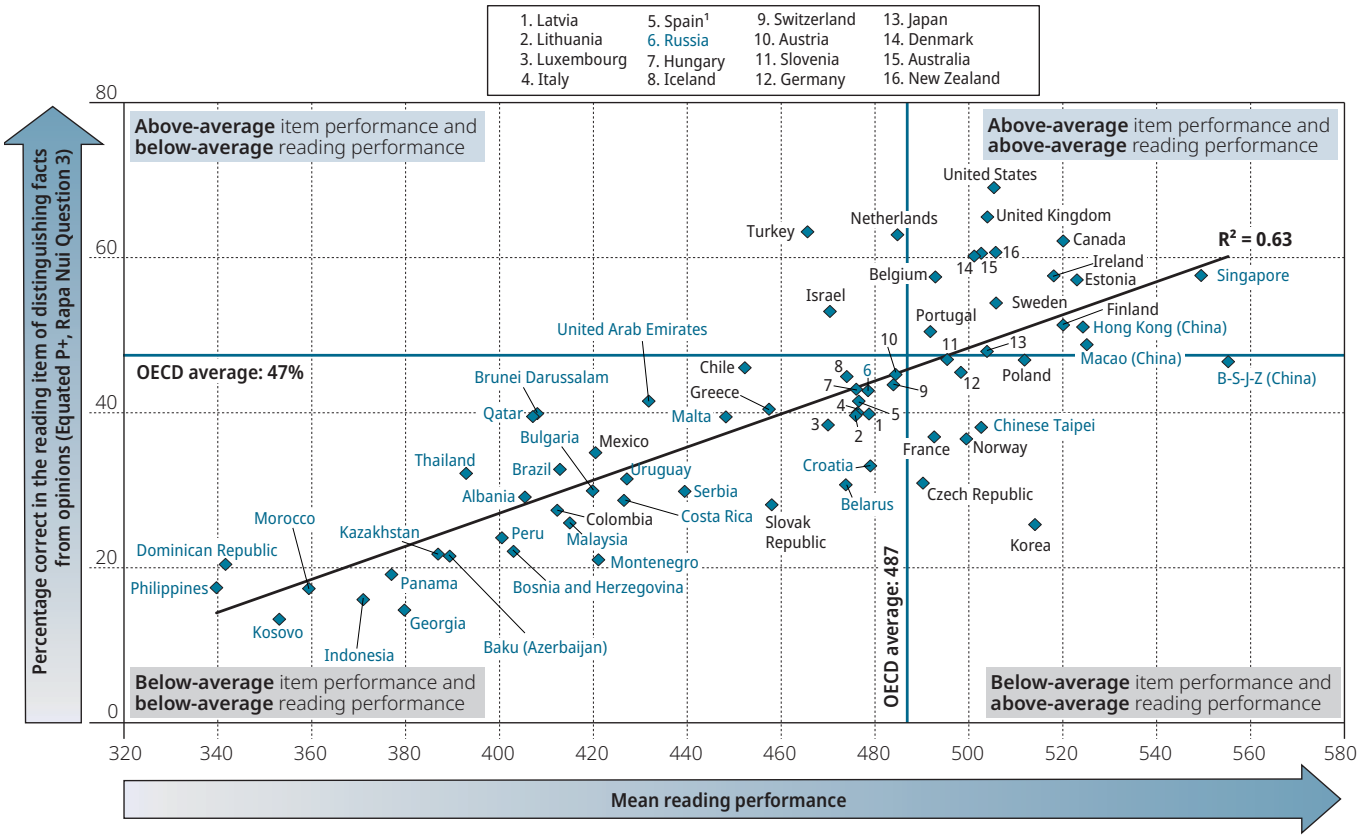
1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Source: OECD, PISA 2018 Database, Table B.2.8.

StatLink https://doi.org/10.1787/888934239439

Figure 2.5 shows the system-level relationship between the estimated percentage correct in the item that focuses on distinguishing facts from opinions and the overall reading performance. This item-unit (Rapa Nui Question 3, CR551Q06) forms part of the PISA reading test and, as expected, is strongly correlated with the total reading score (R^2=0.63)[12]. However, this relationship is remarkably different across countries. The United States was the country with the highest percentage correct in this item (69%) and above the average in the total reading score (505). However, Korea, who performed above the OECD average in reading (514), scored below the average in this particular item (26%) while Turkey, who performed below the OECD average in reading (466), is the country with the highest percentage correct (63%) after the United States (69%) and the United Kingdom (65%). Again, this is just an item and not a full-scaled construct to assess students' capacity to distinguish between fact and opinion. Yet, these results may reflect differences in curriculum across countries as well as different practices and out-of-school experiences. Learning how to distinguish facts from opinions in school likely helps improve PISA reading scores. It is also likely to help students benefit more fully from online resources while reducing online risks.

Figure 2.5 **Reading item of distinguishing facts from opinions and reading performance**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

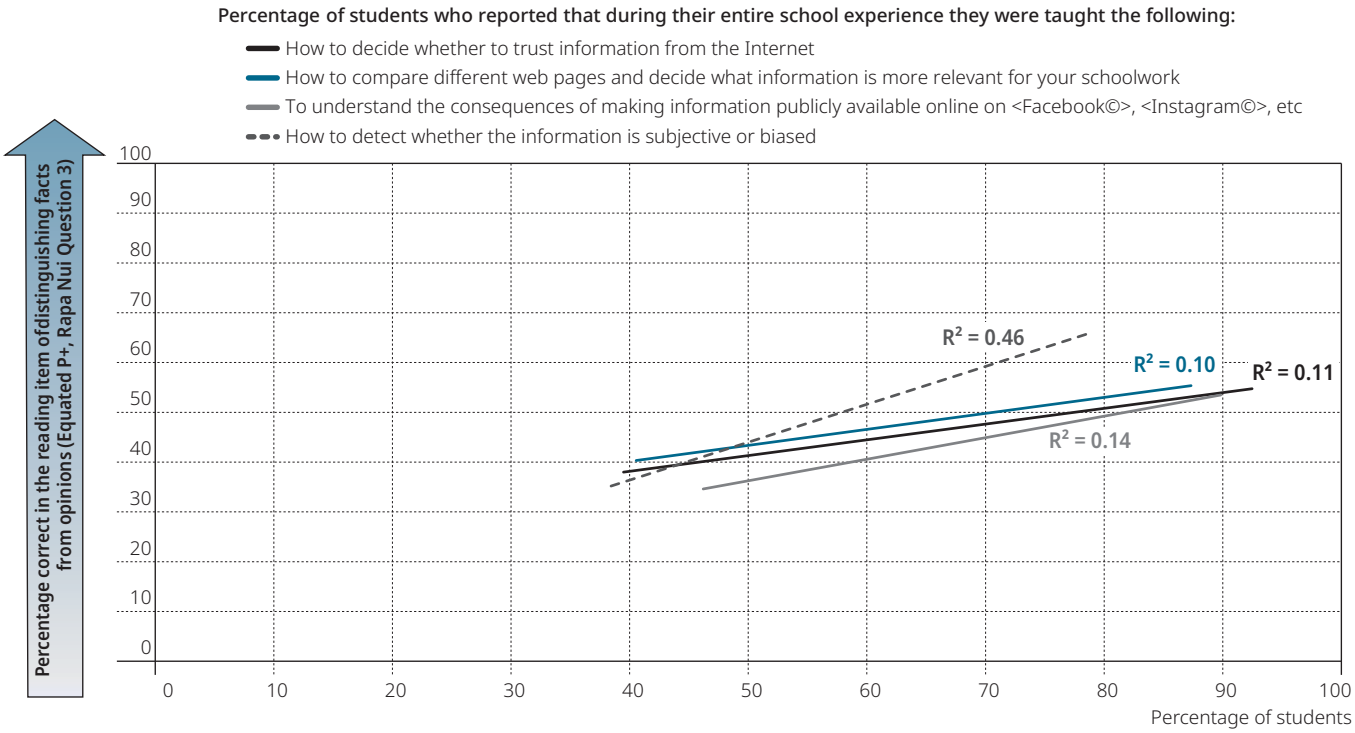
Source: OECD, PISA 2018 Database, Tables B.2.1 and B.2.8.

StatLink https://doi.org/10.1787/888934239458

Figure 2.6 shows the system-level correlations (OECD countries) between indicators collected in PISA 2018 on access to learning digital skills in school which have a meaningful association with the estimated percentage of correct responses in the reading item of distinguishing facts from opinions (Rapa Nui Question 3, CR551Q06). Among these indicators, student access to school training on how to detect whether information is biased was the indicator most strongly correlated with estimated percentage correct in the reading item of distinguishing facts from opinions. Although other indicators such as learning how to understand the consequences of making information publicly available online are still moderately associated with performance in this item, these associations are weaker in magnitude.

Figure 2.6 **Correlations between access to learning digital skills in school and the reading item of distinguishing facts from opinions in OECD countries**

System-level analysis (OECD countries)



Source: OECD, PISA 2018 Database, Table B.2.8.

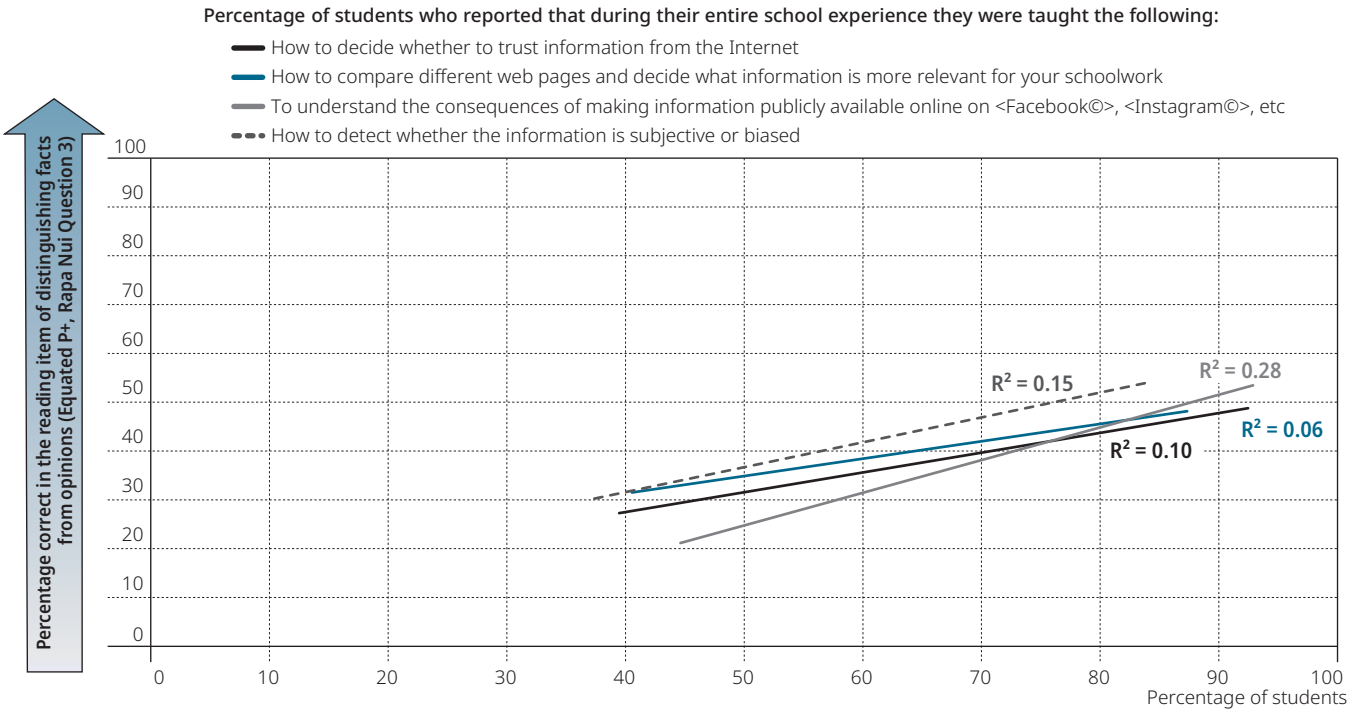
StatLink https://doi.org/10.1787/888934239477

Figure 2.7 shows the same system-level correlations but among all participating countries and economies in PISA 2018. In this case, the magnitude of the correlations is generally smaller than among OECD countries but still relevant. This is particularly the case among students who were taught how to understand the consequences of making information publicly available and to detect biased information.

The findings presented in this chapter highlight the importance of providing digital resources for educational purposes both at school and at home in fostering students' reading performance. This is also important for emergent reading aspects, such as students' capacity to distinguish facts from opinions. For many disadvantaged students, schools are the only way they have to access and use computers linked to the Internet. It is, therefore, reasonable to expect that existing reading gaps among students from different socio-economic backgrounds, including emergent aspects of reading, would be amplified during long periods of school closures such as the ones experienced during pandemics. Altogether, these results show the crucial role of providing equal opportunities to learn digital skills at school and its strong association with students' performance in emergent reading aspects. More analysis showing the association between teaching practices, access to learning digital skills at school and emerging aspects of reading are provided in Chapter 6.

Figure 2.7 **Correlations between access to learning digital skills in school and the reading item of distinguishing facts from opinions in all participating countries**

System-level analysis (All)



Source: OECD, PISA 2018 Database, Table B.2.8.

StatLink https://doi.org/10.1787/888934239496

Notes

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS). A socio-economically disadvantaged (advantaged) student is a student in the bottom (top) quarter of the ESCS in the relevant country/economy.

2. While Spain's data met PISA 2018 Technical Standards, some data showed implausible response behaviour among students. Further analysis of Spain's data by testing time showed that some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data from only a minority of students showed clear signs of lack of engagement, the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured. After careful consideration of the results based on the further analysis of Spain's data, PISA 2018 data for reading for Spain were released in July 2020. They were, therefore, included in this report. While all data are released, Spain's performance results in PISA 2018 might be subject to a possible downward bias in performance results for the reasons previously explained.

3. Because the membership of the OECD has changed over time, the three categories (around, above and below the OECD mean) are not comparable to the corresponding categories used in earlier PISA reports.

4. In order to identify relative strengths and weaknesses, the scores are first standardised by comparison to the mean and standard deviation across all PISA-participating countries. When the standardised score in one subscale is significantly higher than that in another subscale in a country/economy, it can be said to be relatively stronger in the first subscale compared to the average across PISA-participating education systems.

5. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS). A socio-economically disadvantaged (advantaged) school is a school in the bottom (top) quarter of the ESCS in the relevant country/economy.

6. Rapa Nui Question 3 is a partial credit item where non-credit is scored 0, partial credit is scored 0.5, and full credit is scored 1. Therefore, the estimated percentage correct for full credit in this item is lower than 47% on average across OECD countries. This item was estimated to be 39% correct on average across all PISA 2018 participating countries and economies. Rapa Nui Question 3 is a Level 5 item. This means that students need to have a proficiency Level 5 to have a 62% probability of getting full credit in this item (see Figure I.2.1, (OECD, 2019[2])).

7. Countries which administered the paper-based form had no available data to perform this analysis: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

8. The partial correlation is calculated using the percentage of students with access to a computer linked to the Internet at home for schoolwork in PISA 2018 (Table B.2.2) and the percentage correct in the reading assessment items to assess the capacity to distinguish facts from opinions (Table B.2.6), after accounting for per capita GDP (Table B3.1.4, (OECD, 2019[2])).

9. Countries which administered the paper-based form had no available data to perform this analysis: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

10. The partial correlation is calculated using the percentage of students who reported to learn in school how to detect whether the information is subjective or biased (Table B.2.6) and the percentage correct in the reading assessment items to assess the capacity to distinguish facts from opinions (Table B.2.6), after accounting for per capita GDP (Table B3.1.4, (OECD, 2019[2])).

11. The partial correlation is calculated using the percentage of students who reported to learn in school how to detect whether the information is subjective or biased (Table B.2.6) and the percentage correct in the reading assessment items to assess the capacity to distinguish facts from opinions (Table B.2.6), after accounting for average reading performance (Table B.2.1a).

12. The total reading score includes the item that is being correlated, so this R2 value would be slightly lower if the item is extracted from the total reading score.

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PISA

3

Dynamic Navigation in PISA 2018 Reading Assessment: Read, Explore and Interact

This chapter provides item-level analyses using process (or log) data to illustrate how students navigate through multiple text sources to search for and locate relevant information. This chapter focuses on a scenario-based reading unit, Rapa Nui, which was developed with multiple-source text environments. The relationship between navigation skills and reading performance is also examined in this chapter.

What the data tell us

- More than 27% of students from in B-S-J-Z (China), Hong Kong (China), Japan, Korea, Russia, Singapore, Chinese Taipei and the United Kingdom tended to strictly follow item instructions by carefully selecting pages relevant to the tasks and limiting visits to irrelevant pages.
- More than 30% of students in B-S-J-Z (China), Korea, and Singapore tended to actively explore the whole reading unit in both single- and multiple-source environments. These students checked different accessible pages beyond item requirements to complete the task.
- On average, over 70% of students in 70 countries/economies demonstrated limited or no navigation. More than 15% of students with limited navigation were found in Hungary, New Zealand, Peru, Poland, Spain, and Turkey. More than 75% of students in Baku (Azerbaijan), Bosnia and Herzegovina, Colombia, the Dominican Republic, Kosovo, Morocco, Panama, and Uruguay showed no navigation.
- Strictly focused navigation and actively explorative navigation are positively correlated with performance (0.69 and 0.43, OECD average). In contrast, limited navigation and no navigation are negatively associated with performance (-0.28 and -0.32, OECD average).

DYNAMIC NAVIGATION IN PISA 2018 READING ASSESSMENT: READ, EXPLORE AND INTERACT

The rise of digital technology has promoted the emergence of new text forms beyond traditional printed texts. Readers in the digital age must master several emerging reading skills to understand these new text-based genres and socio-cultural practices. They need to apply information and communication technology (ICT) knowledge to understand and operate devices; access the texts they need using search engines, links and tabs; read from multiple sources; distinguish what is high-quality, credible information; and corroborate information, detect potential conflicts and resolve them (OECD, 2019[1]).

Among these emerging reading skills, navigation is recognised as a key component of reading in the digital environment as readers "construct" their text through navigation and spend time retrieving information from eventually targeted texts. Evidence has proven that better readers tend to minimise their visits to irrelevant pages and locate necessary pages efficiently (OECD, 2011[2]). Stronger readers choose strategies that are suited to the demands of individual tasks (OECD, 2011[2]; Lawless and Kulikowich, 1996[3]; Salmerón and García, 2011[4]; Salmerón, Kintsch and Kintsch, 2010[5]; Naumann et al., 2007[6]; Lawless and Schrader, 2008[7]).

The description of readers' navigation process demands tremendous support from log files. Data stored in log files, referred to as process data in this chapter, contain information on the actions undertaken by test takers in terms of computer interaction and time spent on each action during the process. This sort of data provides extra information beyond response data that typically show correctness or incorrectness for accuracy only (He, Borgonovi and Paccagnella, 2019[8]; He, Borgonovi and Paccagnella, 2021[9]; von Davier et al., 2019[10]).

The interactive nature of PISA computer-based assessments makes them ideal candidates for analyses based on process data (Vörös, Kehl and Rouet, 2020[11]; Goldhammer et al., 2014[12]). Given the promise of this valuable information from new data source in log files, the fine-grained student-level process data are deeply explored in this chapter to better understand how students navigated and allocated their time on emerging multiple-source reading items in the PISA 2018 reading assessment. The relationship between navigation skills and performance in reading in digital environments is also examined and illustrated through case studies in this chapter.

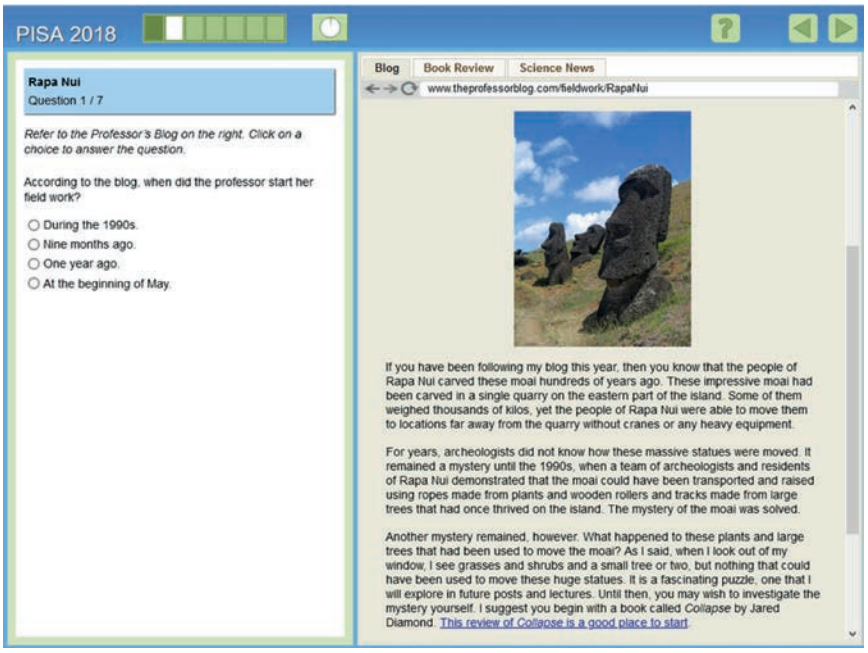
Multiple-source reading items and dynamic navigation

The emerging multiple-source texts featured in PISA 2018 reading items call for comprehensive skills in understanding, retrieving, integrating, and evaluating information in multiple digital text environments. Unlike single-source texts that may have one definite author (or a group of authors), time of writing or publication date, and reference file or number, multiple-source texts are defined by texts with latent links, and which have different authors, have been published at different times, or bear different titles or reference numbers (OECD, 2019[1]). A typical example of a multiple-source text is a set of texts from different sources such as an extract from a printed newspaper, a book page, or a customer review in an online forum.

Dynamic texts feature as an emerging aspect of reading, especially in a multiple-source environment. They give the reader some level of decision-making power as to how to read them. This kind of text generally goes along with a more complex and non-linear[1] organisation and integrates more navigation tools. The interactive design in PISA reading assessments embeds features of dynamic texts to support different types of texts such as authored web pages with combinations of lists, paragraphs and, often, graphics, and message-based texts with online forms, e-mail messages and forums. Readers need to construct their own pathways to complete any reading activity associated with dynamic texts. Students have flexibility to decide which information is important to the individual task and switch between pages. Knowledge not only of what students' responses were but how they reached their responses through dynamic navigation enables a deeper understanding of students' cognitive process in dynamic reading.

This chapter focuses on a scenario-based reading unit, Rapa Nui (CR551), which was developed with multiple-source text environments. It consists of three texts: a webpage from the professor's blog, a book review, and a news article from an online science magazine. In these multiple-text reading situations, readers must make decisions as to which of the available pieces of text is the most important, relevant, accurate or truthful (Rouet and Britt, 2011[13]). Figure 3.1presents the screenshot of the first item in the Rapa Nui unit. Similar to the layout presented in the computer-based assessments in previous PISA cycles, the assessment interface is divided into two parts: the item response area on the left side of the screen and simulation area on the right side of the screen. The three different text sources – blog, book review and science news – are embedded using three tabs. The contents of these three sources connect to and supplement each other to give a whole picture of Rapa Nui from different perspectives. For further information on this unit see https://www.oecd.org/pisa/test/.

Figure 3.1 **Screenshot of the first item in the Rapa Nui reading unit (CR551Q01)**



The Rapa Nui unit consists of seven items ranging in levels from moderate to high difficulty (Table 3.1). The first five items (item 1 to item 5) are items with single-source requirements where students are instructed to complete the task with reference to a single page. Navigation to the accessible pages is optional. The last two items (item 6 and item 7) are items with multiple-source requirements (see Figure 3.2 for a screenshot of item 6). Each item instructs students to refer to all three sources to complete the task, requiring navigation to other pages. As a reminder, Rapa Nui was included in the second unit of the testlet as being of high difficulty[2]. The non-response rate was expected to be high, especially towards the end of the test when students might run out of time[3]. Specifically, the average non-response rate in the Rapa Nui unit was 16%. The non-response rate was the highest, 31%, in the last item (CR551Q11) of this unit (Table B.3.1).

Embedded sources, that is, references to other authors or texts, are included in the Rapa Nui unit. When students scroll down to the end of the blog on the first page of this unit, two hyperlinks appear at the end of the passage. The multiple-source structure is activated by clicking the hyperlinks. The other two tabs (Book Review and Science News) appear in the navigation bar for further navigation. If students miss the hyperlinks on the first page, "Book Review" and "Science News" are later activated by default in item 3 and item 4.

Figure 3.2 **Screenshot of an item with multiple-source requirement in the Rapa Nui reading unit (CR551Q10)**

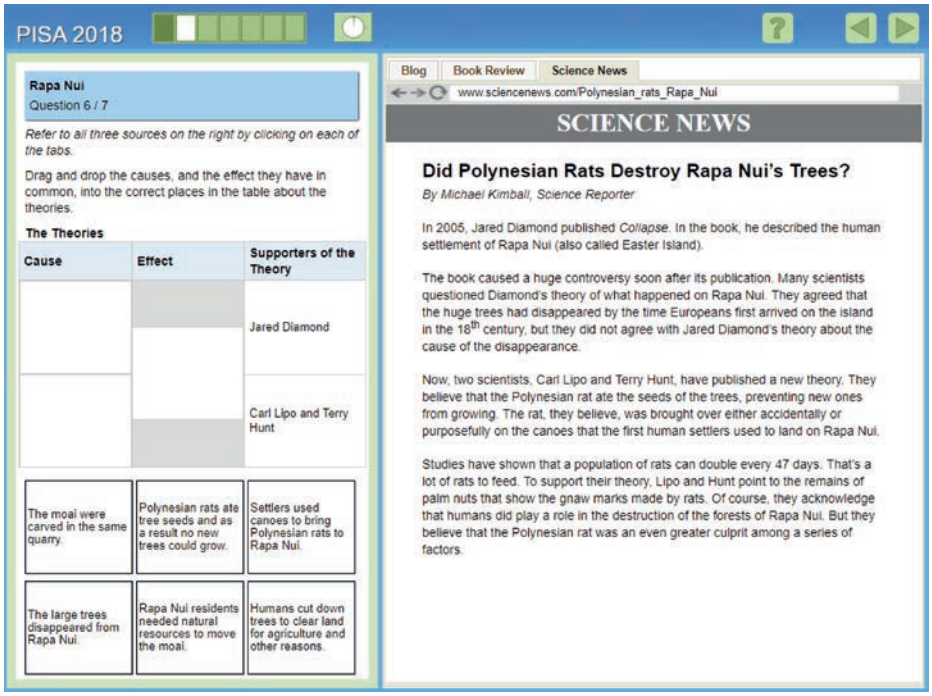


Table 3.1 **Item characteristics and difficulty in the Rapa Nui reading unit**

	Item order	Item difficulty	Item difficulty level	Source required for item (single/multiple)	Response format
CR551Q01	Item 1	559	Level 4	Single	Simple Multiple Choice
CR551Q05	Item 2	513	Level 3	Single	Open Response
CR551Q06	Item 3	654	Level 5	Single	Complex Multiple Choice
CR551Q08	Item 4	634	Level 5	Single	Simple Multiple Choice
CR551Q09	Item 5	597	Level 4	Single[1]	Simple Multiple Choice
CR551Q10	Item 6	665	Level 5	Multiple	Complex Multiple Choice
CR551Q11	Item 7	588	Level 4	Multiple	Open Response

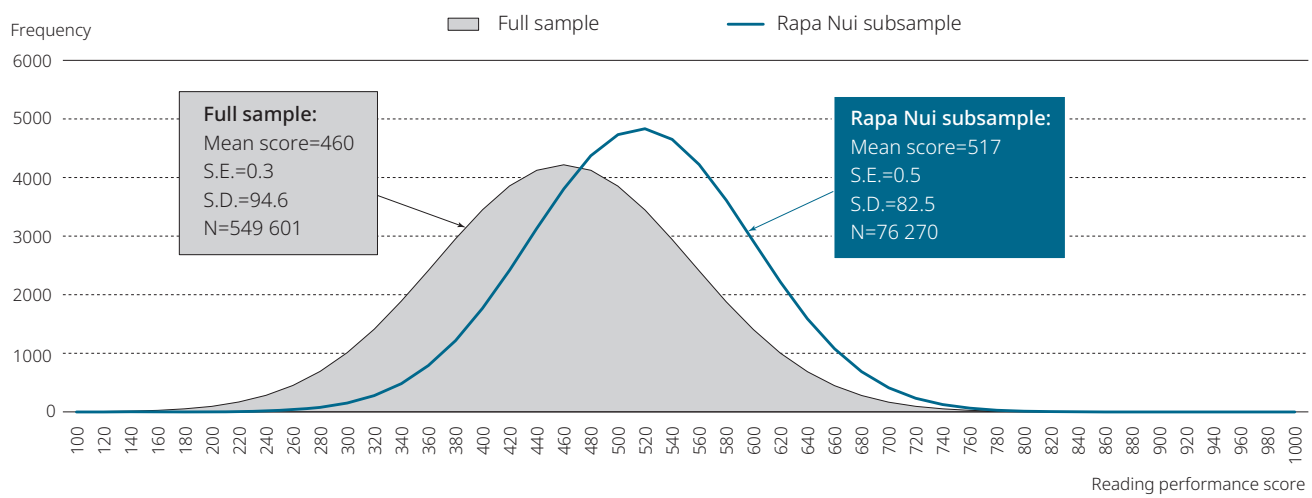
1. The source required for item CR551Q09 could be classified as requiring only a single source, however the item contained evidence that supported the overall theory which is akin to working with multiple sources.

Source: OECD, PISA 2018 Database.

The studies presented in this chapter focus on a total of 76 270 students from 70 countries and economies who responded to the Rapa Nui reading unit (CR551)[4]. It is necessary to note that the multistage adaptive testing design (MSAT; Yamamoto, Shin and Khorramdel, 2019[14]) was applied to the PISA 2018 reading domain for the first time. In accordance with the routing rule in the MSAT, students who performed better in the previous stage have a higher chance of being allocated to a more difficult testlet. The Rapa Nui unit was intended to be of moderate-to-high difficulty and was labelled as being of high difficulty in the testlet. Therefore, the subsample used in this study could be slightly biased towards students who have higher reading skills than the average level.

As shown in Figure 3.3, though the subsample (N=76 270) covers a broad range of reading proficiency levels, from "Below Level 1c" to "Level 6" (see note below Table 3.2 for a description of these proficiency levels), their overall average reading performance score is 517 points, marginally higher than the average reading score of the full sample 460 points from the 70 countries and economies. The distribution of this subsample is slightly shifted to the right compared with the full sample distribution, signalling a marginal bias towards students who have higher reading performance skills than the average level. As a result, background variables such as gender and socio-economic status (measured by the PISA index of economic, social and cultural status [ESCS]) also showed as slightly biased. Of the 76 270 students, 52% of students were girls (with student weights computed), slightly higher than the 50% of girls in the full sample. The index of economic, social and cultural status (ESCS) was -0.05 in the subsample of Rapa Nui respondents, which was a bit higher than that of the full sample: -0.28 (Table B.3.10). It is noted that all the computation in the current study was conducted based on 10 plausible values with students' weight of 80 replicates. A distribution of reading proficiency levels of students who responded to the Rapa Nui unit is presented in Table 3.2.

Figure 3.3 **Distribution of reading performance of students who responded to the Rapa Nui reading unit**



Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239515

Table 3.2 **Overall average of students' reading proficiency levels in the Rapa Nui unit**

Reading proficiency level[1]	Overall average[2]		OECD average	
	%	S.E.	%	S.E.
Level 6	1.96	(0.1)	2.65	(0.1)
Level 5	10.37	(0.2)	13.92	(0.3)
Level 4	24.57	(0.2)	30.16	(0.3)
Level 3	28.68	(0.3)	29.86	(0.3)
Level 2	21.38	(0.3)	16.86	(0.3)
Level 1a	9.79	(0.2)	5.51	(0.2)
Level 1b	2.77	(0.1)	0.93	(0.1)
Level 1c	0.45	(0.1)	0.11	(0.0)
Below Level 1c	0.02	(0.0)	0.01	(0.0)
Total	**100**	**(0.1)**	**100**	**(0.1)**

1. Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

2. Overall average is computed on students who responded to the Rapa Nui unit.

Note: The computation is based on 10 plausible values with student weights 80 replicates.

Source: OECD, PISA 2018 Database.

WHAT CONSTITUTES GOOD DYNAMIC NAVIGATION?

Successful reading, whether in single source or reading and integrating information across multiple sources, requires an individual to perform a range of processes. As defined in the PISA 2018 reading framework (OECD, 2019[15]), these cognitive processes are organised into three categories (see Chapter 1 for more details):

a. Locate information: to access and retrieve information within a text to search for and select relevant texts.

b. Understand: to comprehend the literal meaning of passages and integrate different portions of the text together.

c. Evaluate and reflect: to assess the quality and credibility of information extracted from the text, reflect on the content, form opinions, and detect and handle conflicting information from multiple texts.

Competent readers can adapt to the purpose of each reading task and play a latent role in coordinating the different cognitive processes. As a purpose-driven activity, reading is always performed with goals in mind (Anmarkrud et al., 2013[16]; Rouet, Britt and Durik, 2017[17]; Vidal-Abarca, Mañá and Gil, 2010[18]). Good navigation can be characterised as navigational behaviour that is consistent with these goals and which supports the whole cognitive process.

To describe students' navigation behaviour, the sequences of pages visited by students and time spent on each page as well as fine-grained action sequences (e.g., mouse moving and clicks) in the process of solving each task are extracted from the log files recorded by the test administration platform.

A first measure of students' navigation activity is the length of navigation sequences, which corresponds to the number of transitions between different pages recorded in log files. The number of pages visited beyond the default initial page may be associated with students' engagement and skills in information-locating and assessing (e.g. Naumann, 2015[10]; Sahin and Colvin, 2020[11]; Hahnel et al., 2016[12]). As navigation behaviour may not be the same for single- and multiple-source items, this measure was executed separately by two environments. Some single-source items in a digital reading environment hardly require any navigation (i.e., a single short page of text presented on a computer screen). In contrast, longer sequences are often required to solve more complex tasks (e.g., He et al., 2019; Han et al., 2019; Tang et al., 2020[13]). A multiple-source reading task typically involves comparisons between text information, locating information in difference sources and understanding the content.

A second measure focuses on students' navigation quality and strategies, for instance, whether actively executed explorative navigation beyond the item required pages or strictly followed item instructions to visit the required pages only. The non-linear reading structure in PISA 2018 allows students to judge whether they need and on which page they should navigate through the whole reading unit with dynamic texts. It means that students could access to other pages beyond the page that is required to read on the purpose to solve the current task. Test-takers may have decided to explore the given task to prepare themselves for later questions even though they were aware that this question did not require them to do so. Alternatively, test-takers could strictly follow the task instruction and read only the pages that are required to solve the tasks. These students are expected to actively navigate to relevant pages in items with multiple-source requirements and limit their navigation in items with single-source requirements.

In addition to navigation quantity and quality, a third measure focuses on examining the time information extracted from the navigation process, e.g. time spent on each page and transition time between pages. Competent readers spend enough time on relevant pages to successfully understand the content. Quick switches between pages and frequent clicks on pages back and forth suggest a quick skim or unfocused navigational behaviour. In this study, an a priori assumption has been made that a quick transition of less than three seconds is considered an ineffective page visit[5].

Table 3.3 summarises the navigation behaviour indicators developed for this study. It is noted that all the measures were conducted under single- and multiple- source items respectively. The indicators were analysed on system-level and within-country level and associated with reading performance.

Table 3.3 **A summary of navigation indicators developed in the Rapa Nui study**

Navigation quantity	Navigation quality	Time-related indicator
Number of pages visited	Navigation behaviour and strategy	Median time spent on initial page
	Hyperlink activation	Proportion of time spent on initial page
		Ratio of effective page transition (>3 seconds)
		Time spent on instruction page

Note: All the measures are conducted under single- and multiple- source items respectively.

Box 3.1. **How do students read the instruction page?**

An instruction page (Figure 3.4) is often displayed before students officially enter the response items. It is a separate page from the item pages. A basic idea about the item context is typically presented on the instruction page to help students get ready for the tasks in the unit. Some recent theories posit that effective readers need to build a "task model" based on the instructions and other contextual cues (Rouet, Britt and Durik, 2017[17]). Little attention has been paid to the time spent on the instruction page so far. In the Rapa Nui unit, students spent an average of 14.6 seconds reading the instruction page. Students with high reading proficiency levels (Levels 4 to 6) spent an average of 19.5 seconds reading the instruction page. They tended to spend a bit longer than students with low reading proficiency levels (Level 1a and below) who spent 10.8 seconds on average (Table 3.4).

Figure 3.4 **Screenshot of instruction page**

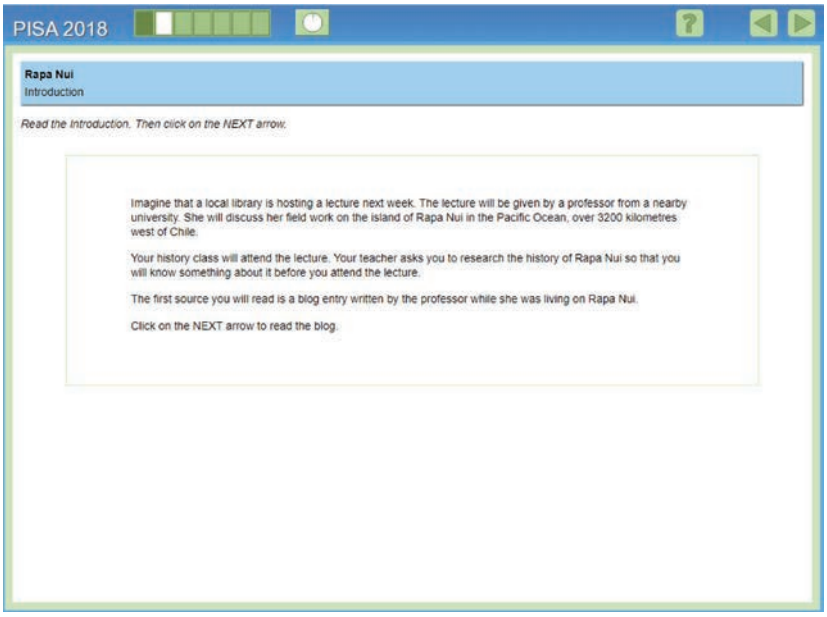


Table 3.4 **Overall average of time spent on instruction page in Rapa Nui unit, by students' reading proficiency levels**

Reading proficiency level[1]	Overall average[2]		Mean time on instruction page	
	%	S.E.	Seconds	S.E.
Level 6	1.96	(0.1)	19.88	(0.9)
Level 5	10.37	(0.2)	20.10	(0.6)
Level 4	24.57	(0.2)	18.39	(0.3)
Level 3	28.68	(0.3)	16.22	(0.2)
Level 2	21.38	(0.3)	13.63	(0.2)
Level 1a	9.79	(0.2)	12.03	(0.4)
Level 1b	2.77	(0.1)	11.09	(1.1)
Level 1c	0.45	(0.1)	11.89	(2.1)
Below Level 1c	0.02	(0.0)	7.99	(1.7)

1. Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

2. Overall average is computed on students who responded to the Rapa Nui unit.

Source: OECD, PISA 2018 Database.

STUDENTS' DYNAMIC NAVIGATION BEHAVIOUR IN DIFFERENT COUNTRIES AND ECONOMIES

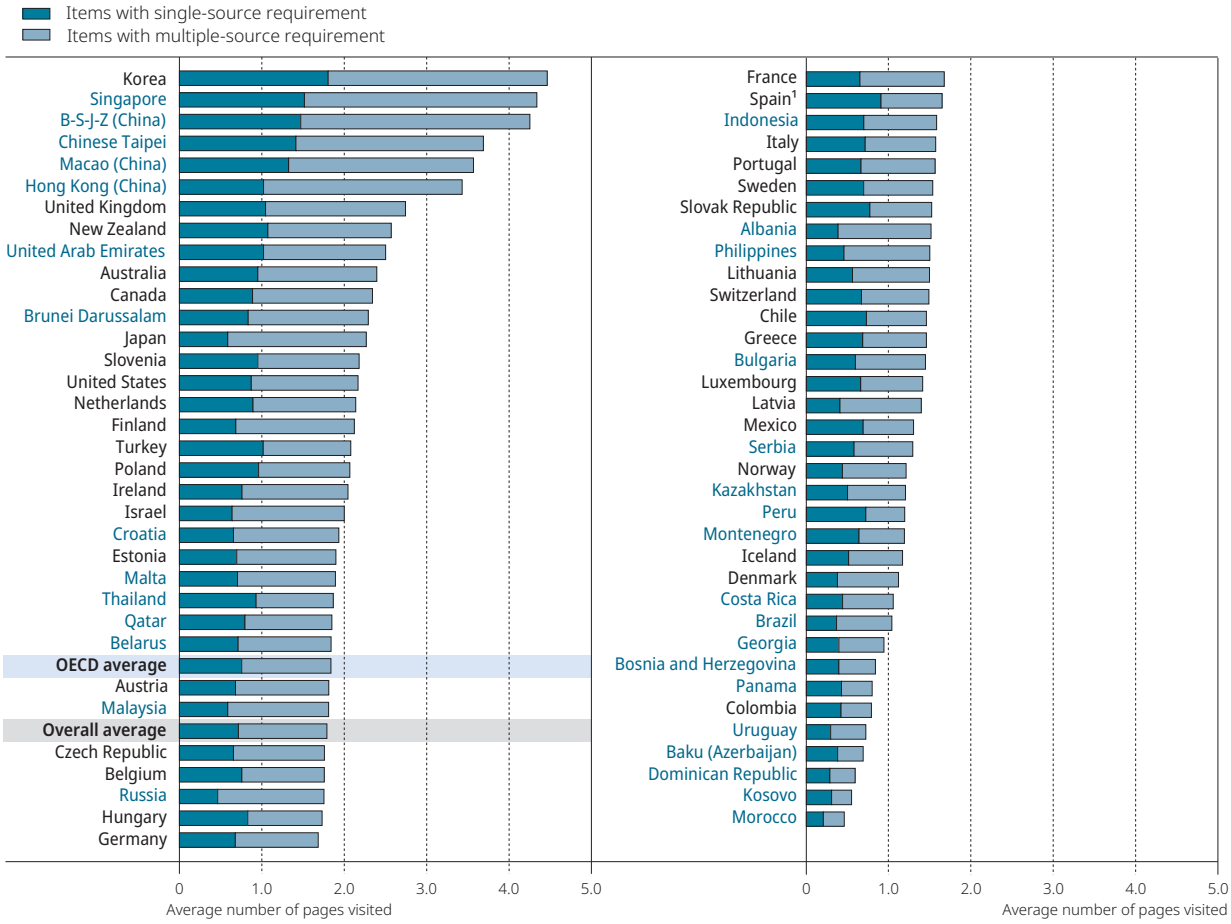
To analyse what constitutes successful and unsuccessful navigation, three analyses were implemented of students' dynamic navigation behaviours across countries and economies. The three aggregate-level analyses focus on the quantity, quality and duration of navigation.

Overall navigation activity

The measurement of overall navigation activity was developed to assess the quantity of navigation. To distinguish students' navigation behaviours in different item environments, the number of pages visited in items with single- and multiple-source requirements were counted separately. The lowest number of page visits was 0, indicating no page transition beyond the default first page. This measurement also provides information about students' engagement in reading, their understanding of reading tasks, familiarity with basic computer skills, and persistence in solving difficult tasks.

Figure 3.5 shows students' navigation quantity in items with single- and multiple-source requirements in the Rapa Nui unit across 70 countries and economies. On average, students in OECD countries visited 1.08 pages in items with multiple-source requirements and 0.76 pages in items with single-source requirements after the default first pages. By this simple measure, East Asian countries and economies (Korea, Singapore, B-S-J-Z (China), Chinese Taipei, Macao (China), Hong Kong (China) in decreasing order of their mean value on this index) stand out for having the highest average number of page visits. A gap as substantial as four pages has been observed between countries and economies with the highest and lowest number of pages visited in this unit (Figure 3.5 and Table B.3.2).

Figure 3.5 **Average number of pages visited in items with single- and multiple-source requirements in Rapa Nui unit**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Note: This figure shows the average rank of students in the international comparison of students taking the same test unit of Rapa Nui.

Countries and economies are ranked in a descending order of the total average number of pages visited beyond default initial pages (sum of number of pages visited in single-source and multiple-source items).

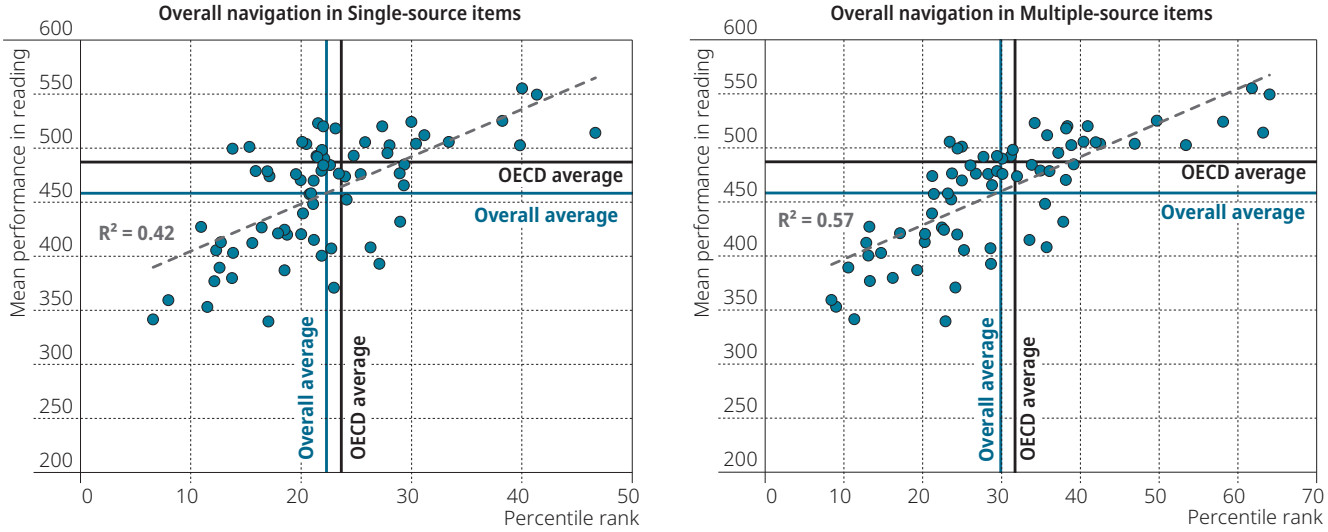
Source: OECD, PISA 2018 Database, Table B.3.2.

StatLink https://doi.org/10.1787/888934239534

Students' average dynamic navigation behaviour – quantified by the indices of overall navigation activity – is found to be positively associated with students' reading performance score in items with both single-source and multiple-source requirements. As shown in Figure 3.6, the quantity of navigation activities is more strongly correlated with reading performance in multiple-source items (r=0.75) than in single-source items (r=0.65), and show strong linear relationships (R^2=0.57) in multiple-source items and (R^2=0.42) in single-source items respectively. The reason could be that students usually execute longer navigation sequences in multiple-source items as is expected. In single-source items, students are not compulsory to execute a navigation sequence to complete the task unless they click on hyperlinks to activate the multiple-source in specific items[6]. The percentage of no-navigation behaviour in multiple-source items has a strong negative correlation (r=-0.65) with students' reading performance score (Table 3.5).

Students' navigation quantity and reading performance are also shown to be positively associated within each country, though not as strong as the system-level correlation. Like the results of the system-level correlation, the association between navigation length and reading performance is stronger in multiple-source than single-source items. No significant correlation was found between the number of page visits in single-source items and reading performance in Belgium, Denmark, Latvia, Luxembourg, Switzerland, and Turkey. No significant correlation was found in Spain in both single- and multiple-source items, which could be evidence of the low engagement issues that have been identified in this country[8] (Table B.3.2). The correlation between number of pages visited and reading performance value within each country is reported in Table B.3.2.

Figure 3.6 **Overall navigation quantity in single- and multiple- source items**



Note: Each dot represents the mean values of a country/economy.

Source: OECD, PISA 2018 Database, Tables B.2.1a and B.3.8.

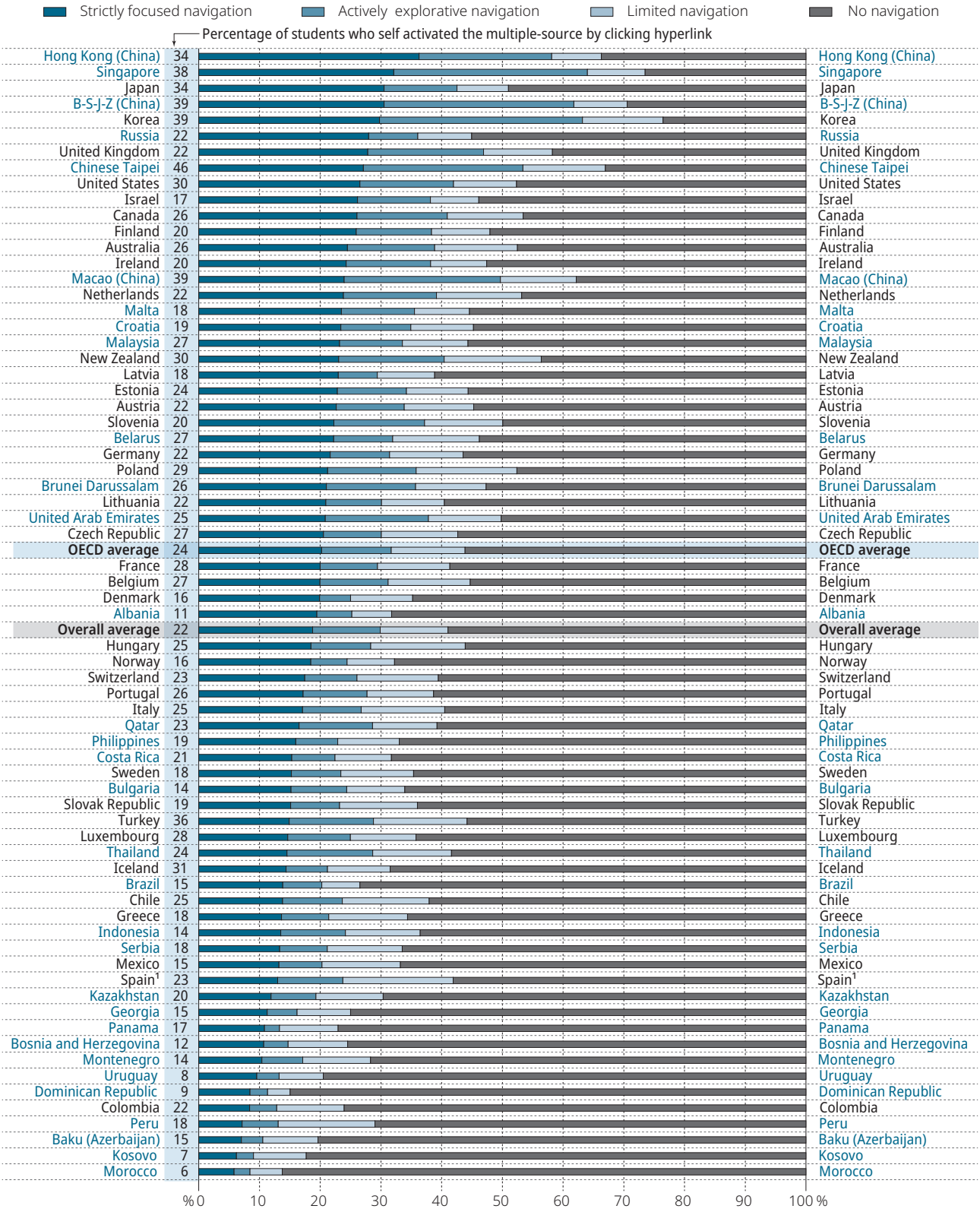
StatLink https://doi.org/10.1787/888934239553

Task-oriented navigation activity

The second analysis characterises students' navigation quality and strategies. Based on their navigation behaviour in the Rapa Nui unit, students were divided into four categories: (1) No navigation: students who had navigation activities neither in single- nor multiple- source items; (2) Limited navigation: students who navigated merely in single-source items but not through multiple-source items; (3) Strictly focused navigation: students who strictly followed the item instruction to actively navigate in multiple-source items only and limit navigation in single-source items, and (4) Actively explorative navigation: students who actively navigated in both single- and multiple-source items. Annex C3 provides a consistency study that examines whether students took the same strategies or showed similar patterns in more than one multiple-source unit.

Figure 3.7 presents the task-oriented navigation according to the four behaviour categories defined above. On average across OECD countries, approximately one out of five students took the strategy of strictly focused navigation when solving the Rapa Nui unit. As shown in Table 3.5, the percentage of students in this navigation group shows the highest correlation with the reading performance score (r=0.73 across all participating countries and r=0.69 among OECD countries). On average, more than 27% of students in B-S-J-Z (China), Hong Kong (China), Japan, Korea, Russia, Singapore, Chinese Taipei and the United Kingdom were in the strictly-focused group (Table B.3.9). These students tended to be the most selective in their dynamic navigation in carefully selecting the pages that were relevant to the tasks and limiting irrelevant page visits.

Figure 3.7 **Task-oriented navigation activities**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Note: This figure shows the average rank of students in the international comparison of students taking the same test unit of Rapa Nui.

Countries and economies are ranked in descending order of the percentage of students in strictly focused navigation group.

Source: OECD, PISA 2018 Database, Table B.3.9.

StatLink https://doi.org/10.1787/888934239572

Table 3.5 **Correlations between percentage of students in navigation behaviours groups and performance score**

	Strictly focused navigation		Actively explorative navigation		Limited navigation		No navigation	
	Corr.	S.E.	Corr.	S.E.	Corr.	S.E.	Corr.	S.E.
OECD average	0.69	(0.12)	0.43	(0.09)	-0.28	(0.09)	-0.32	(0.14)
Overall average	0.73	(0.09)	0.59	(0.09)	0.17	(0.09)	-0.65	(0.15)

Source: OECD, PISA 2018 Database.

More than 15% of students were also found in the actively explorative navigation group in East Asian countries and economies as well as the Netherlands, New Zealand, the United Arab Emirates, the United Kingdom and the United States (Table B.3.9). These students tended to actively explore the whole reading unit in both items with single- and multiple-source requirements. They checked different accessible pages beyond the required pages to complete the task.

Limited navigation behaviours were widely found in most countries and economies. More than 15% of students in this group were found in, Hungary, New Zealand, Peru, Poland, Spain and Turkey. These students tended to navigate in single-source items though they were not restricted to them and did not show further navigation behaviours in multiple-source items. It is noted that New Zealand had a high proportion of both the actively explorative navigation and limited navigation groups but a relatively low proportion (44%) in the no navigation group. This is 15 percentage points lower than the overall average (59%) across 70 countries. Students in New Zealand showed a wide variety of navigation patterns (Table B.3.9).

Over 50% of students did not execute any navigation in the Rapa Nui reading unit, suggesting unfamiliarity with the dynamic text environments or possibly fatigue or low motivation in the last unit of the test. More than 75% of students in Baku (Azerbaijan), Bosnia and Herzegovina, Colombia, the Dominican Republic, Kosovo, Morocco, Panama and Uruguay showed no navigation. Among these students, 92% of students responded to at least one item in the Rapa Nui unit, and nearly half responded to all seven items, though did not navigate to any other pages beyond the initial one (Table B.3.3). This phenomenon has been observed more often in countries with lower proficiency level.

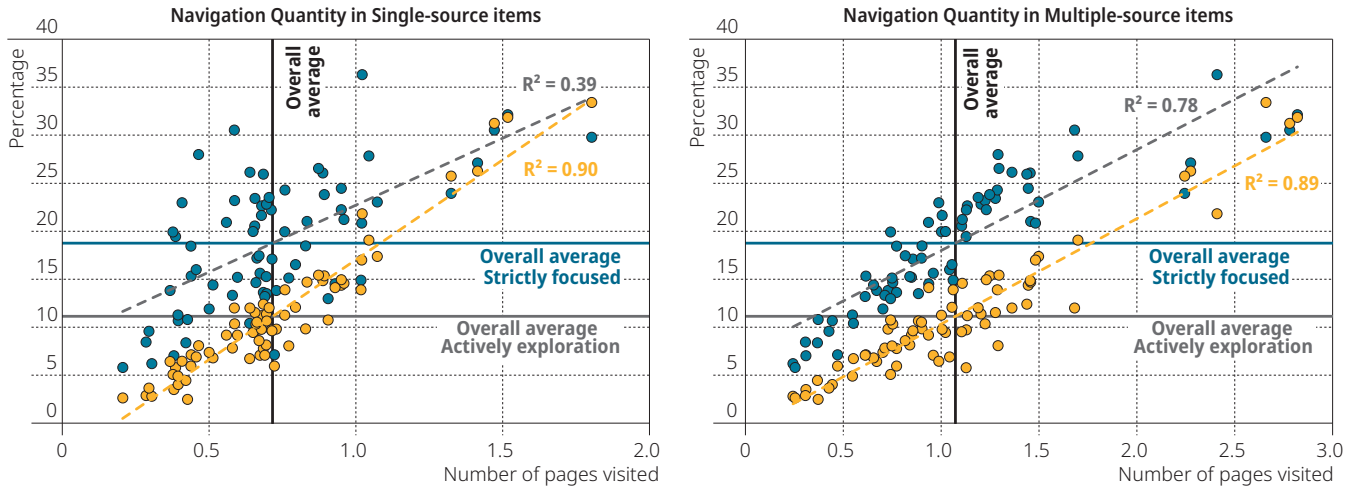
It is noted that both the strictly-focused and actively explorative navigation groups presented efficient reading processes and are associated with higher reading performance compared with the limited-navigation and no-navigation groups. This finding also holds for most countries except Panama where students in the limited-navigation group showed slightly higher average reading performance score than both the actively explorative and strictly-focused groups by 10 and 4 score points, respectively; however this finding was not statistically significant. In B-S-J-Z (China) and Singapore, the proportion of students in the actively explorative navigation group and the strictly-focused navigation group were both as high as more than 30%. In contrast, Denmark, Japan, Latvia, and Russia show a higher proportion of students in the strictly-focused navigation group (approximately 15 percentage-points more) than students in the actively explorative navigation group (Figure 3.7 and Table B.3.9).

As the scatter plot in Figure 3.8 shows, the navigation quantity and proportion of students who employed effective navigation strategies (i.e., actively explorative and strictly focused) showed positive associations in multiple-source items. A positive correlation was also shown in the actively explorative group against the number of pages visited in single-source items while no significant association was found in the strictly-focused group.

Approximately 30% of students in Japan and Russia were categorised in the strictly focused group while nearly 10% of students belonged to the actively explorative navigation or limited-navigation groups in these two countries. It suggests that students in these two countries did not navigate very much but focused on navigation that was highly related to the tasks. In contrast, B-S-J-Z (China) and Korea showed the highest quantity of page visits. The greatest share of students in these two countries belonged to the actively explorative navigation group, suggesting that these students' navigation sequences were long but not necessary for the task requirements (Tables B.3.2 and B.3.9).

A high positive correlation was found between the percentage of students in the two efficient navigation categories (i.e., strictly-focused navigation and actively explorative navigation) by country/economy and the country average performance score. The percentage of students without any navigation activities showed a strong negative correlation with the country reading score. The correlation between the percentage of students in the limited-navigation group and country reading score was a weak positive one across all countries and economies but a negative correlation across OECD countries. The possible reason for this inconsistency could be a mixture of non-responses in this group (Table 3.5).

Figure 3.8 **Correlations between navigation quantity and navigation behaviour groups**



Notes: Each blue dot represents the intersection between the mean number of pages visited of a country/economy and percentage of students in strictly focused navigation group.

Each yellow dot represents the intersection between the mean number of pages visited of a country/economy and percentage of students in actively explorative navigation group.

Source: OECD, PISA 2018 Database, Tables B.3.2 and B.3.9.

StatLink https://doi.org/10.1787/888934239591

Box 3.2. **Which students are likely to activate the multiple-source environment on their own?**

In some reading units like Rapa Nui, students can activate the multiple-source environment earlier than the default design. If students read through the first page (shown in item 1) by scrolling down to the bottom of the passage, two hyperlinks are clickable that activate the new tabbed pages. Students who are more likely to make this self-activation would need to satisfy at least two conditions: (1) highly motivated to scroll down to the end of the passage; (2) enough computer skills to understand the hyperlinks are clickable.

Almost a quarter of students across the 70 countries and economies activated the multiple-source by clicking the hyperlinks before it was activated by default. The percentage of students who activated the multiple-source is reported in Figure 3.7 (shown in this figure next to country names). A high positive correlation of 0.82 is derived between the percentage of students who activated the multiple-source environment and the percentage of students who exerted navigations in single-source items.

Students who have higher reading skills, especially those with higher evaluation and reflection subskills, are more likely to use this function. Students who self-activated both pages (Book Review and Science News) have on average 40 more score points in reading than students who never used this function (Table B.3.8).

Around 28% of boys activated the multiple-source environments by clicking the hyperlinks, approximately 9 percentage points higher than girls (Table B.3.8).

Time spent on initial pages and interval between navigation

Navigation that is too quick or too slow does not help efficient and effective reading. How long students spend on the default initial page may impact their strategies in navigation. Too short of a time in transition between pages suggests insufficient time spent reading the visited page, signalling quick skim, aimless exploration, low engagement in navigation, and possibly poor understanding of the reading goal. A good navigator is expected to spend at least a certain amount of time (e.g., three seconds) on each page for it to be considered effective navigation, that is, to spend the time required to grasp the information they are looking for rather than simply transitioning back and forth. They are also expected to spend sufficient time on the default initial pages in single-source items and not 100% of time merely on the initial page in multiple-source items.

The first measurement focuses on how much time students spent on the default initial page (before any navigation is executed). This variable describes how much time students needed to comprehend the reading task and form the reading goal. Students' concentration on the initial page would help them decide whether further navigation was needed and where to navigate.

Figure 3.9 presents the average time students spent on the default initial page by countries and economies on single-source and multiple-source items in the Rapa Nui unit. Students on average spent more time reading the initial page in single-source items than multiple-source items. The median time spent on the initial page in items with single-source requirements ranges from 46 to 89 seconds across countries/economies with an overall average of 64 seconds and OECD average of 65 seconds. Comparatively, the median duration of time students spent on the initial pages in items with multiple-source requirements is 53 seconds – around 10 seconds shorter than in the single-source items (Table B.3.4).

Interestingly, students in countries with high reading proficiency levels spent a moderate amount of time reading the initial page in both single- and multiple-source items. In contrast, students in countries with low reading proficiency levels spent either a very long or very short time on the default initial pages.

A moderately high correlation (r=0.55) was also found between time spent on the initial page in single- and multiple- source items within country-level[7]. However, similar to the system-level analysis, no linear associations were found between time spent on the initial page and students' reading performance within countries. The median time spent on initial pages within each country is reported in Table B.3.4.

Figure 3.9 **Median time spent on initial reading pages in items with single- and/or multiple- source requirements by countries/economies**

Note: The correspondence of the country codes are found in the reader's guide

1. For the comparability of Spain's data see Readers' guide of this report or PISA 2018 Results (Volume I): What Students Know and Can Do, Annex A9.

Source: OECD, PISA 2018 Database, Table B.3.4.

StatLink https://doi.org/10.1787/888934239610

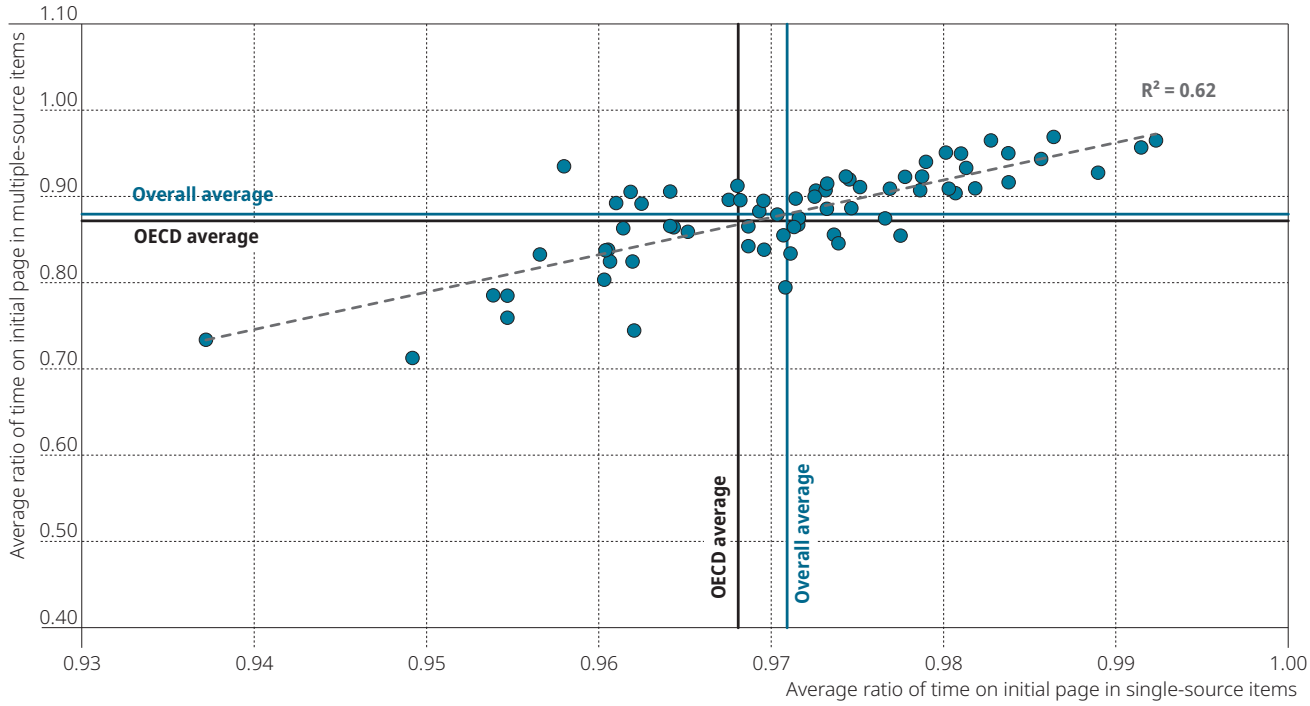
The second time measurement is the ratio of time spent on the initial page over the students' reading process in each item throughout the Rapa Nui unit. A good navigator is expected to spend sufficient time reading the default initial page in items with single-source requirements but spend less time on the initial page in items with multiple-source requirements and allocate time to other related pages in order to collect information in a comprehensive way.

Figure 3.10 presents the countries' mean ratio of time spent on the initial reading page in items with single- and multiple-source requirements. On average, students spent approximately 97% of their total response time on initial page in items with single-source requirements. This percentage goes down to 88% in items with multiple-source requirements (Table B.3.5). The ratio of time spent on the initial reading page in single- and multiple-source items is positively correlated on the country level (r=0.79), with strong linear relationship (R^2=0.62).

A negative correlation was found between the mean reading performance and average percentage of time spent on the initial reading page in single- and multiple-source items by country/economies (-0.66 and -0.75 respectively) as shown in Figure 3.11. It suggests that, on average, the higher the students' reading score, the lower ratio of time they were likely to spend on the initial reading page, thus allocating a higher ratio of time to explore other pages beyond the initial pages. Students in countries with a higher reading performance such as B-S-J-Z (China), Hong Kong (China), Japan, Korea, Macao (China), Singapore and Chinese Taipei spent, on average, less than 80% of the total time on the initial pages in multiple-source items while students with a lower reading performance spent over 90% of the total time on the initial pages (Table B.3.5).

The system-level correlation is also supported by the correlation results on the country-level though is much weaker than the system-level. A stronger negative correlation was found between reading performance and the ratio of time spent on the initial pages in multiple-source items than in single-source items. A higher correlation (lower than -0.35) in multiple-source was highlighted in Brunei Darussalam, the Dominican Republic, Indonesia, Qatar and the United Arab Emirates, suggesting this indicator is more predictable of students' performance scores in these countries. The average ratio of time on the initial pages and the correlation between single- and multiple-source items and average performance in reading within each country is reported in Table B.3.5.

Figure 3.10 **Average ratio of time spent on initial reading page with single- and/or multiple- source requirements by countries/economies**

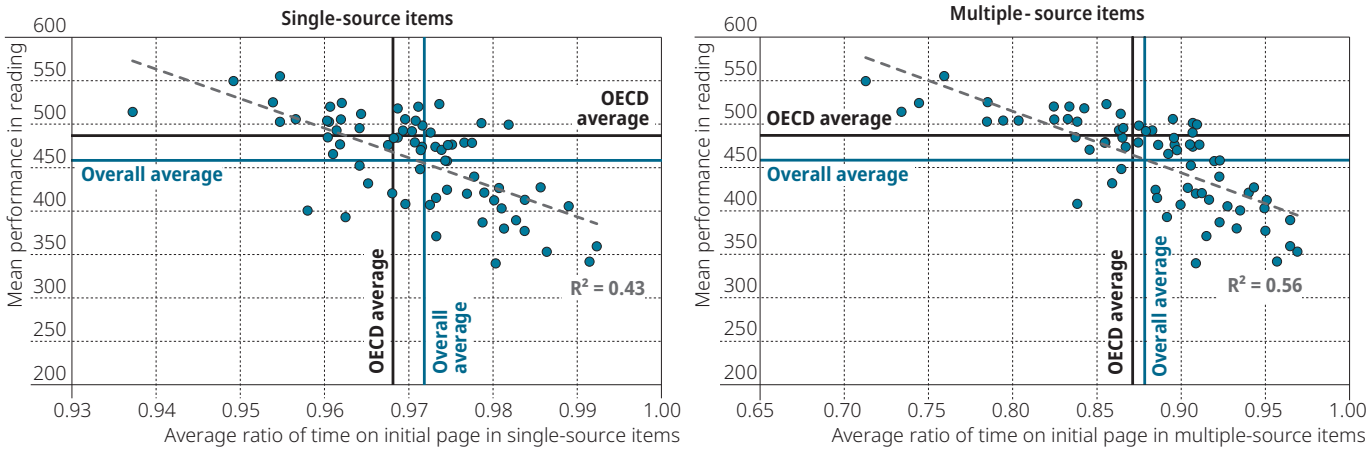


Notes: Each dot represents the mean values of a country/economy.
The average ratio of time indicates the proportion of time that students spent on reading the default initial page throughout the entire process in solving the tasks.

Source: OECD, PISA 2018 Database, Table B.3.5.

StatLink https://doi.org/10.1787/888934239629

Figure 3.11 **Association between reading performance and average ratio of time spent on initial reading page with single- and/or multiple- source requirements by countries/economies**



Notes: Each dot represents the mean values of a country/economy.

The average ratio of time indicates the proportion of time that students spent on reading the default initial page throughout the entire process in solving the tasks.

Source: OECD, PISA 2018 Database, Tables B.2.1a and B.3.5.

StatLink https://doi.org/10.1787/888934239648

In addition to the time spent on the initial pages, the time interval between each navigation was computed to describe students' behaviour during the transition and examine whether the reading on visited page was effective or not. A very quick switch between pages does not guarantee enough time for reading. Fast back-and-forth behaviour may also suggest students' skimming strategy (i.e., quick scanning of a page to spot key information), which is actively taught in some countries (e.g., Germany) or a possible loss of the reading goal in the process.

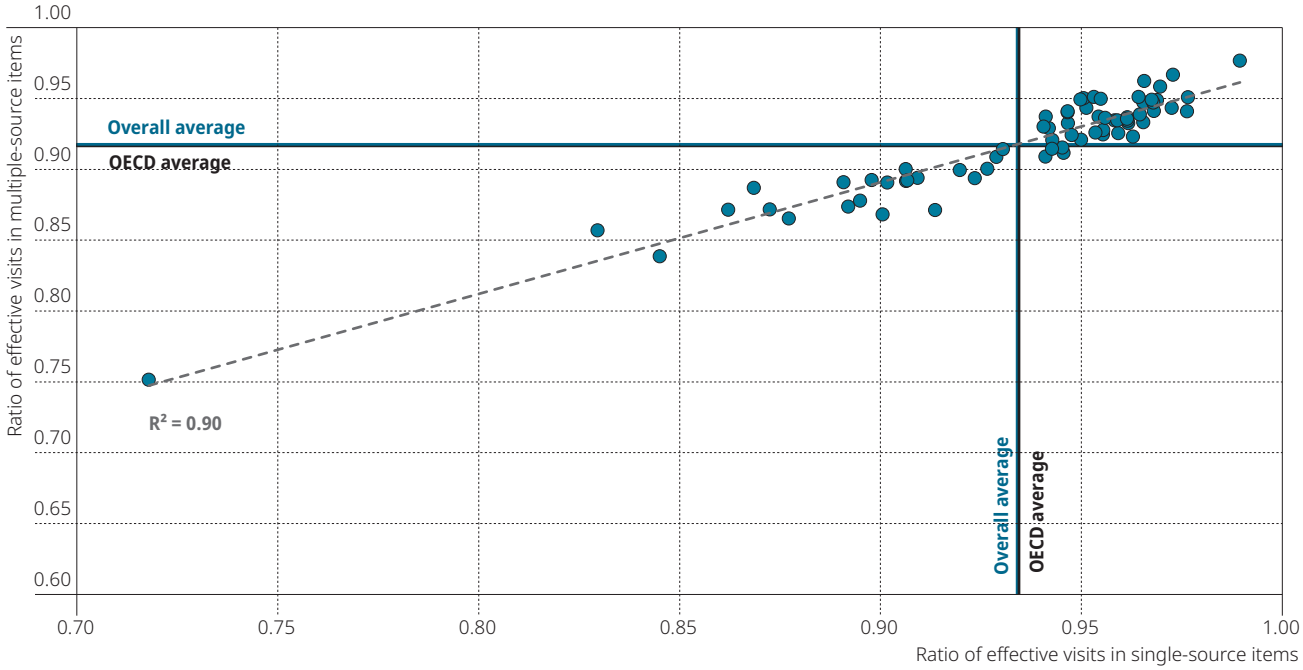
The third time-related measurement is the ratio between effective navigation (at least three seconds between two adjacent transitions defined in the current study) and the total number of transitions. Quick switches between pages may cause ineffective navigation, which were more often observed in countries with a lower reading performance, suggesting a possible loss of reading goals, lack of motivation, and difficulties in understanding the instructions or unfamiliarity with page locations and a multiple-source environment.

Figure 3.12 presents the countries' mean ratio of effective visits in dynamic navigation by single- and multiple-source items. The general average ratio across OECD countries is 0.93 and 0.92 in single- and multiple-source items, respectively. It suggests that most students navigated effectively in reading tasks but that 7% and 8% of navigation in single- and multiple-source items, respectively, were too quick to be considered effective transitions. Students showed quick switches between pages slightly more often in multiple-source items than single-source items. Students in Colombia, the Dominican Republic, and Sweden show a relatively lower ratio of effective navigation (mean ratio lower than 0.86), suggesting that students in these countries quickly switched between pages more often than their peers from other countries. The ratio of effective page transitions in single- and multiple-source items within each country is reported in Table B.3.6.

Box 3.3. **Do students use COPY/PASTE to solve the constructed-response items?**

To solve the constructed-response items, students typically type in their responses. Using the copy-and-paste functions from the reading passage could have helped students save time typing. Two items (item 2 and item 7) in the Rapa Nui unit follow the constructed-response item type. Only around 10% students, on average, executed COPY/PASTE actions in the two constructed-response items. Students in Hong Kong (China) and Macao (China) used copy and paste approximately five times more often than their peers in other countries. Students who used the copy and paste functions on average obtained 28 score points higher than students who never used this function. However, Norway show an opposite pattern, where students who used COPY/PASTE function on average got a slightly lower score, while in Belgium, Denmark, Greece, Iceland, Korea, Sweden and Turkey, no statifistcal differences were shown (Table B.3.8). Boys tended to use the copy-and-paste function more often than girls, which may reflect that boys are probably more "tech-savvy" and are more familiar with computer-based tools than girls (e.g. He, Borgonovi and Paccagnella, 2019[8]; Liao, He and Jiao, 2020[24]).

Figure 3.12 **Average ratio of effective visits in dynamic navigation with single- and/or multiple- source requirements by countries/economies**



Source: OECD, PISA 2018 Database, Table B.3.6.

StatLink https://doi.org/10.1787/888934239667

THE RELATIONSHIP BETWEEN READING PERFORMANCE AND NAVIGATION BEHAVIOUR

The previous section examines the system-level relationships between navigation indicators and country performance. This section further explores the relationships between navigation behaviours and student proficiency levels across countries and economies.

Association between reading performance and quantity and quality of navigation

Table 3.6 presents the association between quantity of navigation and reading proficiency levels. With the increasing proficiency level, the number of visited pages grows. Students in Level 6, the highest proficiency level in reading, visited an average of 1.26 pages in single-source items, which is around three times that of students in Level 1a. The gap is even bigger in multiple-source items where students in Level 6 visited an average of 2.45 pages, which is seven times higher than students in Level 1a.

Not only does the quantity but also the quality of navigation shows strong association with students' reading performance. Consistently with the analysis above, the four navigation behaviour groups – no navigation, limited navigation, active explorative navigation, and strictly focused navigation – are mapped with the average reading performance score.

Figure 3.13 exhibits the distribution of navigation behaviour categories by reading proficiency levels. The no-navigation category takes the biggest proportion in the lower levels of reading proficiency (Level 1c and Below Level 1c). Conversely, the no-navigation category only takes around 10% in the highest proficiency level. With the increase in reading proficiency level, the proportion of students in the actively explorative navigation and strictly-focused navigation groups becomes larger. The active exploration group takes the biggest proportion (over 40%) in the highest proficiency level (Level 6).

Table 3.6 **Number of pages visited, by reading proficiency levels**

Overall average

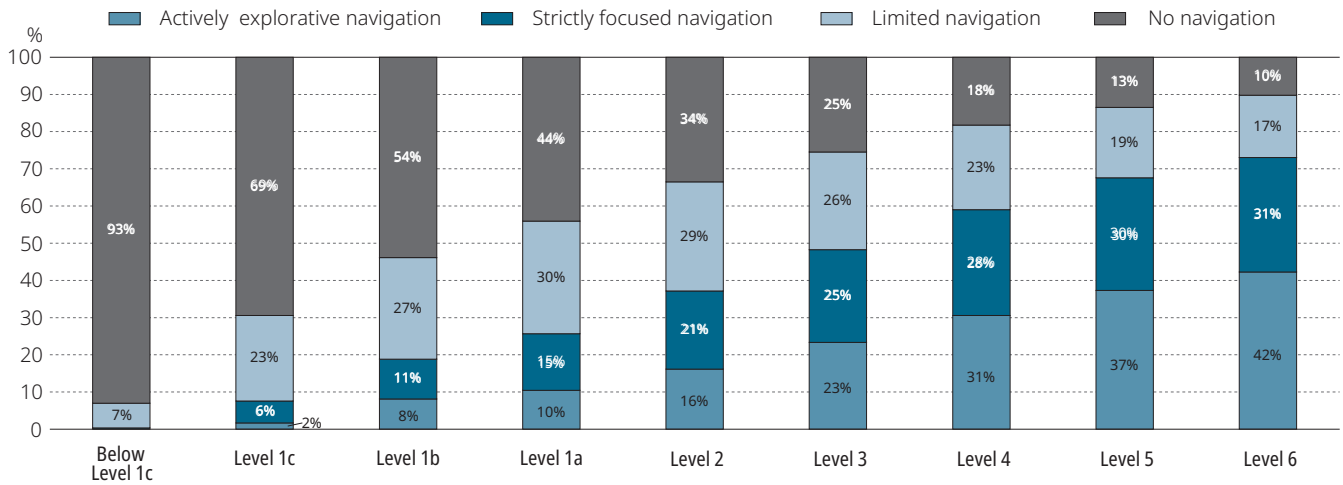
Reading proficiency level[1]	N	Number of pages visited				Number of total pages visited	
		Single-source		Multiple-source			
		Mean	S.E.	Mean	S.E.	Mean	S.E.
Level 6	1966	1.26	(0.16)	2.45	(0.17)	3.70	(0.23)
Level 5	9657	1.09	(0.06)	1.98	(0.10)	3.07	(0.11)
Level 4	21316	0.09	(0.03)	1.48	(0.04)	2.39	(0.05)
Level 3	22656	0.68	(0.02)	0.99	(0.02)	1.67	(0.03)
Level 2	14538	0.53	(0.02)	0.61	(0.02)	1.14	(0.03)
Level 1a	5728	0.44	(0.03)	0.35	(0.03)	0.79	(0.04)
Level 1b	1353	0.34	(0.06)	0.18	(0.04)	0.52	(0.08)
Level 1c	198	0.39	(0.12)	0.10	(0.06)	0.49	(0.13)
Below Level 1c	10	0.11	(0.05)	0.02	(0.06)	0.13	(0.07)
OECD average		**0.76**	**(0.01)**	**1.08**	**(0.01)**	**1.84**	**(0.02)**
Overall average		**0.72**	**(0.01)**	**1.07**	**(0.01)**	**1.79**	**(0.01)**

1. Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

Source: OECD, PISA 2018 Database.

Figure 3.13 **Distribution of navigation behaviours, by reading proficiency levels**

Overall average



Note: Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

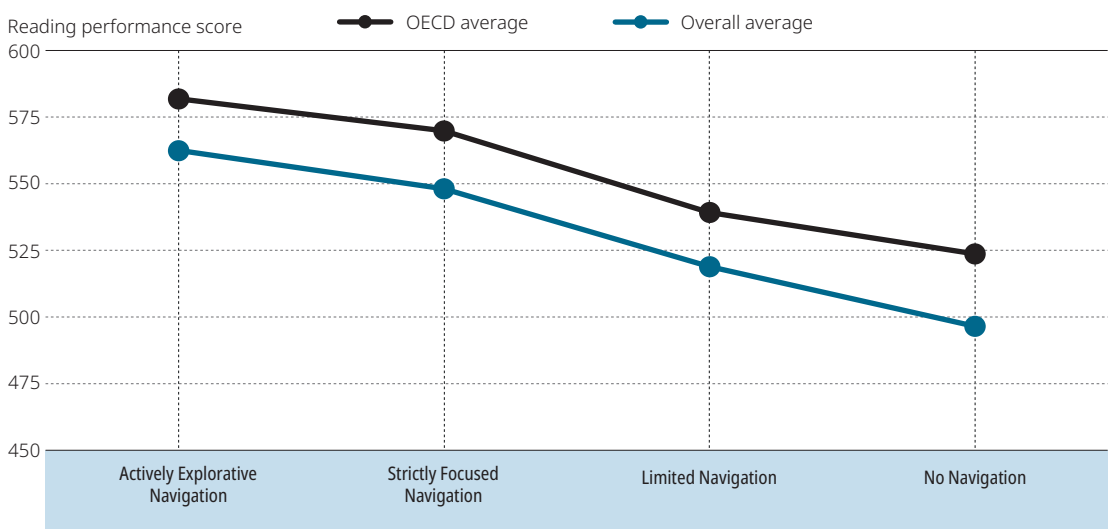
Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239686

Figure 3.14 demonstrates that the overall average reading performance significantly varies according to navigation behaviour with representative lines by OECD average and overall average. A consistent pattern of decreasing performance score with the reduction of activeness in navigation was found in most countries and economies (Table B.3.9). A substantial 66 score-point difference was found between students who actively navigated among pages and those who did not execute navigation activities. Among the sample in this study, 11% of students who belonged to the actively explorative navigation group had the highest average performance score in reading in digital environments (Table B.3.9). These students actively navigated through both single- and multiple-source items. Their navigation in items with single-source requirements was beyond the required number of pages to complete the reading task. Not only was the required page read but other accessible pages as well. Such navigation did not seem relevant to the current reading task but may have helped students get a general overview of the whole reading unit in advance and prepare them for the collection of information that may be required later in the items with multiple-source requirements (in the dynamic-text unit, the items with single-source requirements were always located before the items with multiple-source requirements). Their propensity for evaluating further reading pages beyond the current task was reflected in a higher success rate in multiple-source items that were located later within the unit. This may also help explain the reason for the average higher reading score in the active explorative group than the strictly-focused group whose navigation patterns strictly followed task instructions.

The pages that may not have been immediately relevant to a specific task could be regarded as potentially relevant to the whole unit. For instance, in the Rapa Nui item, the item specified "Refer to the Professor's Blog", making the "Professor's Blog" the direct relevant page. However, the other two pages in this unit were still highly linked to the content.

Figure 3.14 **Association between reading performance and navigation behaviour**



Source: OECD, PISA 2018 Database, Table B.3.9.

StatLink https://doi.org/10.1787/888934239705

Over one-fifth of students belonged to the strictly-focused navigation group that ranks in second place in the average performance score. Students in this group strictly followed the task instructions by executing the navigation merely in multiple-source items while focusing on the required page only in the single-source items. The students in this group did not take the explorative efforts to check other accessible pages even though they had the chance to do so. This suggests that the students were probably not familiar with the dynamic-text environment, lacked motivation for any further exploration, misunderstood the task or did not know how the platform worked.

A large difference was observed in the reading score of the limited-navigation group compared to the previous two groups. Students in this group only made optional navigations in single-source items but limited navigation in multiple-source items. Even though the navigation in this group was not effective enough to help the students locate the required information, their willingness to make some exploration was still helpful in completing the reading task. Compared to the group without any navigation activity, which was also the group with the lowest reading performance score, some exploration and navigation seemed better than nothing.

Box 3.4. **How do students distinguish between "Facts" and "Opinions"?**

Question 3 of the unit Rapa Nui is a typical Level 5 task, asking students to distinguish between facts and opinions that are expressed in complex and abstract statements. The ability to distinguish fact from opinion is part of the process "reflecting on content and form". In this item, students must classify five distinct statements taken from a review of the book Collapse as either "fact" or "opinion". Only students who classified all five statements correctly were given full credit; partial credit was given to students who classified four out of five statements correctly (this corresponds to Level 3 proficiency). The most difficult statement in this list is the first statement ("In the book, the author describes several civilisations that collapsed because of the choices they made and their impact on the environment"). It presents a fact (what the book is about), but some students, particularly those who are proficient below Level 5, may have misclassified this as "opinion" based on the embedded clause, which summarises the book author's theory (the civilisations "collapsed because of the choices they made and their impact on the environment"). (see Box 2.2 in Chapter 2).

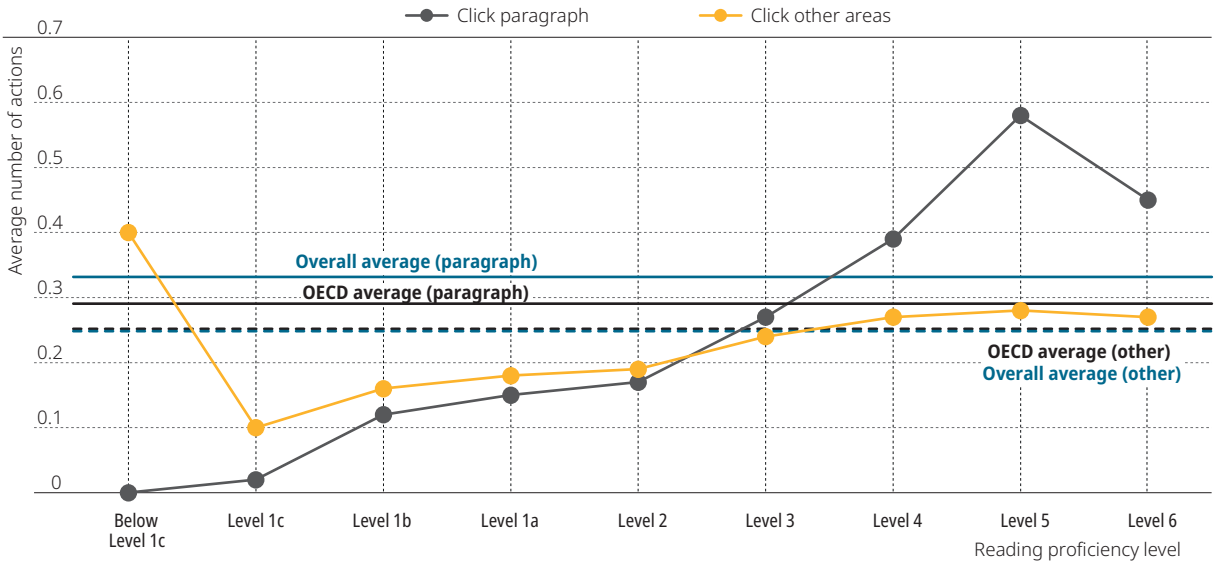
In test-takers' behaviour analysis, it was found that 16% of the students who responded to the Rapa Nui unit executed clicks on the sentences in paragraphs, images or other areas when reading through the passage and/or judging whether the statement was fact or opinion. For instance, students clicked on "pg2p2" (the second sentence in paragraph 2) to match the third statement on the list. Interestingly, this group of students was more likely to achieve higher scores than their peers who randomly clicked on the interface or made no clicks.

Also notable was that students with higher reading proficiency level tended to click on the sentences along the paragraphs more frequently. However, random clicks on other areas do not show a significant association with the proficiency level (see Figure 3.15).

The action of scanning sentences in the paragraph provides evidence of students' high engagement in solving the task.

Figure 3.15 **Association between reading performance and click actions**

Number of action clicks by reading proficiency levels, overall average



Note: Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239762

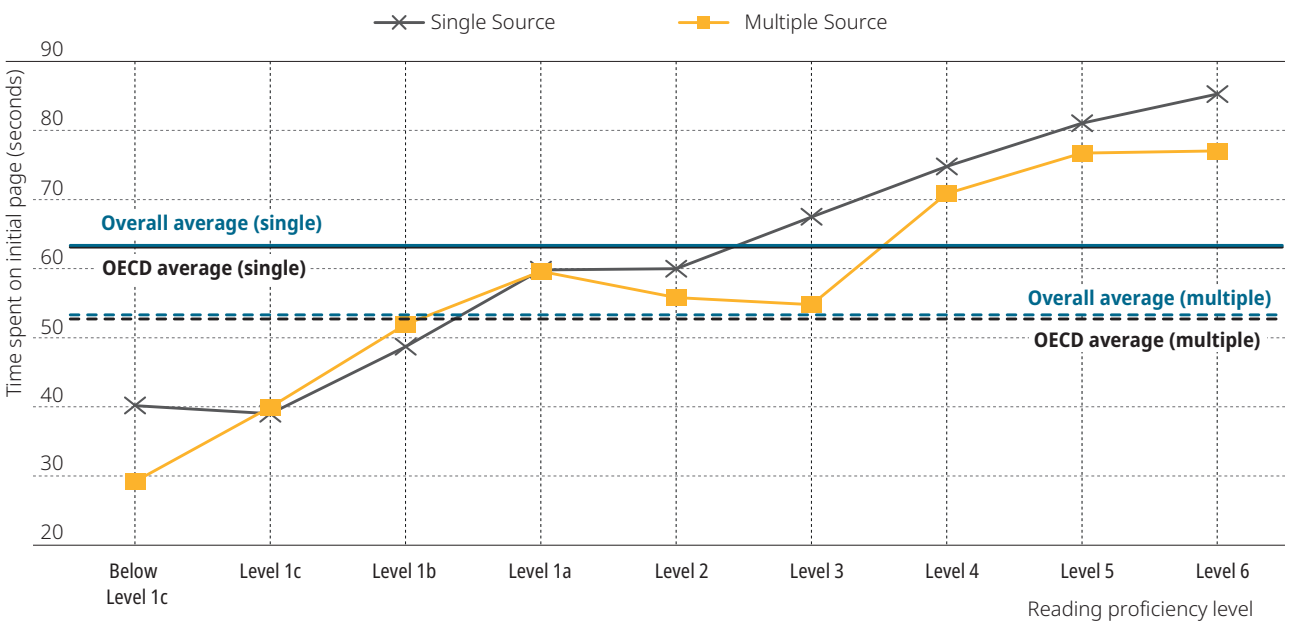
Association between reading performance and time spent in navigation

Figure 3.16 demonstrates the association between time spent on the default initial page and students' reading proficiency level. The average time spent on the initial page gradually rose with increasing reading proficiency level in both single-source and multiple-source items. Students in the lowest proficiency levels spent an average of 40 seconds on the initial pages in both single- and multiple-source items. The time spent on the initial page increased to over 75 seconds in the highest reading proficiency levels in both single- and multiple-source items.

Figure 3.17 illustrates the association between students' reading proficiency level and the ratio of time spent on the default initial page. The two curves – the ratio of time spent on the initial page in single-source and multiple-source items – both display a negative correlation with reading performance. That is, as reading proficiency level increased, students spent a smaller ratio of time on the initial page during the whole reading navigation process. This tendency was more obvious in the multiple-source items. Students in Level 1a or below spent almost all the time reading the default initial page while students in Level 6 spent only two-thirds of their time on the initial page but one-third of time navigating to other pages. Because of much less navigation expected in the single-source items, the ratio of time allocated to the initial page displays a marginal 5 percentage-point drop from the lowest proficiency level to the highest proficiency level.

Figure 3.16 **Association between reading performance and time spent on the initial page**

Overall average

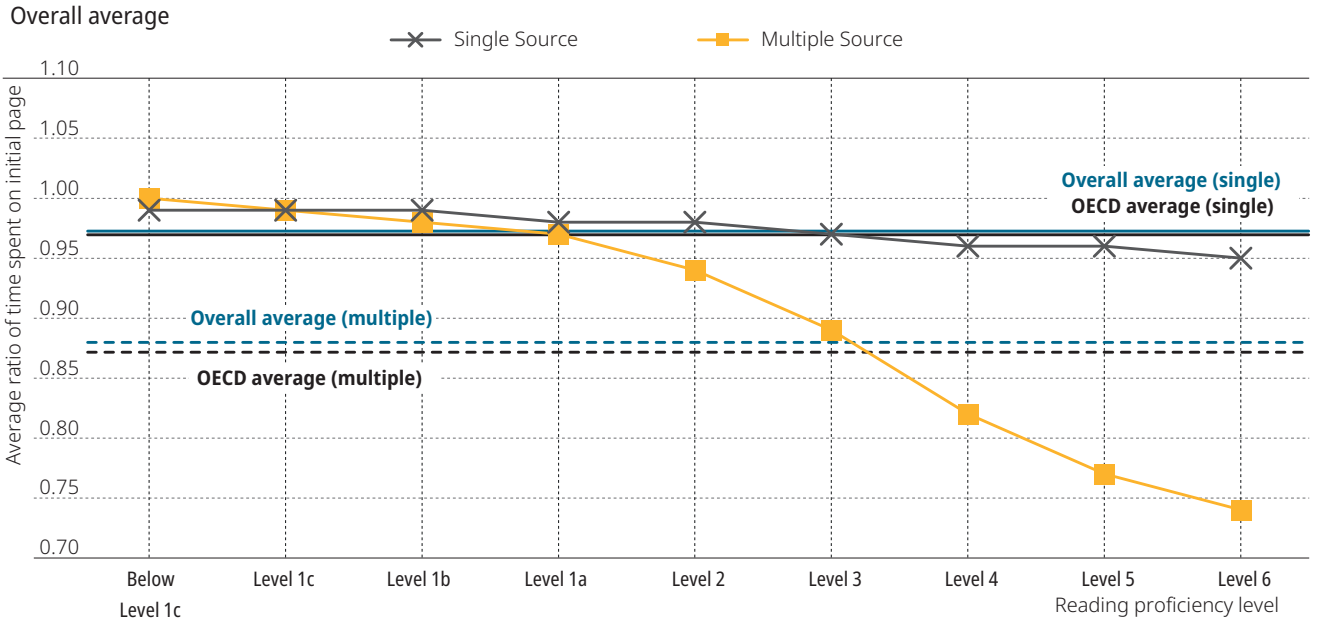


Note: Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239724

Figure 3.17 **Association between reading performance and average ratio of time spent on the initial page during the reading process**



Notes: The average ratio of time indicates the proportion of time that students spent on reading the default initial page throughout the entire process in solving the tasks.

Reading proficiency levels are defined based on reading performance plausible values: Level 6: Above 698.32 score points; Level 5: From 625.61 to less than 698.32 score points; Level 4: From 552.89 to less than 625.61 score points; Level 3: From 480.18 to less than 552.89 score points; Level 2: From 407.47 to less than 480.18 score points; Level 1a: From 334.75 to less than 407.47 score points; Level 1b: From 262.04 to less than 334.75 score points; Level 1c: From 189.33 to less than 262.04 score points; Below Level 1c: Less than 189.33 score points. Refer to PISA 2018 Results (Volume I) - What Students Know and Can Do, Chapter 5.

Source: OECD, PISA 2018 Database.

StatLink https://doi.org/10.1787/888934239743

In summary, students' reading performance has a strong association with their navigation activities not only in terms of quantity and quality of navigation but time spent during navigation. The number of page visits in both single- and multiple-source items is positively correlated with reading performance. Students who actively navigated in both single- and multiple-source items obtained the highest reading score. Even though these students may have executed navigation activities that were beyond the required pages in the single-source items, active exploration helped them achieve a better overview of the whole reading task unit and locate and collect information in advance before the multiple-source items were activated. In addition, students in the highest reading proficiency levels, on average, did not quickly switch between pages. And, these students tended to allocate a smaller proportion of time to the initial page during the whole reading and navigation process; instead, reserving time for navigating to other pages.

Box 3.5. **How do students execute navigation and allocate time in an item with multiple-source requirement?**

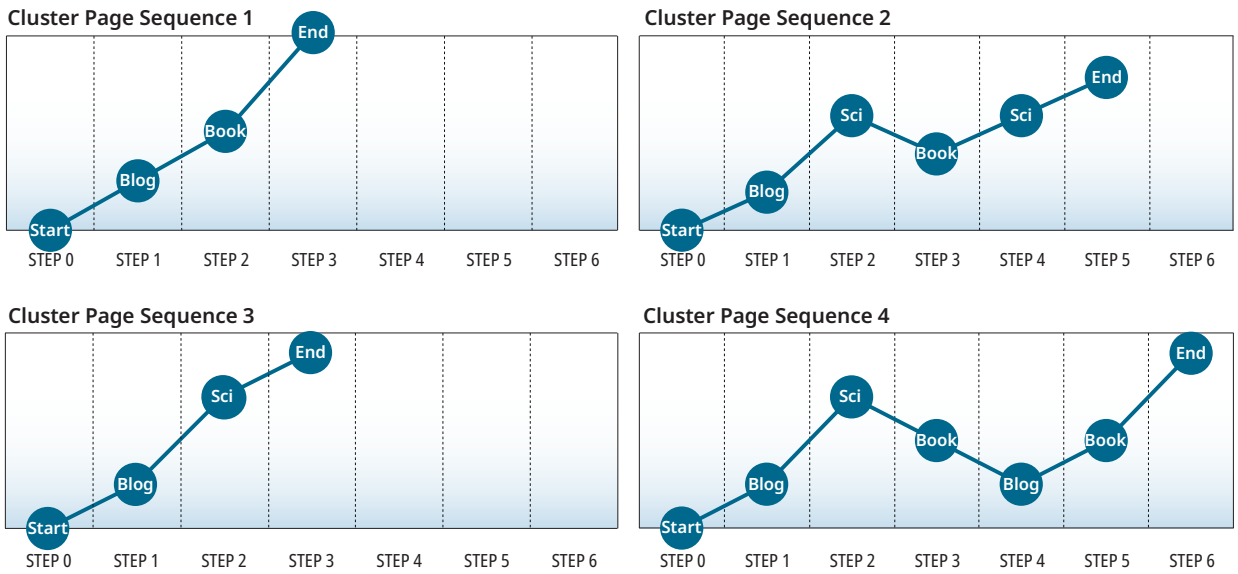
The data-driven investigation on sequence of page transitions and sequence of time spent on each transition provides insight into students' navigation strategy. Specifically, the pages that students visited, and the time spent on each page could be extracted on item-level and recorded in a sequence manner. This case study draws on sequence data from one multiple-source item (CR551Q11) in the Rapa Nui unit to illustrate how students' navigation strategies could be tracked in solving a multiple-source reading item (see Annex C1 for an illustration on how students spent their time and employed navigation activates across the Rapa Nui unit).

A sequence clustering analysis was conducted to identify students' typical strategies in navigation by two sections: first, clustering on navigation sequence (i.e., the sequence of page transitions) and second, clustering on navigation time sequence (i.e., the time of transition through each page). Basically, the distance between each pair of sequences was computed. The closer the distance, the more similar the sequences were. The sequences with high similarity were

categorised into homogenous groups (Tang et al., 2020[22]; Ulitzsch et al., 2021[25]; Dong and Pei, 2007[26]; He et al., forthcoming[27]). Details of the methodology of sequence mining used in this case study are provided in Annex C2.

A small subsample of 17 126 students who showed at least one navigation activity in the Rapa Nui question CR551Q11 were included in this study. In the first section, four typical navigation paths (page sequence cluster P1 to P4) employed in this item were derived (Figure 3.18).

Figure 3.18 **Cluster centroids of visiting page sequence in CR551Q11**



Notes: "Blog" indicates the blog page, "Book" indicates book review page, "Sci" indicates science news page.

X axis indicates the sequence of steps (e.g., starting from step 0 to step 6), and Y axis indicates the predefined page visit sequence (i.e., 1-start, 2-blog page, 3- book review page, 4-science news page, and 5-end).

How to read this chart (take Cluster Page Sequence 1 as an example): Students in Cluster Page Sequence 1 (P1) started the sequence at the first step and then transit to the book review page at the second step, the students only navigated to one page and ended the navigation at the third step.

Source: OECD, PISA 2018 Database.

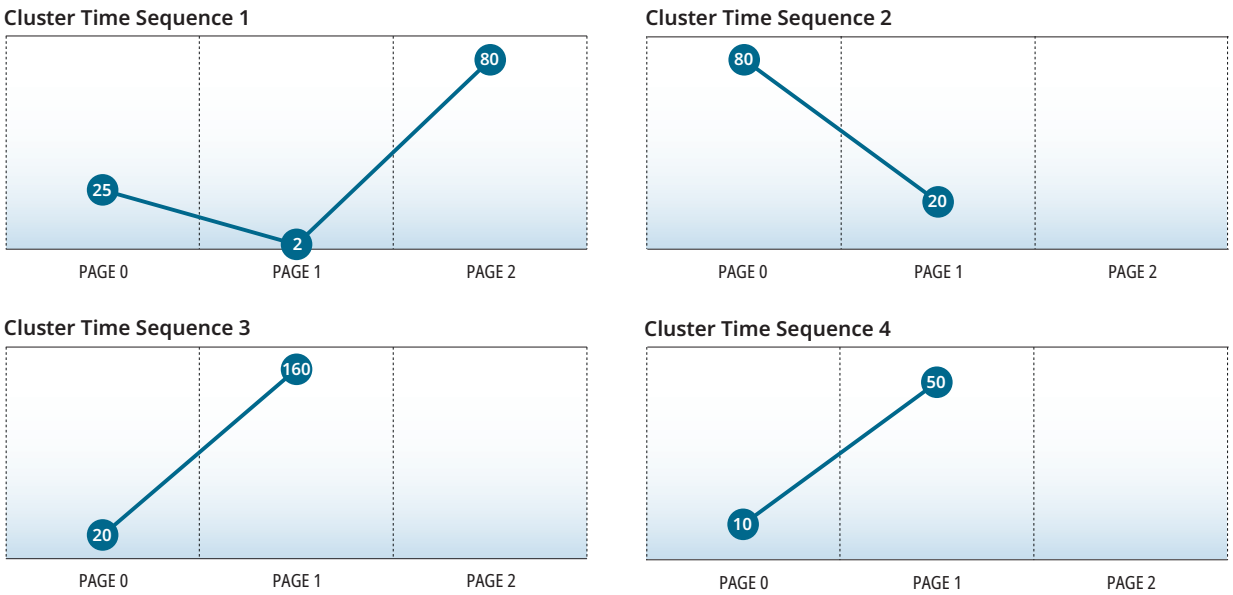
StatLink https://doi.org/10.1787/888934239781

- **P1**: Students started from the initial page – blog page, then navigated to book review page, and ended the navigation sequence at the third step.
- **P2**: Students started from the initial page – blog page, then navigated to the scientific news page, followed by a transition to the book review page, a back-and-forth navigation pattern shown on step 4 and ended the navigation at step 5.
- **P3**: Students started from the initial page – blog page, then navigated to the scientific news page, and ended the navigation sequence at the third step.
- **P4**: Students started from the initial page – blog page, then navigated to the scientific news page, and transitioned to the book review page and then to the blog page. After a revisit to the book review page at step 5, the students ended the navigation at step 6.

The students in P2 who adopted a multiple-page navigation strategy with a focus on the scientific news and book review pages got the highest average reading score (601 points). In contrast, students in P1 who only navigated to the book review page obtained the lowest reading score (575 points) (Table B.3.7).

Analogously, in the second section, four representative time allocation sequence patterns (time sequence cluster T1 to T4) were derived (Figure 3.19).

Figure 3.19 **Cluster centroids of transition time sequence in CR551Q11**



Note: The vertical axis indicates the time in seconds that students spent in navigation, while the horizontal axis indicates the transition steps. The first transition time is defined as the time interval between the item start and the first-time page click, that is, the staying time on the initial page.

How to read this chart: Students in Cluster Time Sequence 1 spent 25 seconds on the default initial page and made a very quick page switch with only 2 seconds during the second transition, then kept staying on the third page for a long time averagely 75 seconds until the end.

Source: OECD, PISA 2018 Database,

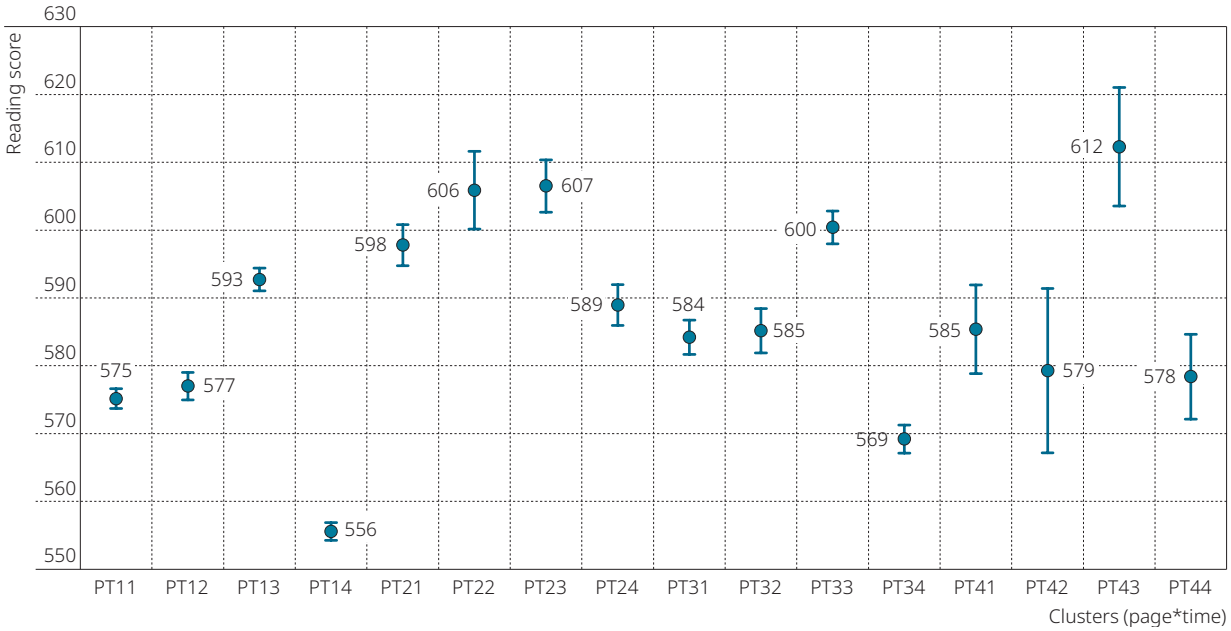
StatLink https://doi.org/10.1787/888934239800

- **T1**: Students spent a short time (25 seconds on average) on the initial page and made a quick page transition to the second page, then remained on the third page for a long time (80 seconds on average) until the end.
- **T2**: Students spent a long time (80 seconds on average) on the initial page but a short time on the second page (20 seconds on average) until the end.
- **T3**: Students started with a short time on the initial page (20 seconds on average), then transited to the second page and remained there for a long time (160 seconds on average) until the end.
- **T4**: Students started with a short time on the initial page (10 seconds on average), then transited to the second time where they stayed a short time (50 seconds on average) until the end.

The students in T3 who stayed for a long time on the transited page got the highest average reading score (599 points) while students in T4 who stayed a short time on the transited page after a quick switch from the initial page got the lowest reading score (565 points) (Table B.3.7).

As shown in Figure 3.20, the joint behaviour patterns in page sequence and time allocation were further explored. Cluster PT14 – that is, a combination of P1 and T4, a short time on both initial page and transited page as well as short navigation path, resulted in the lowest reading performance score. In contrast, Clusters PT43, namely, the pattern of a long length of time spent on the transited page and multiple navigations across different pages, showed the highest reading performance score. A substantial reading performance gap (55 score points) was found between these two groups. This finding stresses the importance of examining students' strategies in the reading and problem-solving process. Such an investigation is also helpful for teachers to understand what strategies students use in solving literacy tasks and better support students' learning in reading, navigation and information-gathering.

Figure 3.20 **Distribution of reading performance scores by clusters of page and time sequence**



Note: The clusters PT indicates the joint combination of page clusters ("P") and time clusters ("T").

Source: OECD, PISA 2018 Database,

StatLink https://doi.org/10.1787/888934239819

Notes

1. Linear reading is the traditional mode of reading as a sequential reading process, for instance, reading left to right, from start to finish. In contrast, non-linear reading describes a reader jumping from section to section and often not needing to finish any particular reading selection.

2. The Rapa Nui unit (CR551) locates in two highly difficult testlets R21H and R25H. Each testlet consists of two reading units. Specifically, R21H consists of CR543 and CR551 while R25H consists of CR544 and CR551. The Rapa Nui unit has a fixed position as the second unit in both R21H and 25H testlets. Also, the reading unit right before the Rapa Nui unit is also designed as multiple-source environment. Therefore, the pre-knowledge on the format of multiple-source environment could be assumed as equal, and no position effect would need to be considered in this study.

3. Because the Rapa Nui unit locates as the last unit in R21H and R25H, a high non-response rate was expected with students possibly running out of time at the end of the test. The non-response rate could be higher in Design A than Design B. The reason is that in Design A (with 75% student administration), the Rapa Nui unit is at the very end of the reading test where both the two testlets, R21H and R25H, are at Stage 2. In Design B (with 25% student administration), the Rapa Nui unit is at the end of Stage 1. Fatigue and running out of time are not as likely in terms of possibilities as in Design A.

4. Process data are not available in the nine countries that administered in pencil-paper based assessments in PISA 2018, hence are not included in the current study.

5. In the Survey for Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), 5 seconds are used to set the effective time threshold for missing response (Weeks, von Davier and Yamamoto, 2016[29]; OECD, 2016[30]). It suggested that if a person "solved" an item in less than 5 seconds, the item typically could not be solved in an effective way. The three-second threshold set in this study was considered a plausible amount of time for effective reading. Any transition under 3 seconds is labelled a fast transition in the current study.

6. Students who clicked on the hyperlinks to self-activate the multiple-source environment intended to visit the newly emerged tabs. This could result in a longer navigation sequence for these students in single-source items.

7. Students who spent more than 1800 seconds (30 minutes) on the initial page in either single or multiple environments are labelled as outliers. A total of 18 students were detected as outliers, accounting for 0.002% of the whole sample used in Chapter 3. Students were generally expected to complete each cluster within 30 minutes in PISA, though the multistage adaptive testing (MSAT) in reading is restricted to 60 minutes (including 3-minute reading fluency). See Table B.3.4.

8. Refer to *PISA 2018 results (Volume I) - What Students Know and Can Do*, Annex A9 (OECD, 2019[28]) regarding a note about Spain in PISA 2018 https://www.oecd.org/pisa/PISA2018-AnnexA9-Spain.pdf.

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4

The interplay between digital devices, enjoyment, and reading performance

This chapter discusses how students' reading enjoyment has changed in the last two decades, and the interplay between digital devices, enjoyment, and reading performance. The chapter also discusses what activities strong readers undertake to leverage the benefits of digital technologies and the benefits of print reading activities.

What the data tell us

- In PISA 2018, approximately half of students (49%) on average across OECD countries agreed or strongly agreed with the statement "I read only if I have to". This is approximately 13 percentage points more than in PISA 2000.
- Approximately one-third of students reported that they rarely or never read books, another third reported reading books more often in paper format than on digital devices, about 15% that they read more often on digital devices, and about 13% that they read equally often in paper format and on digital devices.
- Compared to students who rarely or never read books, digital-book readers read for enjoyment about 3 hours more a week, print-book readers about 4, and those who balance both formats about 5 hours or more a week after accounting for students' and schools' socio-economic background and gender.
- Students who reported reading more often or equally often in paper format and on digital devices reported more than 1 standard deviation more enjoyment than those who reported that they rarely or never read books.
- Compared to students who rarely or never read books, students in OECD countries who reported reading books more often on paper scored 49 points more in reading while students who reported reading books more often on digital devices scored only 15 points more after accounting for students' and schools' socio-economic profile and gender.

DO 15-YEAR-OLDS SPEND MORE TIME READING FOR ENJOYMENT THAN TWO DECADES AGO?

In PISA, students who read for enjoyment have typically been stronger performers in reading (OECD, 2010[1]). Reading engagement and performance are mutually dependent (Nurmi et al., 2003[2]). Students who regularly read for enjoyment have more opportunities to improve their reading skills through practice. They also perceive themselves as more competent and motivated readers (Smith et al., 2012[3]; Sullivan and Brown, 2015[4]). At the same time, students with more difficulties reading and who perceive themselves as less competent readers are less motivated to read for enjoyment.

As in previous cycles of PISA, the contextual questionnaire distributed in PISA 2018 allowed the measurement of reading for enjoyment. It asked students whether they agree ("strongly disagree", "disagree", "agree", "strongly agree") with several statements about their attitudes towards reading, including "I read only if I have to"; "Reading is one of my favourite hobbies"; and "I read only to get information that I need." Students' responses to these questions were summarised in an index of enjoyment of reading. The index is standardised to have a mean of 0 and a standard deviation of 1 across OECD countries.

In PISA 2018, approximately half of the students (49%) in OECD countries agreed or strongly agreed with the statement "I read only if I have to" and one in four (28%) students agreed or strongly agreed that reading is a waste of time (Table B.4.1). The index of reading enjoyment might be particularly sensitive to cross-cultural differences in the response style. Therefore, comparisons within countries are more advisable than comparison between countries (see Box 4.1).

Box 4.1. **Interpretation of questionnaires indices**

Some caution is advised when interpreting PISA indicators on students' attitudes. While PISA aims to maximise the cross-national and cross-cultural comparability of complex constructs, it must do so while keeping the questionnaires relatively short and minimising the perceived intrusiveness of the questions. Despite the extensive investments PISA makes in monitoring the process of translation, standardising the administration of the assessment, selecting questions and analysing the quality of the data, full comparability across countries and subpopulations cannot always be guaranteed.

The indicators analysed in this report are based on students', teachers', and principals' reports, which are susceptible to several possible measurement errors: memory decay; social desirability (the tendency to respond in a manner that is more acceptable in one's own social and cultural context); reference-group bias (what the comparison group is); and response-style bias (e.g. straight-lining, over-reporting, modesty, heaping, acquiescence). These biases can operate differently in different cultural contexts, thus limiting the cross-country comparability of responses

(Benítez, Van de Vijver and Padilla, 2019[5]; Van de Vijver et al., 2019[6]; van Hemert, Poortinga and van de Vijver, 2007[7]; Lee, 2020[8]). Above all, readers should be particularly cautious when interpreting indicators with a strong subjective component such as enjoyment of reading, perceived competence in reading (chapter 5), and teachers' stimulation of reading engagement (chapter 6), which are more likely to be influenced by cultural norms and the response style of the respondent. Therefore, the results should be interpreted with caution when comparing countries/economies' means or interpreting system-level relationships that do not hold within-country.

In order to minimise the risk of misleading interpretations, a number of reliability and invariance analyses of the PISA indices used in this report have been carried out (see Annex A1 for more details), providing readers with an indication of how reliable cross-country comparisons are.

In all PISA-participating countries and economies in 2018, girls reported much higher levels of reading enjoyment than boys (Table B.4.2). On average across OECD countries, the difference in reading for enjoyment between boys and girls was larger than half a standard deviation. The largest gender gap in reading for enjoyment was observed in Germany, Hungary, and Italy while the smallest gender gap was observed in Indonesia and Korea (Table B.4.2).

Nevertheless, gender is not the only factor that shows differences in the reading enjoyment index within countries. On average across OECD countries, the difference in reading for enjoyment between students from advantaged and disadvantaged socio-economic backgrounds[1] was about half a standard deviation in favour of advantaged students. Students enrolled in general programmes reported one-third of standard deviation more enjoyment of reading than students enrolled in vocational programmes on average across OECD countries (Table B.4.2). The vast majority of variance in this index lies within schools, and only 6% constitutes between-schools variance on average across OECD countries (Table B.4.3).

Figure 4.1 shows the change in reading performance associated with a one-unit increase in the reading enjoyment index after accounting for students' and schools' socio-economic profile and gender. Reading for enjoyment was positively associated with reading performance in all PISA-participating countries and economies after accounting for students' and schools' socio-economic profile[2] and gender. However, the strength of the association varies across countries and economies. In Ireland, Macao (China) and Chinese Taipei this change in reading is over 30 score points, while in Kazakhstan, Lithuania, and Morocco it is smaller than 11 score points (Table B.4.1).

The index of enjoyment of reading decreased between 2009 and 2018 on average across OECD countries (Figure 4.2). For example, approximately 8 percentage points more students reported in PISA 2018 than in PISA 2009 that they only read if they have to. This trend, however, varies across countries and economies. Approximately students in one-third of countries and economies with available data on this index enjoyed reading less, while in another one-third reading enjoyment increased. The most pronounced decline was observed in Germany, Finland and Norway, where the index of enjoyment of reading decreased by around 0.30 or more of a standard deviation over the last decade. However, Bulgaria, Colombia, Costa Rica, Mexico, Russia, the Slovak Republic and Uruguay, the reading enjoyment index increased by at least 0.2 of a standard deviation (Table B.4.4a).

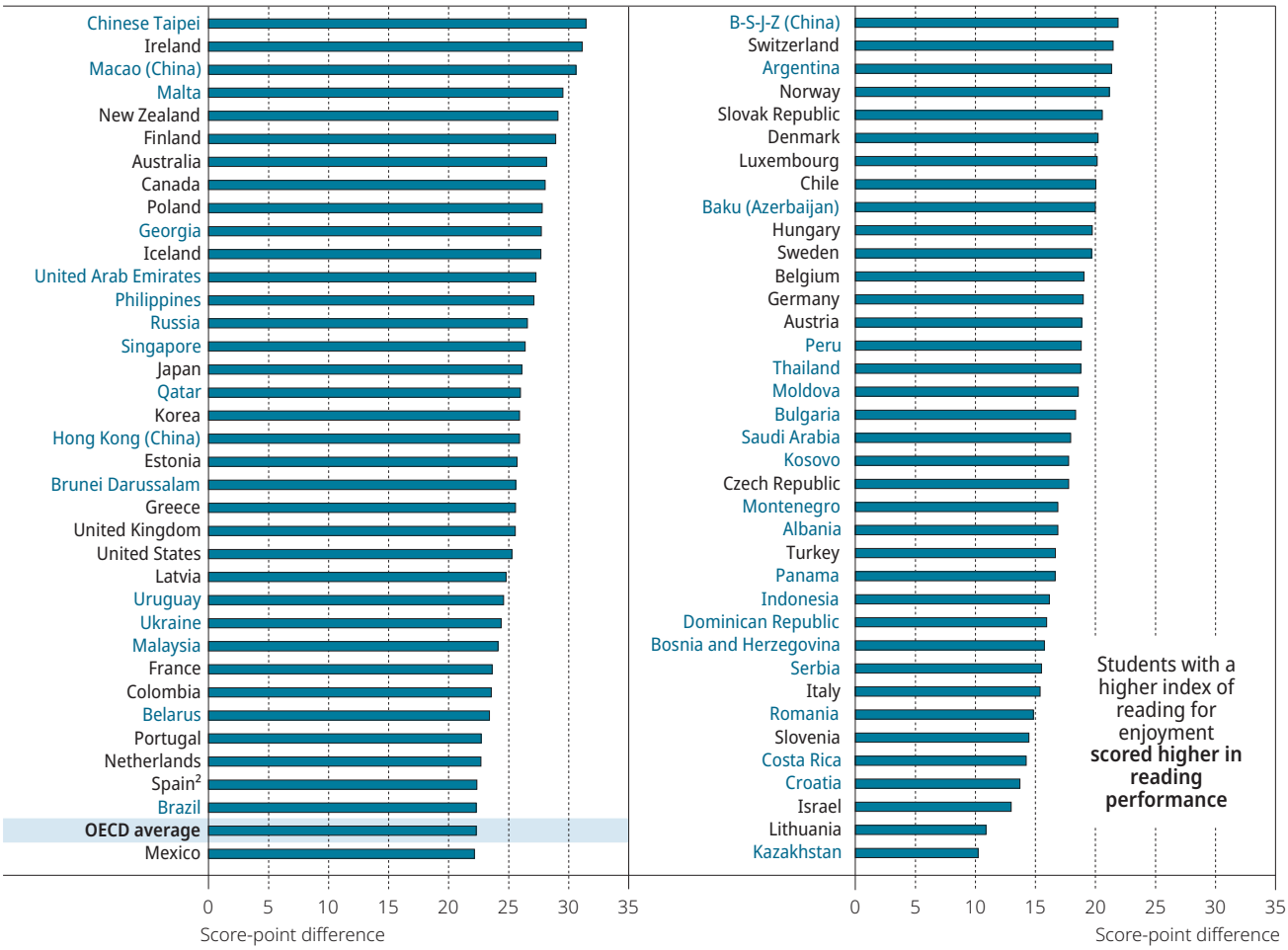
The elements that compose the index of reading enjoyment have changed since PISA 2000. However, some items remain identical. Approximately 13 percentage points more students in OECD countries reported in PISA 2018 than in PISA 2000 that they only read if they have to while about 8 percentage points more did it between PISA 2018 and PISA 2009. This decline, therefore, has been steady if not more pronounced in the last years. In the Czech Republic, Denmark, Finland, Iceland, Indonesia, Mexico, Peru, and Sweden, since PISA 2000 this difference widens to at least 20 percentage points (Tables B.4.4a and B.4.4b).

To summarise, students who read for enjoyment achieved higher reading scores in the PISA reading test than those who do not. Over the last decade, students report that they enjoy reading less. Could it be, however, that they also read fewer hours?

As in previous cycles of PISA, the contextual questionnaire distributed in PISA 2018 asked students how much time they usually spend reading for enjoyment. This includes books, magazines, newspapers, websites, blogs, and emails. It asked students to select one of the following responses: "I do not read for enjoyment"; "30 minutes or less a day"; "More than 30 minutes to less than 60 minutes a day"; "1 to 2 hours a day"; and "More than 2 hours a day'. Students' responses to this question was summarised in an index of hours spent reading for enjoyment a week.

Figure 4.1 **Enjoyment of reading and reading performance**

Change in reading performance associated with a one-unit increase in the index of enjoyment of reading, after accounting for students' and schools' socio-economic profile[1] and gender



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

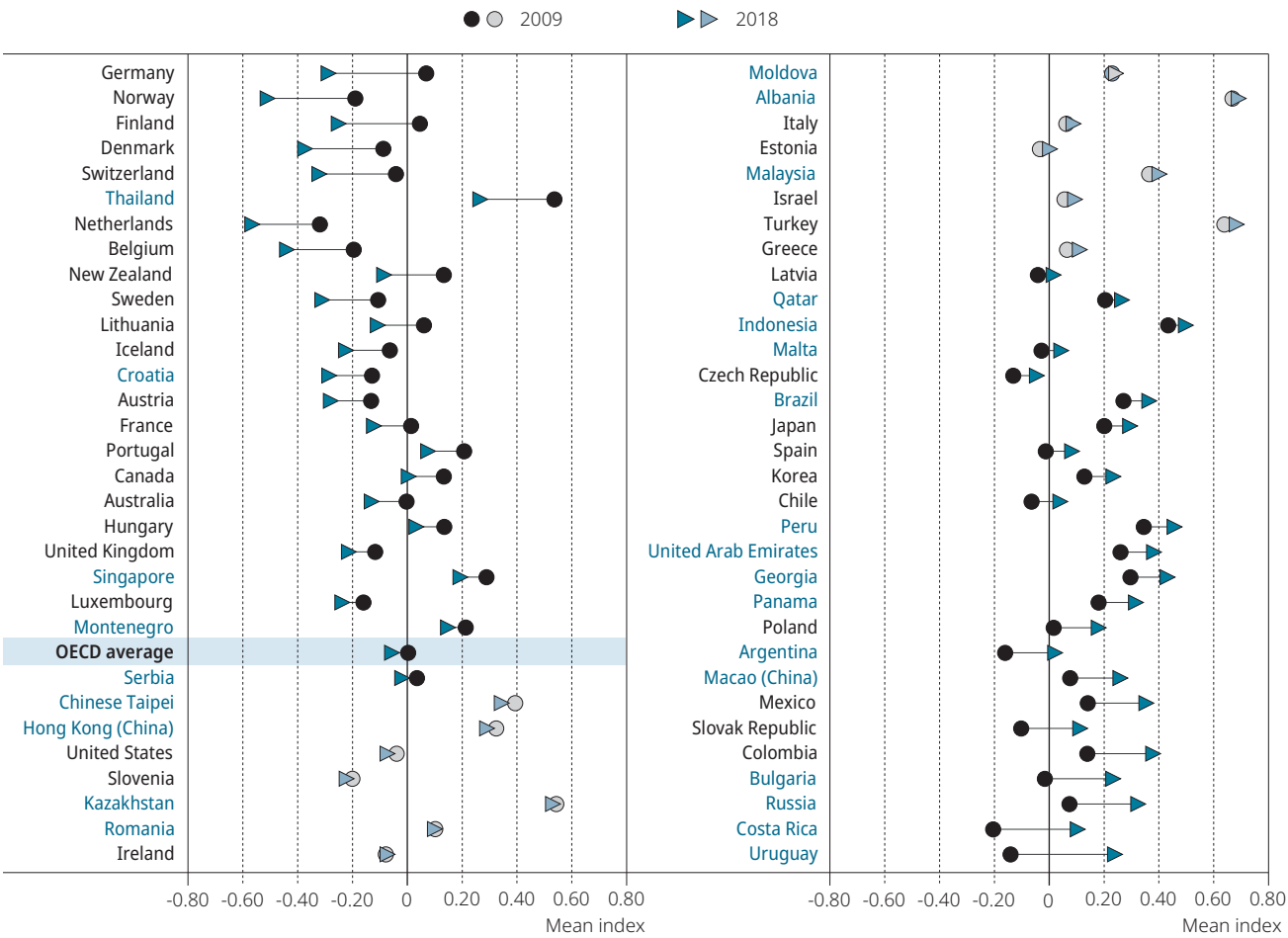
Note: All score-point differences are statistically significant.

Countries and economies are ranked in descending order of the change in reading performance.

Source: OECD, PISA 2018 Database, Table B.4.1.

StatLink https://doi.org/10.1787/888934239838

Figure 4.2 **Change between 2009 and 2018 in the enjoyment of reading**



Notes: Statistically significant differences between PISA 2018 and PISA 2009 are marked in a darker tone.

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in ascending order of the change between 2009 and 2018 (PISA 2018 - PISA 2009) in the index of enjoyment of reading.

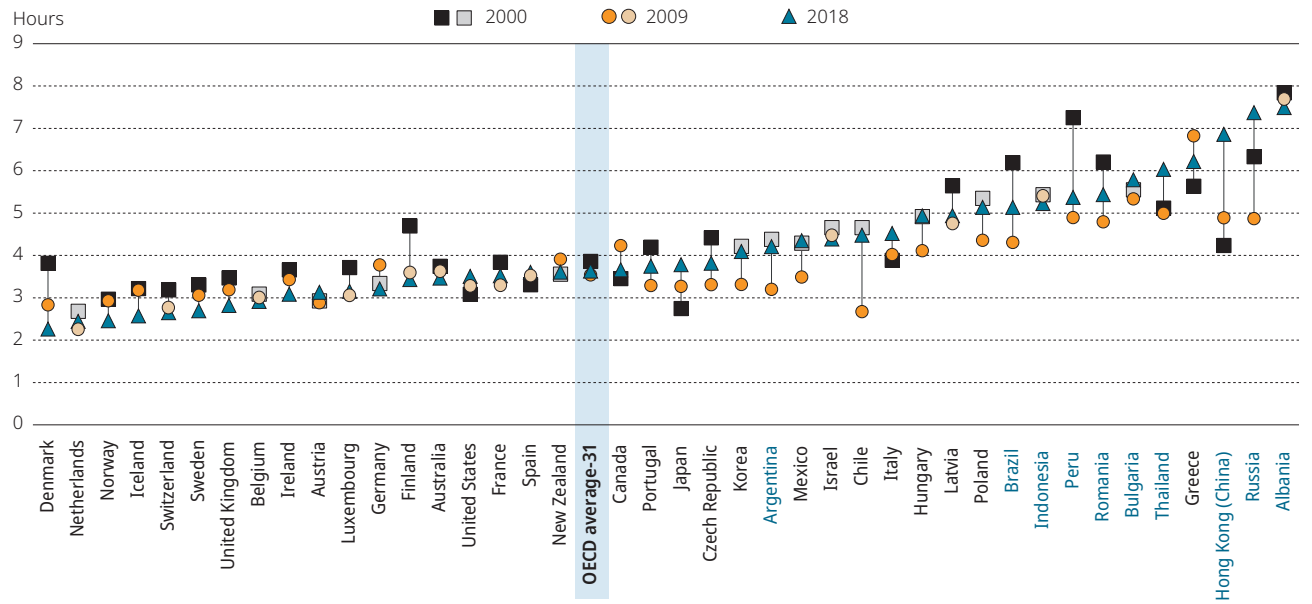
Source: OECD, PISA 2018 Database, Table B.4.4a.

StatLink https://doi.org/10.1787/888934239857

The number of hours 15-year-old students spent reading for enjoyment decreased between 2000 and 2009 and, although at a slower rate, increased between 2009 and 2018 on average across OECD countries (Figure 4.3). This is in contrast to the decrease in enjoyment of reading between 2009 and 2018 (Figure 4.2). Although reading for enjoyment and time spent reading are moderately correlated (r = 0.55, OECD average), there are some interesting differences at the country level. Of the 13 countries and economies that reported reading significantly fewer hours in 2018 than in 2009, 11 of them also reported decreased enjoyment of reading and two reported no significant differences. However, of the 32 countries/economies that reported reading significantly more hours in 2018 than in 2009, almost half (13 countries/economies) reported no differences or significantly less enjoyment of reading (Tables B.4.4a and B.4.8).

Students in Austria, Hungary, Portugal, Serbia, and Thailand – as well as the OECD average level – showed significantly less enjoyment but more hours of reading in 2018 compared to 2009 (Tables B.4.4a and B.4.8). In other words, these results suggest that fewer hours reading is associated with less enjoyment (or no change), while long hours of reading do not always translate into more enjoyment. At the same time, PISA 2018 Results (Volume I) - What Students Know and Can Do (Box I.1.1, (OECD, 2019[9])) showed that students reported reading less for leisure and reading fewer books of fiction, magazines or newspapers because they want to (as opposed to because they have to). Instead, they read more to fulfil practical needs, and they read more online in the form of chats, online news or websites containing practical information. This is likely associated with more time spent reading and the stagnation of enjoyment. For example, students in Hungary, Serbia, and Thailand – which showed significantly less enjoyment but more hours of reading in 2018 compared to 2009 – reported reading fewer fiction books in PISA 2018 compared to PISA 2009. Also, the percentage of students in Austria, Hungary, Portugal, and Serbia who read fiction books several times a month or more because they want to was below the OECD average in PISA 2018 (Tables I.B1.57, I.B1.58 and I.B1.59 from Volume I, (OECD, 2019[9])).

Figure 4.3 **Change between 2000 and 2018 in time spent reading for enjoyment**



Notes: Only countries and economies that participated in the PISA 2000, PISA 2009 and PISA 2018 assessments are shown.

Albania, Argentina, Bulgaria, Chile, Indonesia, Peru and Thailand conducted the PISA 2000 assessment in 2001, Hong Kong (China), Israel and Romania conducted the assessment in 2002, as part of PISA 2000+.

Symbols in lighter tones refer that differences between PISA 2018 and earlier cycles are not statistically significant.

Countries and economies are ranked in ascending order of the time spent reading for enjoyment a week, in 2018.

Source: OECD, PISA 2018 Database, Table B.4.8.

StatLink https://doi.org/10.1787/888934239876

The most pronounced decline in time spent reading for enjoyment was observed in Chile and Peru between 2000 and 2009 with a drop of at least 2 hours a week. On the other hand, the most pronounced increase was observed in Hong Kong (China) between 2000 and 2018 with an almost 3-hour increase, and Russia between 2009 and 2018 with an increase of 2 ½ hours per week (Table B.4.8). In PISA 2018, on average across OECD countries, 83% of students reported reading 60 minutes or less per day, while 11% of students reported reading between 1 and 2 hours and only 6% more than 2 hours a day (Table B.4.5).

In almost all PISA-participating countries and economies in 2018, girls reported spending more hours a week reading for enjoyment than boys. Girls spend about two hours more a week reading for pleasure than boys. In Brunei Darussalam and Georgia this gender difference is as big as around 5 hours while this difference in Baku (Azerbaijan) and Korea is not statistically significant. Students from more advantaged socio-economic backgrounds also read, on average, more hours than students from less advantaged socio-economic backgrounds. This is particularly the case in Belarus, Bulgaria, the Philippines, Thailand and Ukraine, where advantaged students read, on average, at least 2 hours and half more a week than disadvantaged students do. However, in B-S-J-Z (China), Hong Kong (China) and Macao (China) this difference is not statistically significant. Students enrolled in general programmes reported spending more hours a week reading for enjoyment than students enrolled in vocational programmes on average across OECD countries (Table B.4.6). The vast majority of variance in this index lies within schools, and only 2% is between-schools variance on average across OECD countries (Table B.4.7).

In conclusion, the index of reading for enjoyment has significantly declined on average across OECD countries over the last decade. Still, the amount of time spent reading for pleasure has significantly increased. Enjoyment of reading and time spent reading for enjoyment are moderately correlated (r = 0.55, OECD average). However, the association between enjoyment of reading and reading performance is higher (r = 0.32, OECD average) than the association between time spent reading for enjoyment and reading performance (r = 0.19, OECD average). This finding suggests that how much students enjoy reading matters more than how many hours students spend reading for enjoyment. It is important to consider that since the reading enjoyment index was introduced in PISA 2000, the nature of reading has dramatically changed: students read in an increasingly digital environment. Therefore, it is important to keep in mind that the most recent measures of reading for leisure might be better interpreted as the enjoyment of written online communication rather than a paper book.

It is still too early to predict how these trends will evolve in the future. As shown in the next section, many factors shaping the direction of these trends may be related to a change in what students are reading and how they are reading.

DO 15-YEAR-OLDS SPEND MORE TIME READING FOR ENJOYMENT ON PAPER OR DIGITAL DEVICES?

The rapid digitalisation of communication over the last decade is changing what 15-year-olds do and read. There are two competing theories about the relationship between new and legacy media use: a) the displacement theory assumes that teenagers spend a relatively fixed amount of time on media consumption and, therefore, time spent in one media would decrease the time spent on other media, b) the complementary theory assumes that media use has an additive effect and, therefore, time spent in one media would change minimally or, conversely, increase the total time spent on all media (Twenge, Martin and Spitzberg, 2019[10]).

Displacement of media use occurs when individuals seek to fulfil their uses and gratifications through digital media rather than legacy media. For example, students read more online in the form of chats, online news, and searching for practical information, and fewer fiction books, magazines, and newspapers (OECD, 2019[9]). In Ireland, for example, the percentage of students who read newspapers several times a month or more because they wanted to decreased by 43 percentage points between 2009 and 2018 while reading the news online increased by 44 percentage points. The way students interact with online formats is also changing. In Japan, for example, the percentage of students who read emails several times a week or more decreased by 62 percentage points between 2009 and 2018 while chatting online increased by 77 percentage points (Figure 4.5). The percentage of students in Indonesia, Kazakhstan, and Thailand who speak online, read online news, and search for information online increased approximately around 40 percentage points during the last decade. Students in some OECD countries may have already experienced this transition yet the OECD average still rose by 12 to 20 percentage points on the indicators previously mentioned (Table B.4.10). Does this mean that the amount of time students spend reading for enjoyment in print is being overtaken by digital devices? Or, rather, that the time spent reading on digital devices is complementary to time spent reading on paper?

PISA 2018 did not ask students to describe a main mode of reading – paper or digital – for various types of reading for enjoyment. Still, it did ask to what extent students think the following statements best describe how they read books: a) "I rarely or never read books"; b) "I read books more often in paper format"; c) "I read books more often on digital devices" (e.g. e-reader, tablet, smartphone, computer); and d) "I read books equally often in paper format and on digital devices." Not only do students' responses throw light on their enjoyment of reading, reading format may play a role in how much they enjoy reading as well. But it is not the only factor: previous reading experience, and home and school learning environments also affect reading enjoyment (Sullivan and Brown, 2015[4]).

On average across OECD countries, print-book readers reported chatting online as much as non-print-book readers. A smaller share of print-book readers takes part in online discussions (about 6 percentage points less) than non-print-book-readers, while they are more likely to search for information online on a particular topic (about 6 percentage points more) or search for practical information online (about 4 percentage points more). In other words, students who reported reading more often in print engage in digital activities such as chatting online as frequent as non-print-book readers and they engage more frequently in activities related to reading for information. Results by each participating country and economy in PISA 2018 can be consulted in Table B.4.9.

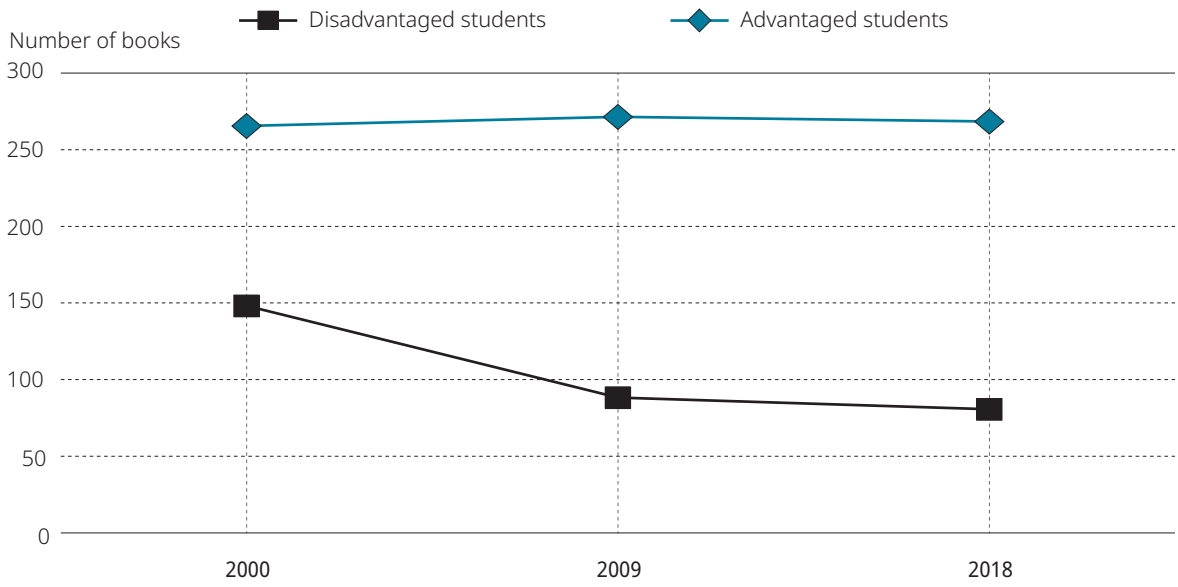
Approximately one-third of students reported that they rarely or never read books, another third reported reading books more often in paper format than on digital devices, about 15% that they read more often on digital devices, and about 13% that they read equally often in paper format and on digital devices. More than 40% of students in Hong Kong (China), Indonesia, Malaysia, Chinese Taipei and Thailand, reported reading books more often on digital devices. In contrast, more than 45% of students in Japan, Korea, Slovenia and Turkey reported reading books on paper more often than on digital devices (Table B.4.11).

Students who read books on digital devices more often are more likely to be students with an immigrant background (20% of immigrant students compared to 14% of non-immigrant students), from a socio-economically disadvantaged background (16% of disadvantaged students compared to 13% of advantaged students), and boys (15% of boys compared to 14% of girls) (Table B.4.12). The variance in the percentage of students who read books on digital devices more often lies almost exclusively within schools and marginally between-schools (less than 2%) (Table B.4.13).

From OECD countries, Belgium, Chile, France, and the United Kingdom, however, girls are more likely to read books on digital devices than boys. In Colombia and Mexico, socio-economically advantaged students are more likely to read books on digital devices than disadvantaged students. The largest gender differences were observed in Albania where 27% of boys compared to 14% of girls reported reading books on digital devices more. In Morocco, advantaged students are twice as likely to read books on digital devices as disadvantaged students (Table B.4.12). These results may reflect a more pronounced decrease in access to print books at home among students from lower socio-economic backgrounds (Figure 4.4). On average across OECD countries, socio-economically disadvantaged students in 2018 had approximately half the number of books at home they used to have in 2000 while advantaged students had essentially the same number. In addition, the even larger share of students with an immigrant background using digital devices might be possibly related to a greater availability of print books at home in their home language rather than the language they took the PISA test in.

Figure 4.4 **Change in number of books between 2000, 2009, and 2018, by socio-economic status**

Based on students' reports, OECD average-31



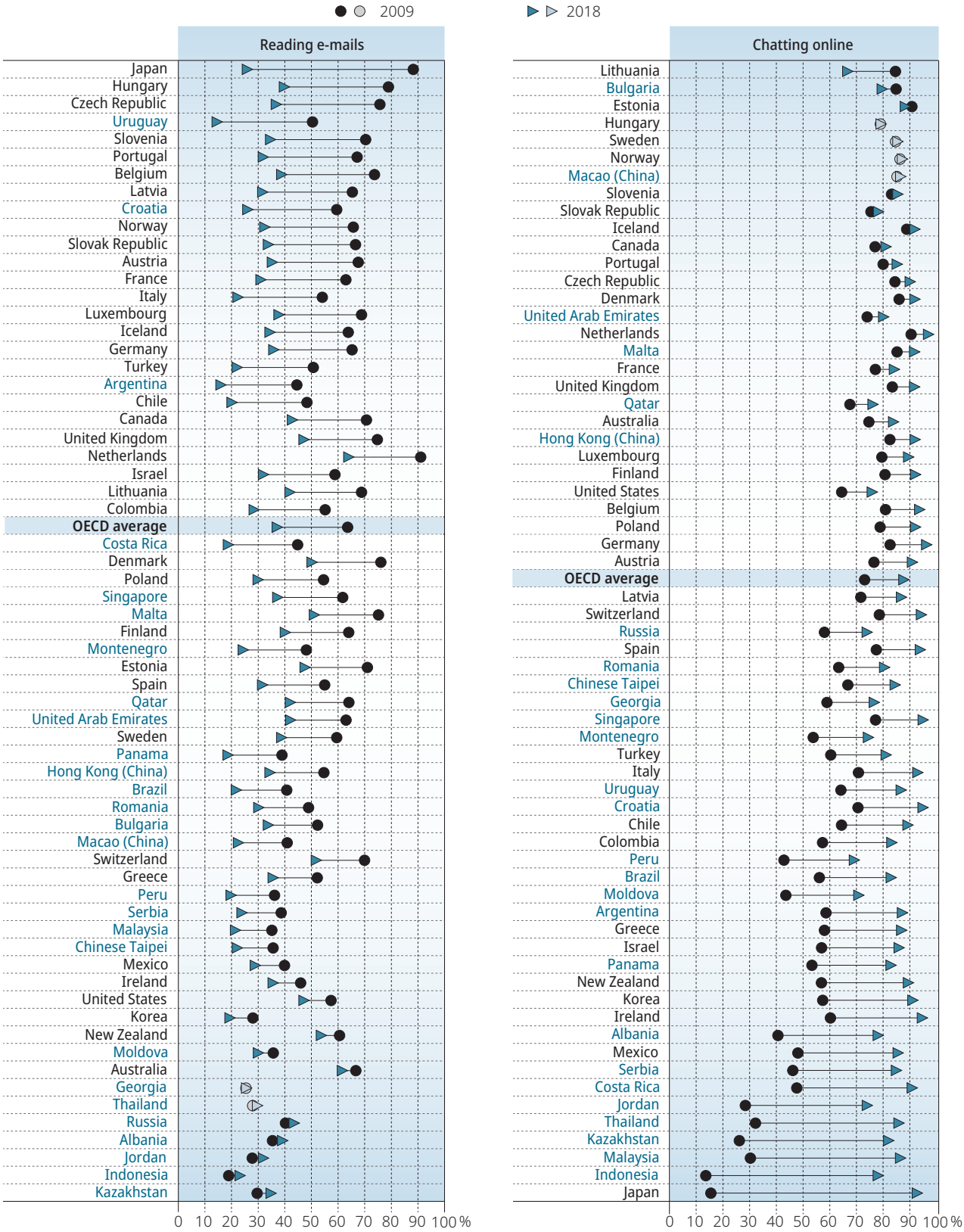
Notes: Differences between advantaged and disadvantaged students for each cycle are all statistically significant.
Change in number of books between 2018 and 2009, and change between 2009 and 2000 are all statically significant.
Source: OECD, PISA 2018 Database, Tables B.4.14a and B.4.14b.
StatLink https://doi.org/10.1787/888934239895

Students who reported reading between 1 and 2 hours and more than two hours a day for enjoyment were collapsed in the following analysis to provide a further analysis focusing on the higher end of the reading time spectrum. They represent 17% of students on average across OECD countries (Table B.4.5). Some 28% of girls who read at least 1 hour a day reported reading books equally often in paper format and on digital devices compared to 22% of boys. In Switzerland and Uruguay, girls surpassed boys by more than 14 percentage points in this comparison. The largest gender differences among students who read at least 1 hour a day were observed in Bosnia and Herzegovina, Greece, Lithuania, Montenegro, Serbia, the Slovak Republic, and Slovenia, where girls reported reading more often in paper format compared to boys (Table B.4.15).

Numerous studies have shown that younger generations might be quite familiar with technology; however, "digital natives" are not necessarily always equipped with adequate skills in terms of access to and use of digital information (OECD, 2011[11]; Breakstone et al., 2018[12]; Macedo-Rouet et al., 2019[13]; McGrew et al., 2018[14]). Students' reading habits and preferences have changed over the past decades because of changes in the digitalisation of communication. Teenagers increasingly read for enjoyment on digital devices. Yet, printed books still have a fair share of readers, especially among avid readers.

Students who reported reading books more often on digital devices read about 3 hours more a week than those who reported that they rarely or never read books, while students who reported reading books more often in paper format read about 4 hours more a week on average across OECD countries. Most importantly, students who reported reading books equally often in paper format and on digital devices read about 5 hours or more a week than those who reported that they rarely or never read books, after accounting for students and schools socio-economic background and gender (Figure 4.6).

Figure 4.5[1/3] **Change between 2009 and 2018 in what students read**



Notes: Values that are statistically significant are marked in a darker tone.

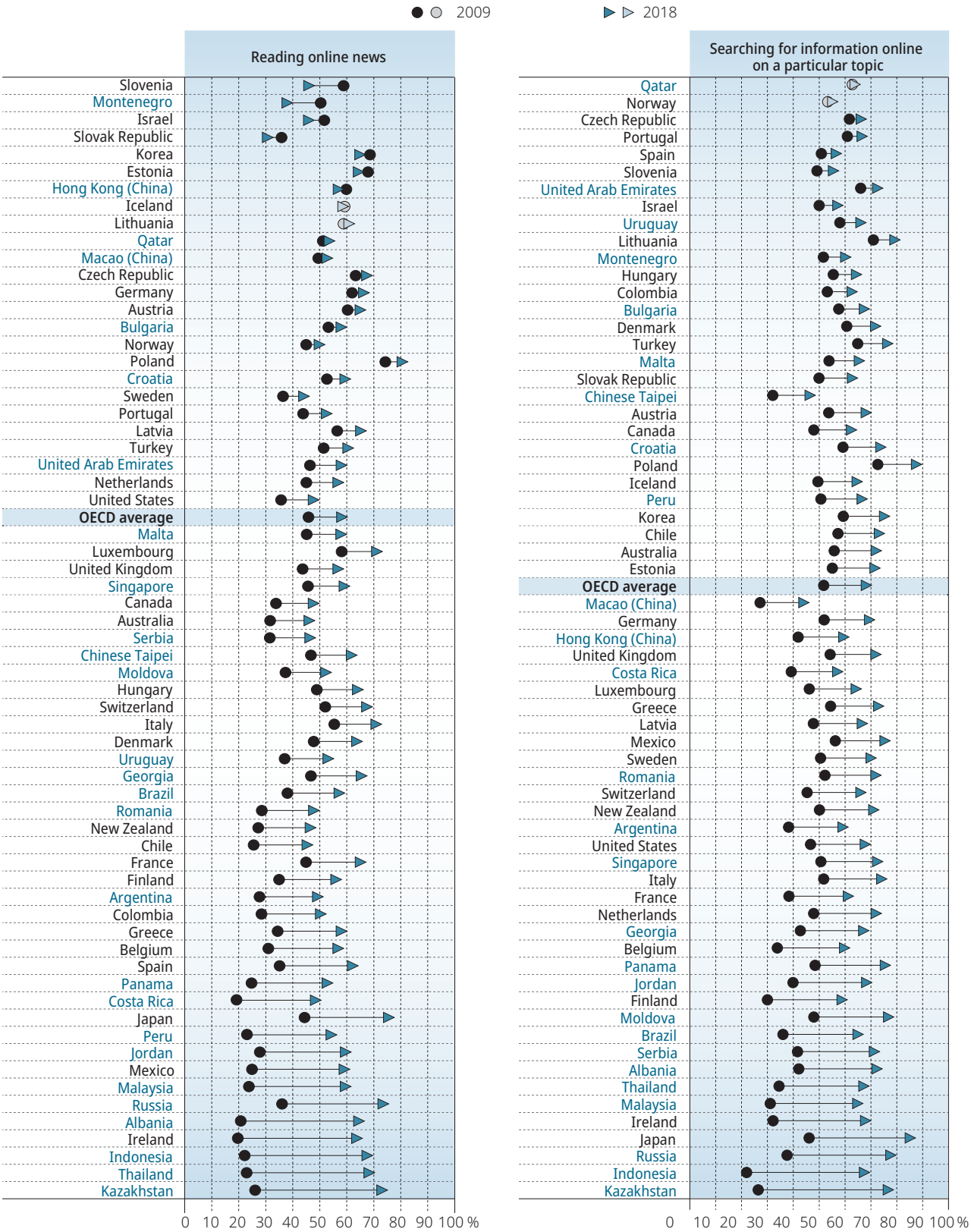
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in ascending order of difference in percentage of students who engaged in the activities several times a week or more.

Source: OECD, PISA 2018 Database, Table B.4.10.

StatLink https://doi.org/10.1787/888934239914

Figure 4.5[2/3] **Change between 2009 and 2018 in what students read**



Notes: Values that are statistically significant are marked in a darker tone.

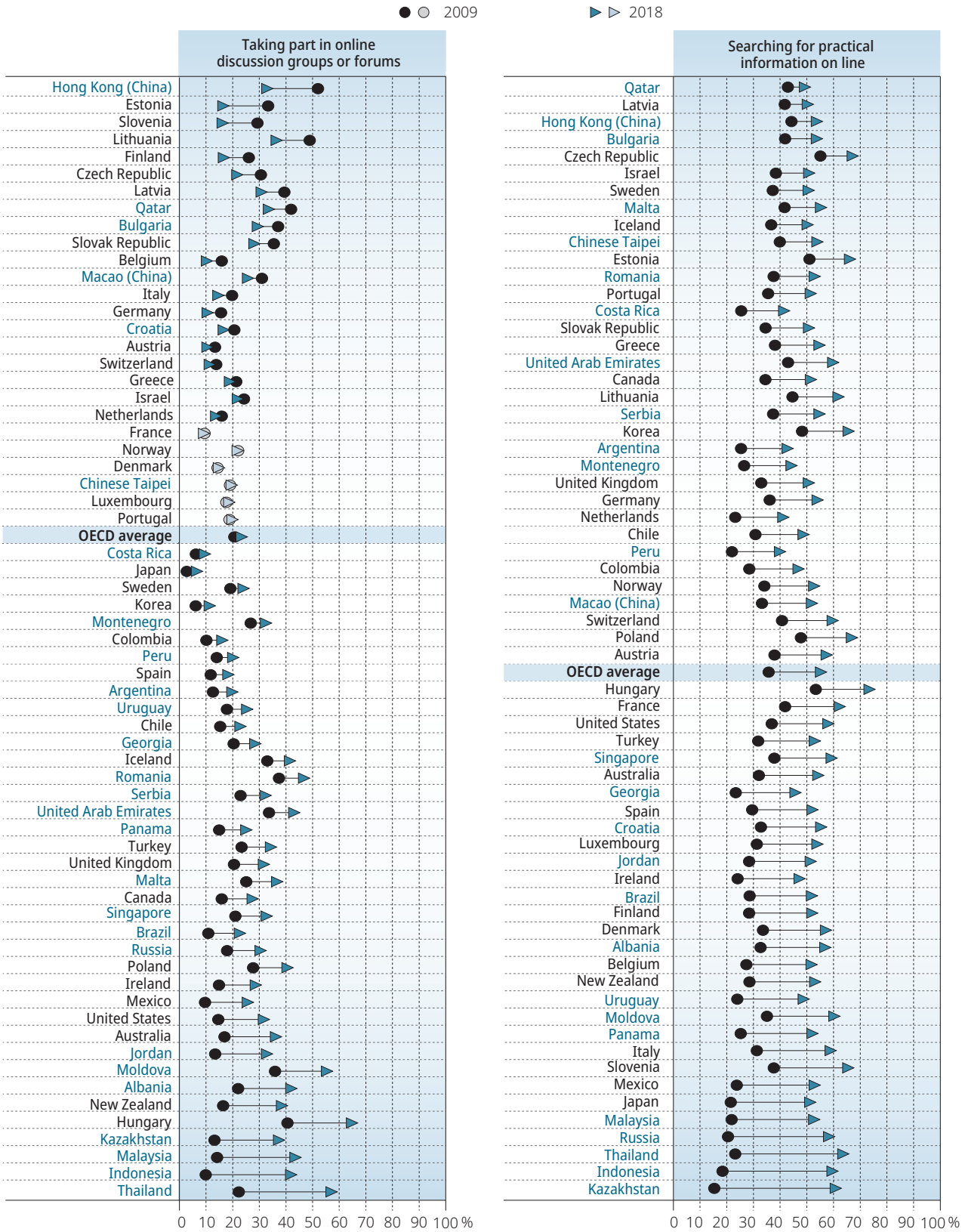
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in ascending order of difference in percentage of students who engaged in the activities several times a week or more.

Source: OECD, PISA 2018 Database, Table B.4.10.

StatLink https://doi.org/10.1787/888934239914

Figure 4.5[3/3] **Change between 2009 and 2018 in what students read**



Notes: Values that are statistically significant are marked in a darker tone.

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

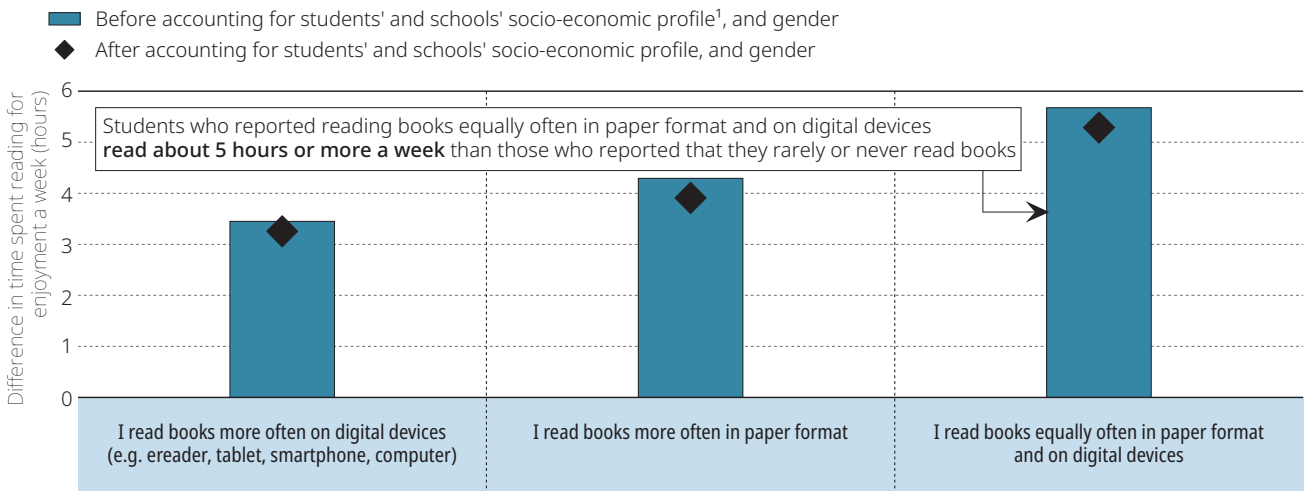
Countries and economies are ranked in ascending order of difference in percentage of students who engaged in the activities several times a week or more.

Source: OECD, PISA 2018 Database, Table B.4.10.

StatLink https://doi.org/10.1787/888934239914

Figure 4.6 **Time spent reading for enjoyment per week and format of reading**

Difference between students who read books in the following way and those who "rarely or never read books", OECD average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: All values are statistically significant.

Source: OECD, PISA 2018 Database, Table B.4.16.

StatLink https://doi.org/10.1787/888934239933

Box 4.2. **Home reading habits: what parents can do**

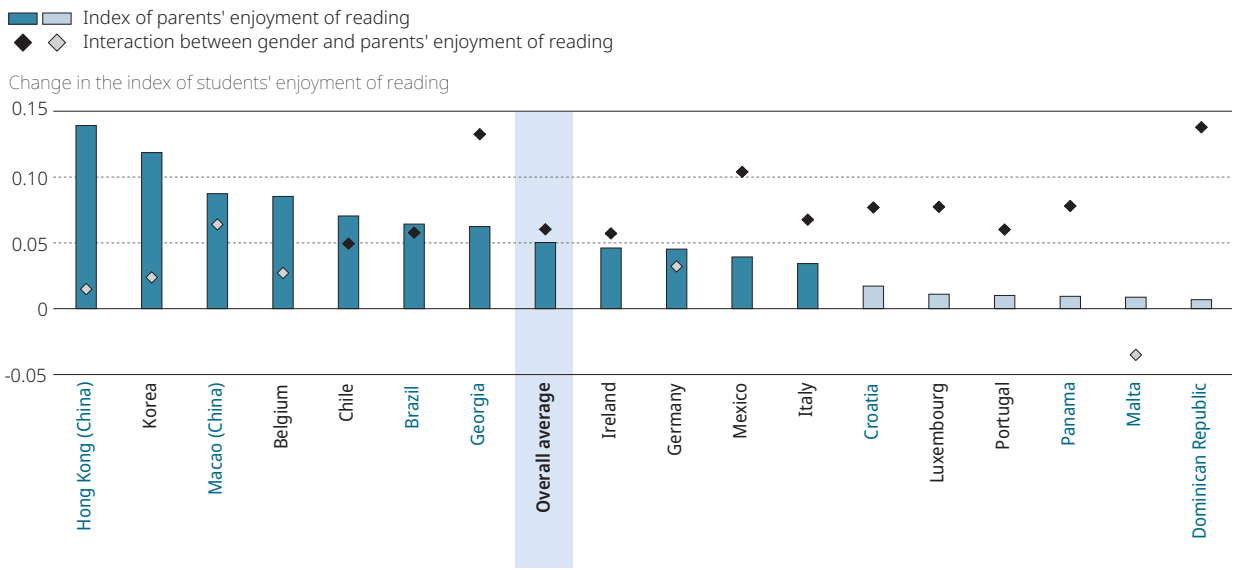
Reading enjoyment is important in helping students develop their reading skills. Yet, the index of enjoyment of reading decreased significantly between 2009 and 2018 in one-third of the countries and economies (Figure 4.2). This drop in the appreciation of reading may affect reading skills and equity, given that reading enjoyment mediates the relationship between socio-economic background and reading performance (OECD, 2010[1]).

In addition to teachers, parents are also important role models for reading habits. In PISA 2018, students whose parents enjoy reading the most have a higher index of reading enjoyment[3]. A one-unit increase in the index of parental reading enjoyment is associated, on average, with a 0.05 increase in student reading enjoyment for boys, and 0.11 for girls (Figure 4.7). In Belgium, Hong Kong (China), Korea and Macao (China), variations in the index of parental reading enjoyment are associated with variations in student reading enjoyment that are not significantly different between boys and girls. On the contrary, in Croatia, the Dominican Republic, Luxembourg, Malta and Portugal, variations in parental reading enjoyment are only associated with variations in girl students' reading enjoyment. On average across OECD countries, students who talk to their parents about what they read or go with their parents to a bookstore or library at least once a week have a higher index of reading enjoyment by 0.13 and 0.10, respectively.

Parents play a crucial role in conveying positive attitudes towards reading at home beginning in a child's early years. The day-to-day activities that parents undertake are highly correlated with children's early learning and social-emotional development (OECD, 2020[15]). Examples of these include reading to them almost every day when they are children and providing them with books. Furthermore, PISA data suggests that parents who are observed reading or who endorse the view that reading is pleasurable are associated with children's reading activities at home, reading motivation and achievement.

Figure 4.7 **Relationship between students' and parents' enjoyment of reading, and students' characteristics**

Change in the index of students' enjoyment of reading associated with one-unit increase of the following variables, based on students' and parents' reports



Notes: All values are statistically significant.

Only countries and economies that administered the parent questionnaire are shown.

The linear regression model accounts for students' and schools' socio-economic profile. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Countries and economies are ranked in descending order of the effect of the index of parents' enjoyment of reading in the index of students' enjoyment of reading.

Source: OECD, PISA 2018 Database, Table B.4.19.

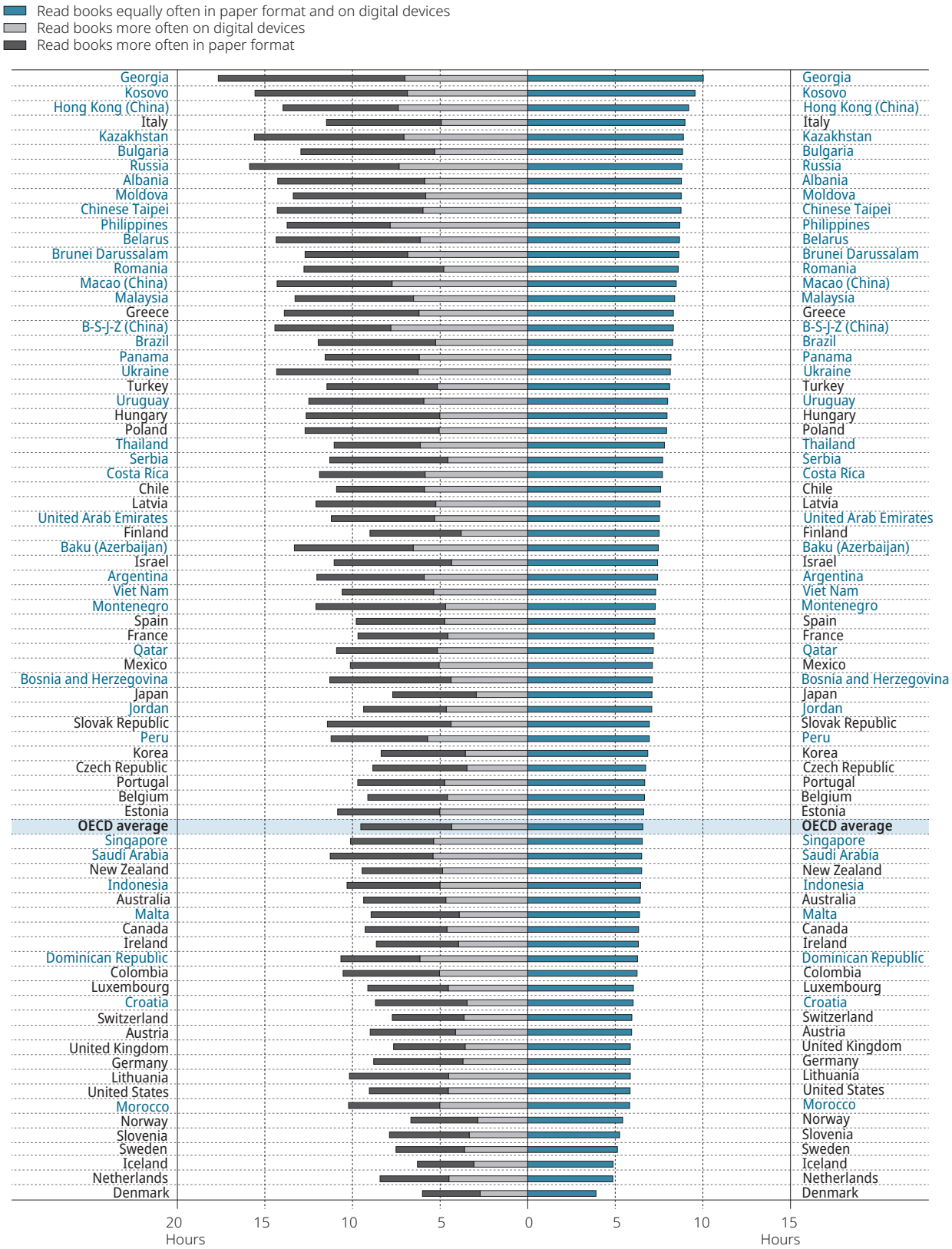
StatLink https://doi.org/10.1787/888934239952

In absolute terms, students in Georgia, Hong Kong (China), Italy, and Kosovo spent on average 9 hours or more a week reading books equally often in paper format and on digital devices (Figure 4.8). In relative terms, students in Hong Kong (China), Italy and Japan who reported reading books equally often in paper format and on digital devices read more than 6.5 hours a week than those who reported that they rarely or never read books after accounting for students' and schools' socio-economic background and gender (Table B.4.16).

In conclusion, students in OECD countries who use both formats read close to 2 hours more a week than those who only use one of the reading formats (i.e. the number of hours students read using both formats minus the average time between students who read books more often in paper format and those who do more often on digital devices). In other words, students who gave the highest frequency ratings for both formats are the heaviest readers. It is true that the overall time students spend on digital devices doing online activities *other* than reading for enjoyment – such as social networks or games – is time taken away from print reading (Twenge, Martin and Spitzberg, 2019[10]). But, this data suggest that time spent reading for enjoyment on digital devices may not always displace time spent reading for leisure on print.

Figure 4.8 **Time spent reading for enjoyment by reading format**

Total number of hours a week in reading for enjoyment



Countries and economies are ranked in descending order of the number of hours students spent in reading books equally often in paper format and on digital devices.

Source: OECD, PISA 2018 Database, Table B.4.16.

StatLink https://doi.org/10.1787/888934239971

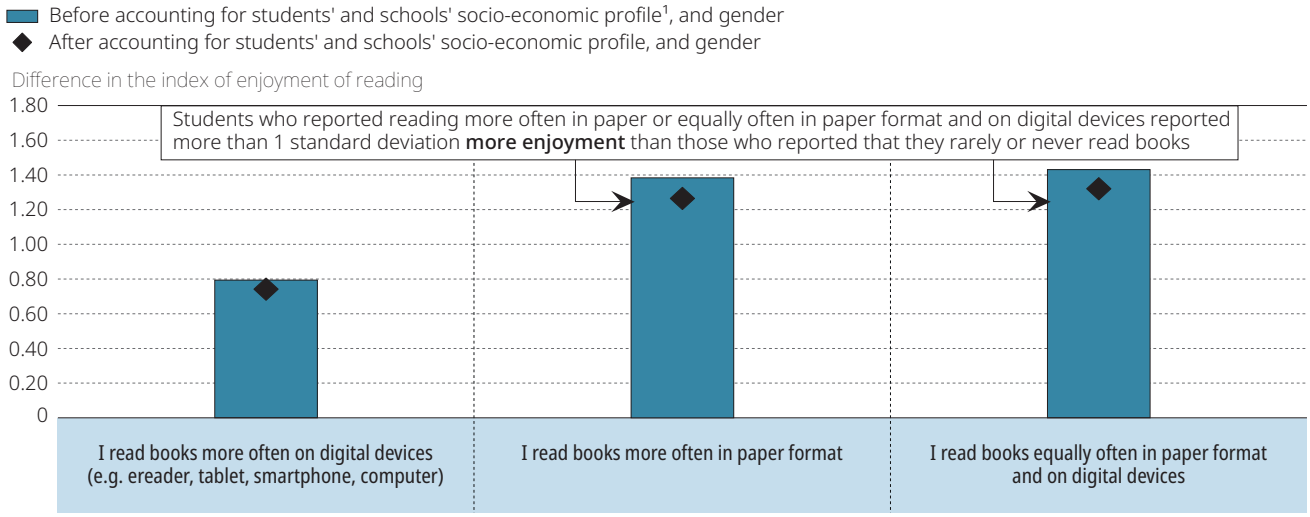
ARE DIGITAL TECHNOLOGIES HELPING IMPROVE STUDENTS' READING EXPERIENCE?

The impact digital technologies have on students' well-being is being debated, and the evidence on whether they have a positive or negative effect is still inconclusive. Students can use digital technologies to unwind, find sources of moral and social support in times of need and maintain social relationships, which are all beneficial for emotional health (Kardefelt-Winther, 2019[16]). On the other hand, extreme Internet users usually report less life satisfaction, are less likely to report positive feelings, are more likely to be bullied and feel lonely at school, and more at risk of being less engaged with school (OECD, 2017[17]; OECD, 2015[18]; OECD, 2019[19]).

Another relevant question is whether digital technologies help to improve the reading experience. Figure 4.9 shows the difference in the reading enjoyment index between students who reported rarely or never reading books and those who read books more often digitally, more often on paper, and equally often on paper and on digital devices. The average results across OECD countries show a clear relationship between reading print books and enjoyment regardless of whether students read equally often on paper and on digital devices or more often on paper. Moreover, these differences were significantly lower after accounting for the student's and schools' socio-economic status and gender (Table B.4.17).

Figure 4.9 **Enjoyment of reading and reading format**

Difference between students who read books in the following way and those who "rarely or never read books", OECD average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: All values are statistically significant.

Source: OECD, PISA 2018 Database, Table B.4.17.

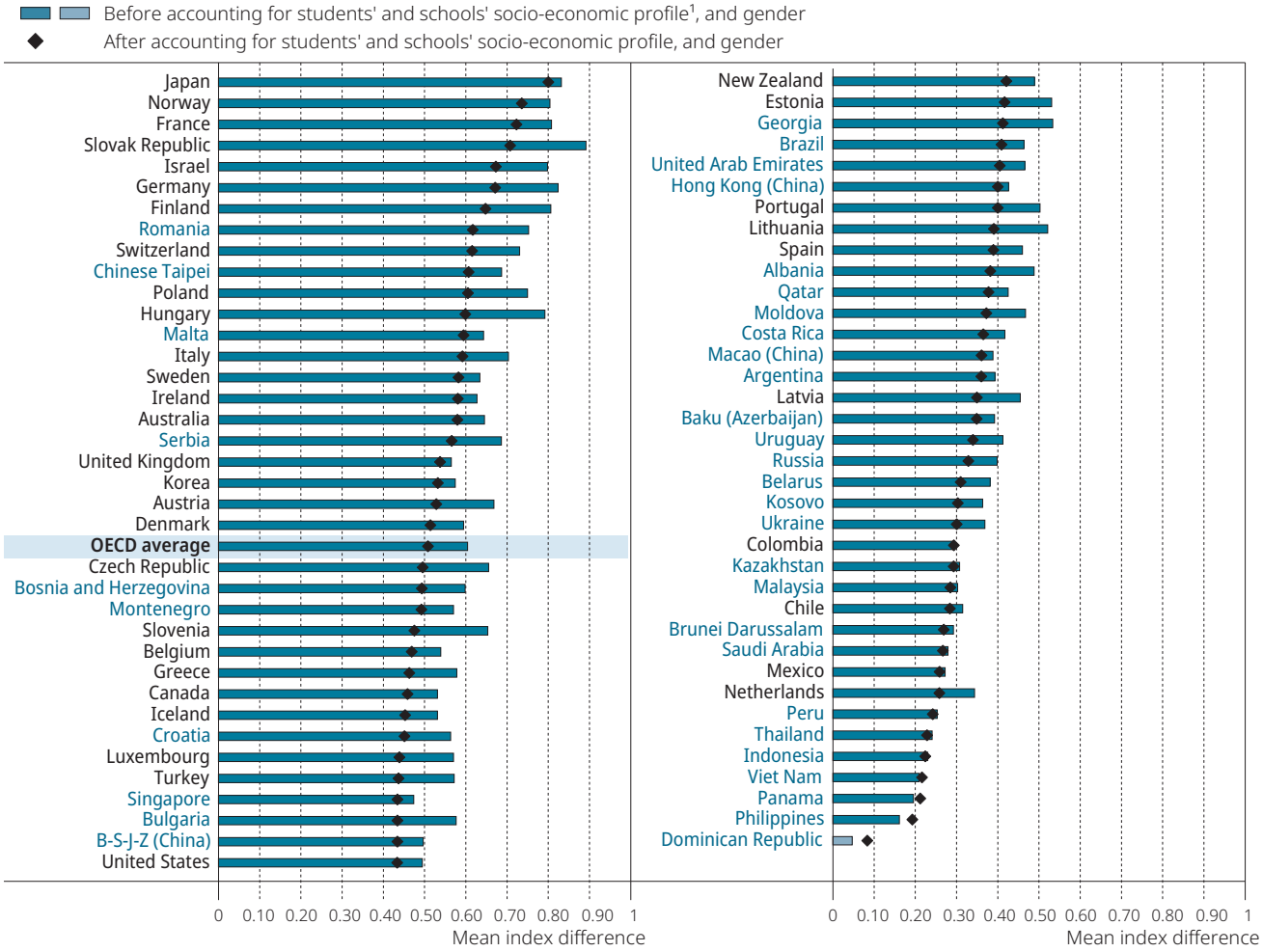
StatLink https://doi.org/10.1787/888934239990

Figure 4.10 shows the differences in the index of enjoyment of reading between students who read books equally often in print and on digital devices or more often in paper compared to students who read books more often on digital devices. In all participating countries/economies in PISA 2018, students who read books equally often in paper format and on digital devices or more often in paper format reported higher scores in the reading enjoyment index compared to students who read books more often on digital devices after accounting for the student's and school's socio-economic status and the student's gender. As previously shown (Figure 4.6), students who read books equally often in print and on digital devices are the heaviest readers, and, therefore, they are expected to be the ones who enjoy reading the most. However, students who read books equally often in paper format and on digital devices reported higher scores in the reading enjoyment index even after accounting for time spent reading for enjoyment in all countries and economies.

On average across OECD countries, this score-point difference in favour of students who read equally often in both formats or more often in print was of almost half a standard deviation after accounting for students' and schools' socio-economic profile, gender, and time spent reading. Students in France, Japan and Norway who read equally often in both formats or more often in paper format scored at least 0.60 of a standard deviation more in the reading enjoyment index than those who read more often on digital devices. In the Dominican Republic, Jordan, Morocco, Panama, the Philippines, and Viet Nam, however, these differences were smaller than 0.20 of a standard deviation (Table B.4.17).

Figure 4.10 **Index of enjoyment of reading by reading format**

Difference in the index of enjoyment of reading between students who read books equally often in print and on digital devices or more often in paper format and students who read books more often on digital devices



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: Statistically significant values are shown in darker tones.

Countries and economies are ranked in descending order of the difference in the index of enjoyment of reading, after accounting for students' and schools' socio-economic profile, and gender.

Source: OECD, PISA 2018 Database, Table B.4.17.

StatLink https://doi.org/10.1787/888934240009

Box 4.3. **How do future ICT professionals interact with digital devices?**

One out of every four 15-year-old student in OECD countries have no clear expectation about what their work will be when they are 30 years old. The large majority of those who do chose a highly-skilled occupation (76% of students, OECD average). About one-third of students chose science-related occupations (32% of students, OECD average), and approximately one student in every typical classroom chose ICT-related careers (4% of students, OECD average) (see Table II.B1.8.19 from PISA 2018 Results (Volume II) - Where All Students Can Succeed (OECD, 2019[20])). Reading in digital environments is important for all students but ICT-related professionals will need to be particularly on top of digital world changes.

PISA 2018 shows that students who reported they would like to work as ICT professionals or technicians in the future were more in touch with the digital environment than other students who also chose science-related careers. Compared to health professionals, students who chose ICT professional careers reported reading books (20% compared to 14%) or the news (48% compared to 43%) more often on digital devices (Tables B.4.23b, B.4.23c,

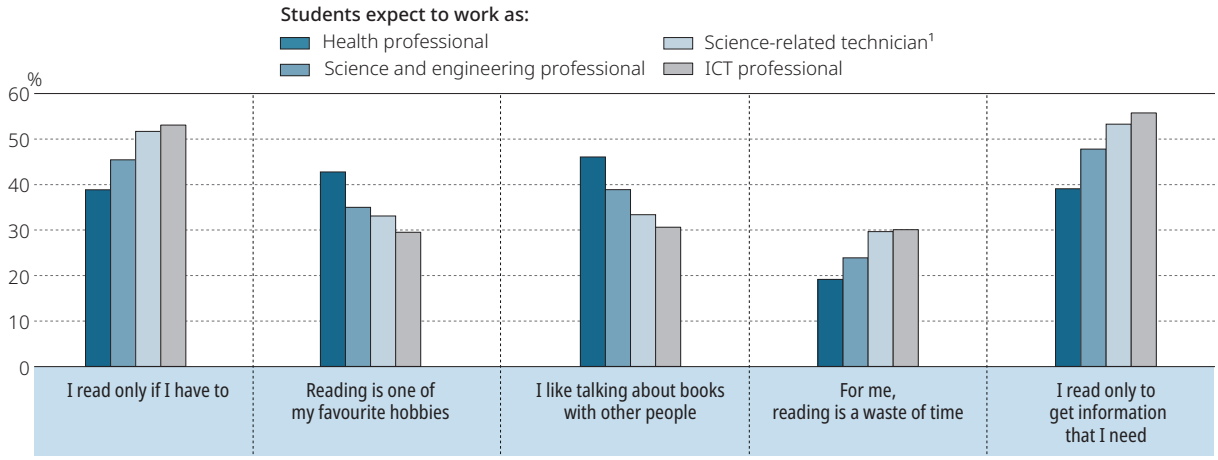
B.4.24b and B.4.24c). They were also the highest share of students who reported reading e-mails (47% compared 39%) and taking part in online discussion groups or forums (31% compared 21%) (Tables B.4.22b and B.4.22c). On the other hand, students who chose health professional careers read books more often in paper format (46% compared to 28%). They were also the highest share of students who reported searching for practical information online (61% compared to 56%). In the use of digital devices for school, the share of 'future' technicians playing simulations at school is 10 percentage points more than health professionals (38% compared to 28%) (Tables B.4.25b and B.4.25d). All of these differences are statistically significant.

At the same time, students who chose ICT professions reported reading for enjoyment less frequently than other science-related careers (-0.20, on average across OECD countries). In contrast, students who chose health professional careers as future jobs reported reading for enjoyment the most frequently (0.24). Compared to ICT professionals, the highest share of students who reported that reading is one of their favourite hobbies (43% compared to 30%) and talk about books with other people (46% compared to 31%) were students who chose health professional careers. In contrast, the highest share of students who reported reading only if they had to or to get information were students who chose technician or ICT professional careers (more than 50% compared to 39% for health professions) (Figure 4.11 and; Tables B.4.20a-d). It is important to bear in mind that girls typically report reading for enjoyment more frequently than boys so professional careers chosen mostly by girls (e.g. health) are expected to have higher enjoyment levels than professional careers mostly chosen by boys (e.g. technicians or ICT professionals). Nonetheless, the largest gender gap is observed among those who chose ICT careers, where girls showed the largest reading frequency for enjoyment. On average across OECD countries, 60% of 'future' ICT girls (compared to 27% of boys) agreed or strongly agreed that reading is one of their favourites hobbies (Figure 4.12 and; Tables B.4.21a-d).

These results highlight how, even among students with science-related career expectations, the interplay between digital environments, motivation and enjoyment of reading is different. As students' professional expectations differ so do their preferences for paper or digital format, level of enjoyment of reading, and ultimately their behaviour towards reading. Students interested in ICT already have higher exposure to digital devices at the age of 15 but they read for enjoyment less frequently, especially boys. Given the close relationship between reading enjoyment and performance, further attention in this area is needed.

Figure 4.11 **Reading habits, by students' career expectation**

Percentage of students who expect to work in the following careers, and who agreed or strongly agreed on the following reading behaviours, OECD average



1. Because of too few observations to provide reliable estimates in many OECD countries, OECD average considers 27 OECD countries.

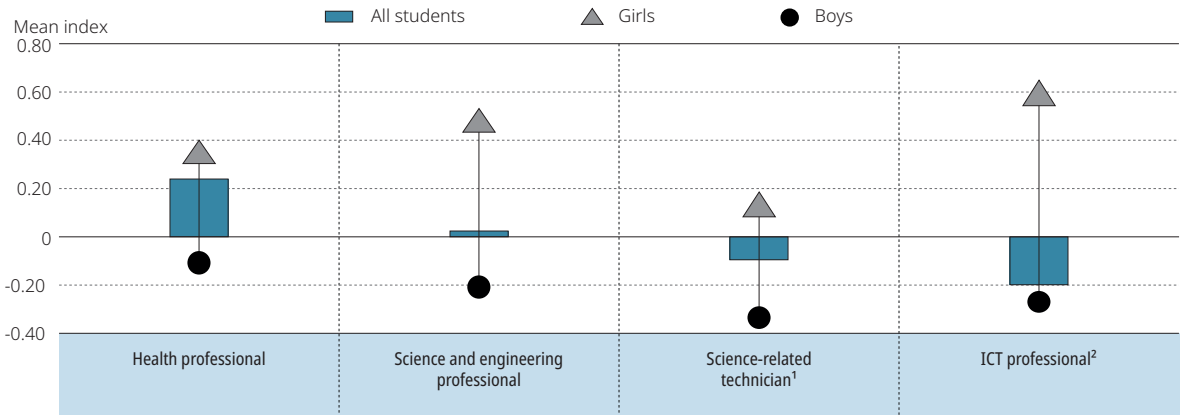
Careers are ranked in ascending order of the percentage of students who reported "I read only if I have to".

Source: OECD, PISA 2018 Database, Tables B.4.20a-d.

StatLink https://doi.org/10.1787/888934240028

Figure 4.12 **Enjoyment of reading, by students' career expectation and gender**

Index of enjoyment of reading, OECD average



1. Because of too few observations to provide reliable estimates in many OECD countries, OECD average for all students considers 27 OECD countries, for boys it considers 19 OECD countries and for girls it considers 10 OECD countries.

2. Because of too few observations to provide reliable estimates in many OECD countries for girls, OECD average considers 9 OECD countries.

Note: All gender differences are statistically significant.

Careers are ranked in descending order of the mean index of enjoyment of reading.

Source: OECD, PISA 2018 Database, Tables B.4.20a-d and B.4.21a-d.

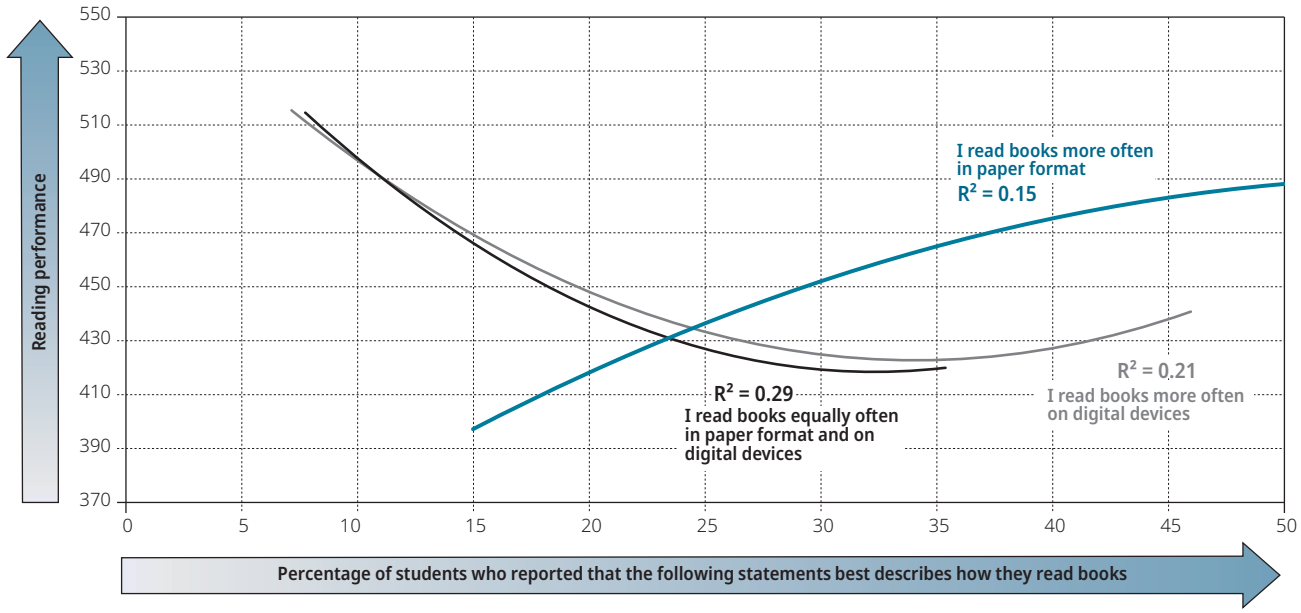
StatLink https://doi.org/10.1787/888934240047

Figure 4.13 shows the system-level relationship between reading performance and book formats. Education systems in which a higher percentage of students read books more often on paper perform better in reading than education systems in which students read books more often using digital devices. A similar relationship can be observed within countries and economies. In all countries and economies, except in the Dominican Republic and Morocco where there are no differences, students who reported reading paper books scored higher in reading than students who rarely or never read books once students' and school's socio-economic profile and students' gender had been accounted for. In comparison to students who rarely or never read, students in OECD countries who reported reading books more often on paper scored 49 points more in reading while students who reported reading books more often on digital devices scored only 15 points more (Table B.4.16). These results are aligned with recent meta-analyses that revealed that reading on paper resulted in better comprehension than reading the same text on a screen (Delgado et al., 2018[21]; Clinton, 2019[22]).

Figure 4.14 shows the system-level relationship between reading performance and the format news is read in. Education systems in which a higher percentage of students read the news more often on digital devices perform better in reading than education systems in which students do not follow the news at all. This result is consistent across all participating countries and economies with available data on the ICT questionnaire once students' and school's socio-economic profile, and students' gender had been accounted for. As previously pointed out, less than 5% of students across the OECD reported reading the news on paper compared to 41% who reported reading the news more often on digital devices (Table B.4.18).

Figure 4.13 **Correlations between reading performance and the format of reading books**

System-level analysis (All)

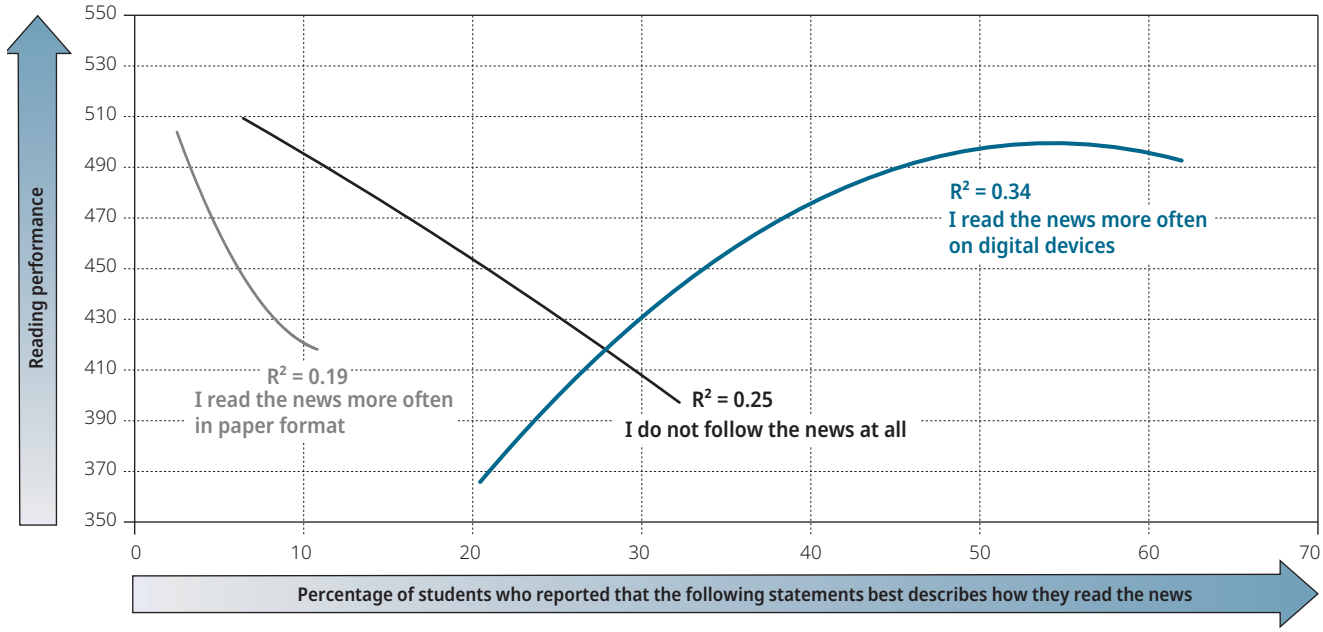


Source: OECD, PISA 2018 Database, Tables B.2.1 and B.4.11.

StatLink https://doi.org/10.1787/888934240066

Figure 4.14 **Correlations between reading performance and the format of reading the news**

System-level analysis (All)



Source: OECD, PISA 2018 Database, Tables B.2.1 and B.4.18.

StatLink https://doi.org/10.1787/888934240085

Box 4.4. **What are the common characteristics among strong reading performers?**

Stronger reading performers are more likely to be female students and students from higher socio-economic backgrounds (OECD, 2019[9]; OECD, 2019[20]). However, these are not the only characteristics that define strong readers. Previous PISA results showed that, although students who read fiction are more likely to achieve high scores, it is students who read a wide variety of material who perform particularly well in reading (OECD, 2010[1]). In the last decade, there has been considerable debate as to what format, type, and length of reading may be most effective in fostering reading skills and improving reading performance (Wolf, 2018[23]; Firth et al., 2019[24]).

PISA 2018 shows that strong readers tend to read books in paper or balance their reading time between paper and digital (Table B.4.16). At the same time, stronger readers tend to read the news more often on digital devices or balance their reading time between paper and digital. In other words, it seems that most proficient readers are able to effectively optimise the use of digital technology, depending on the activity. For example, strong readers use digital devices to read for information such as the news (Table B.4.18) or browse the Internet for schoolwork (Table B.6.16) while still enjoying reading a good book on paper. Most of the high performers in reading also read longer pieces of text for school (Table B.6.11a) and different types of texts, including fiction books such as novels or short stories, and texts with diagrams and graphs (Table B.6.8a).

In conclusion, PISA 2018 data suggest that digital devices are increasingly displacing print media, particularly in activities most closely tied to reading for information (e.g. newspapers, magazines). Yet, print book readers still read for pleasure diverse kinds of reading materials (e.g. books, magazines, newspapers, websites, etc.) more hours a week than digital book readers, and the biggest book readers balance their reading time between paper and digital. Compared to digital-book readers, print-book readers tend to perform better in reading and spend more time reading for enjoyment in all participating countries/economies in PISA 2018. Therefore, the potential benefit of using technology to enhance students' reading experience seems bigger in activities related to reading for information rather than reading books. Chapter 6 of this report provides some insights into how teaching practices can enhance reading in digital environments.

Notes

1. A socio-economically disadvantaged (advantaged) student is a student in the bottom (top) quarter of the PISA index of economic, social and cultural status (ESCS) in the relevant country/economy.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. In PISA 2018, 17 countries and economies distributed the parental questionnaire: 9 OECD countries – Belgium, Chile, Germany, Ireland, Italy, Korea, Luxembourg, Mexico, and Portugal; and 8 partner countries and economies – Brazil, Croatia, the Dominican Republic, Georgia, Hong Kong (China), Macao (China), Malta, and Panama.

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5

Strategies to tackle inequality and gender gaps in reading performance

This chapter discusses the relationship between students' perception of competence, reading strategies, and reading performance. This chapter also focuses on ways in which these variables mediate the relationship between socio-economic status, gender, and reading performance.

What the data tell us

- Almost one in five students in OECD countries reported feeling lost in the PISA test when navigating through different pages.
- Approximately 40% of students on average across OECD countries responded that clicking on the link of a phishing email was somewhat appropriate or very appropriate.
- Disadvantaged students perceived the PISA reading assessment as more difficult even after accounting for students' reading scores in the 70 countries and economies that participated in PISA 2018
- The OECD average change in reading performance associated with a one-unit increase in the index of perception of the PISA test's difficulty was 30 points after accounting for students' and schools' socio-economic status. This change in the index of knowledge of strategies for assessing the credibility of sources was 36 points.
- Almost 30% of the association between socio-economic background and reading performance can be accounted for by the difference between socio-economically advantaged and disadvantaged students' reported self-perception of reading competence.
- Almost two-thirds of the association between gender and reading performance can be accounted for by the difference between boys' and girls' knowledge of effective reading strategies.

HOW STUDENTS' SELF-PERCEPTION OF READING COMPETENCE IS ASSOCIATED WITH READING PERFORMANCE

Academic self-concept and self-efficacy are a person's perception of their ability in a particular domain. Self-concept often refers to a more stable and general perception of competence while self-efficacy refers to a perception of competence to solve a specific, well-defined task. Both constructs are therefore related; some researchers even argue that self-efficacy is an active precursor of self-concept (Bong and Skaalvik, 2003[1]). Most importantly, both concepts are strongly associated with students' motivation, learning, and performance (Retelsdorf, Köller and Möller, 2011[2]; Suárez-Álvarez, Fernández-Alonso and Muñiz, 2014[3]) and are mutually reinforcing (Marsh and Craven, 2006[4]).

PISA 2018 asked students about their general self-efficacy, whose results have been extensively discussed in earlier volumes of PISA (OECD, 2019[5]; OECD, 2019[6]). In addition, for the first time, PISA 2018 asked students about their self-concept in reading by choosing one of these six categories: "I am a good reader", "I am able to understand difficult texts", "I read fluently", "I have always had difficulty with reading", "I have to read a text several times before completely understanding it", and "I find it difficult to answer questions about a text". The first three positively worded categories were combined into an index of perceived competence in reading (screadcomp), and the last three negatively worded items into an index of perceived difficulty in reading (screaddiff). Positive values in the index of perceived competence in reading (screadcomp) mean that the student reported higher self-concept than did the average student across OECD countries. Positive values in the index of perceived difficulty in reading (screaddiff) mean that the student reported lower self-concept than did the average student across OECD countries (OECD, 2020[7]).

PISA 2018 also included a new reading self-efficacy index linked to the PISA task itself called index of perception of difficulty of the PISA test (pisadiff). In this task, students were asked to report the extent to which they agree (i.e. strongly disagree, disagree, agree, and strongly agree) with the following statements about the PISA reading tasks they had just completed: "Many texts were too difficult for me", "There were many words I could not understand", "I was lost when I had to navigate between different pages". This index can be regarded as a proxy for measuring self-efficacy in reading. Positive values in this index mean that the student reported lower self-efficacy than did the average student across OECD countries.

Being able to navigate through different pages to understand a text is particularly important for digital literacy as students often face similar challenges when navigating through information on the Internet. However, almost one in five students across OECD countries reported feeling lost in the PISA test when navigating through different pages. Approximately one out of every two students in Indonesia, Thailand, and the Philippines reported these difficulties while less than 15% did so in B-S-J-Z (China), Belarus, Denmark, Finland, Germany, Hungary, Ireland, Italy, Lithuania, Russia, and Spain. Approximately 17% of students in OECD countries agreed or strongly agreed that many texts in the PISA reading assessment were too difficult for them. Similarly, about 18% agreed or completely agreed that they could not understand many words (Table B.5.1).

The index of perception of difficulty of the PISA test (pisadiff) is moderately correlated with the index of perceived difficulty in reading (screaddiff) (r = 0.49, OECD average), and negatively correlated with the index of perceived competence in reading (screadcomp) (r = -0.37, OECD average). As will be further discussed in this section, student perception of difficulty of the PISA test (pisadiff) is also the indicator of perception of competence included in PISA that is more strongly associated with reading performance. While this chapter prioritises the novel and reading-related aspects not described in previous volumes of PISA, such as the new measure of self-efficacy in reading, the annex tables include detailed results for student perceived competence in reading, student perceived difficulty in reading, and general self-efficacy (Tables B.5.2 and B.5.3).

Austria, Denmark, and Germany were the countries whose students had the lowest perception of difficulty (-0.35 or lower). In contrast, students in the Philippines, Thailand, and Viet Nam reported the highest perception of difficulty (0.87 or higher). And despite performing above the OECD average in reading, students of several countries and economies considered the reading test more difficult than the OECD average. These include some East Asian education systems such as B-S-J-Z (China), Hong Kong (China), Japan, Korea, Macao (China) and Chinese Taipei, which might be more sensitive to modesty bias. This is attributed to the fact that in East Asian cultures people value being modest more than in Western cultures (Van de gaer et al., 2012[8]).

Students' perception of competence typically varies as a function of different students' characteristics (Figure 5.1). In all participating countries and economies in PISA 2018, students from a lower socio-economic background[1] perceived the PISA reading assessment as more difficult (Tables B.5.4a and B.5.4c) and reported a lower perception of competence (Table B.5.4b). On average across OECD countries, the difference in the index of perception of the difficulty of the PISA test between students from advantaged and disadvantaged socio-economic backgrounds[2] was about half of a standard deviation (0.52) in favour of advantaged students – i.e. they perceived the test as less difficult. Students in France, Luxembourg, New Zealand, and Singapore, in particular, reported the largest socio-economic gap in this index (0.74 or higher) while the Dominican Republic, Indonesia, and Thailand, reported the smallest socio-economic gap (lower than 0.20).

Although not as pronounced as between students from different socio-economic status, there are also differences in the perception of competence depending on students' immigration backgrounds. On average across OECD countries, the difference in the index of perception of the difficulty of the PISA test between students from an immigrant and non-immigrant background was about one-quarter of a standard deviation in favour of students with a non-immigrant background - i.e. they perceive the test as less difficult. Students from an immigrant background in Finland, Iceland, and Mexico, in particular, perceived the PISA reading test as more difficult compared to non-immigrant students. However, immigrant students in Brunei Darussalam, Qatar, and the United Arab Emirates, perceived the PISA reading test as less complicated than non-immigrant students (Figure 5.1 and Table B.5.4a). It is important to bear in mind that students from an immigrant background in Brunei, Qatar, and the United Arab Emirates are, on average, stronger performers in reading than their non-immigrant counterparts (OECD, 2019[5]). In other words, it is important to take into account that perceptions of competence and performance are mutually reinforcing so when higher-performing students receive and process performance feedback, their perception of competence tends to be higher.

It would be reasonable to expect that disadvantaged students' higher perception of difficulty is due in part to their lower performance in reading. However, disadvantaged students still perceived the PISA reading assessment as more difficult even after accounting for students' reading scores in all countries and economies that participated in PISA 2018. The five countries that were an exception are Belgium, the Dominican Republic, Indonesia, Saudi Arabia, and Thailand (Table B.5.4a).

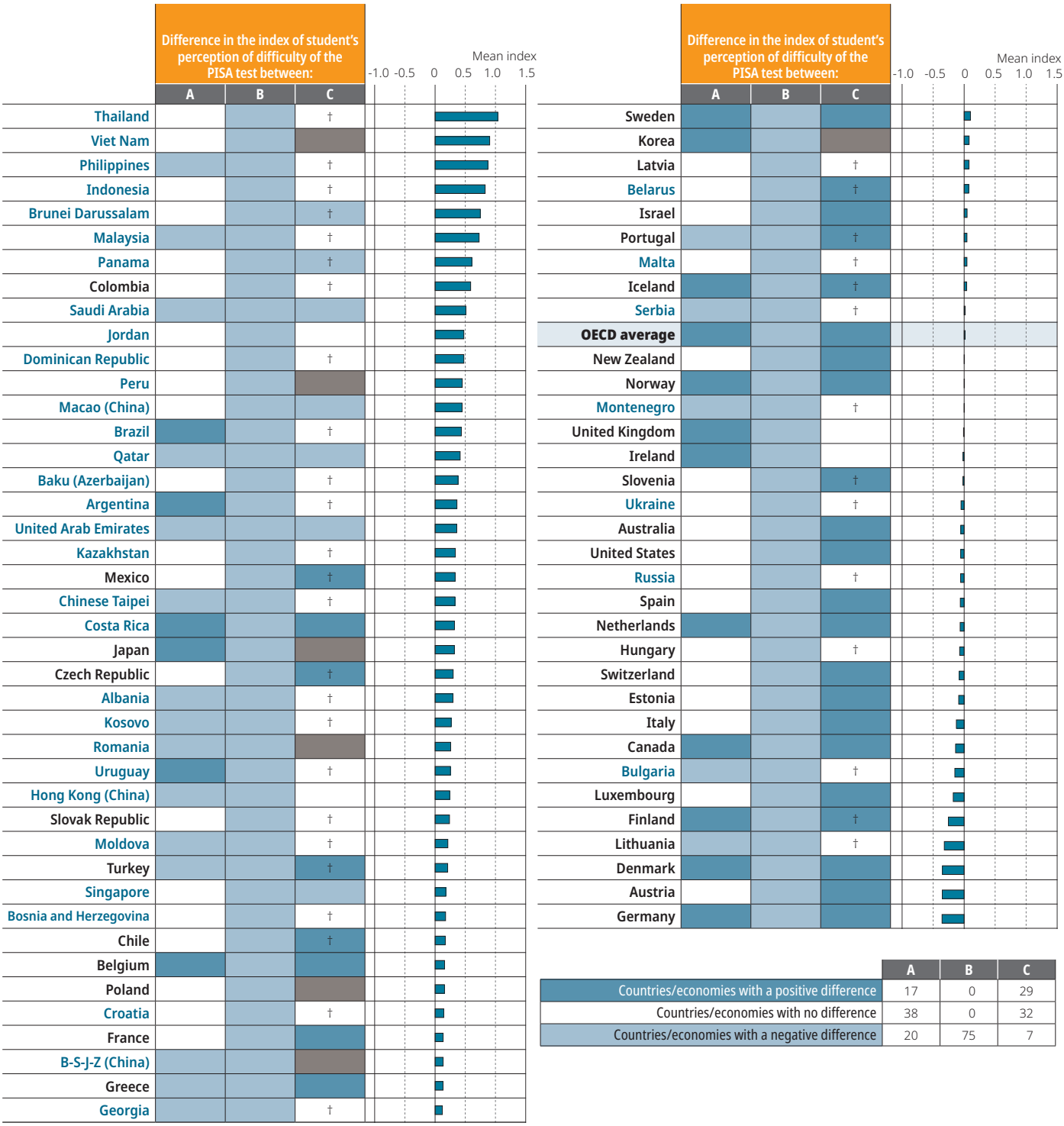
The gender difference in students' perception of competence are relatively smaller in magnitude than socio-economic background yet present in about half of the countries. Girls in Iceland, the Netherlands, and Sweden, in particular, perceived the PISA reading test as more complicated compared to boys, while boys, instead of girls, perceived it to be more difficult in Albania, Greece, and Kosovo. The vast majority of variance in this index lies within schools and only 6% constitutes between-schools variance on average across OECD countries (Tables B.5.4a and B.5.5a).

Countries in which the average student perceived the PISA reading test to be more challenging are also the countries where students tended to have lower scores in the PISA reading assessment. For example, students in Denmark and Germany scored above the OECD average in reading performance and they were also the countries where students had the lowest perception of difficulty (around -0.35 points or lower). On the other hand, students in Indonesia, the Philippines, and Thailand scored below the OECD average and their students reported the highest perception of difficulty (0.8 points or higher). These relationships are also observed within-countries and economies in the overall reading score as well as in single- and multiple-source reading subscales (Figure 5.2; Tables B.5.6, B.5.7 and B.5.8). Nonetheless, as previously pointed out, modesty bias might be playing a role in the list of countries that appear in the upper right part of the figure as they are predominantly from East Asia (Van de gaer et al., 2012[8]).

Figure 5.1 **Index of perception of difficulty of the PISA reading test, by student characteristics**

Positive difference | Negative difference | Difference is not significant | Missing values

A Girls - boys | B Advantaged - disadvantaged students | C Immigrant - non-immigrant students



	A	B	C
Countries/economies with a positive difference	17	0	29
Countries/economies with no difference	38	0	32
Countries/economies with a negative difference	20	75	7

Note: One dagger (†) means that the share of immigrant students in the country is less than 10%.

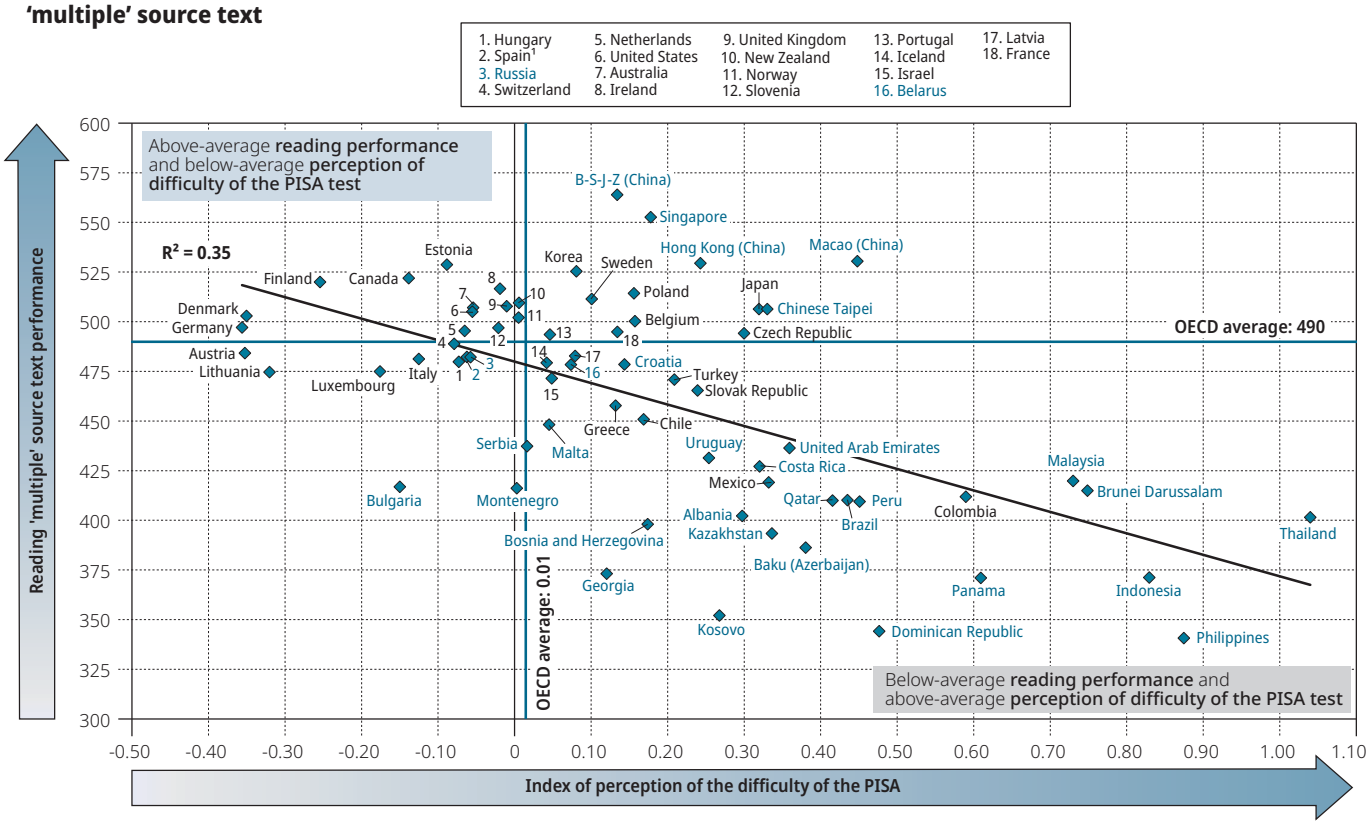
Countries and economies are ranked in descending order of the index of perception of difficulty of the PISA test.

Source: OECD, PISA 2018 Database, Tables B.5.1 and B.5.4a.

StatLink https://doi.org/10.1787/888934240104

On average across OECD countries, students in the top quarter of the index of perception of difficulty of the PISA test scored 95 points – or approximately one standard deviation – less in reading than students in the bottom quarter of this index. Note that students in the top quarter of this index had more perception of difficulty and therefore, lower reading self-efficacy. This score-point difference for single and multiple-source reading subscales was 97 points (Tables B.5.6, B.5.7 and B.5.8).

Figure 5.2 **Relationship between the perception of the difficulty of the PISA reading test and performance in 'multiple' source text**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Source: OECD, PISA 2018 Database, Tables B.5.1 and B.5.8.

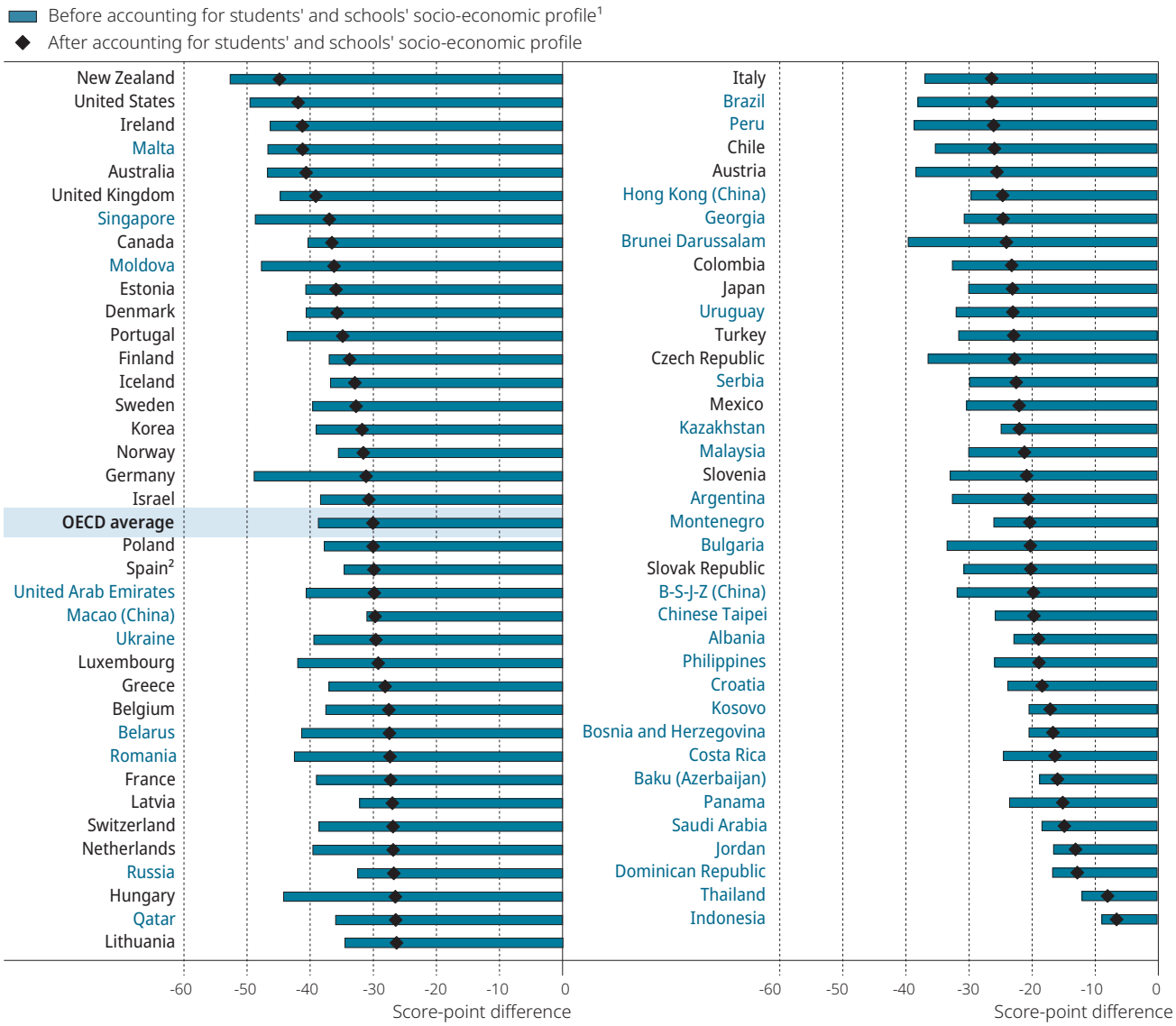
StatLink https://doi.org/10.1787/888934240123

Figure 5.3[3] shows the change in reading performance associated with a one-unit increase in the index of perception of difficulty of the PISA test. Figure 5.4 does the same but for single- and multiple-source text subscales. The relationship is statistically significant in all participating countries and economies in PISA 2018. However, the magnitude of this relationship is not the same across countries. The OECD average change in reading performance associated with a one-unit increase in the index of perception of difficulty of the PISA test was 30 points after accounting for students' and schools' socio-economic status (Table B.5.6). In Australia, Ireland, Malta, New Zealand, and the United States, this change in reading performance is of at least 40 points after accounting for students' and schools' socio-economic status. However, in Indonesia and Thailand, this score-point difference is lower than 10 points. Students' perception of self-efficacy in reading is also strongly associated with single- and multiple-source subscales of reading after accounting for socio-economic status. (Figure 5.4, Tables B.5.7 and B.5.8).

When interpreting these results, it is important to bear in mind that as a result of the Multistage Adaptive Testing (MSAT) used in PISA 2018, students who answered the computer-based assessment were assigned to different booklets based on their ability at the beginning of the cognitive test (see PISA 2018 Technical Report for further details). Nevertheless, the results presented above hold even after accounting for the MSAT effect (Table B.5.6).

Figure 5.3 **Relationship between the perception of the difficulty of the PISA reading test and reading performance**

Score-point difference in reading associated with a one-unit increase in the index of perception of the difficulty of the PISA reading test



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Notes: All score-point differences are statistically significant.

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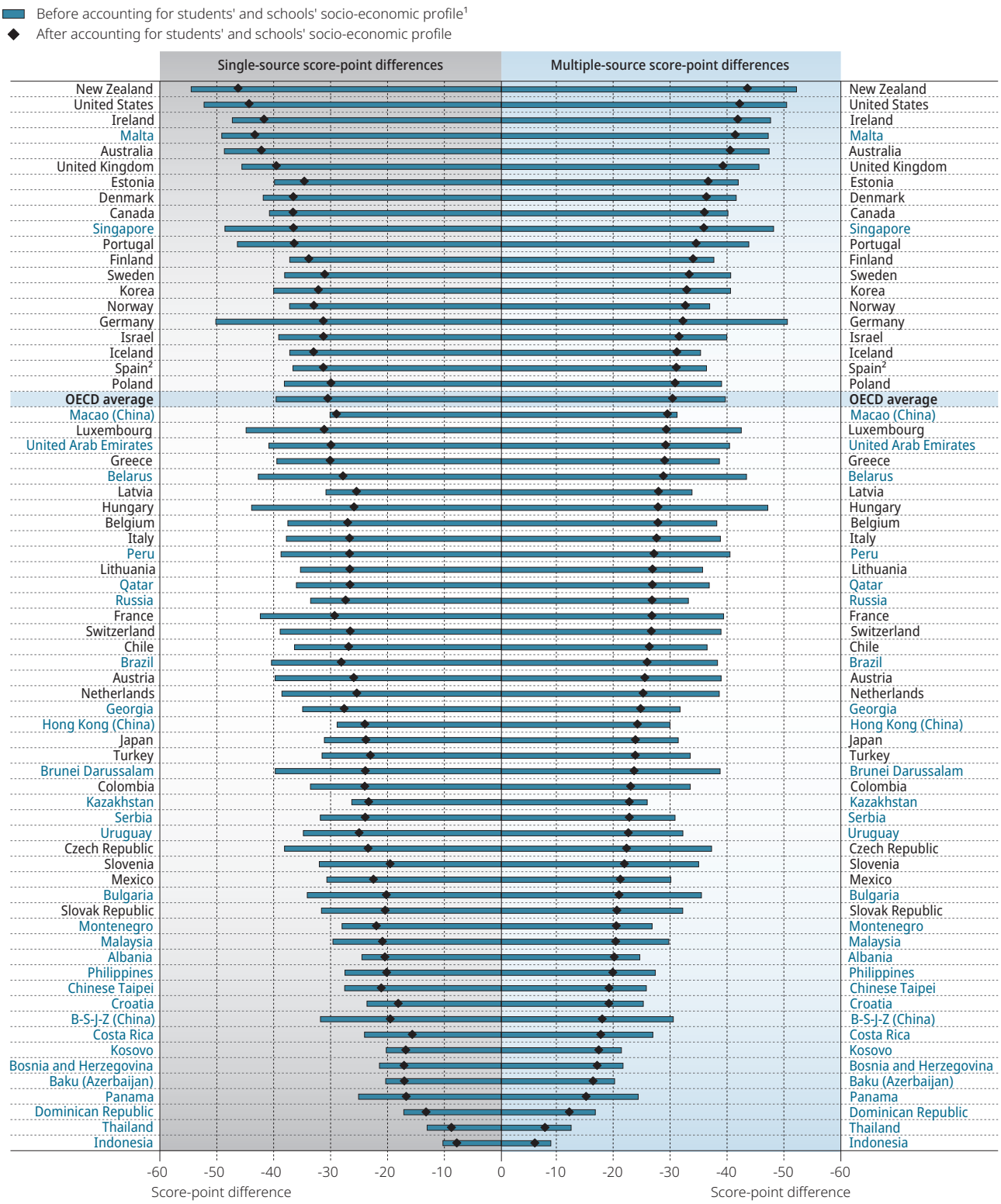
Countries and economies are ranked in ascending order of the score-point difference in reading, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.5.6.

StatLink https://doi.org/10.1787/888934240142

Figure 5.4 **Relationship between the perception of the difficulty of the PISA reading test and single- and multiple-source scores**

Score-point difference in each reading subscale associated with a one-unit increase in the index of perception of the difficulty of the PISA reading test



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Note: All score-point differences are statistically significant.

Countries and economies are ranked in ascending order of the multiple-source score-point difference, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Tables B.5.7 and B.5.8.

StatLink https://doi.org/10.1787/888934240161

Box 5.1. **Performance and difficulty-perception mismatch**

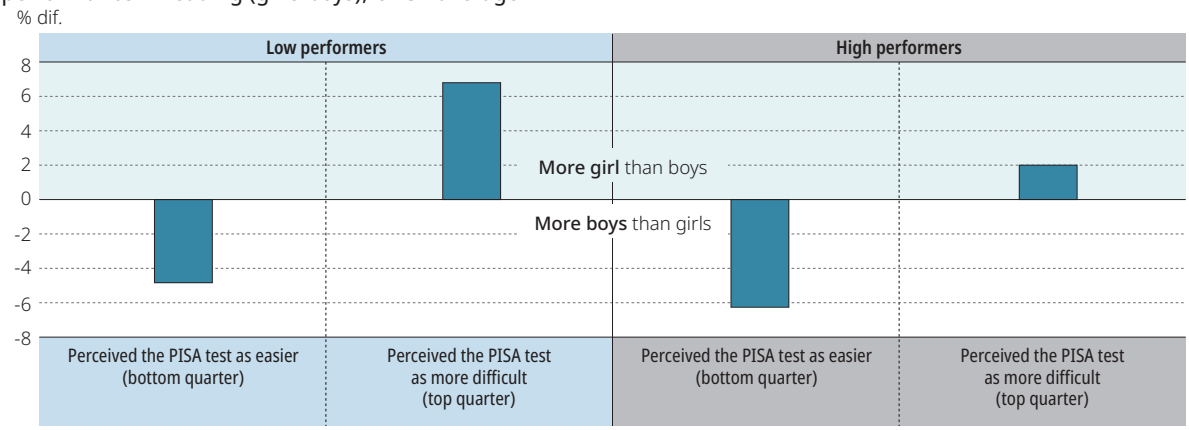
In PISA 2018, girls outperformed boys in reading by 25 points after accounting for students' socio-economic backgrounds (Figure 5.11). However, boys' average index of perception of the difficulty of the PISA test was significantly lower than girls (- 0.03 across OECD countries), meaning boys reported that they felt the test was easier than what girls reported. Among low performers (the bottom 25% of the distribution within countries/economies) in the PISA reading test, boys were more likely to report the PISA test as being easier than girls. This observation holds among high performers (the top 25% of the distribution) as well, although the gender gap is narrowed (Figure 5.5). As students' performance level increased both boys and girls reported perceiving fewer difficulties in the PISA reading tasks though the association between performance and the perception of the PISA test as being easier is stronger for girls (Tables B.5.21 and B.5.22). This means that the perception gap between boys and girls narrows with performance but mostly because of girls.

A measure of performance and difficulty-perception mismatch is developed based on an approach similar to the one measuring academic resilience in PISA[4]. This indicator shows the share of students who scored in the bottom quarter of reading in their country/economy and in the bottom quarter of the reported difficulty for the PISA test in that country/economy (i.e. low performers who reported that the test was easier than most of their peers). The share of low performers who displayed this performance and difficulty-perception mismatch ranges from below 10% for Ireland, Moldova, Portugal, Romania, Singapore, and the United States to more than 20% for Indonesia, Jordan, the Dominican Republic, Panama, the Philippines, and Thailand. On average across OECD countries, 13.4% of low-performing students reported finding the PISA test easier than most of their peers. In Chinese Taipei and Japan, both countries with an average reading score above the OECD average, around 17% of low performers reported finding the PISA test easier than most of their peers (Table B.5.23). It is important to bear in mind that in top-performing countries/economies, even low-performing students may find fewer difficulties[5] in the PISA reading tasks than top-performing students in low-performing countries/economies.

Students' perceptions of how good (or bad) they are at reading, and more generally, how competent they are, have important ramifications. They influence how well students motivate themselves, set goals and persevere in the face of difficulties (Fang et al., 2018[9]). These are critical qualities for improving reading skills, which require persistent practice (Peura et al., 2019[10]). After taking the PISA test, students who thought that the reading tasks were easy yet did not perform well might have overestimated their competence, particularly their reading skills. Students who perceive themselves as more competent than they really are may be hampered in their motivation and persistence in developing their reading skills. This may explain, to some extent, their more unsatisfactory performance in the PISA test. Students need to know how to manage their knowledge about what they actually know, and what they can do with what they know. Intensified teacher feedback, increased peer assessment opportunities, systematic reviewing of past performance, and the development of self-appraisal skills may help students better calibrate their perception of competence with their actual performance (Dunning, Heath and Suls, 2004[11]).

Figure 5.5 **Perceived difficulty of the PISA test across levels of performance**

Difference in the proportion of boys and girls according to their perception of difficulty of the PISA test and their performance in reading (girls-boys), OECD average



Note: All differences between girls and boys are statistically significant.

Source: OECD, PISA 2018 Database, Table B.5.21.

StatLink https://doi.org/10.1787/888934240180

HOW STUDENTS' KNOWLEDGE OF EFFECTIVE READING STRATEGIES IS ASSOCIATED WITH READING PERFORMANCE

Students' awareness of reading strategies (i.e. how students monitor and manage reading tasks) is fundamental to cognitively processing texts. Meta-cognition strategies consist of an individual's ability to think about, monitor and adjust their activity for a particular goal. Numerous studies have found a positive association between meta-cognitive strategies and reading proficiency (Artelt, Schiefele and Schneider, 2001[12]; Cantrell et al., 2010[13]; Artelt and Schneider, 2015[14]). Previous PISA cycles have shown that meta-cognition is a robust predictor of reading achievement even after accounting for gender and socio-economic status (OECD, 2010[15]).

As in previous PISA cycles, students in PISA 2018 were asked to evaluate the effectiveness of different reading strategies in understanding and memorising a text (Table B.5.9) as well as strategies for summarising information (Table B.5.10). In the first task, students were asked what strategies would be more useful for remembering the information in a text. Examples of these strategies include "I concentrate on the parts of the text that are easy to understand" or "I quickly read through the text twice". In the second task, students were asked what strategies would be more useful for writing a summary of a long and rather difficult two-page text about fluctuations in the water level of a lake in Africa. Examples of these strategies include "I write a summary. Then I check that each paragraph is covered in the summary because the content of each paragraph should be included" or "I try to copy out accurately as many sentences as possible".

Additionally, PISA 2018 also collected information about knowledge of reading strategies linked explicitly to the goal of assessing the credibility of sources for the first time (Table B.5.11). In this task, students were asked what strategies would be more appropriate for responding to a spam email (Box 5.2). The reading task presented to students read as follows: "You have received a message in your inbox from a well-known mobile phone operator telling you that you are one of the winners of a smartphone. The sender asks you to click on the link to fill out a form with your data so they can send you the smartphone". Examples of these strategies include "Click on the link to fill out the form as soon as possible" or "Delete the email without clicking on the link".

Box 5.2. **PISA 2018 scenario-based assessment of knowledge of reading strategies**

The PISA 2018 questionnaires included three scenarios assessing students' knowledge of strategies for "Understanding and remembering" (undrem, ST164), "Summarising" (metasum, ST165) and "Assessing credibility" (metaspam, ST166). Metaspam was newly developed for PISA 2018. Each scenario consists of (a) a stem which is a reading task and (b) a set of strategies. Students were asked to rate how useful the strategies were for solving the reading task. All strategies were also rated by reading experts via multiple pairwise comparisons. This rating resulted in a hierarchy of all strategies for each task based on all the pairs agreed upon by at least 80% of the experts. For the new metaspam scenario (based on question ST166), for example, the experts' ratings resulted in the following order: Q02HA, Q04HA, Q05HA > Q01HA, Q03HA. The final scores assigned to each student for each task ranges from 0 to 1 and can be interpreted as the proportion of the total number of expert pairwise relations that are consistent with the student ordering. The higher the score, the more a student chose an expert-validated strategy over a less useful one. Finally, all three indices were standardised to have an OECD mean of 0 and a standard deviation of 1. Nonetheless, one should be cautious when comparing countries' and economies' means in these indices as cross-cultural comparability is not always guaranteed.

Reading Task: *You have received a message in your inbox from a well-known mobile phone operator telling you that you are one of the winners of a smartphone. The sender asks you to click on the link to fill out a form with your data so they can send you the smartphone.*

ST166 **In your opinion, how appropriate are the following strategies in reaction to this email?**

(Please select one response in each row.)

		Not appropriate at all (1)	(2)	(3)	(4)	(5)	*Very appropriate* (6)
ST166Q01HA	Answer the email and ask for more information about the smartphone	☐01	☐02	☐03	☐04	☐05	☐06
ST166Q02HA	Check the sender's email address	☐01	☐02	☐03	☐04	☐05	☐06
ST166Q03HA	Click on the link to fill out the form as soon as possible	☐01	☐02	☐03	☐04	☐05	☐06
ST166Q04HA	Delete the email without clicking on the link	☐01	☐02	☐03	☐04	☐05	☐06
ST166Q05HA	Check the website of the mobile phone operator to see whether the smartphone offer is mentioned	☐01	☐02	☐03	☐04	☐05	☐06

The index of knowledge of reading strategies for assessing the credibility of sources (metaspam) is moderately correlated with the index of knowledge of reading strategies for understanding and remembering (undrem) (r = 0.32, OECD average), and the index of knowledge of reading strategies for writing a summary (metasum) (r = 0.39, OECD average). The index of knowledge of reading strategies for understanding and remembering and the index of knowledge of reading strategies for writing a summary are also moderately correlated (r = 0.47, OECD average). Assessing the credibility of sources is particularly relevant in digital reading and when reading multiple pieces of text online. Therefore, this section will pay special attention to the index of knowledge of reading strategies for assessing the credibility of sources. For further country results of two other reading strategies consult the annex tables (Tables B.5.9, B.5.10 and B.5.11).

Approximately 40% of students in OECD countries responded that clicking on the link to fill out the form as soon as possible was somewhat appropriate or very appropriate. About 31% of students in OECD countries reported that deleting the email without clicking on the link would be very appropriate. Students in Denmark, Germany, Ireland, Japan, the Netherlands, and the United Kingdom scored the highest in the index of knowledge of reading strategies for assessing the credibility of sources across all participating countries and economies in PISA 2018 (higher than 0.20 points). In contrast, students in Baku (Azerbaijan), Indonesia, Kazakhstan, the Philippines, and Thailand had the lowest scores in this index (lower than -0.65 points). Among OECD countries, students in Chile, Colombia, Hungary, Korea, Mexico, and Turkey had the lowest scores in this index (lower than -0.20 points) (Table B.5.11).

Students' knowledge of reading strategies typically vary by different students' characteristics (Figure 5.6). Students from advantaged socio-economic backgrounds in all participating countries and economies who participated in PISA 2018 scored higher in the index of knowledge of reading strategies for assessing the credibility of sources than students from disadvantaged socio-economic backgrounds. The widest socio-economic disparities were observed in the index of knowledge of strategies for assessing the credibility of sources compared with the two other reading strategies indices. On average across OECD countries, the difference between students from advantaged and disadvantaged socio-economic backgrounds was close to half a standard deviation (0.45) in favour of the wealthier students (compared to 0.37 in undrem and 0.42 in metasum). Students in Germany, Luxembourg, Portugal, Switzerland and the United States, in particular, reported the largest socio-economic gap (0.65 points or higher) in this index of knowledge of strategies for assessing the credibility of sources across all participating countries and economies in PISA 2018. In contrast, Albania, Baku (Azerbaijan), Kazakhstan, and Macao (China) reported the smallest socio-economic gap (lower than 0.15 points). Among OECD countries, Canada, Estonia, Iceland, Ireland, Italy, Korea, Latvia, and Lithuania reported the smallest socio-economic gap among OECD countries (lower than 0.35 points) (Tables B.5.12a-c).

Girls also predominantly reported better knowledge of reading strategies than boys in the three indices included in PISA 2018. Although still present, less gender difference was observed in the index of knowledge of strategies for assessing the credibility of sources (one-fifth of standard deviation) than the index of knowledge of strategies for understanding and remembering as well as for summarising information (both around one-third of standard deviation) on average across OECD countries. The largest gender difference in the index of knowledge of strategies for assessing the credibility of sources was observed in the Czech Republic, Finland, Hong Kong (China), Iceland, Japan, and Korea (at least one-quarter of standard deviation). On the other hand, in 16 countries and economies including the OECD countries Chile, Colombia, and Mexico, the gender difference was not statistically significant (Tables B.5.12a-c).

On average across OECD countries, students from an immigrant background reported lower knowledge of effective reading strategies than non-immigrant students in the three indices included in PISA 2018. However, in Australia, Canada, and New Zealand, immigrant students reported higher levels in undrem and metasum indices. In 17 OECD countries, immigrant and non-immigrant students showed the same level in undrem index, in 11 OECD countries for metasum index, and in 10 OECD countries for metaspam index. The widest disparities based on immigrant background were observed in the index of knowledge of strategies for assessing the credibility of sources (about one-fifth of standard deviation).

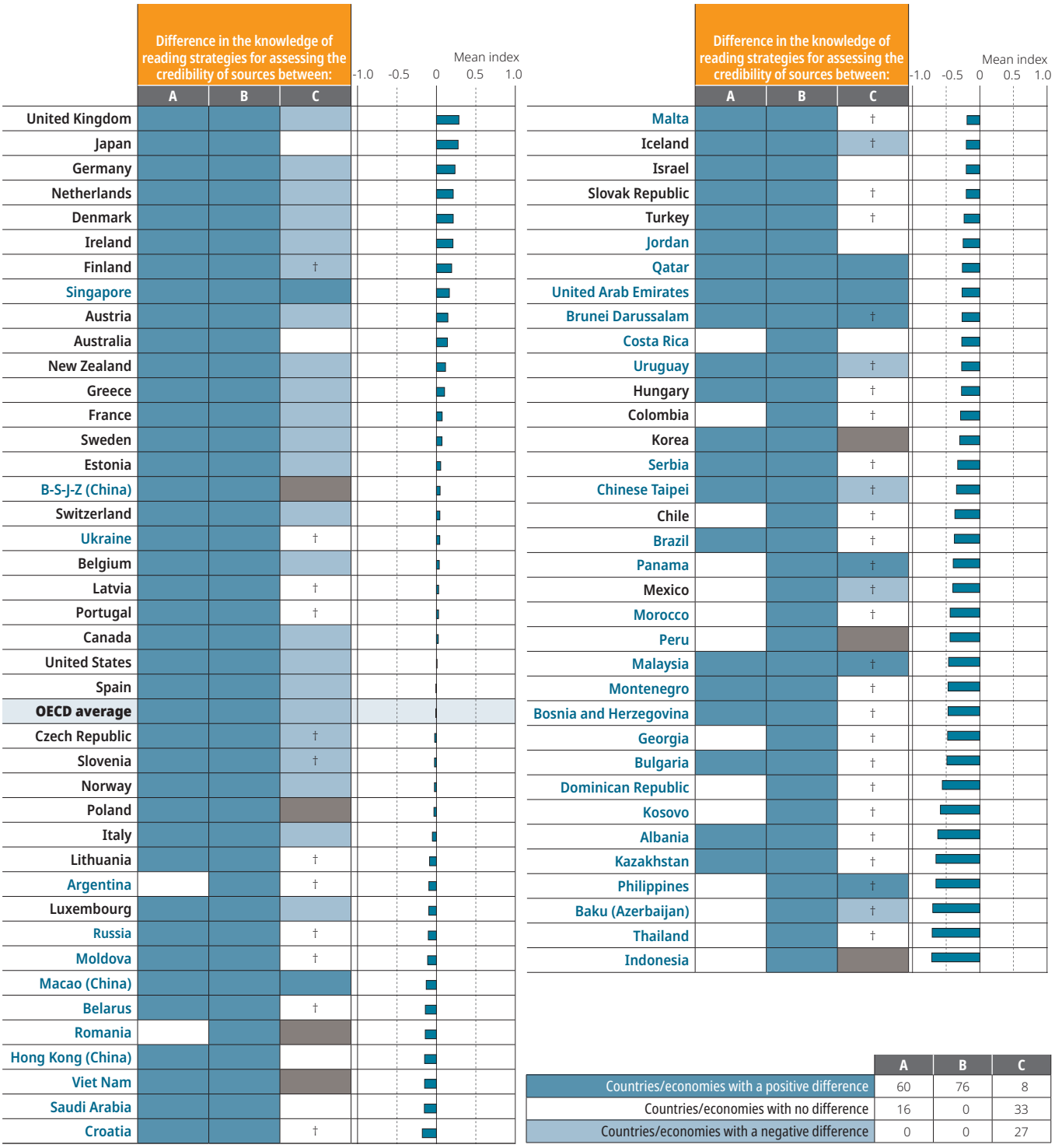
Between 8 to 10% of the variance in the three indices of knowledge of reading strategies is between-school on average across OECD countries (Tables B.5.13a-c). In Austria, Germany and the Netherlands, the between-schools variance in the index of knowledge of reading strategies for assessing the credibility of sources is higher than 15% while in Albania, Georgia, and Kosovo it is lower than 2% (Table B.5.13c). Although the proportion of variation that lies between schools is slightly higher than other indices presented in this report (e.g. enjoyment of reading, or reading self-efficacy), the variance in the indices of knowledge of reading strategies still lays mostly within-schools.

Countries in which the average student is more aware of effective strategies for assessing the credibility of sources are also those in which students tend to perform better in the PISA reading assessment, including single and multiple-source reading subscales (Table B.5.16). And within countries and economies on average across OECD countries, students in the top quarter of the index of knowledge of strategies for assessing the credibility of sources scored 114 points more in reading than students in the bottom quarter of this index. This score-point difference for single- and multiple-source reading subscales were 116 and 115 respectively.

Figure 5.6 **Index of knowledge of reading strategies for assessing the credibility of sources, by student characteristics**

Positive difference | Negative difference | Difference is not significant | Missing values

A Girls - boys | B Advantaged - disadvantaged students | C Immigrant - non-immigrant students



	A	B	C
Countries/economies with a positive difference	60	76	8
Countries/economies with no difference	16	0	33
Countries/economies with a negative difference	0	0	27

Note: One dagger (†) means that the share of immigrant students in the country is less than 10%.

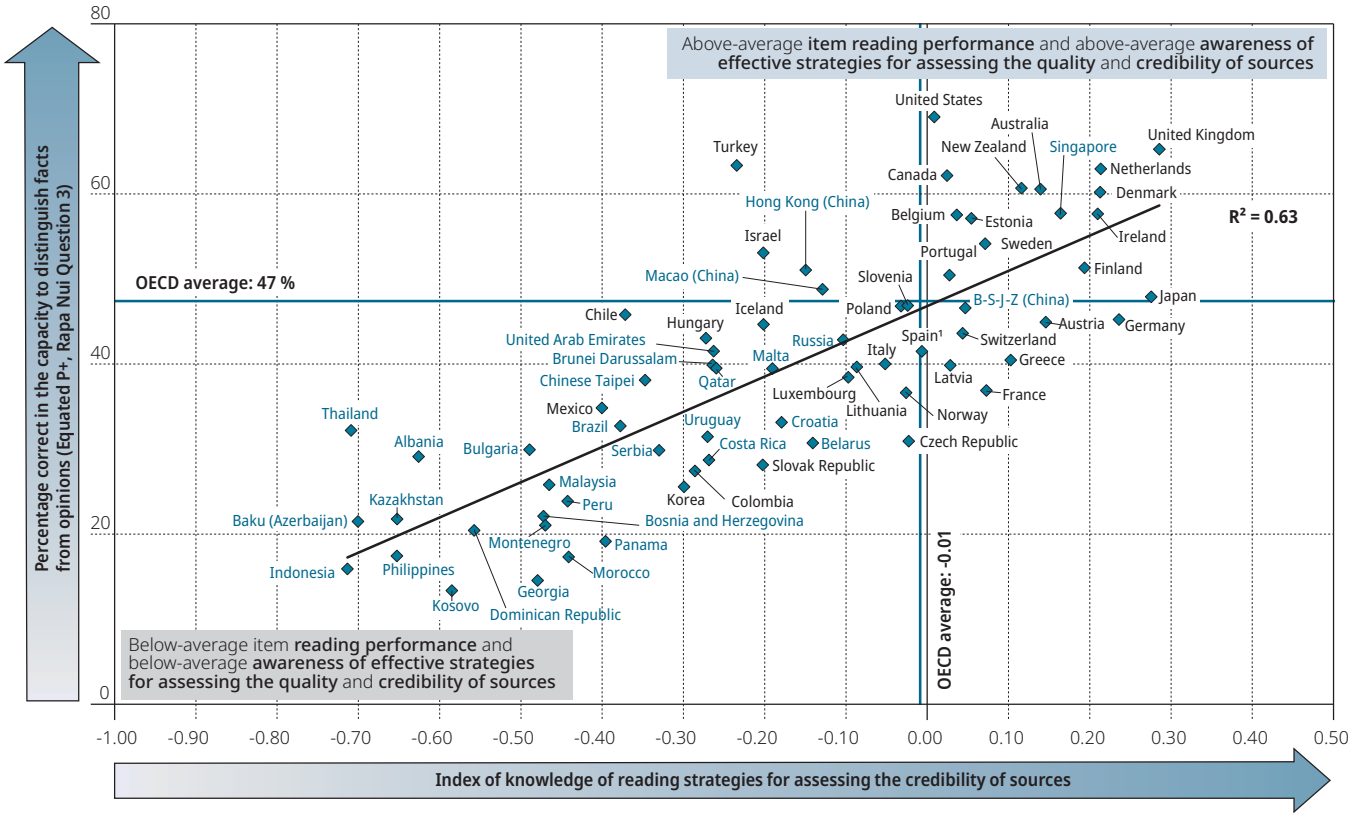
Countries and economies are ranked in descending order of the index of knowledge of reading strategies for assessing the credibility of sources.

Source: OECD, PISA 2018 Database, Tables B.5.11 and B.5.12c.

StatLink https://doi.org/10.1787/888934240199

The PISA 2018 reading assessment included one item-unit (Rapa Nui Question 3, CR551Q06) that tested whether students can distinguish between facts and opinions when presented with multiple texts (see Chapter 2, Box 2.2). Figure 5.7 illustrates how education systems in which the average student is aware of effective strategies for assessing the credibility of sources are also those in which the estimated percentage correct in the reading item of distinguishing facts from opinions is higher.

Figure 5.7 **Relationship between the reading item of distinguishing facts from opinions and the index of knowledge of reading strategies for assessing the credibility of sources**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Source: OECD, PISA 2018 Database, Tables B.2.8 and B.5.11.

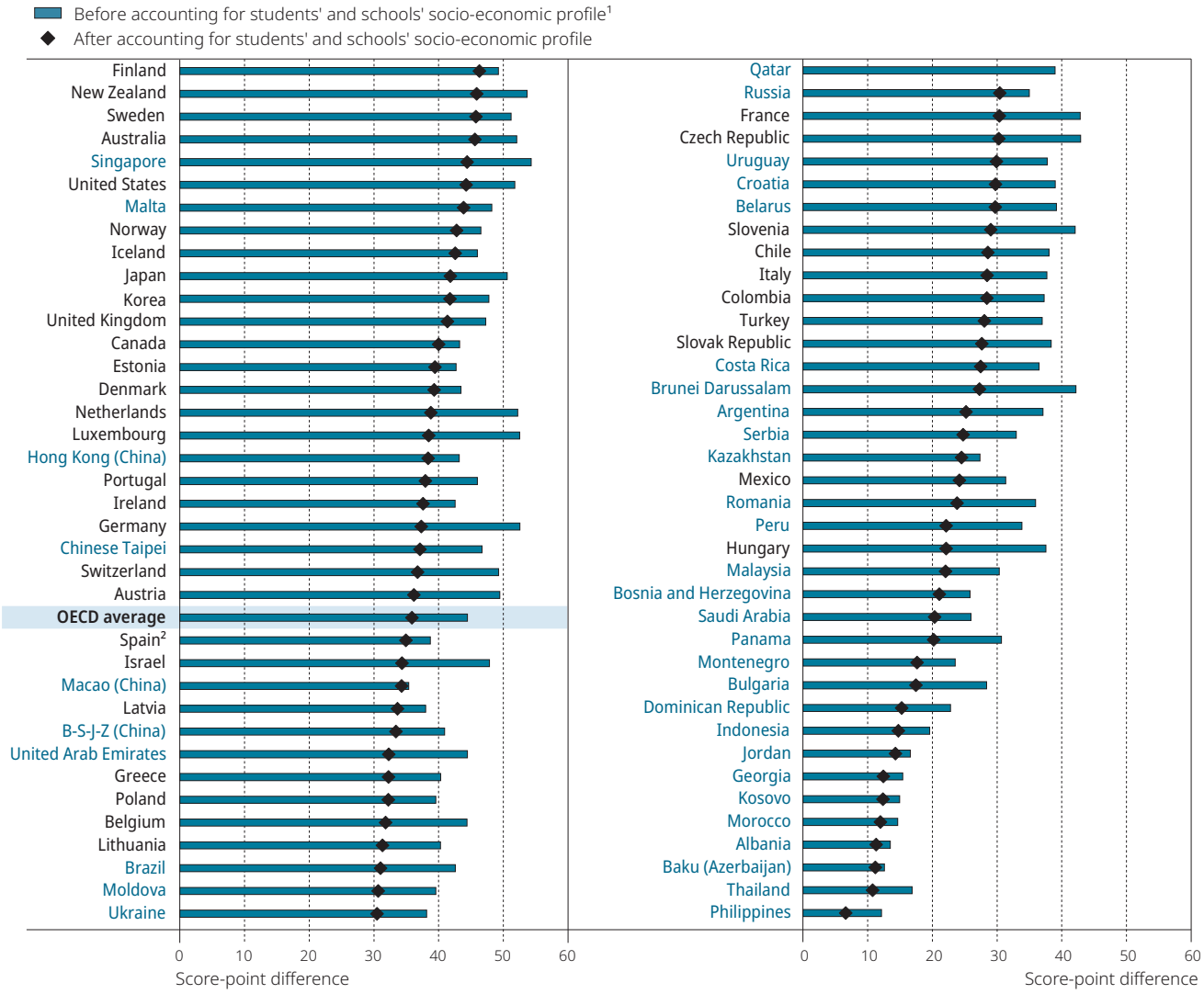
StatLink https://doi.org/10.1787/888934240218

Figure 5.8 shows the change in reading performance associated with a one-unit increase in the index of knowledge of strategies for assessing the credibility of sources within countries and economies. Figure 5.9 shows the same, but for single- and multiple-source text reading subscales. The OECD average change in reading performance associated with a one-unit increase in this index is 36 points after accounting for students' and schools' socio-economic status. In Australia, Finland, New Zealand, and Sweden, this change was at least 45 points in reading after accounting for students' and schools' socio-economic status. In Albania, Baku (Azerbaijan), the Philippines, and Thailand, however, this score-point difference was about 11 points or less. Nonetheless, these differences are statistically significant across all participating countries and economies in PISA 2018 (Table B.5.16).

Students' knowledge of reading strategies for assessing the credibility of sources is also strongly associated with single- and multiple-source subscales of reading after accounting for socio-economic status. Thus, supporting the idea that students who are able to think about, monitor and adjust their activity for assessing the credibility of sources will similarly master single- and multiple-source texts (Figure 5.9 and Table B.5.16).

Figure 5.8 **Relationship between knowledge of reading strategies for assessing the credibility of sources and reading performance**

Change in reading performance associated with a one-unit increase in the index of knowledge of reading strategies for assessing the credibility of sources



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Note: All score-point differences are statistically significant.

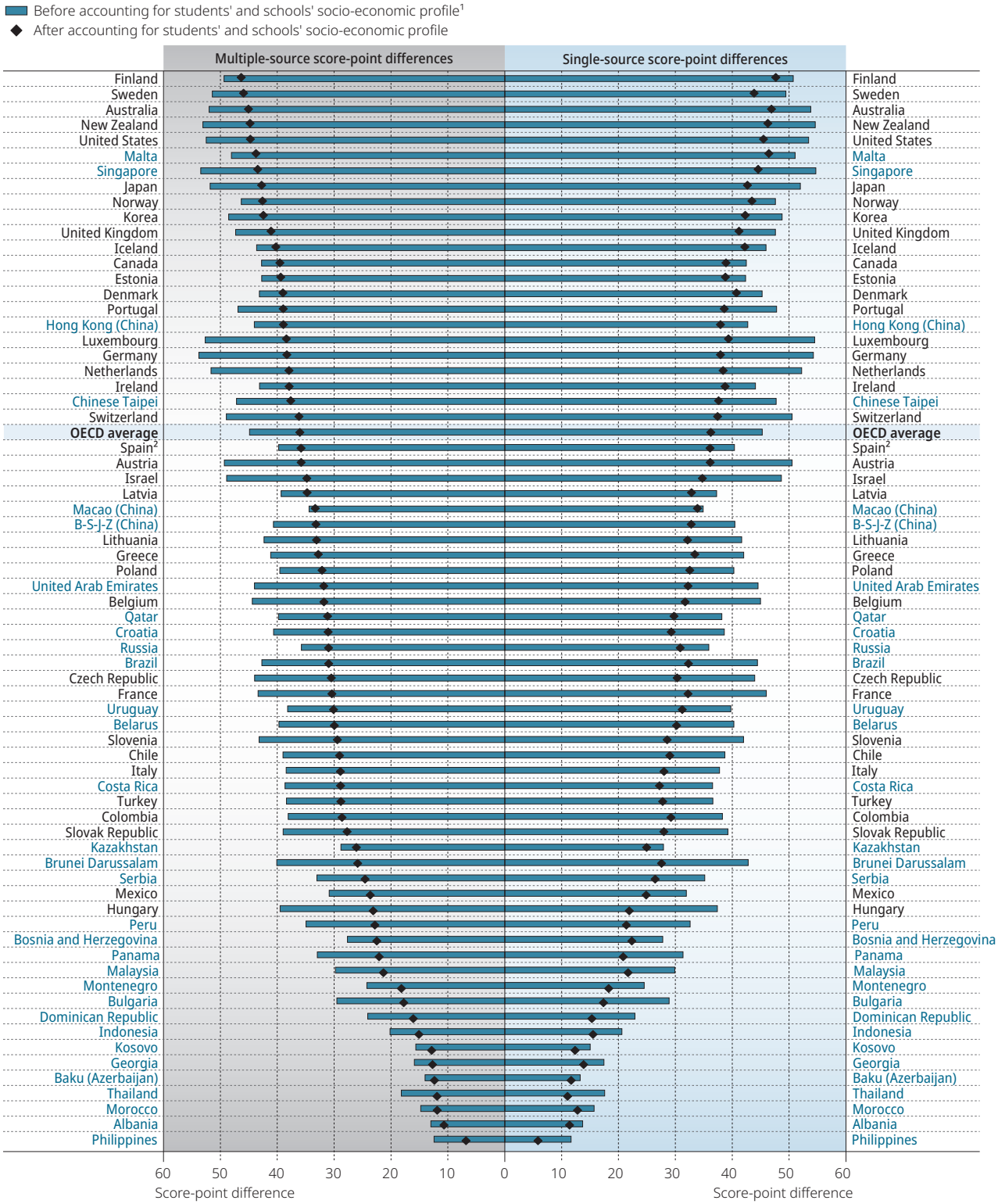
Countries and economies are ranked in descending order of the score-point difference in reading performance, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.5.16.

StatLink https://doi.org/10.1787/888934240237

Figure 5.9 **Relationship between knowledge of reading strategies for assessing the credibility of sources, and single- and multiple-source scores**

Score-point difference in each reading subscale associated with a one-unit increase in the index of knowledge of reading strategies for assessing the credibility of sources



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or PISA 2018 Results (Volume I): What Students Know and Can Do, Annex A9.

Note: All score-point differences are statistically significant.

Countries and economies are ranked in descending order of the multiple-source score-point difference, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.5.16.

StatLink https://doi.org/10.1787/888934240256

Box 5.3. **Students' awareness of reading strategies and navigation behaviours**

Students' ability to think about, monitor and adjust their activity for a particular goal are essential aspects when reading in digital environments. Digital readers not only need to follow linear information structures but also construct their own texts by selecting and assessing information from different sources. Using process data from PISA 2018, students were divided into four groups based on their navigation behaviour in the Rapa Nui unit (see Chapter 3):

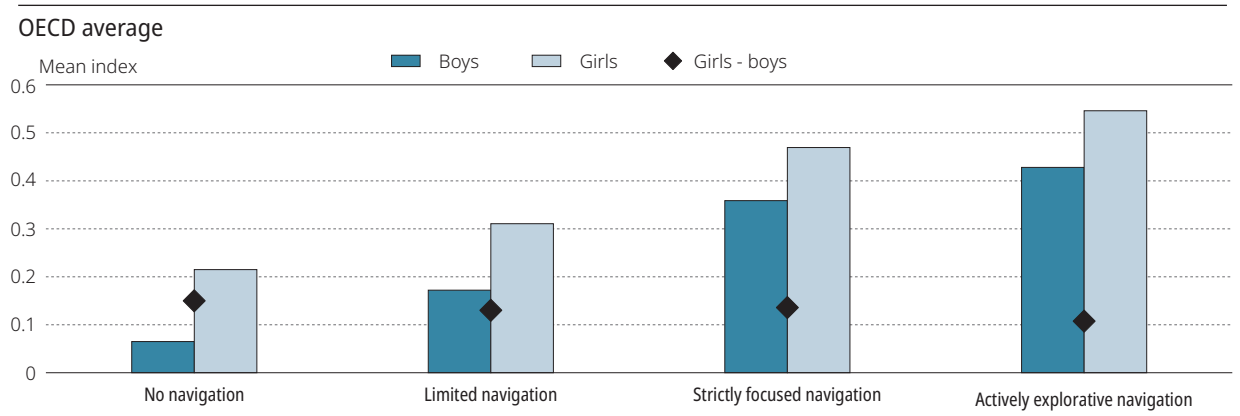
1. **No navigation**: students who had navigation activities neither in single- nor multiple-source items;
2. **Unfocused Limited navigation**: students who navigated merely in single-source items but not through multiple-source items;
3. **Strictly focused navigation**: students who strictly followed the item instruction to actively navigate in multiple-source items only and limit navigation in single-source items, and
4. **Actively explorative navigation**: students who actively navigated in both single- and multiple-source items.

PISA 2018 results show that, on average across OECD countries, students who have a better knowledge of effective reading strategies are also more likely to have an actively explorative navigation across single- and multiple-source items in the PISA reading assessment. This is the case for the three reading strategies assessed in PISA 2018: understanding and memorising a text, summarising information, and, in particular, assessing the credibility of sources (Tables B.5.24, B.5.25 and B.5.26). In the Index of knowledge of reading strategies for assessing the credibility of sources, students who actively navigated and explored the Rapa Nui unit scored three times more than students who did not navigate at all. These differences remain significant even after accounting for students' and schools' socio-economic profile in 70% of the countries/economies with available data (42/60). No statistically significant differences were observed in 18 countries/economies (Table B.5.26).

Girls predominantly reported better reading strategies than boys in the three indices included in PISA 2018 (Tables B.5.12a-c). This is also the case across every type of navigation behaviour (Tables B.5.27, B.5.28 and B.5.29). Still, both boys and girls who actively navigated and explored the Rapa Nui unit have better knowledge of reading strategies for assessing sources' credibility than students with no or limited navigation. Moreover, gender differences in reading strategies are narrower among students with more active navigation that those with no navigation (Figure 5.10).

These results highlight the importance of teaching and learning effective reading strategies to bolster reading in digital environments. As reading in digital environments requires many more self-organisational skills, students may benefit from knowing effective reading strategies and how to assess information critically.

Figure 5.10 **Index of knowledge of reading strategies for assessing the credibility of sources, by navigation behaviours and gender**



Note: All differences between girls and boys are statistically significant.
Source: OECD, PISA 2018 Database, Table B.5.29.
StatLink https://doi.org/10.1787/888934240275

HOW MUCH OF STUDENTS' READING PERFORMANCE RELIES ON SOCIO-ECONOMIC STATUS AND GENDER, AND HOW MUCH ON SELF-PERCEPTION AND READING STRATEGIES?

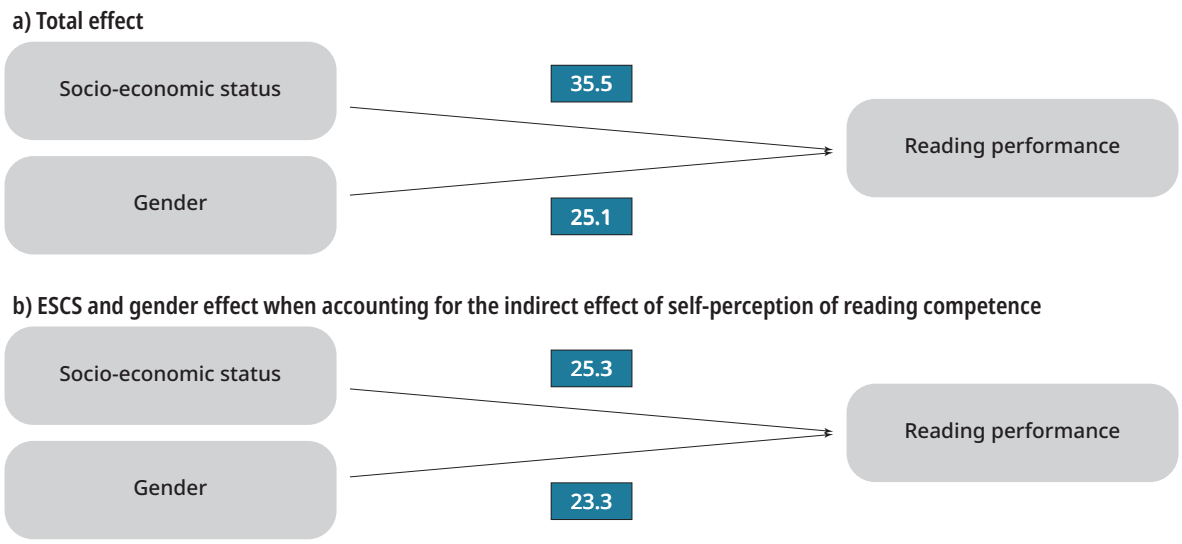
PISA data consistently shows that students' socio-economic status and gender are strongly associated with their performance in reading (OECD, 2019[5]). However, a large body of research shows that students' social-emotional skills and learning strategies play an essential role in academic outcomes beyond socio-economic status, and they are malleable and amenable to change (Kankaraš and Suarez-Alvarez, 2019[16]; Suarez-Alvarez et al., 2020[17]; Roberts, Walton and Viechtbauer, 2006[18]; Soto, 2015[19]; Chamorro-Premuzic and Furnham, 2008[20]; O'Connor and Paunonen, 2007[21]).

In PISA 2018, the OECD average change in reading performance associated with one-unit increase in the PISA index of economic, social and cultural status was 36 points after accounting for gender. At the same time, girls outperformed boys in reading by 25 points after accounting for students' socio-economic background (Figure 5.11, and Figure 5.12). To what extent are students' self-perception of reading competence and reading strategies in PISA 2018 mediators of socio-economic and gender inequalities in reading performance?

Almost 30%[6] of the difference in reading performance between socio-economically advantaged and disadvantaged students is the indirect result of disparities in socio-economically advantaged and disadvantaged students' reported self-perception of reading competence, on average across OECD countries, (Figure 5.11 and Table B.5.17). However, only about 10% of the difference in reading performance between boys and girls is the indirect result of disparities in boys' and girls' reported self-perception of reading competence. In other words, almost one-third of the association between socio-economic background and reading performance can be accounted for by the differences in students' perception of reading competence across socio-economic backgrounds. Gender differences in students' perception of competence, however, are relatively smaller in magnitude as pointed out earlier.

Figure 5.11 **Student's self-perception of reading competence as a mediator of the relationship between socio-economic background, gender, and reading performance**

OECD average



Notes: Socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS); gender = girl.

Total socio-economic status effect represents the score-point change in reading performance that is associated with a one-unit change in socio-economic status when accounting for gender.

Total gender effect represents the score-point change in reading performance that is associated with a one-unit change in gender when accounting for socio-economic status.

Socio-economic status effect when accounting for the indirect effect of perceived competence in reading represents the score-point change in reading performance that is associated with a one-unit increase in ESCS when accounting for gender, the index of perceived competence in reading (SCREADCOMP), the index of perceived difficulty in reading (SCREADDIFF), and the index of perception of difficulty of the PISA test (PISADIFF).

Gender effect when accounting for the indirect effect of self-perception of reading competence represents the score-point change in reading performance that is associated with being a girl when accounting for ESCS, the index of perceived competence in reading (SCREADCOMP), the index of perceived difficulty in reading (SCREADDIFF), and the index of perception of difficulty of the PISA test (PISADIFF).

Source: OECD, PISA 2018 Database.

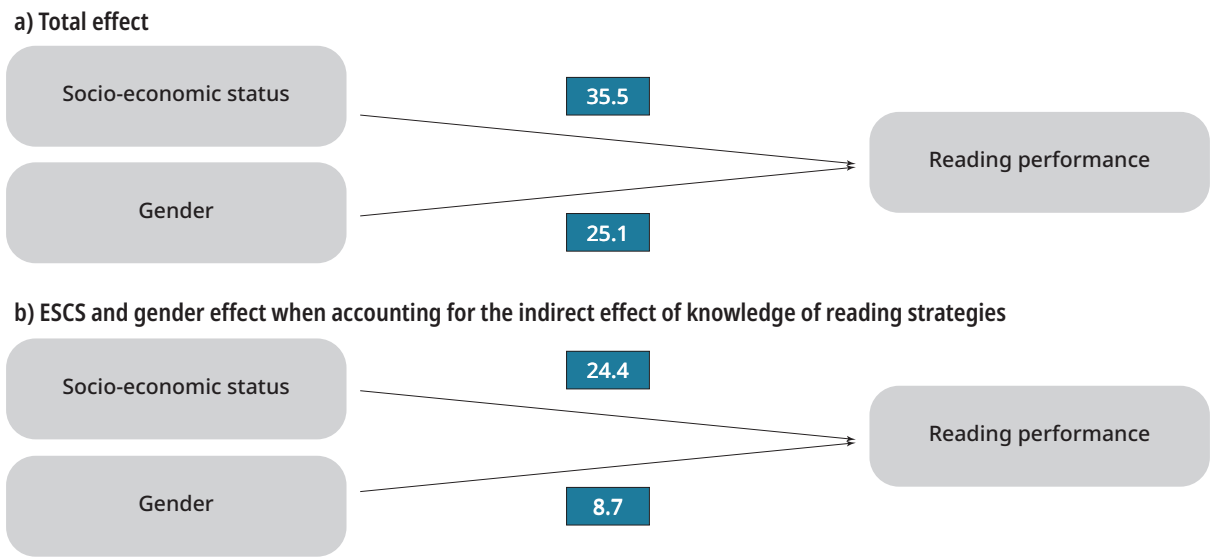
On average across OECD countries, about 32%[7] of the difference in reading performance between socio-economically advantaged and disadvantaged students is the indirect result of disparities in socio-economically advantaged and disadvantaged students' reported knowledge of effective reading strategies (Figure 5.12 and Table B.5.18). However, about 65% of the difference in reading performance between boys and girls is the indirect result of disparities in boys' and girls' reported knowledge of effective reading strategies. In other words, almost two-thirds of the association between gender and reading performance can be accounted for by the difference between boys' and girls' knowledge of effective reading strategies.

These results imply that the impact of socio-economic disparities and gender on reading performance is likely to be reduced by aligning students' perception of reading competence to their actual reading competency (see Box 5.1), and teaching effective reading strategies to navigate digital enviroments (see Box 5.2).

Among the indices of perception of competence included in PISA 2018, the reading self-efficacy (i.e. index of perception of difficulty of the PISA reading test) is a comparatively more potent mediator in the association between students' socio-economic status and reading performance.

Figure 5.12 **Student's knowledge of reading strategies as a mediator of the relationship between socio-economic background, gender, and reading performance**

OECD average



Notes: Socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS); gender = girl.

Total socio-economic status effect represents the score-point change in reading performance that is associated with a one-unit change in socio-economic status when accounting for gender.

Total gender effect represents the score-point change in reading performance that is associated with a one-unit change in gender when accounting for socio-economic status.

Socio-economic status effect when accounting for the indirect effect of perceived competence in reading represents the score-point change in reading performance that is associated with a one-unit increase in ESCS when accounting for gender, the index of perceived competence in reading (SCREADCOMP), the index of perceived difficulty in reading (SCREADDIFF), and the index of perception of difficulty of the PISA test (PISADIFF).

Gender effect when accounting for the indirect effect of knowledge of reading strategies represents the score-point change in reading performance that is associated with being a girl when accounting for ESCS, the indices of knowledge of reading strategies for understanding and remembering (UNDREM), for writing a summary (METASUM), and for assessing the credibility of sources (METASPAM).

Source: OECD, PISA 2018 Database.

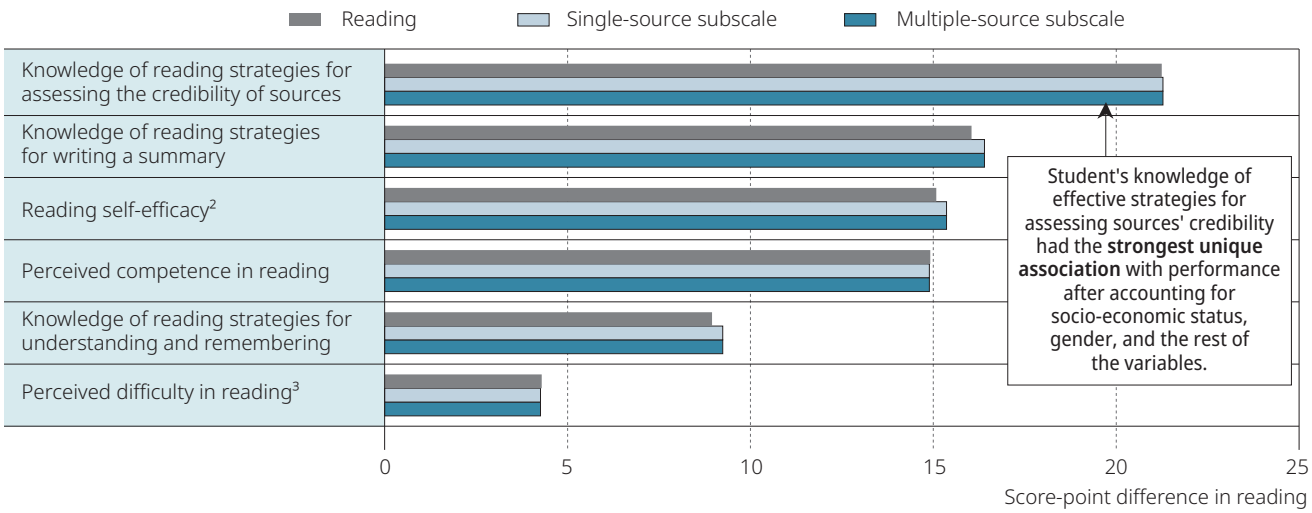
Figure 5.13 shows the change in reading performance associated with a one-unit increase in the indices of self-perception of reading competence and knowledge of reading strategies after accounting for students' and schools' socio-economic profile and gender, and the effect of the rest of the indices. Among the indices included in this analysis, students' knowledge of effective strategies for assessing sources' credibility had the strongest unique association with performance after accounting for socio-economic status, gender, and the rest of the variables, followed by the indices of knowledge of reading strategies for summarising information, of reading self-efficacy, and of perceived competence in reading (Table B.5.19).

All of these variables together explained 47% of the variance in reading performance on average across OECD countries. This set of variables explains a similar amount of variance as well in single- and multiple-source reading subscales (Table B.5.19). The total explained variance in reading performance drops about one-fourth (from 47% to 36%) when dropping awareness of effective reading strategies (undrem, metasum, metaspam). However, it approximately drops about 15% (from 47% to 40%) when dropping students' self-perception of reading competence (pisadiff, screaddiff, screadcomp) or background variables (students' and schools' socio-economic profile, and gender). Thus, indicating that the indices of awareness of effective reading strategies showed a higher unique variance (Table B.5.20).

These results imply that students with the same socio-economic status who have better knowledge of effective reading strategies and better self-efficacy in reading are more likely to be proficient readers. Therefore, despite socio-economic status and gender, students' self-perceptions and awareness of effective reading strategies play a decisive role in reading performance. First, both sets of indicators are effective mediators in the association between socio-economic status, gender, and reading performance. Second, the indices of awareness of effective reading strategies are more likely to be susceptible to provide visible changes as they showed a higher unique variance. These finding are particularly important for education policies. Contrary to socio-economic status, which cannot be changed, knowledge of effective reading strategies can be taught. There is strong evidence that teaching and supportive classroom practices can enhance meta-cognitive reading strategies (Christenson, Reschly and Wylie, 2012[22]; Guthrie, Klauda and Ho, 2013[23]; Reeve, 2012[24]; Autin and Croizet, 2012[25]). For instance, a recent study shows that classroom training on sourcing skills can help improve teenagers' critical thinking when comprehending multiple documents (Pérez et al., 2018[26]). Students' general self-concept and reading self-efficacy are also likely to be enhanced through school-based social and emotional learning programmes (Corcoran et al., 2018[27]; Smithers et al., 2018[28]).

Figure 5.13 **Perception of reading competence, knowledge of reading strategies, socio-economic status and gender as predictors of reading performance**

Change in reading performance associated with a one-unit increase in the following indices after accounting for students' and schools' socio-economic profile, gender, and the effect of the rest of the indices, OECD average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. The change in reading performance associated with one-unit increase of the index of perception of difficulty of the PISA test (pisadiff) was inverted for easier interpretation. A positive score, therefore, means higher reading self-efficacy.

3. The change in reading performance associated with one-unit increase of the index of perceived difficulty in reading (screaddiff) was inverted for easier interpretation. A positive score, therefore, means a lower perception of difficulty in reading.

Indices are ranked in descending order of the change in reading performance, after accounting for students' and schools' socio-economic profile, gender, and the effect of the rest of the indices.

Source: OECD, PISA 2018 Database, Table B.5.19.

StatLink https://doi.org/10.1787/888934240294

Notes

1. The socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).

2. A socio-economically disadvantaged (advantaged) student is a student in the bottom (top) quarter of the PISA index of economic, social and cultural status (ESCS) in the relevant country/economy.

3. When interpreting these results, it is important to bear in mind that as a result of the Multistage Adaptive Testing (MSAT) there were three stages to the PISA 2018 reading assessment: Core, Stage 1 and Stage 2. Students first saw a short non-adaptive Core stage, which consisted of between 7 and 10 items. The vast majority of these items (at least 80% and always at least 7 items) were automatically scored. Students' performance in this stage was provisionally classified as low, medium or high, depending on the number of correct answers to these automatically scored items. Nevertheless, the results presented above hold even after accounting for the MSAT effect (Table B.5.6).

4. Academically resilient students are disadvantaged students who are in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in their own country/economy but who score in the top quarter of reading in that country/economy.

5. Students were asked to report the extent to which they agree (i.e. strongly disagree, disagree, agree, and strongly agree) with the following statements about the PISA reading tasks they had just completed: "Many texts were too difficult for me", "There were many words I could not understand", "I was lost when I had to navigate between different pages".

6. This value is calculated as 1 minus the result of dividing the ESCS coefficient of the equation b by the ESCS coefficient of equation A and then multiply by 100 (see Figure 5.11).

7. This value is calculated as 1 minus the result of dividing the ESCS coefficient of the equation b by the ESCS coeffsicient of equation A and then multiply by 100 (see Figure 5.12).

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6

Teaching and learning literacy skills in a digital world

This chapter discusses how teachers' stimulation of students' reading engagement has changed in the last years and its association with students' reading enjoyment and performance. This chapter also focuses on the relationship between the type and length of texts used for teaching, learning and reading performance, and how schools are using digital devices to leverage the potential of technology.

What the data tell us

- About one in four students (23%) on average across OECD countries reported that their teacher never or hardly ever helps students relate the stories they read to their lives. The most pronounced increase from PISA 2009 to PISA 2018 in this indicator was observed in Japan (from 30% to 50%) and Korea (from 32% to 62%), while the most pronounced decline was observed in Georgia (from 54% to 48%) and Russia (74% to 60%).
- In 49 participating countries and economies in PISA 2018, students from a lower socio-economic status perceived less stimulation from their teachers to engage in reading. In 49 participating countries and economies in PISA 2018, girls perceived more stimulation from their teachers to read than boys.
- Reading fiction texts more frequently was positively associated with reading performance in 55 countries and economies after accounting for students' and schools' socio-economic profiles. Reading digital texts more frequently, however, shows a negative association with reading performance after accounting for students' and schools' socio-economic profiles.
- Students who had to read longer pieces of text for school (101 pages or more) achieved 31 points more in reading than those who reported reading smaller pieces of text (10 pages or less) after accounting for students' and schools' socio-economic profiles and students' gender. Yet, this was not the case in Greece, Japan, and Korea.
- Students in Australia, Denmark, New Zealand, Sweden and the United States reported spending more than 1 hour a week using digital devices during and outside classroom lessons for lessons in the language the PISA test was taken in. In contrast, students in Slovenia and Chinese Taipei reported spending about 23 and 24 minutes a week while Japan reported spending only 10 minutes a week.

HAS TEACHERS' STIMULATION OF STUDENTS' READING ENGAGEMENT CHANGED OVER THE LAST NINE YEARS?

Together with teachers' enthusiasm, their stimulation of students' reading engagement is the teaching practice most strongly associated with students' enjoyment of reading after accounting for socio-economic status, reading performance and other teaching practices (OECD, 2019[1]). As shown in Chapter 4 of this report, students' enjoyment of reading has significantly decreased between 2009 and 2018 in one-third of the countries/economies – including at the OECD average – while in another one-third it has increased. Does teachers' stimulation of students' reading engagement mirror that trend?

The contextual questionnaire distributed in PISA 2018 asked students how often ("never or hardly ever", "in some lessons", "in most lessons", "in all lessons") the following things happened in their language of instruction lessons: "The teacher encourages students to express their opinion about a text"; "The teacher helps students relate the stories they read to their lives"; "The teacher shows students how the information in texts builds on what they already know"; "The teacher poses questions that motivate students to participate actively". The index teachers' stimulation of students' reading engagement is standardised to have a mean of 0 and a standard deviation of 1 across OECD countries. Positive values in the index indicate that the teaching practices are used more frequently. The index teachers' stimulation of students' reading engagement might be sensitive to cross-cultural differences so caution should be taken when comparing average results across countries (see Box 4.1, Chapter 4).

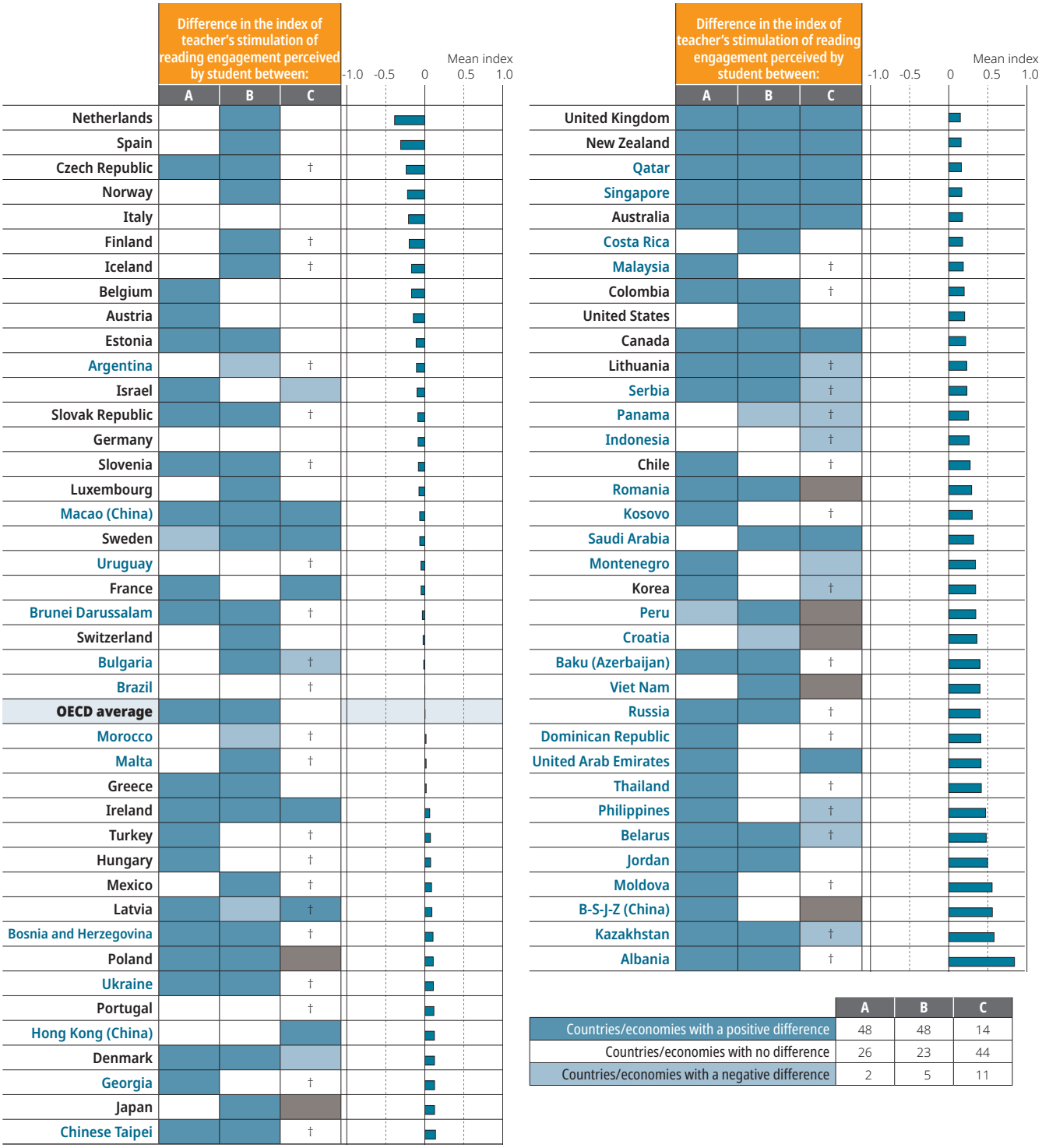
In PISA 2018, about one in ten students (11%) on average across OECD countries reported that their teacher never or hardly ever encourages students to express their opinion about a text. However, about one in four students (23%) reported that their teacher never or hardly ever helps students relate the stories they read to their lives. The first teaching practice is more general and covers a broad range of opinions about a text while the second is more specific to students' lives. These are, respectively, the most and the least frequent teaching practices stimulating reading engagement across OECD countries (Table B.6.1).

Teachers' stimulation of students' reading engagement typically varies by different students and schools' characteristics (Figure 6.1). In 49 participating countries and economies in PISA 2018, students from a lower socio-economic status perceived less stimulation from their teachers to engage in reading (Table B.6.2). On average across OECD countries, the difference in the index of teachers' stimulation of reading engagement between students from advantaged and disadvantaged socio-economic backgrounds was 0.15 in favour of advantaged students. Students in Australia, Belarus, B-S-J-Z (China), Singapore, and the United States, in particular, reported the largest socio-economic gap in this index (higher than 0.30). In contrast, students from a lower socio-economic status in Argentina, Mexico, Morocco, Panama, and Peru perceived more stimulation from their teachers to engage in reading (more than 0.10).

Figure 6.1 **Index of teacher's stimulation of reading engagement perceived by student, by student characteristics**

Positive difference | Negative difference | Difference is not significant | Missing values

A Girls - boys | B Advantaged - disadvantaged students | C Immigrant - non-immigrant students



	A	B	C
Countries/economies with a positive difference	48	48	14
Countries/economies with no difference	26	23	44
Countries/economies with a negative difference	2	5	11

Note: One dagger (†) means that the share of immigrant students in the country is less than 10%.

Countries and economies are ranked in ascending order of teacher's stimulation of reading engagement perceived by student.

Source: OECD, PISA 2018 Database, Tables B.6.1 and B.6.2.

StatLink https://doi.org/10.1787/888934240313

In 49 participating countries and economies in PISA 2018, girls perceived more stimulation from their teachers to engage in reading (Table B.6.2). Students in Bosnia and Herzegovina, the Philippines, and Serbia, in particular, reported the largest gender gap in favour of girls (around 0.25 or higher). Only in two countries (Korea and Sweden) boys perceived higher stimulation from their teachers to engage in reading, than girls do (higher than 0.10). Interestingly, immigrant students in Latvia, Qatar, and Singapore reported higher stimulation from their teachers than non-immigrant students (more than 0.15), while in Bulgaria, Indonesia, and the Philippines, the gap was in favour of non-immigrant students (about 0.45 or more).

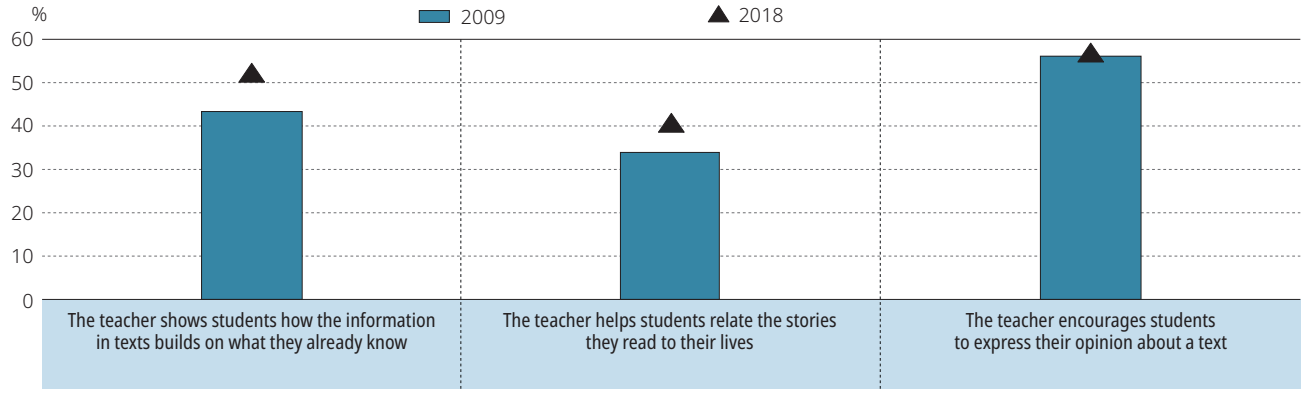
On average across OECD countries, the difference in the teachers' stimulation of students' reading engagement index between advantaged and disadvantaged schools was approximately one-tenth of standard deviation, yet significant in favour of advantaged schools. This was also the case in 33 countries and economies that participated in PISA 2018. However, students in 36 countries and economies with available data on this index showed no difference, and in eight of them, disadvantaged schools scored significantly higher. Nevertheless, it is important to take into account when analysing school-level indicators that the vast majority of variance in this index lays within schools, and only 6% is between-schools variance on average across OECD countries. In the Czech Republic, Hungary, Israel, Latvia, and Panama the between-schools variance in this index is 10% while in Indonesia, Baku (Azerbaijan), and Luxembourg it is lower than 2% (Table B.6.3).

It would be reasonable to expect that teachers would be more likely to stimulate students who need it the most as strong readers would be already more engaged in reading. It is important to consider that teachers' stimulation of reading engagement is typically associated with students' enjoyment of reading as well as reading performance. The association between teachers' stimulation of reading engagement and students' enjoyment of reading is positive in all participating countries and economies in PISA 2018, and with reading performance in 61 countries and economies after accounting for students' and schools' socio-economic profile (Tables B.6.4 and B.6.5).

The following items of the PISA 2018 teachers' stimulation of students' reading engagement index were also administered in PISA 2009: "The teacher encourages students to express their opinion about a text"; "The teacher helps students relate the stories they read to their lives"; and "The teacher shows students how the information in texts builds on what they already know". On average across OECD countries, more students reported these indicators occurred in most or all lessons in PISA 2018 than in PISA 2009 (Figure 6.2). The most pronounced change was observed in Japan and Korea where the three indicators of the teachers' stimulation of students' reading engagement index increased the most, i.e., an increase of 30 to 38 percentage points for Korea, and 14 to 23 percentage points for Japan. In contrast, the most pronounced decline was observed in Georgia and Russia where the three indicators of the teachers' stimulation of students' reading engagement index decreased the most, i.e., a decrease of 8 to 19 percentage points for Georgia, and 10 to 14 percentage points for Russia (Table B.6.6).

Figure 6.2 **Change between 2009 and 2018 in teachers' stimulation of reading engagement**

Percentage of students who reported that in their language-of-instruction lessons the teaching practice occurred in "most" or "all" lessons, OECD average



Note: All differences between 2009 and 2018 are statistically significant.
Items are ranked in descending order of the difference between 2009 and 2018.
Source: OECD, PISA 2018 Database, Table B.6.6.
StatLink https://doi.org/10.1787/888934240332

To summarise, students' reported reading for enjoyment across OECD countries has decreased over the last decade even though indicators of teachers' stimulation of students' reading engagement have significantly increased. However, there are differences across countries. For example, if the change in students' responses to the "teacher encourages students to express their opinion

about a text" is compared with the change in those to "student's enjoyment of reading", both trends seem to go in the same positive direction in Chile, Japan, Korea, and Macao (China) while in Hungary, Lithuania, Montenegro, Serbia, Sweden, and Thailand they both go in the opposite direction. In the other 55 countries and economies, the trends do not align either in a positive or negative direction (Table B.4.4a and Table B.6.6). This could be, in part, because teachers know that teenagers are less engaged in reading and they feel the need to stimulate them more.

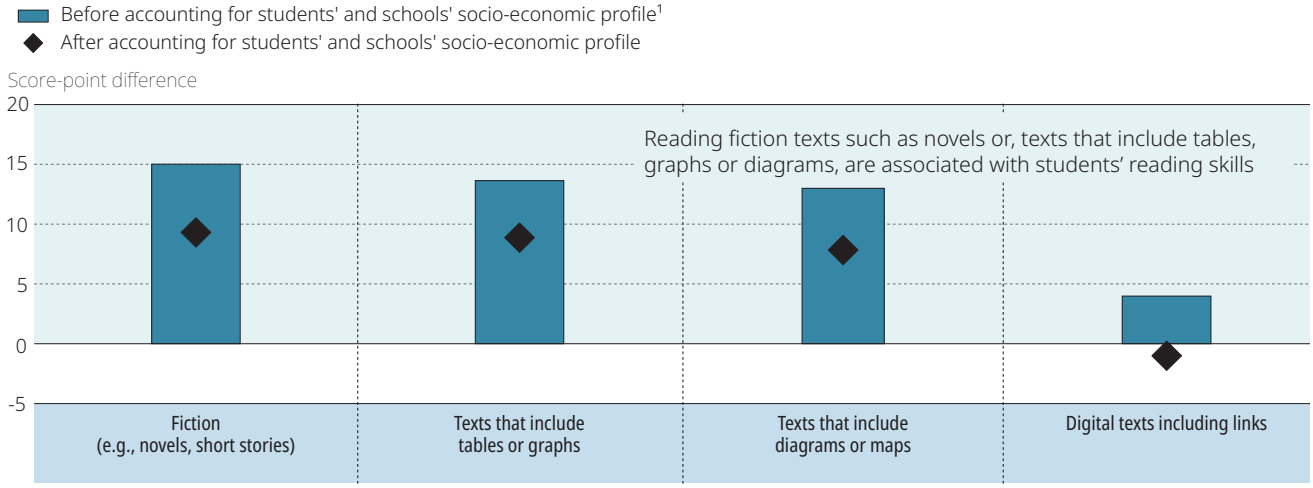
WHAT ARE THE LEARNING AND TEACHING PRACTICES IN TERMS OF TYPE AND LENGTH OF TEXTS MORE STRONGLY ASSOCIATED WITH READING PERFORMANCE?

Some experts would argue that we are moving from a word-based culture into a far faster-paced digital- and screen-based one (Wolf, 2018[2]). News are in real-time 24/7 and social media reactions spread across the globe in a matter of seconds. It is no longer rare to find the length of an online text (in minutes) before the topic has even been introduced (e.g. online newspapers), listen to 18-min inspirational talks (e.g. TED talks), or limit our thoughts to 280 characters in Twitter (about 56 words). The increasing production and consumption of content are resulting in the more rapid exhaustion of individuals' attention, and the staying power of topics in the collective memory is shorter than ever before (Lorenz-Spreen et al., 2019[3]). Over the last few years, there has been a lot of debate about the extent to which digital immersion is shaping not only our behaviour but also our brains (Firth et al., 2019[4]; Wolf, 2018[2]; Carr, 2010[5]). Are students still able to read long pieces of text? Are schools still asking students to read fiction books? Is there an association between the length and type of texts read in school and reading performance in PISA?

PISA 2018 asked students how often they read the following types of texts for school during the last month: texts that include diagrams or maps, fiction (novels, short stories), texts that include tables or graphs, and digital texts including links. Approximately 85% of students reported that they read fiction texts for school at least once during the previous month while 66% reported reading digital texts with the same frequency (Table B.6.7) on average across OECD countries. Figure 6.3 shows the score-point difference in reading performance between students who reported reading texts for school «two or more times» during the last month and those who reported «once or none» for different types of texts (texts that include diagrams or maps, fiction, texts that include tables or graphs, and digital texts including links). A higher frequency of reading fiction texts, texts that include tables and graphs, and texts that include diagrams more frequently is significantly associated with reading performance after accounting for students and schools' socio-economic profile on average across OECD countries. Digital texts, on the other hand, show a negative association with reading performance after accounting for students and schools' socio-economic profile. However, the magnitude of this difference is comparatively smaller than in the other three types of text.

Figure 6.3 **Reading performance, by the type of text read for school**

Score-point difference between "two or more times" and "once or none" during the previous month, OECD average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: All score-point differences are statistically significant.

Items are ranked in descending order of the score-point differences after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.6.8a.

StatLink https://doi.org/10.1787/888934240351

Reading fiction texts more frequently was positively associated with reading performance in 55 countries and economies after accounting for students' and schools' socio-economic profiles. In contrast, 16 showed no significant differences, including the following OECD countries: Chile, Colombia, Czech Republic, Denmark, Finland, France, Hungary, Ireland, Latvia, New Zealand,

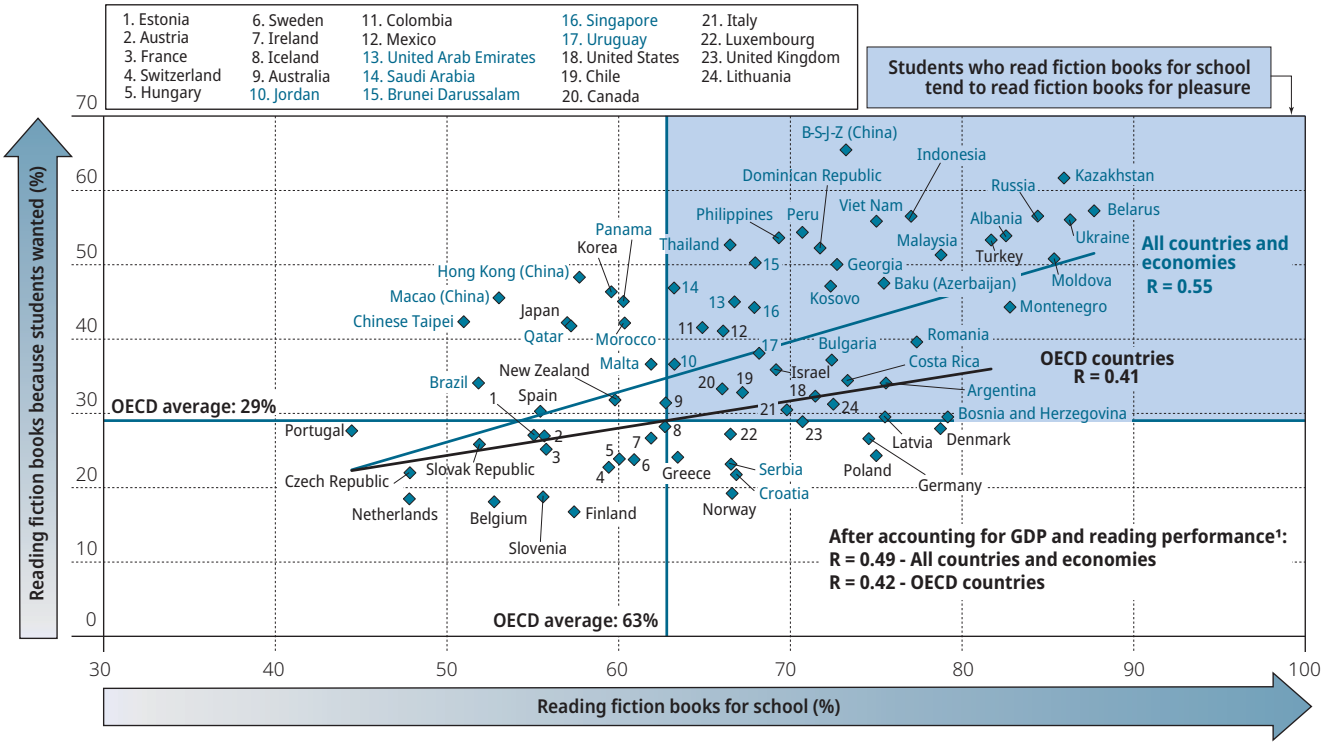
and Portugal. In Estonia, Mexico, Morocco, Panama, Qatar, and the Slovak Republic differences favoured students who read less fiction – yet the score-point difference was less than 10 points (Table B.6.8a).

Although students seem to read less for leisure and to read fewer fiction books (OECD, 2019[6]), reading fiction texts such as novels or texts that include tables, graphs, and diagrams are still associated with students' reading skills (Tables B.6.8a-c).

PISA results also show that students who reported reading fiction books for school during the last month are more likely to have also reported reading fiction books because they wanted to. This relationship is observed in all participating countries and economies in PISA (Table B.6.9). Besides, education systems in which more students reported reading fiction books for school more than once a month are also those with more students who reported reading fiction books more than once a month because they wanted to (Figure 6.4). These results suggest that teachers' assignments to read books for school encourages reading for pleasure outside of school. At the same time, it is also possible that students who frequently read fiction books for pleasure ask teachers for more fiction books to read for school.

Figure 6.4 **System-level relationship between reading fiction for school and reading fiction for pleasure**

Percentage of students who reported reading fiction books, more than once a month

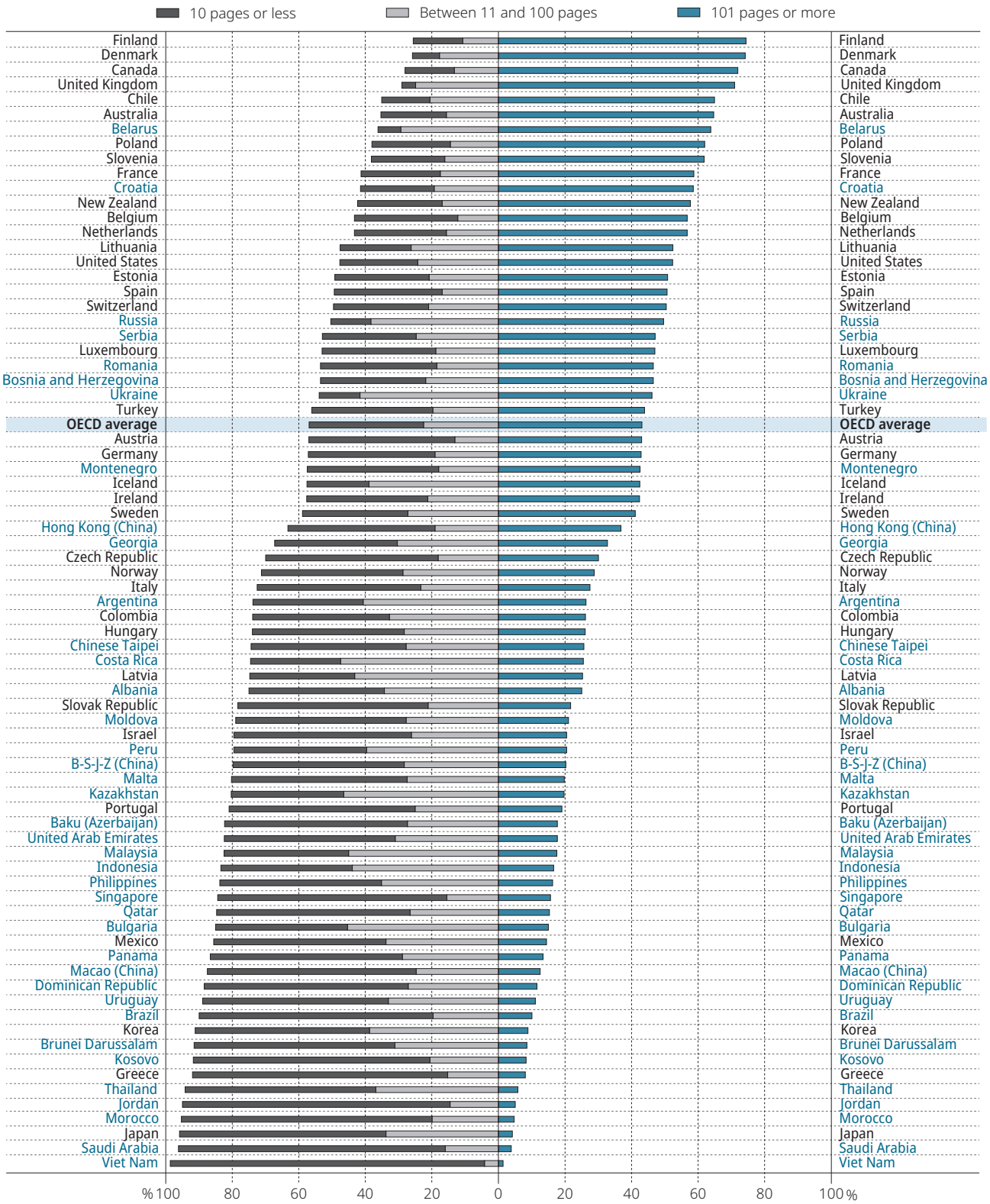


Source: OECD, PISA 2018 Database, Table B.6.9.

StatLink https://doi.org/10.1787/888934240370

PISA 2018 also asked students how many pages was the longest piece of text they had to read for their language test lessons (i.e. the language they took the test in) during the last academic year: "one page or less", "between 2 and 10 pages", "between 11 and 50 pages", "between 51 and 100 pages", "between 101 and 500 pages", and "more than 500 pages". A higher percentage of students (43%) reported that the longest piece of text they had to read for school was at least 101 or more compared to any other length of text across OECD countries (Table B.6.10). In Canada, Denmark, Finland, and the United Kingdom more than 70% of students reported that the longest piece of text they had to read for school was 101 pages or more (Figure 6.5). In contrast, less than 6% of students did so in Japan, Jordan, Morocco, Saudi Arabia, Thailand, and Viet Nam. These comparisons could be marginally affected by what translation studies refer to as the expansion rate. For example, Swedish is often more concise than English while Finnish or German have a slightly higher expansion rate. Therefore, a 100-page text in English could be a 125-page text in Finnish. However, it is unlikely that the expansion rate could account for the differences presented here, especially between the top and bottom part of the graph. Some students may have also interpreted that the question was asking about the longest piece of text they had to read for their language lessons test excluding school assignments, for example, during winter or summer breaks.

Figure 6.5 **Length of the longest piece of text that students had to read for school**



Countries and economies are ranked in descending order of the percentage of students who had to read 101 pages or more, for school.

Source: OECD, PISA 2018 Database, Table B.6.10.

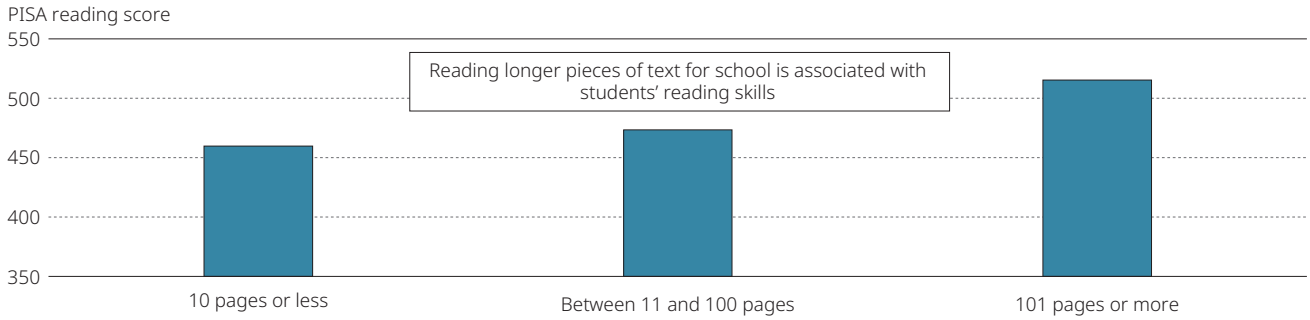
StatLink https://doi.org/10.1787/888934240389

The results also showed that there are differences between the longest piece of text boys and girls reported reading for school. For example, in 50 countries/economies, there are differences between boys and girls reporting that the longest piece of text they had to read for school was 10 pages or less (Table B.6.10). In 20 countries/economies, more boys than girls reported reading texts of 10 pages or less while in 30 of them more girls than boys reported reading these texts. No differences were observed in 27 countries/economies. In Macao (China), girls are 11 percentage points more than boys reporting reading texts of 10 pages or less while around 6 percentage points more boys than girls reported reading texts of more than 100 pages. In Belarus, Romania, and Ukraine, more than 4 percentage points more boys than girls reported reading texts of 10 pages or less while over 10 percentage points more girls than boys reported reading texts of more than 100 pages. Most differences in these teaching practices seem to be within schools or the same class rather than to different practices between schools. On average across OECD countries, approximately 13% of the variance in the average length of the longest piece of text read for school lies between schools (Table B.6.12a).

Figure 6.6 shows the PISA reading score for students who reported that the longest piece of text they had to read for school during the last academic year was 10 pages or less, between 11 and 100 pages, or 101 pages or more. The relationship between reading longer pieces of text for school and reading performance is clear. On average across OECD countries, students who had to read longer pieces of texts for school (101 pages or more) achieved between 14 and 55 points higher in reading than those who reported reading smaller pieces of text (between 11 and 100 pages, and 10 pages or less respectively). The magnitude of the difference between students who reported reading texts of 101 pages or more compared to those who reported reading 10 pages or less was of 31 points after accounting for students' and schools' socio-economic profiles and students' gender on average across OECD countries (Table B.6.11a).

Figure 6.6 **Reading performance, by the length of text read for school**

OECD average

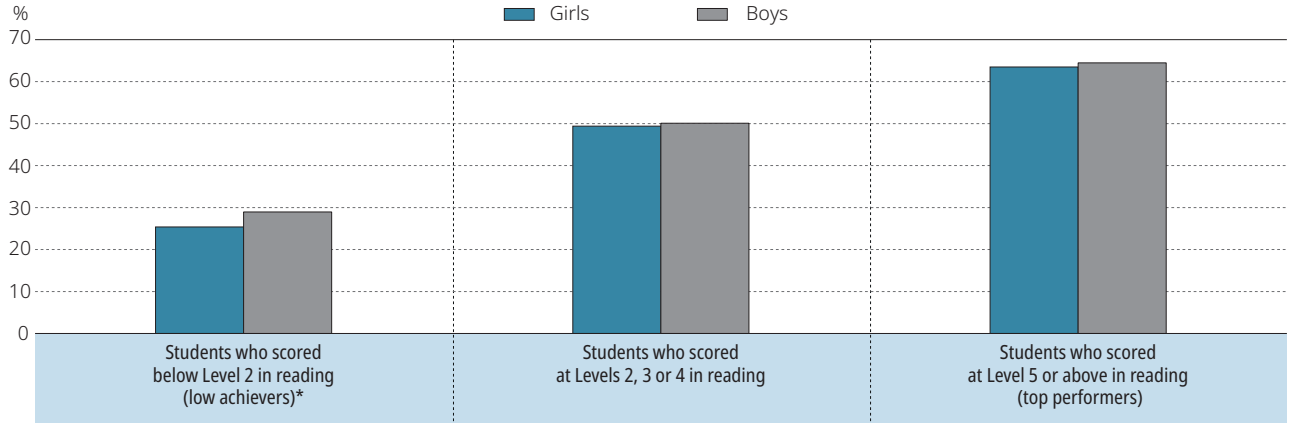


Source: OECD, PISA 2018 Database, Table B.6.11a.

StatLink https://doi.org/10.1787/888934240408

Figure 6.7 **The length of text read for school, by proficiency levels and gender**

Percentage of students who reported that during the last academic year the longest piece of text that had to read for school was 101 pages or more, OECD average



* Difference between girls and boys is statistically significant.

Source: OECD, PISA 2018 Database, Table B.6.10.

StatLink https://doi.org/10.1787/888934240427

When looking by performance level, more than half of top performers in reading (Level 5 or above) reported reading 101 pages or more for school across OECD countries while only about one in four students reported reading that amount for school among low performers (below Level 2). The gender difference among low performers is statistically significant – there are 4 percentage points more boys than girls. However, the gender differences among top performers were not statistically significant (Figure 6.7 and Table B.6.10).

Figure 6.8 shows the score-point differences in reading between the students who reported that the longest piece of text they had to read for school during the last academic year was "101 pages or more", and those who reported "10 pages or less". In 60 countries and economies (or four in five countries/economies), students who reported that the longest piece of text they had to read for school was 101 pages or more scored significantly higher on reading performance than those who reported 10 pages or less after accounting for students and schools' socio-economic profile and students' gender. In 10 countries/economies, the differences were not statistically significant. In six other education systems, the differences were in favour of students who reported that the longest piece of text was 10 pages or less. The negative differences in these six education systems were also observed between the categories "10 pages or less" and "11 and 100 pages" except in Japan, where there are no significant differences between these two categories. In Australia, Belarus, Finland, Kazakhstan, Russia, Ukraine and the United Kingdom, the score-point differences are of, at least, 60 points in favour of longer pieces of text after accounting for students' and schools' socio-economic profile and students' gender. In contrast, the score-point differences in students in Jordan, Morocco, and Saudi Arabia who reported that the longest piece of text they had to read for school was 101 pages or more scored at least 30 points less in reading – yet 5% or fewer students reported reading 101 pages or more in those countries (Table B.6.11a).

Four of the top-performing countries in PISA – Japan, Korea, Macao (China), and Singapore – did not show differences in terms of the length of texts used for school or show them in a negative direction (i.e. favouring shorter texts). However, it is important to take into account that 9% of students in Korea, 4% in Japan, 13% in Macao (China) and 16% of students in Singapore reported that the longest piece of text they had to read for school during the last academic year was more than 100 pages (Table B.6.10). There is no such thing as a unique standard text length for school practice across all countries/economies. Nevertheless, the results are consistent when correlating the average length of the longest piece of text read for school with performance (Figure 6.9 and Table B.6.12a).

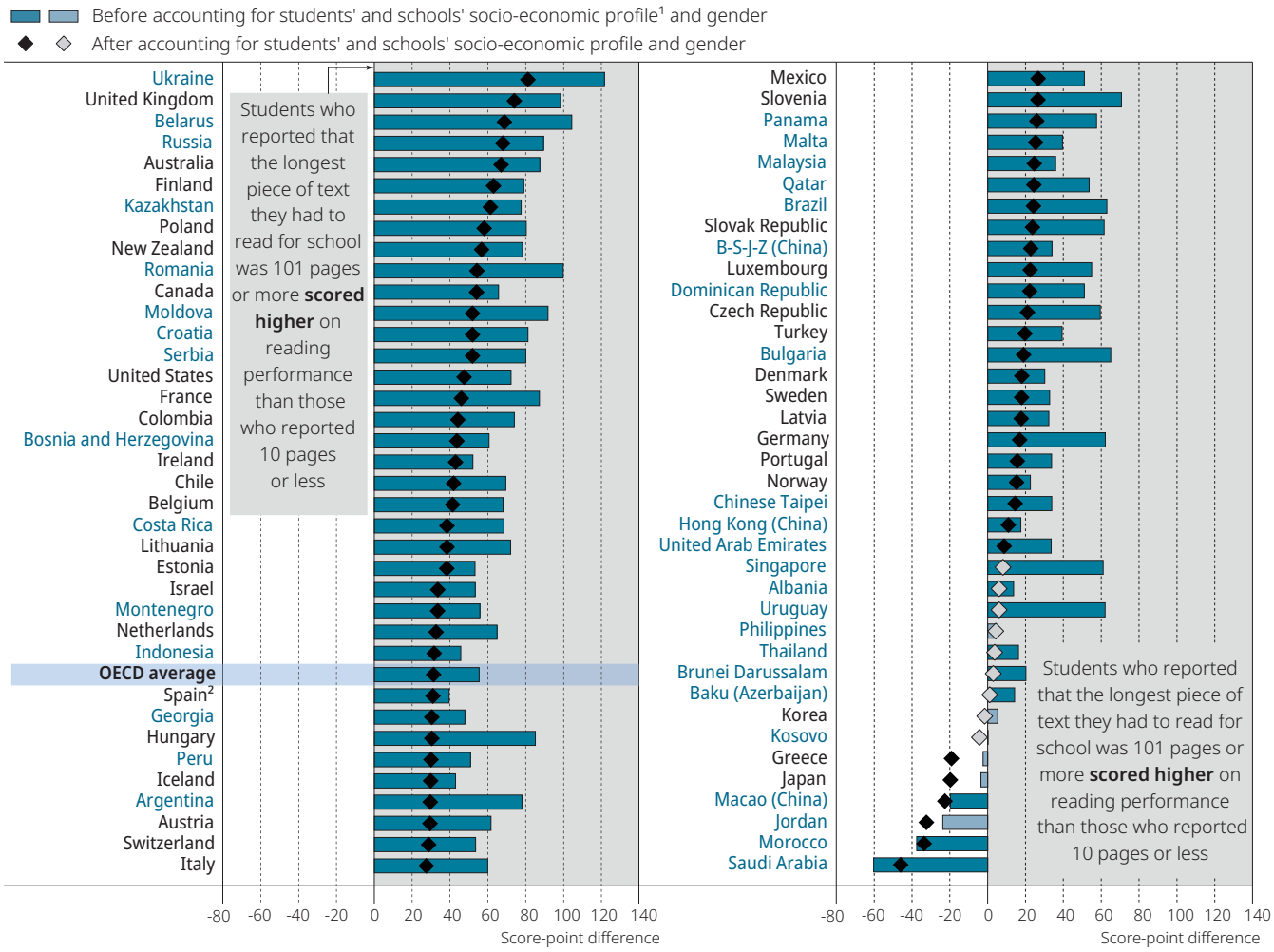
PISA 2018 also asked teachers how many pages constituted the longest piece of text their students had to read for their reading and/or language lessons during the last academic year. Although teachers and students were asked the same question, it is important to note that the following results represent the average number of pages assigned by teachers in the school where the student was enrolled, not necessarily what his/her actual teacher assigned. Teachers' and students' reports are strongly correlated (r = 0.85, system-level) among the 19 countries and economies with available data. This means that countries and economies where students reported reading on average longer pieces of text for their reading/language lessons were also the countries/economies where their teachers did so. For example, Chile, Spain, the United Kingdom, and the United States showed up at the top of both indicators.

Within-countries, however, the average correlation across OECD countries[2] was 0.13, indicating that teachers and students did not always agree on the number of pages reported. For example, Chinese Taipei students reported reading, on average, more than twice the number of pages reported by their test language teachers (46 versus 115). Conversely, students in Albania, the Dominican Republic, and Panama reported about half the number of pages reported by teachers. In schools attended by 15-year-olds, the average text length reported by teachers in Korea and Macao (China) was quite consistent with that reported by students (45 versus 47 pages in Korea, and 48 versus 60 pages in Macao (China)). Despite the association between the longest piece of text read for test language lessons and reading performance remaining negative based on teachers' reports in Macao (China), the association – which was non-significant before – becomes significant when looking at what teachers in Korea reported. In other words, schools where teachers on average reported that their students read longer pieces of text for their test language lessons performed better in reading (Tables B.6.12a and B.6.12b).

There is no doubt that the content of texts is probably as crucial, if not more, than the length of texts. It is important to bear in mind that in some countries/economies it may be more common to assign books for students to read while in other countries teachers may focus more on a textbook, which is a compilation of short texts. Nevertheless, these results show that most of the high performers in reading read longer pieces of text for school. At the same time, schools with stronger readers may assign them longer readings than schools with less proficient readers. In other word, schools possibly assign longer readings to stronger readers because they can handle it. Although it is not possible to determine causal relationships between these factors, the results show that this association is observed in the vast majority of countries/economies participating in PISA.

Figure 6.8 **Reading performance, by the length of the text read for school**

Score-point differences between students who reported that the longest piece of text that they had to read for school was "101 pages or more" and those who reported "10 pages or less"



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).
2. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

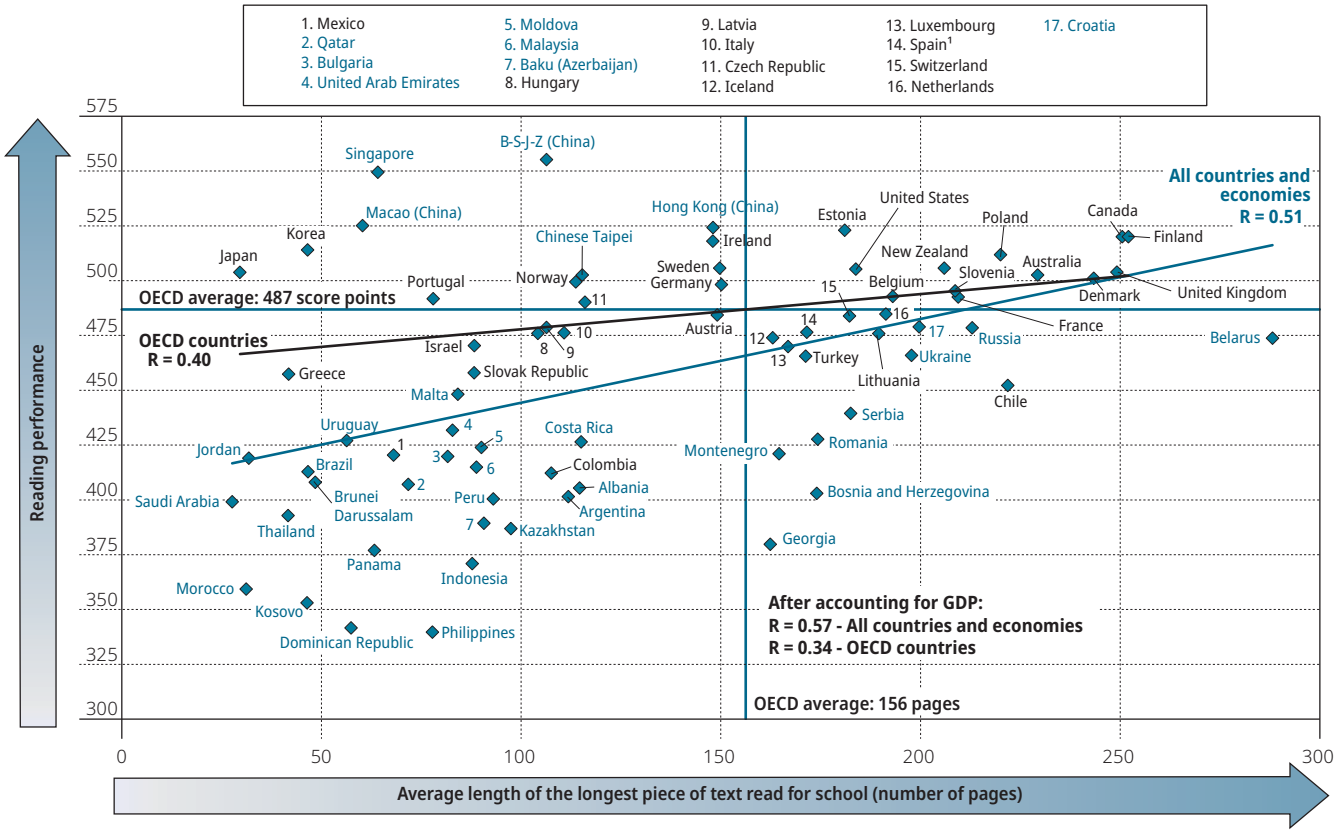
Note: Statistically significant differences are shown in a darker tone.

Countries and economies are ranked in descending order of the score-point differences in reading, after accounting for students' and schools' socio-economic profile and gender.

Source: OECD, PISA 2018 Database, Table B.6.11a.

StatLink https://doi.org/10.1787/888934240446

Figure 6.9 **System-level relationship between reading performance and the average length of the longest piece of text read for school**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

Source: OECD, PISA 2018 Database, Tables B.2.1 and B.6.12a.

StatLink https://doi.org/10.1787/888934240465

HOW ARE SCHOOLS ENHANCING TEACHING AND LEARNING IN DIGITAL ENVIRONMENTS?

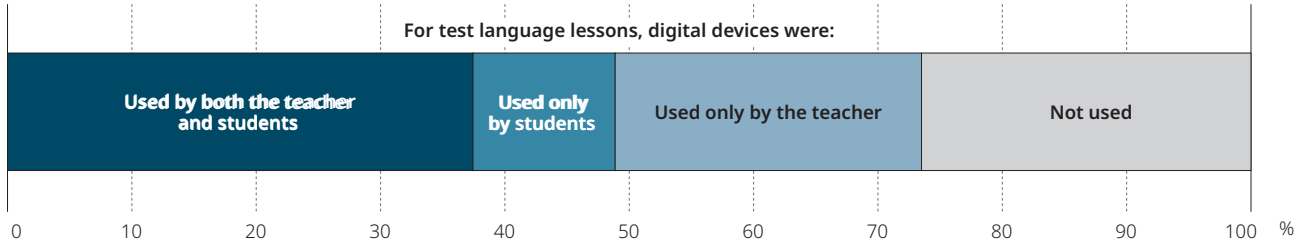
At the system level, some school capacity and practices to enhance teaching and learning using digital devices were related to education outcomes after accounting for GDP per capita. These include fewer shortages of material resources, a higher share of school computers connected to the Internet, availability of adequate software, and written statements about the use of digital devices (OECD, 2020[7]). At the country level, however, most of these relationships between schools' capacity, practice and performance are largely accounted for by socio-economic disparities. The opportunity to learn digital skills at school is another important school practice to enhance teaching and learning in digital environments. As already shown in Chapter 2 of this report, providing equal opportunities to learn digital skills at school could help to reduce socio-economic disparities in emergent aspects of reading, such as distinguishing facts from opinions.

The PISA 2018 ICT familiarity questionnaire asked students whether digital devices had been used in the previous month for learning and teaching during school lessons, and how much time they spent using digital devices during classroom lessons and outside of classroom lessons for the different subjects. On average across OECD countries with available data, 37% of students reported that both the teacher and students used digital devices for learning or teaching during the last month, 25% reported that only teachers used them, 11% reported that only students did and 26% reported that they did not use them at all (Figure 6.10). More than 90% of students in Australia, Denmark, Finland, New Zealand, Sweden and the United States reported that they used digital devices for learning and teaching. In comparison, 73% of students in Japan and 54% in Morocco and Panama reported they did not use them at all in the previous month (Table B.6.15).

The average duration of time per week students spent using digital devices during classroom lessons and outside of classroom lessons for language lessons across OECD countries was 41 minutes. Students in Australia, New Zealand, Sweden and the United States reported spending more than 1 hour a week, and students in Denmark reported about 2 hours a week. In contrast, students in Slovenia and Chinese Taipei reported spending about 23 and 24 minutes a week while Japan reported spending only 10 minutes a week (Table B.6.15).

Figure 6.10 **Frequency of use of digital device for teaching and learning in test language lessons**

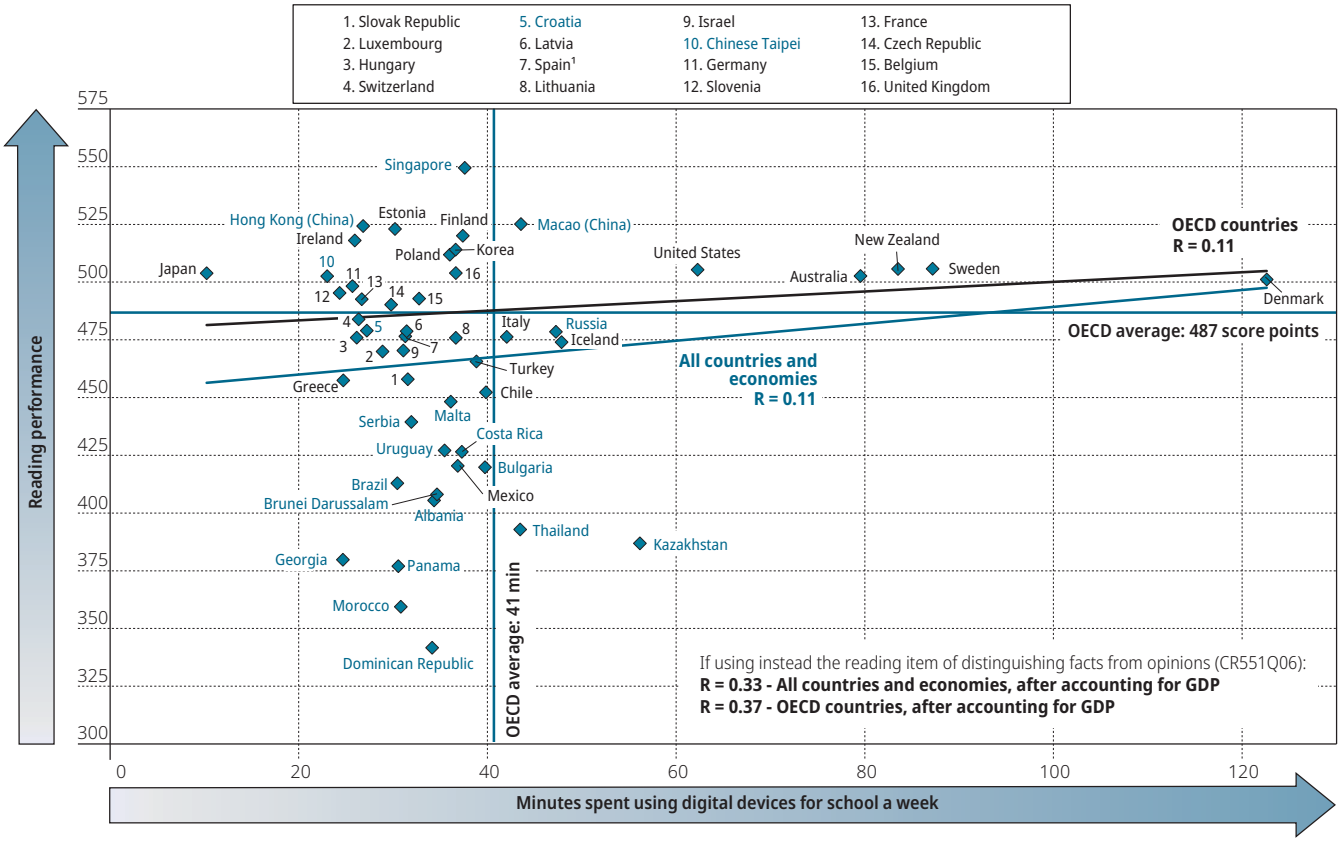
Percentage of students who reported that during the last month a digital device has been used for learning and teaching, OECD average



Source: OECD, PISA 2018 Database, Table B.6.15.
StatLink https://doi.org/10.1787/888934240484

Figure 6.11 shows the system-level relationship between reading performance and time spent using digital devices for school. There is no association between the average amount of time per week students spent using digital devices for schoolwork and student reading performance at the system level. However, a positive relationship is observed at the system level when the time spent using digital devices for school is compared with the test item that assesses emergent aspects of reading such as distinguishing facts from opinions (CR551Q06, see Box 2.1 in Chapter 2). This means that education systems where students reported spending a greater amount of time per week using digital devices for schoolwork were more likely to solve the item about distinguishing facts from opinions after accounting for GDP.

Figure 6.11 **Reading performance and time spent using digital devices for school**



1. For the comparability of Spain's data see Readers' guide of this report or *PISA 2018 Results (Volume I): What Students Know and Can Do*, Annex A9.

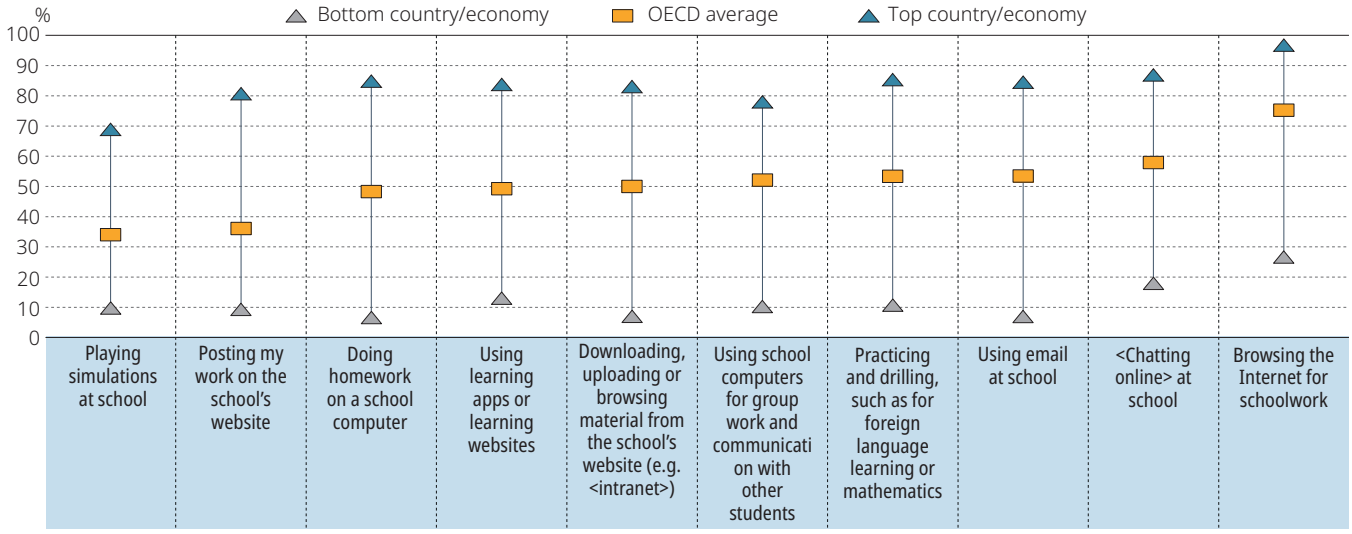
Source: OECD, PISA 2018 Database, Tables B.2.1 and B.6.15.
StatLink https://doi.org/10.1787/888934240503

Within countries, the relationship between reading performance and time spent using digital devices for schoolwork was generally negative but with a few exceptions. This negative association, after accounting for students' and schools' socio-economic status, was observed in 36 countries and economies; while in Australia, Denmark, Korea, New Zealand, and the United States, this relationship was positive after accounting for students' and schools' socio-economic status. When looking at programmes where students are enrolled, no differences were observed in the average amount of time digital devices were used for schoolwork between students on OECD countries attending general and vocational programmes. However, in Costa Rica, Japan, Korea, Luxembourg, and Turkey, students in general programmes spent, on average, more time using digital devices for schoolwork than students enrolled in vocational programmes. In contrast, students attending vocational programmes in 11 countries and economies spent more time using digital devices for schoolwork than students in general programmes. No differences were observed in the remaining 16 countries/economies with available data (Table B.6.15).

The great variability across countries in the relationship between time spent using digital devices for school and reading performance suggests that how digital devices are used may matter more than how much time is spent on them. The PISA 2018 ICT familiarity questionnaire asked students how often they use digital devices for a wide range of activities at school. Figure 6.12 shows that the most common use of digital devices at school across OECD countries is for browsing the Internet for schoolwork (75% of students reported doing this activity between once a month and everyday). The least common use was playing simulations at school (34% of students reported doing this activity between once a month to everyday). There are also considerable differences across countries in the use of digital devices at school. For example, more than 90% of students in Japan and 70% in Korea reported that they never did homework on a school computer while only 22% of students in the United States and 15% in Denmark reported the same. When looking at the use of digital devices for browsing the Internet for schoolwork, more than half of students in Japan and Korea also reported never using them while this percentage in Denmark and Sweden is just 3% (Table B.6.14).

Figure 6.12 **Frequency of activities on digital devices in school**

Percentage of students who reported using digital devices for the following activities at school, at least once a month, OECD average



Items are ranked in ascending order of the percentage of students within OECD average.

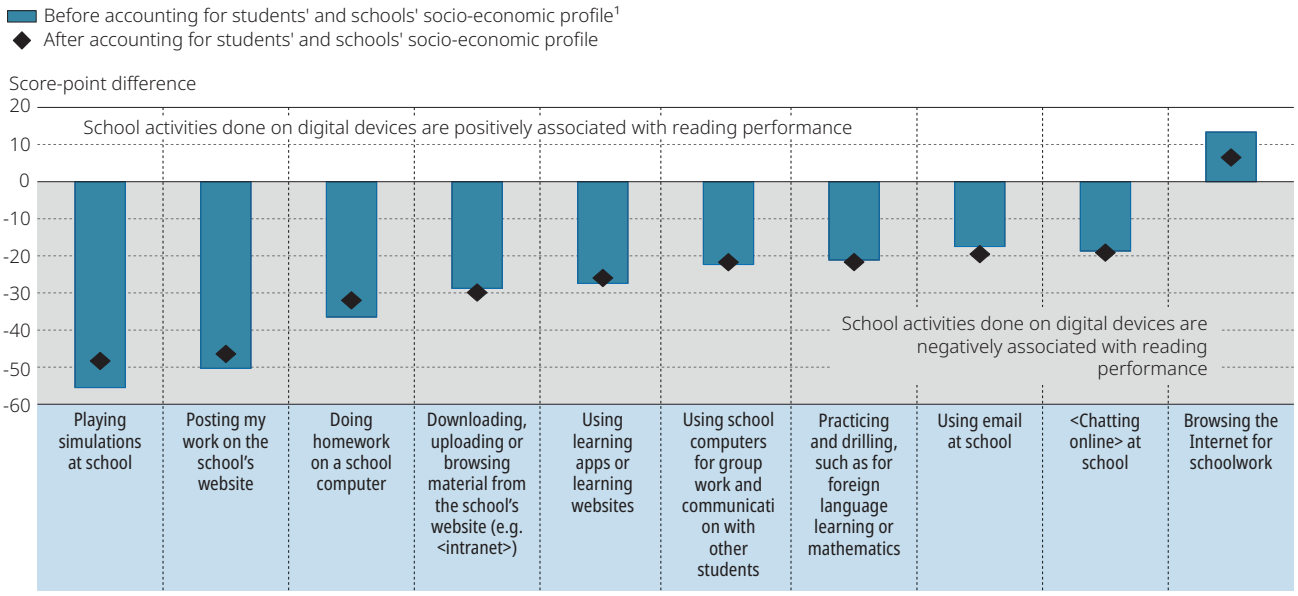
Source: OECD, PISA 2018 Database, Table B.6.14.

StatLink https://doi.org/10.1787/888934240522

How digital devices are used at school matter: some activities are positively associated with reading performance while others are negatively associated. Figure 6.13 shows the relationship between reading performance and the type of school activities done on digital devices on average across OECD countries. Students who reported browsing the Internet for schoolwork performed 6 points higher in reading compared to those who reported that they never did that after accounting for students' and schools' socio-economic profiles. In contrast, students who reported posting work on the school's website and playing simulations at school scored less than 45 points in reading compared to those who reported never doing that.

Figure 6.13 **Relationship between reading performance and the type of school activities done on digital devices**

Score-point difference in reading between students who reported using digital devices for the following activities at school compared to those who reported that never did, OECD average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: All score-point differences are statistically significant.

Items are ranked in ascending order of the score-point differences in reading, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.6.16.

StatLink https://doi.org/10.1787/888934240541

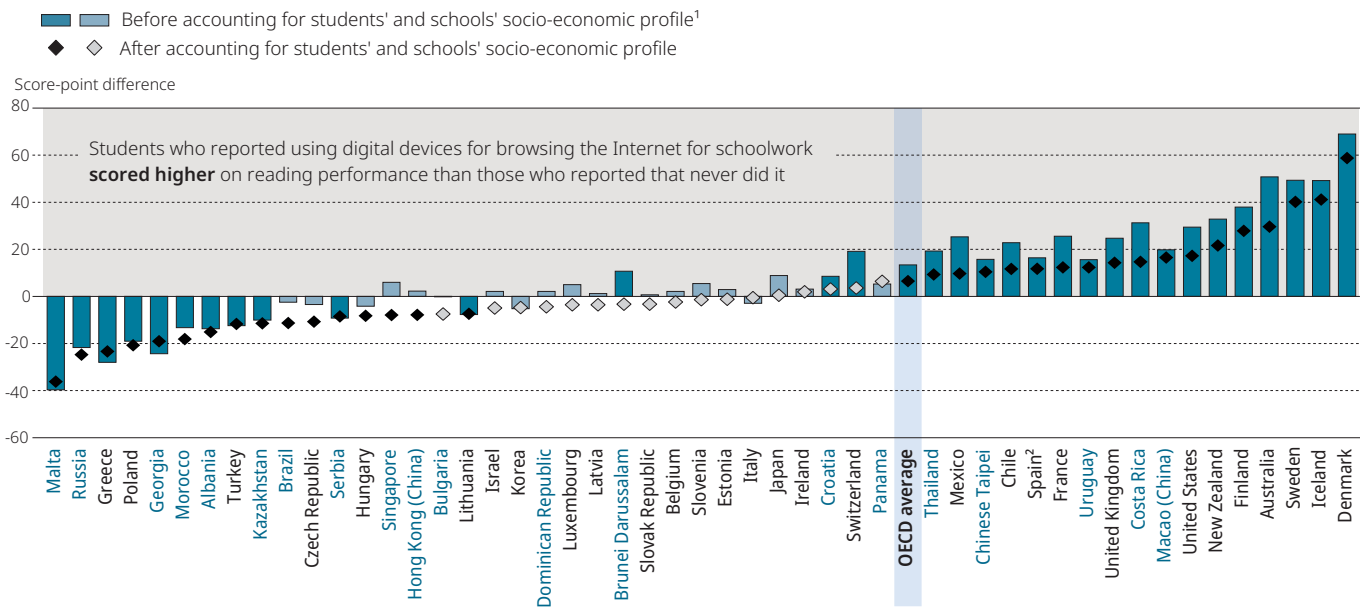
There are, however, remarkable differences across countries. In 18 countries/economies, the association between browsing the Internet for schoolwork and reading performance is positive – after accounting for students' and schools' socio-economic profiles. In contrast, in 17 countries/economies, this association is negative and in another 17 the association is not statistically significant. However, all countries/economies showed a negative relationship between playing simulations at school and reading performance even after accounting for students' and schools' socio-economic profiles (Figure 6.14 and Figure 6.15). The rest of the digital activities previously mentioned also presented negative relationships with reading performance across the vast majority of countries/economies (Table B.6.16).

It is probably not surprising to find Australia, Denmark, New Zealand, and the United States as some of the countries with the strongest positive association between browsing the Internet for schoolwork and reading performance (Table B.6.16). These countries also showed that about half or more of their students do this activity everyday or almost everyday (Table B.6.14). At the same time, these countries showed a positive relationship between reading performance and time spent using digital devices for schoolwork (Table B.6.15). The only exception is Korea. Despite showing a positive relationship between reading performance and time spent using digital devices for schoolwork, the association between browsing the Internet for schoolwork and reading performance was not significant. Most students in Korea reported that they never or hardly ever use digital devices at school for any of the activities mentioned above. This suggests that other uses of digital devices might be related to the positive association between reading performance and time using digital devices in Korea.

It is important to bear in mind that the negative correlation between the use of digital devices for school and reading performance might be subject to selection bias and that students undertaking these activities may not necessarily represent the full population of students. Nonetheless, these results suggest that digital devices are more helpful in some school activities than others and that the use of digital devices might be displacing other instructional activities sometimes or could be better done without digital devices (Falck, Mang and Woessmann, 2017[8]; OECD, 2019[9]). For example, browsing the Internet for schoolwork may be more effective in reading for information compared to students who have to perform this activity without digital devices. Playing simulations at school or posting work on the school's website could perhaps displace other activities more beneficial to student reading outcomes. Doing homework on a school computer is also negatively associated with reading performance. Although this association is after accounting for students' and schools' socio-economic profile, other factors could also play a role. For example, prior knowledge is often an important moderator in this relationship as students with more reading difficulties may spend more time doing homework. In addition, whether students do homework autonomously is more important than the time spent doing homework (Fernández-Alonso, Suárez-Álvarez and Muñiz, 2015[10]), and doing it at school could imply doing homework with the help of other peers or teachers.

Figure 6.14 **Reading performance and browsing the Internet for schoolwork**

Score-point difference in reading of students who reported using digital devices for browsing the Internet for schoolwork compared to those who reported that never did it



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or PISA 2018 Results (Volume I): What Students Know and Can Do, Annex A9.

Note: Statistically significant differences are shown in a darker tone.

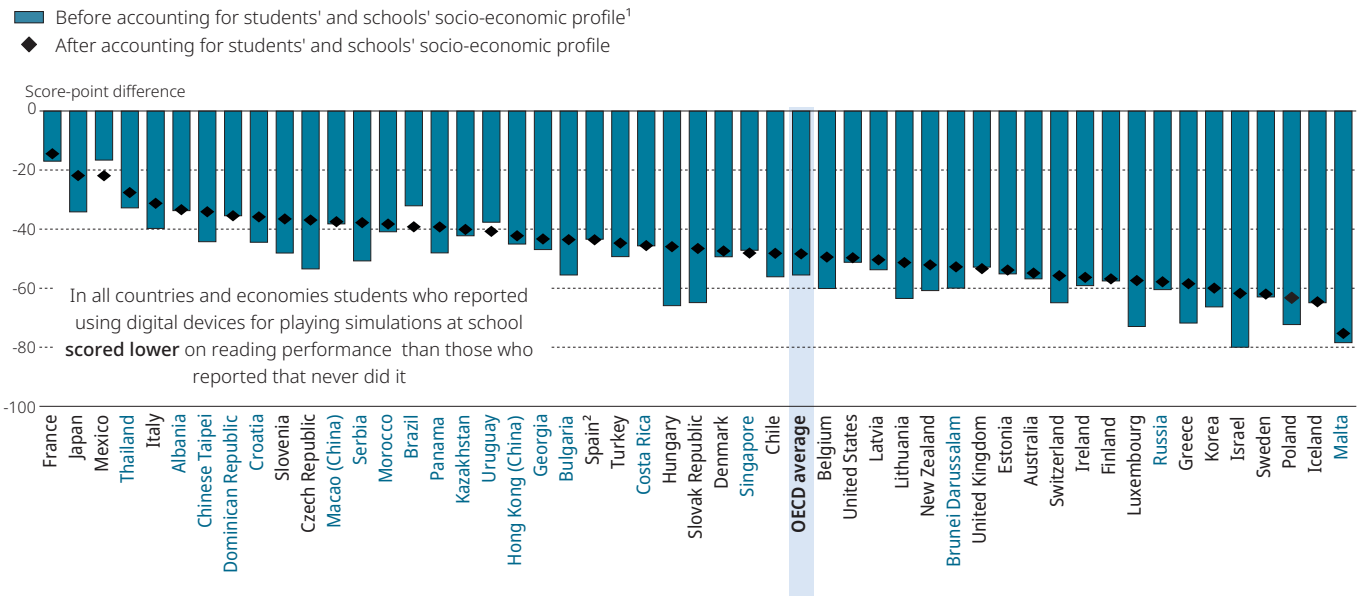
Countries and economies are ranked in ascending order of the score-point differences in reading, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.6.16.

StatLink https://doi.org/10.1787/888934240560

Figure 6.15 **Reading performance and playing simulations at school**

Score-point difference in reading of students who reported using digital devices for playing simulations compared to those who reported that never did it



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Readers' guide of this report or PISA 2018 Results (Volume I): What Students Know and Can Do, Annex A9.

Note: All score-point differences in reading are statistically significant.

Countries and economies are ranked in descending order of the score-point differences in reading, after accounting for students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table B.6.16.

StatLink https://doi.org/10.1787/888934240579

The magnitude of these negative associations also holds when comparing students attending general programmes with those attending vocational programmes except in playing simulations at school and chatting online at school where the magnitude of the effect is smaller yet statistically significant. Browsing the Internet for schoolwork, however, only has a significant association with performance among students in general programmes (Table B.6.17).

In conclusion, the time teachers spent using digital devices in teaching and learning activities is often negatively associated with reading performance. According to the data analysed here, few have managed to integrate digital devices in teaching and learning activities effectively, and they are the exception rather than the rule. The association between time spent using digital devices and reading performance is only positive in Australia, Denmark, Korea, New Zealand, and the United States. The results also imply that how digital devices are used may matter more than how much time is spent on them. Browsing the Internet for schoolwork is the activity on digital devices more strongly related to reading performance on average across OECD countries. The countries listed above (except Korea) are among the countries with the highest share of students who browse most days or everyday and show a strong association with reading performance. Posting work on the school's website and playing simulations at school are the most negatively associated with reading performance on average across OECD countries, and Korea is among the countries with the highest share of students who do not do such activities (Table B.6.14).

Integrating digital devices into regular teaching and learning activities may also be important for emergent aspects of reading such as improving students' critical thinking when comprehending multiple texts online. For example, as extensively discussed in Chapter 2, learning how to detect biased information in school is not only likely to contribute to better reading skills in digital environments but would also help to maximise online opportunities while reducing online risks for all students. Classroom interventions aimed to develop students' assessment of information reliability have proven to be effective in improving students' critical thinking when comprehending multiple documents (Pérez et al., 2018[11]). Providing access and promoting the use of digital tools does not automatically lead to better results. Digital technologies have the potential to amplify teaching and learning. This is all the more so when they also integrate innovative teaching and learning methods (e.g. gamification, or computational thinking, see Paniagua and Istance, 2018[12]), quality teacher professional learning (e.g. through developing teacher's digital literacy, see Boeskens, Nusche and Yurita, 2020[13]; Minea-Pic, 2020[14]), and leverage the pedagogical effect of technology through elaborate instructional design developments (Sung, Chang and Liu, 2016[15]). Finally, yet importantly, the use of digital technologies should also be aligned with health-promoting activities that are compatible with enhancing physical and mental well-being (Burns and Gottschalk, 2019[16]; Burns and Gottschalk, 2020[17]).

Notes

1. The partial correlation is calculated using the percentage of students who reported reading fiction books for school more than once a month (the sum of categories 3 and 4) and the percentage of students who reported reading fiction books more than once a month because they wanted (the sum of categories 4 and 5, Table B.6.9), after accounting for per capita GDP (Figure I.4.3 from PISA 2018 Results (Volume I) - What Students Know and Can Do (OECD, 2019[6])), and reading performance (Table B.2.1).

2. The Teacher questionnaire for PISA 2018 was conducted in seven OECD countries: Chile, Germany, Korea, Portugal, Spain, the United Kingdom, and the United States.

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PISA

7

Developing literacy skills in a digital world: Implications for education policy and practice

Before the printing press, knowledge spread orally and handwritten books were available only to wealthy elites. The printing press allowed for the mass production of printed books, making written information widely available, and encouraging and incentivising the wide development of reading skills. Still, the production of books remained in the hands of the few, not the many. Texts were usually, at the least, carefully curated if not requiring authoritative endorsement.

Digital technologies created another revolution of the written word in the 21st century. Suddenly, everyone could become a journalist or a publisher. Literacy in the 20th century was about extracting and processing pre-coded information; in the 21st century, it is about constructing and validating knowledge. In the past, teachers could tell students to look up information in an encyclopaedia, and to rely on that information as accurate and true. Nowadays, Google presents them with millions of answers, and nobody tells them what's right or wrong and true or not true. The more knowledge technology allows us to search and access, the more important it becomes to develop deep understanding and the capacity to navigate ambiguity, to triangulate viewpoints, and to make sense of content.

The fact that advancements in reading literacy, as measured by PISA, have fallen sharply behind the evolution of the nature of information has profound consequences in a world where virality seems sometimes privileged over quality in the distribution of information. In the "post-truth" climate in which we now find ourselves, assertions that "feel right" but have no basis in fact become accepted as fact. Algorithms that sort us into groups of like-minded individuals create social media echo chambers that amplify our views, and leave us insulated from opposing arguments that may alter our beliefs. These virtual bubbles homogenise opinions and polarise our societies; and they can have a significant – and adverse – impact on democratic processes. Those algorithms are not a design flaw; they are how social media work. There is scarcity of attention, but an abundance of information. We are living in this digital bazaar where anything that is not built for the network age is cracking apart under its pressure.

This is the age of acceleration, a speeding-up of human experience through the compound impact of disruptive forces on every aspect of our lives. It is also a time of political contestation. The priority of the wider international community is to reconcile the needs and interests of individuals, communities and nations within an equitable framework based on open borders and markets and a sustainable future. But where disruption has brought a sense of dislocation, political forces emerge that are offering closed borders, the protection of traditional jobs and a promise to put the interests of today's generation over those of the future. The fake news phenomenon can significantly amplify those forces.

The question is then: how can we live successfully in this new world of information? To what extent do we approach this issue from a consumer protection angle; that is, working on it from the supply side? Or do we approach it from a skills or demand side angle; that is, strengthening people's capacity to better navigate information? PISA offers important insights on the latter. The PISA 2018 reading framework was devised to include essential reading skills in a digital world. This report aims to understand better how 15-year-old students are developing reading skills to navigate the technology-rich 21st century. This chapter offers a synthesis of the findings. It focuses on policies and practices that can harness digitalisation to create better learning opportunities and counter some of digitalisation's disruptive effects in and for education

While interpretative skills are needed to read printed books, digital readers must also employ new techniques in simply accessing information to read. Readers now navigate through multiple sources of text. They must be more selective in what they read due to the vast quantities of information available at the click of a button. Digital readers not only need to follow linear information structures but construct their own texts by selecting and assessing information from various sources. Reading in a digital world requires continuously evaluating the quality and validity of different sources, navigating through ambiguity and constructing knowledge. Individuals can benefit from effective strategies that help them think about, monitor and adjust their reading for a particular goal (also known as metacognitive reading strategies). These strategies can also help readers' motivation to persevere in the face of difficulties (also known as self-efficacy).

Reading in a digital world is even more challenging given that the increasing production and consumption of media content rapidly exhausts people's attention. Real-time 24/7 news and social media reactions spread across the globe in a matter of seconds. It is no longer rare to find the length of an online text (in minutes) before the topic has even been introduced (e.g. online newspapers), listen to 18-minute inspirational talks (e.g. TED talks), and limit our thoughts to 280 characters in Twitter (about 56 words).

PISA 2018 was conducted before the COVID-19 pandemic. The findings discussed in this report do not reflect the impact of the pandemic but they are useful when considering that a) the digital divide, exacerbated by school disruptions, will have likely amplified the learning gaps discussed in this report, b) where students are learning at home and on their own, it becomes even more urgent to develop advanced reading skills such as critical reading to prepare for the demands of an increasingly volatile, uncertain, and ambiguous world, and c) understanding the challenges education systems faced before the pandemic may help them act on solving those issues more effectively and become more resilient.

ARE STUDENTS WHO HAD THE OPPORTUNITY TO LEARN DIGITAL SKILLS IN SCHOOL MORE LIKELY TO DISTINGUISH FACTS FROM OPINIONS IN THE PISA READING TEST?

PISA data shows that Internet use in 15-year-olds has risen from 21 hours a week in PISA 2012 to 35 hours per week in PISA 2018. This represents a 66% increase in just 6 years and is almost as much time as an average adult workweek in OECD countries. Yet, only about half of students across OECD countries reported being trained at school on how to recognise whether information is biased. An average of approximately 40% of students in OECD countries responded that clicking on the link of a phishing e-mail was somewhat appropriate or very appropriate. Around 8.7% of students were top performers in reading, meaning that they attained Level 5 or 6 in the PISA reading test. At these levels, students are able to comprehend lengthy texts, deal with concepts that are abstract or counterintuitive, and establish distinctions between fact and opinion, based on implicit cues pertaining to the content or source of the information. This report goes one step forward and pays special attention to the estimated percentage correct in the PISA reading released item – Rapa Nui - that focuses on distinguishing fact from opinion as one of the most emergent aspects of reading in digital environments. The PISA reading item of distinguishing fact from opinion was estimated to be 47% correct[1] on average across OECD countries. This means that you need to be at, at least, Level 5 in the PISA test to be likely to obtain the full score in this item. The estimated percentage correct of this item was higher than 60% in Australia, Canada, the Netherlands, New Zealand, Turkey, the United Kingdom and the United States while lower than 20% in Georgia, Indonesia, Kosovo, Morocco, Panama, and the Philippines. Among OECD countries, the estimated percentage correct was lower than 30% in Colombia, Costa Rica, the Czech Republic, Korea, and the Slovak Republic. The United States was the country with the highest percentage correct in this item (69%) and was above the average in the total reading score (505). However, Korea, who performed above the OECD average in reading, scored below the average in this particular item while Turkey, who performed below the OECD average in reading, is the country with the highest percentage correct (63%) after the United States (69%) and the United Kingdom (65%).

PISA 2018 shows that education systems with a higher proportion of students who were taught digital skills in school have a higher percentage correct in the reading item of distinguishing facts from opinions. The same happened with education systems with a higher proportion of students who reported having a computer for schoolwork linked to the Internet. These associations still hold even after accounting for the country per capita GDP. In Hong Kong (China) and Singapore, the percentage of students who had access to training on how to detect biased information in school and their percentage correct in the reading item of distinguishing fact from opinion was above the OECD average. However, students in Chinese Taipei scored below the OECD average in this item even though the proportion of students reporting that they were taught how to detect biased information in school was well above the OECD average.

These results may reflect differences in curriculum across countries but practice and out-of-school experiences may also be explanations. Parents can play an essential role in providing access and encouraging appropriate use of digital devices at home, and conveying positive attitudes towards reading. For instance, students whose parents enjoy reading the most tend to report that they read for enjoyment more frequently than those whose parents enjoy reading the least. However, for many of the most disadvantaged students, schools are the only way to learn and practice digital skills. The next section provides further details on this matter.

Bottom line

Education systems with a higher proportion of students who were taught how to detect biased information in school were more likely to distinguish fact from opinion in the PISA reading assessment, even after accounting for country per capita GDP.

ARE SCHOOLS READY TO COMPENSATE FOR THE DIGITAL DIVIDE AND LEVERAGE THE POTENTIAL OF TECHNOLOGY?

Digital technologies offer great opportunities as to what, how, where, and when people learn. However, digital divides mirror or even amplify prevailing socio-economic gaps. Remote learning, which most students around the world experienced because of the COVID-19 health crisis, often requires or benefits from having access to a computer linked to the Internet at home for schoolwork. In PISA 2018, 88% of students had both a connection to the Internet at home and a computer that they could use for schoolwork – 28 percentage points more than in PISA 2003. However, in the Dominican Republic, Indonesia, Malaysia, Mexico, Morocco, Peru, the Philippines, Thailand, and Viet Nam, half or less of students had access to both. This percentage was lower than 20% in rural areas of Indonesia, Mexico, Morocco and the Philippines. Four in five disadvantaged students in Malaysia, Mexico, Morocco, Peru, the Philippines and Viet Nam do not have access to the Internet at home but at school only.

The situation is also worrisome when looking at OECD countries. Socio-economically disadvantaged students in 2018 had approximately half of the books at home they used to have in 2000 while advantaged students had essentially the same number. This may explain why the average student from a disadvantaged socio-economic background is more likely to report reading books on digital devices than in paper format. This is also the case in 30 countries/economies. In B-S-J-Z (China), Hong Kong (China), and Chinese Taipei, the socio-economic difference in reading books on digital devices more often than in paper format is of at least 10 percentage points. Colombia and Mexico are the only exception across OECD countries where socio-economically advantaged students are more likely to read books on digital devices than disadvantaged students.

In summary, disadvantaged students from OECD countries are increasingly losing the cultural capital of having books in their home-learning environments, and many of the most disadvantaged students across all participating countries/economies in PISA 2018 can only access computers linked to the Internet at school.

Providing access to digital technologies at school does not automatically lead to better results. In fact, the amount of time teachers spend using digital devices in teaching and learning activities is often negatively associated with reading performance. According to the data analysed in this report, few have managed to integrate digital devices into teaching and learning activities effectively, and they are the exception rather than the rule. The association between time spent using digital devices and reading performance is only positive in Australia, Denmark, Korea, New Zealand, and the United States. These countries (except Korea) are among the countries with the highest share of students who browse the Internet for schoolwork most days or everyday and show a strong association with reading performance. Posting work on the school's website and playing simulations at school are the most negatively associated with reading performance on average across OECD countries, and Korea is among the countries with the highest share of students who do not do such activities. PISA results are correlational, so it is impossible to determine whether these activities result in lower performance or that low-performing schools use these approaches more frequently.

In either case, this only provides part of the picture. Many other potential benefits of digital technologies fall outside what PISA 2018 measured but are no less important. For instance, PISA 2022 will provide more insights into how schools used digital technologies to provide learning opportunities during school disruptions due to the pandemic[2]. The only thing that seems clear so far is that integrating digital devices into regular teaching and learning activities is still challenging, and providing access to digital technologies does not automatically lead to better results. How schools, teachers, and students use digital devices matters more than how much time is spent on them. The following sections provide further insights into what policies and practices can lead to better results.

Bottom line

Many of the most disadvantaged students in PISA 2018 can only access computers linked to the Internet at school, but, unfortunately, providing access to digital technologies at school does not automatically lead to better results.

HOW DO PROFICIENT READERS NAVIGATE DIGITAL ENVIRONMENTS?

This report analysed data stored in log files that contain information on what test-takers did in terms of computer interaction and time spent on each action during the process (see Rapa Nui unit). More than half of students in B-S-J-Z (China), Chinese Taipei, Hong Kong (China), Korea, and Singapore followed instructions by carefully selecting pages relevant to the tasks and limiting visits to irrelevant pages (strictly focused navigation) or actively navigated in both single- and multiple-source items (actively explorative navigation). At least 40% of students followed these navigation behaviours in Canada, Japan, Macao (China), New Zealand, the United Kingdom, and the United States. However, over half of the students in 70 countries/economies demonstrated limited or no navigation. These students had difficulties navigating multiple sources and merely navigated single-source items. Strictly focused navigation and actively explorative navigation are strongly correlated with performance while limited navigation and no-navigation are negatively associated with performance. In addition, students in Hong Kong (China) and Macao (China) used the 'copy and paste' function five times more often than their peers in other countries/economies. Students who used this strategy scored about 30 points more in reading than students who didn't use this function at all.

In other words, proficient readers were more likely to explore the given task to prepare themselves for later questions even though they were aware that the question did not require them to do so. They were better positioned to locate and collect information in advance before the more complex multiple-source items were activated. Proficient readers spent enough time

on relevant pages to understand the content. For example, they did not quickly switch between pages. Instead, they allocated a smaller proportion of time to the initial page and reserved more time for navigating more demanding pages. In short, they actively regulated their cognition and behaviour to achieve their goal in this particular task.

Students in PISA 2018 were asked to evaluate the effectiveness of different metacognitive reading strategies in understanding and memorising a text, summarising information, and assessing sources' credibility. PISA 2018 data shows that, on average across OECD countries, students who have better knowledge of effective reading strategies are also more likely to show actively explorative navigation across single- and multiple-source items in the PISA reading assessment. That is not all. These reading strategies also correlate with overall reading performance. Education systems in which the average student is more aware of effective reading strategies are also those in which students perform better in the PISA reading assessment. The OECD average change in reading performance associated with a one-unit increase in the index of knowledge of reading strategies for assessing the credibility of sources is 36 points after accounting for students' and schools' socio-economic status. These findings are consistent across every country and economy participating in PISA 2018. As reading in digital environments requires many more self-organisational skills, students benefit from knowing effective metacognitive reading strategies and how to assess information critically.

Furthermore, when comparing students with similar socio-economic status, those who have better knowledge of effective reading strategies are more likely to be proficient readers. Knowledge of effective reading strategies is an effective mediator in the association between socio-economic status, gender, and reading performance. Concretely, the index of effective reading strategies for assessing the credibility of sources is the most strongly associated with reading performance after accounting for background variables while the other two reading strategies (i.e. the indices of student knowledge of reading strategies for understanding and memorising a text and summarising information) are also associated with reading performance. These findings are particularly important for education policies and practices. Contrary to socio-economic status, which cannot be changed, knowledge of effective metacognitive reading strategies can be taught[3]. For instance, in Austria, Belgium, the Czech Republic, France, Germany, Luxembourg, the Netherlands, and Switzerland, students attending advantaged schools are more than two-thirds of a standard deviation ahead in the Index of knowledge of reading strategies for assessing the credibility of sources compared to students attending disadvantaged schools. Empirical studies have shown that classroom interventions aimed at developing students' assessment of information reliability have proven to be effective in improving students' critical thinking when comprehending multiple documents[4].

Bottom line

Stronger readers tend to have a better knowledge of reading strategies and are more likely to actively explore and navigate single- and multiple-source items in the PISA reading assessment.

WHAT DOES THE INTERPLAY BETWEEN ENJOYMENT, READING PERFORMANCE AND DIGITAL DEVICES MEAN FOR STUDENTS?

Students' reading habits and preferences have changed over the past decades because of changes in digitalisation of communication. PISA 2018 data suggest that digital devices are increasingly displacing print media, particularly in activities most closely tied to reading for information (e.g. newspapers, magazines). In Ireland, for example, the percentage of students who read physical newspapers several times a month or more because they wanted to decreased by 43 percentage points between 2009 and 2018 while reading the news online increased by 44 percentage points. This sometimes even happens within digital reading activities. In Japan, for example, the percentage of students who read e-mails several times a week or more decreased by 62 percentage points between 2009 and 2018 while chatting online increased by 77 percentage points.

PISA 2018 asked students what describes best how they read books: more often in paper format, more often on digital devices, or equally often in paper format and on digital devices. Students who reported reading books more often in paper than digital format perform better in reading and spend more time reading for enjoyment in all participating countries/economies in PISA 2018. However, this does not mean that print-book readers do not read online. Print-book readers read diverse kinds of reading materials for pleasure (e.g. books, magazines, newspapers, websites, etc.) more hours a week than digital-book readers, and the biggest book readers balance their reading time between paper and digital. Compared to students who rarely or never read books, digital-book readers on average across OECD countries read for enjoyment about 3 hours more a week, print-book readers about 4, and those who balance both formats about 5 hours or more a week after accounting for students' and schools'

socio-economic background and gender. Moreover, print-book readers reported chatting online as much as non-print book readers. These findings suggest two things. First, that the time spent reading for enjoyment on digital devices may not always displace time spent reading for enjoyment on print. Second, the potential benefit of using technology to enhance students' reading experience seems greater in activities related to reading for information and meeting practical needs than reading books for pleasure.

In summary, strong readers tend to read books in paper format or balance their reading time between paper and digital. At the same time, strong readers tend to read the news more often on digital devices but not exclusively. In other words, it seems that most proficient readers are able to optimise the use of digital technology depending on the activity. Strong readers will use digital devices to read the news or browse the Internet for schoolwork while still enjoying a book on paper.

Bottom line

Most proficient readers seem to optimise the use of digital technology depending on the activity (e.g. reading news online, browsing the Internet for schoolwork) while still enjoying reading a book on paper.

DO TEACHING AND LEARNING REFLECT STUDENTS' DIVERSE NEEDS?

Even with the best implementation, digital technologies will likely benefit students differently depending on their individual differences and interests. For example, as students' professional expectations differ, so do their preferences for paper or digital format, level of enjoyment of reading, and, ultimately, their behaviour towards reading. Even among students with science-related career expectations, the interplay between digital environments, motivation and enjoyment of reading is different. Students interested in ICT-related careers have higher exposure to digital devices at the age of 15 but read for enjoyment less frequently, especially boys. Given the close relationship between reading enjoyment and performance, further attention in this area is needed.

Students who reported reading for enjoyment in OECD countries have dropped in number over the last decade even though indicators of teachers' stimulation of students' reading engagement have significantly increased. It would be reasonable to expect that teachers are more likely to stimulate students who need it the most as strong readers would already be more engaged in reading. However, students from a lower socio-economic background and boys – who typically have a lower reading performance – perceived less stimulation from their teachers in reading activities in 49 countries/economies participating in PISA 2018.

Students are increasingly reading fewer fiction books. For example, at least 8 percentage points more students reported reading fiction books several times a month or more in PISA 2009 than in PISA 2018 in Canada, Finland, Kazakhstan, New Zealand, Sweden, and Thailand. Moreover, less than 20% of students reported reading fiction books several times a month or more in Belgium, Finland, the Netherlands, Norway, and Slovenia. PISA 2018 data also shows that students who reported reading fiction books for school during the last month are more likely to have also reported reading fiction books because they wanted to. In addition, most of the high performers in reading also reported reading longer pieces of text for school. These results suggest that teachers' assignments to read books for school may actually encourage students to read for pleasure outside of school.

Education systems that aim to improve students' resilience should understand why disadvantaged students still perceived the PISA reading assessment as more difficult than advantaged students did even after accounting for students' reading scores. This perception-of-difficulty gap among advantaged and disadvantaged students is the largest in B-S-J-Z (China), Luxembourg, and Singapore – close to a half standard deviation after accounting for reading performance. There is also a paradox: boys reported they felt the PISA reading test was easier than girls did even though boys scored 25 points lower than girls in reading after accounting for students' socio-economic backgrounds. In some students, there is a gap between their perceptions of their competency level – in this case, in reading – and the reality of that competency level or what that competency level actually is. And this gap may be hampering their motivation and perseverance in developing their reading skills. The relationship between one's perception of one's competence and performance is a mutually reinforcing one so when higher-performing students receive and process performance feedback their perception of competence tends to be higher. Teachers' feedback can be beneficial in helping poorer readers have a better sense of their strengths and weaknesses.

As automation, artificial intelligence, and robotics continue to seep into the workplace, tomorrow's schools will need to help students develop skills that will be difficult for machines to replicate. This is crucial for students' labour market prospects and well-being. To become proficient readers in a digital world, students need strong reading foundations but also the ability to think critically, monitor and adjust their behaviour for a particular goal and motivate themselves to persevere in the face of difficulties. In conclusion, the countries and economies that will be the most successful in fostering proficient readers in a digital world are those that mobilise learning opportunities across the reading spectrum, encompassing both digital technologies as well as traditional print reading. This will enable students to learn to think critically and develop metacognitive and self-efficacy skills to navigate the technology-rich 21st century.

Bottom line

Countries and economies that foster proficient readers in a digital world are those that offer learning opportunities that respond to students' diverse needs.

Notes

1. Rapa Nui Question 3 is a partial credit item where non-credit is scored 0, partial credit is scored 0.5, and full credit is scored 1. Therefore, the estimated percentage correct for full credit in this item is lower than 47% on average across OECD countries. This item was estimated to be 39% correct on average across all PISA 2018 participating countries and economies. Rapa Nui Question 3 is a Level 5 item. This means that students need to have a proficiency level 5 to have a 62% probability of getting full credit in this item.

2. Bertling, J., et al. (2020), "A tool to capture learning experiences during Covid-19: The PISA Global Crises Questionnaire Module", *OECD Education Working Papers*, No. 232, OECD Publishing, Paris, https://doi.org/10.1787/9988df4e-en.

3. Autin, F. and J. Croizet (2012), "Improving working memory efficiency by reframing metacognitive interpretation of task difficulty.", *Journal of Experimental Psychology: General*, Vol. 141/4, pp. 610-618, http://dx.doi.org/10.1037/a0027478.

4. Pérez, A. et al. (2018), "Fostering teenagers' assessment of information reliability: Effects of a classroom intervention focused on critical source dimensions", *Learning and Instruction,* Vol. 58, pp. 53-64, http://dx.doi.org/10.1016/j.learninstruc.2018.04.006.

PISA

ANNEX A

PISA 2018 technical background

The table in Annex A is avaliable on line

Annex A1: Construction of indices
https://doi.org/10.1787/888934240598

Annex A2: Technical notes on analyses in this report

ANNEX A1
Construction of indices

EXPLANATION OF THE INDICES

This section explains the indices derived from the PISA 2018 parent, student, school, teacher and educational career questionnaires used in this report.

Several PISA measures reflect indices that summarise responses from students, their parents, teachers or school representatives (typically principals) to a series of related questions. The questions were selected from a larger pool on the basis of theoretical considerations and previous research. The *PISA 2018 Assessment and Analytical Framework* (OECD, 2019[1]) provides an in-depth description of this conceptual framework. Item response theory modelling was used to confirm the theoretically expected behaviour of the indices and to validate their comparability across countries. For this purpose a joint model across all countries was estimated. Item fit (RMSD) was evaluated separately for each item and each group (county by language). This procedure is in line with the PISA 2015 scaling approach. For a detailed description of other PISA indices and details on the methods, see the *PISA 2015 Technical Report* (OECD, 2017[2]) and the *PISA 2018 Technical Report* (OECD, forthcoming[3]).

There are three types of indices: simple indices, new scale indices and trend scale indices.

Simple indices are the variables that are constructed through the arithmetic transformation or recoding of one or more items in exactly the same way across assessments. Here, item responses are used to calculate meaningful variables, such as the recoding of the four-digit ISCO-08 codes into "Highest parents' socio-economic index (HISEI)" or teacher-student ratio based on information from the school questionnaire.

New and scale indices from other cycles: are the variables constructed through the scaling of multiple items. Unless otherwise indicated, the index was scaled using a two-parameter item-response model (a generalised partial credit model was used in the case of items with more than two categories) and values of the index correspond to Warm likelihood estimates (WLE) (Warm, 1989[4]). For details on how each scale index was constructed, see the *PISA 2018 Technical Report* (OECD, forthcoming[3]). In general, the scaling was done in two stages:

1. The item parameters were estimated based on all students from equally-weighted countries and economies; only cases with a minimum number of three valid responses to items that are part of the index were included. In the case of trend indices, a common calibration linking procedure was used: countries/economies that participated in both PISA 2009 and PISA 2018 contributed both samples to the calibration of item parameters; each cycle and, within each cycle, each country/economy contributed equally to the estimation.[1]

2. For new scale indices, the Warm likelihood estimates were then standardised so that the mean of the index value for the OECD student population was zero and the standard deviation was one (countries were given equal weight in the standardisation process).

Sequential codes were assigned to the different response categories of the questions in the sequence in which the latter appeared in the student, school or parent questionnaires. Where indicated in this section, these codes were inverted for the purpose of constructing indices or scales. Negative values for an index do not necessarily imply that students responded negatively to the underlying questions. A negative value merely indicates that the respondents answered less positively than all respondents did on average across OECD countries. Likewise, a positive value on an index indicates that the respondents answered more favourably, or more positively, on average, than respondents in OECD countries did. Terms enclosed in brackets < > in the following descriptions were replaced in the national versions of the student, school and parent questionnaires by the appropriate national equivalent. For example, the term <qualification at ISCED level 5A> was translated in the United States into "Bachelor's degree, post-graduate certificate program, Master's degree program or first professional degree program". Similarly the term <classes in the language of assessment> in Luxembourg was translated into "German classes" or "French classes", depending on whether students received the German or French version of the assessment instruments.

In addition to simple and scaled indices described in this annex, there are a number of variables from the questionnaires that were used in this report and correspond to single items not used to construct indices. These non-recoded variables have prefix of "ST" for the questionnaire items in the student questionnaire and "SC" for the items in the school questionnaire. All the context questionnaires, and the PISA international database, including all variables, are available through www.oecd.org/pisa.

STUDENT-LEVEL SIMPLE INDICES

Immigrant background

Information on the country of birth of the students and their parents was also collected. Included in the database are three country-specific variables relating to the country of birth of the student, mother and father (ST019). The variables are binary and indicate whether the student, mother and father were born in the country of assessment or elsewhere. The index on immigrant background (IMMIG) is calculated from these variables, and has the following categories: (1) native students (those students who had at least one parent born in the country); (2) second-generation students (those born in the country of assessment but whose parent[s] were born in another country); and (3) first-generation students (those students born outside the country of assessment and whose parents were also born in another country). Students with missing responses for either the student or for both parents were given missing values for this variable.

Career expectations

In PISA 2018, students were asked to answer a question (ST114) about "what kind of job [they] expect to have when [they] are about 30 years old". Answers to this open-ended question were coded to four-digit ISCO codes (ILO, 2007), in variable BSMJ.

This variable was used to derive several indices related to career expectations.

Science-related career expectations are defined as those career expectations whose realisation requires further engagement with the study of science beyond compulsory education, typically in formal tertiary education settings. The classification of careers into science-related and non-science-related is based on the four-digit ISCO-08 classification of occupations.

Only professionals (major ISCO group 2) and technicians/associate professionals (major ISCO group 3) were considered to fit the definition of science-related career expectations. In a broad sense, several managerial occupations (major ISCO group 1) are clearly science-related; these include research and development managers, hospital managers, construction managers, and other occupations classified under production and specialised services managers (submajor group 13). However, when science-related experience and training is an important requirement of a managerial occupation, these were not considered to be entry-level jobs, and 15-year-old students with science-related career aspirations would not expect to be in such a position by age 30.

Several skilled agriculture, forestry and fishery workers (major ISCO group 6) could also be considered to work in science-related occupations. The United States O*NET OnLine (2019[5]) classification of science, technology, engineering and mathematics (STEM) occupations indeed include these occupations. These, however, do not typically require formal science-related training or study after compulsory education. Thus, only major occupation groups that require ISCO skill levels 3 and 4 were included amongst science-related occupational expectations.

Amongst professionals and technicians/associate professionals, the boundary between science-related and non-science-related occupations is sometimes blurred, and different classifications draw different lines.

The classification used in this report includes four groups of jobs:

- Science and engineering professionals: All science and engineering professionals (sub-major group 21), except product and garment designers (2163), graphic and multimedia designers (2166).
- Health professionals: All health professionals in sub-major group 22 (e.g. doctors, nurses, veterinarians), with the exception of traditional and complementary medicine professionals (minor group 223).
- ICT professionals: All information and communications technology professionals (sub-major group 25).
- Science technicians and associate professionals, including:
  - physical and engineering science technicians (minor group 311)
  - life science technicians and related associate professionals (minor group 314)
  - air traffic safety electronic technicians (3155)
  - medical and pharmaceutical technicians (minor group 321), except medical and dental prosthetic technicians (3214)
  - telecommunications engineering technicians (3522).

Number of books in the student's home

Students in PISA 2018 and 2009 were allowed to respond in intervals of 0-10 books, 11-25 books, 26-100 books, 101-200 books, 201-500 books, and more than 500 books. Students in PISA 2000 were allowed to respond in intervals of none, 1-10 books, 11-50 books, 51-100 books, 101-250 books, 251-500 books, and more than 500 books. Each cycle's responses were recoded to 0-10 books, 11-100 books, 101-500 books, and more than 500 books. These responses were converted to the average number of books in the interval (5, 55.5, 300.5, 500).

Access to digital resources at home

PISA 2018 asked students (ST011): 'which of the following are in your home?'. The positive asnwers to 'a computer you can use for school work' and 'a link to the internet' were aggregated against students who do have access to one or none of them at home. The answers to these items are also reported seperately.

Acess to digital resources at home and at school

In 52 countries and economies that distributed the ICT questionnaire, PISA 2018 asked students whether they have available a 'desktop computer', 'portable laptop, or notebook', and 'Internet connection' at home (IC001), and at school (IC009). Desktop computers and portable laptop or notebook were combined into access to computers. Four categories of access to computers were created using the responses to hese questions: at home only, at school only, at home and at school, and not at home not at school. Four categories were also created for access to the Internet: at home only, at school only, at home and at school, and not at home not at school.

Time spent online outside of school

In 51 of the 52 countries and economies that distributed the ICT questionnaire, PISA 2018 asked students how much time they spend using the Internet during the typical weekday (IC006) and weekend day (IC007) outside of school. These two questions were combined to calculate the amount of time students spend connected to the Internet during a typical week. For each category, the intermediate value was used (e.g. 15.5 minutes for the category "1-30 minutes per day"), and a value of 420.5 minutes was used for the category "More than 6 hours per day", then multiplied by 5 if they refer to a school day and by 2 if they refer to a weekend day, and divided by 60 to convert them into hours.

Time spent reading for enjoyment

PISA 2018 asked students (ST175): "about how much time do you usually spend reading for enjoyment?". The answers ("more than 30 minutes to less than 60 minutes a day"; "more than 30 minutes to less than 60 minutes a day"; "1 to 2 hours a day"; "more than 2 hours a day") were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment."

Average length of longest piece of text read for school

PISA 2018 asked students (ST154): "During this academic year, how many pages was the longest piece of text you had to read for your test language lessons?". Students were allowed to respond in intervals of one page or less, between 2-10 pages, between 11-50 pages, between 51-100 pages, between 101-500, and more than 500 pages. These responses were converted to the average number of pages in the interval (0.5, 6, 30.5, 75.5, 300.5, 600.5) to reflect the average length of longest piece of text read for school.

Total time a week using digital devices for school

In 52 countries and economies that distributed the ICT questionnaire, PISA 2018 asked students how much time do you spend using digital devices during classroom lessons (IC150), and outside of classroom lessons (IC151). Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

STUDENT-LEVEL SCALE INDICES

New scale indices

Self-efficacy

PISA 2018 asked (ST188) students to report the extent to which they agree ("strongly disagree", "disagree, "agree", "strongly agree") with the following statements about themselves: "I usually manage one way or another"; "I feel proud that I have accomplished things"; "I feel that I can handle many things at a time"; "My belief in myself gets me through hard times"; and "When I'm in a difficult situation, I can usually find my way out of it". These statements were combined to create the index of self-efficacy (RESILIENCE). Positive values in this index mean that the student reported higher self-efficacy than did the average student across OECD countries.

Perception of difficulty of the PISA test

PISA 2018 asked (ST163) students to report the extent to which they agree ("strongly disagree", "disagree, "agree", "strongly agree") with the following statements about their perception of difficulty of the PISA test: "There were many words I could not understand"; "Many texts were too difficult for me"; and "I was lost when I had to navigate between different pages". These statements were combined to create the index of perception of difficulty of the PISA test (PISADIFF). Positive values in this index mean that the student perceived higher difficulty than did the average student across OECD countries.

Perceived competence in reading

PISA 2018 asked (ST161) students to report the extent to which they agree ("strongly disagree", "disagree, "agree", "strongly agree") with the following statements about their self-concept in reading: "I am a good reader"; "I am able to understand difficult texts"; and "I read fluently". These statements were combined to create the index of perceived competence in reading (SCREADCOMP). Positive values in this index mean that the student perceived higher competence in reading than did the average student across OECD countries.

Perceived difficulty in reading

PISA 2018 asked (ST161) students to report the extent to which they agree ("strongly disagree", "disagree, "agree", "strongly agree") with the following statements about their self-concept in reading: "I have always had difficulty with reading"; "I have to read a text several times before completely understanding it."; and "I find it difficult to answer questions about a text". These statements were combined to create the index of perceived difficulty in reading (SCREADDIFF). Positive values in this index mean that the student perceived higher difficulty in reading than did the average student across OECD countries.

Metacognitive reading strategies

The PISA 2018 questionnaires included three scenarios assessing students' meta-cognition of reading: "Understanding and remembering" (UNDREM, ST164), "Summarising" (METASUM, ST165) and "Assessing credibility" (METASPAM, ST166). UNDREM and METASUM were already administered in PISA 2009 (cf. Technical Report 2009: OECD, 2012, p. 282). METASPAM was newly developed for PISA 2018.

Each scenario consists of (a) a stem which is a reading task and (b) a set of strategies. Students were asked to rate the strategies regarding their usefulness for solving the reading task. All strategies have also been rated by reading experts regarding their usefulness via multiple pairwise comparisons. This rating resulted in a hierarchy of all strategies for each task and it was based on all the pairs agreed upon by at least 80% of the experts. For the new scenario METASPAM (based on question ST166), for example, the experts' ratings resulted in the following order: Q02HA, Q04HA, Q05HA > Q01HA, Q03HA.

Based on this rating order, pairwise rules were then created to construct a score for each student indicating the number of times in which he or she chose a more useful over a less useful strategy. The final scores assigned to each student for each task ranges from 0 to 1 and can be interpreted as the proportion of the total number of expert pairwise relations that are consistent with the student ordering. The higher the score, the higher the number of times in which a student chose an expert-validated strategy over a less useful one. For METASPAM, there were 6 (3x2) resulting pairwise rules based on this order, namely Q04HA > Q01HA, Q04HA > Q03HA, Q02HA > Q01HA, Q02HA > Q03HA, Q05HA > Q01HA, and Q05HA > Q03HA. Consequently, a student following 4 of these rules receives a score of 4/6=0.67. A similar procedure was carried out for the remaining two meta-cognition tasks. For UNDREM (based on question ST164), the expert-rated strategy order was Q03IA, Q04IA, Q05IA > Q01IA, Q02IA, Q06IA. For METASUM (based on question ST165), the expert-rated strategy order was Q04IA, Q05IA > Q01IA, Q03IA > Q02IA.

In case of a missing value on one or more items of the question, a missing score was assigned. Finally, all three indices were standardized to have an OECD mean of 0 and a standard deviation of 1.

Indices included in earlier assessments

Enjoyment of reading

The index of enjoyment of reading (JOYREAD) was constructed based on a trend question (ST160) from PISA 2009 (ID in 2009: ST24) asking students whether they agree ("strongly agree", "agree", "disagree", "strongly disagree") with the following statements: "I read only if I have to"; "Reading is one of my favourite hobbies"; "I like talking about books with other people"; "For me, reading is a waste of time"; and "I read only to get information that I need". Positive values on this scale mean that the student enjoyed reading to a greater extent than the average student across OECD countries. Scores of the index of enjoyment of reading are directly comparable between PISA 2009 and PISA 2018 (see note 1 for more details).

Teachers' stimulation of reading engagement

The index of teachers' stimulation of reading engagement (STIMREAD) was constructed partly based on questions (ST152) from PISA 2009 (ID in 2009: ST37) asking students how often («never or hardly ever", "some lessons", "most lessons", "every lesson") the following occur in their language-of-instruction lessons: "The teacher encourages students to express their opinion about a text"; "The teacher helps students relate the stories they read to their lives"; "The teacher shows students how the information in texts builds on what they already know"; and "The teacher poses questions that motivate students to participate actively". Positive values on this scale mean that the students perceived their teacher to provide greater stimulation than did the average student across OECD countries.

Scaling of indices related to the PISA index of economic social and cultural status

The PISA index of economic, social and cultural status (ESCS) was derived, as in previous cycles, from three variables related to family background: parents' highest level of education (PARED), parents' highest occupational status (HISEI), and home possessions (HOMEPOS), including books in the home. PARED and HISEI are simple indices, described above. HOMEPOS is a proxy measure for family wealth.

Household possessions

In PISA 2018, students reported the availability of 16 household items at home (ST011), including three country-specific household items that were seen as appropriate measures of family wealth within the country's context. In addition, students reported the amount of possessions and books at home (ST012, ST013). HOMEPOS is a summary index of all household and possession items (ST011, ST012 and ST013).

Computation of ESCS

For the purpose of computing the PISA index of economic, social and cultural status (ESCS), values for students with missing PARED, HISEI or HOMEPOS were imputed with predicted values plus a random component based on a regression on the other two variables. If there were missing data on more than one of the three variables, ESCS was not computed and a missing value was assigned for ESCS.

In previous cycles, the PISA index of economic, social and cultural status was derived from a principal component analysis of standardised variables (each variable has an OECD mean of zero and a standard deviation of one), taking the factor scores for the first principal component as measures of the PISA index of economic, social and cultural status. In PISA 2018, ESCS is computed by attributing equal weight to the three standardised components. As in PISA 2015, the three components were standardised across all countries and economies (both OECD and partner countries/economies), with each country/economy contributing equally (in cycles prior to 2015, the standardisation and principal component analysis was based on OECD countries only). As in every previous cycle, the final ESCS variable was transformed, with 0 the score of an average OECD student and 1 the standard deviation across equally weighted OECD countries.

SCHOOL-LEVEL SIMPLE INDICES

School type

Schools are classified as either public or private according to whether a private entity or a public agency has the ultimate power to make decisions concerning its affairs. As in previous PISA surveys, the index of school type (SCHLTYPE) has three categories: (1) public schools managed directly or indirectly by a public education authority, government agency or governing board appointed by government or elected by public franchise; (2) government-dependent private schools, managed directly or indirectly by a non-government organisation (e.g. a church, trade union, business or other private institution), which receive more than 50% of their total funding in a typical school year from government agencies (including departments, local, regional, state and national agencies); and (3) government-independent private schools, controlled by a non-government organisation, which receive less than 50% of their core funding from government agencies.

Socio-economic profile of the schools

Advantaged and disadvantaged schools are defined in terms of the socio-economic profile of schools. All schools in each PISA-participating education system are ranked according to their average PISA index of economic, social and cultural status (ESCS) and then divided into four groups with approximately an equal number of students (quarters). Schools in the bottom quarter are referred to as "socio-economically disadvantaged schools"; and schools in the top quarter are referred to as "socio-economically advantaged schools".

PARENT-LEVEL SCALE INDICES

Indices included in earlier assessments

Parents' enjoyment of reading

The index of parents' enjoyment of reading (JOYREADP) was constructed using parents' responses to the trend question (PA158) from PISA 2009 (ID in 2009: PA06) and is parallel to the Student questionnaire (ST160). Parents were asked whether they agree ("strongly agree", "agree", "disagree", "strongly disagree") with the following statements: "I read only if I have to"; "Reading is one of my favourite hobbies"; "I like talking about books with other people"; "For me, reading is a waste of time"; and "I read only to get information that I need". Positive values on this scale mean greater parental motivation to engage in reading activities than parents across OECD countries. Scores of the index of parent' enjoyment of reading are directly comparable between PISA 2009 and PISA 2018 (see note 1 for more details).

CROSS-COUNTRY COMPARABILITY OF SCALED INDICES

While the forthcoming PISA 2018 Technical Report (OECD, forthcoming[3]) will explain in detail the scaling procedures and the construct validation of all context- questionnaire data, this section presents a summary of the analyses carried out to validate the cross-country comparability of the main scaled indices used in this report. The internal consistency of scaled indices and the invariance of item parameters are the two approaches that PISA 2018 used to examine the comparability of scaled indices across school systems. Based on these two approaches, all indices examined in this report met the reporting criteria.

Internal consistency refers to the extent to which the items that make up an index are inter-related. Cronbach's Alpha was used to check the internal consistency of each scale within the countries/economies and to compare it amongst countries/economies. The coefficient of Cronbach's Alpha ranges from 0 to 1, with higher values indicating higher internal consistency. Similar and high values across countries/economies are an indication of having measured reliably across countries/economies. Commonly accepted cut-off values are 0.9 for excellent, 0.8 for good, and 0.7 for acceptable internal consistency. In the PISA 2018 context, indices were always omitted for countries and economies with values below 0.6, and for some countries and economies with values between 0.6 and 0.7.

Table A1.1, available online (see below), presents the Cronbach's Alpha for the main scaled indices in this report. Based on these results, the following indices were omitted in the figures and flagged in the tables from individual countries/economies:

- Self-efficacy (RESILIENCE): Viet Nam.
- Perception of reading competence (SCREADCOMP): Belarus, the Russian Federation.
- Perception of difficulty in reading (SCREADDIFF): Indonesia, Malaysia, Morocco, Saudi Arabia, Viet Nam.
- Enjoyment of reading (JOYREAD): Jordan, Morocco.

PISA 2018 examined the cross-country comparability of scaled indices also through the invariance of item parameters. The idea was to test whether the item parameters of an index could be assumed to be the same (invariant) across groups of participating countries and language groups. In a first step, groups were defined based on samples of at least 300 students responding to the same language-version questionnaire in a country. In a second step, international and student parameters were estimated based on students across all groups. In a third step, the root mean square deviance (RMSD) item-fit statistics was calculated for each group and item. Values close to zero signal a good item fit, indicating that the international model describes student responses within individual groups accurately. Any group receiving a value above 0.3 was flagged and a group-specific item parameter was calculated. Steps 2 and 3 were then repeated until all items exhibited RMSD values below 0.3. The RMSD values will be reported in the forthcoming PISA 2018 Technical Report. Amongst the main indices examined in this report, some needed just one round to ensure that all items exhibited acceptable levels of RMSD, whereas other indices needed several iterations:

- One round: perception of difficulty of the PISA test, perception of difficulty in reading, teacher's stimulation of reading engagement.

- Several rounds: self-efficacy (2 rounds), perception of reading competence (2 rounds), enjoyment of reading (2 rounds), enjoyment of reading – trend – (4 rounds), parents' enjoyment of reading (2 rounds).

In addition to country-specific omissions, some indices were also omitted for all countries. With regard to this report, the original plan was to produce an index of metacognitive reading strategies combining "Understanding and remembering" (UNDREM, ST164), "Summarising" (METASUM, ST165) and "Assessing credibility" (METASPAM, ST166). However, the composite index was omitted because it showed low internal consistency and low invariance of item parameters. Consequently, metacognitive reading strategies are analysed individually in the report and caution should be paid when comparing countries and economies means in these individual indices as cross-cultural comparability can not be guaranteed.

Table available on line

https://doi.org/10.1787/888934240598

- Table A1.1 Internal consistency of the main scaled indices

Note

1. PISA expert groups identified a few indices that should be scaled to make index values directly comparable between PISA 2009 and PISA 2018. These indices include DISCLIMA, JOYREAD and JOYREADP. For these trend indices, a common calibration linking procedure was used. Countries/Economies that participated in both PISA 2009 and PISA 2018 contributed both samples to the calibration of item parameters. Each country/economy contributed equally to the estimation in each cycle. Trend indices were equated so that the mean and standard deviation of rescaled PISA 2009 estimates and of the original estimates included in the PISA 2009 database, across OECD countries, matched. Trend indices are therefore reported on the same scale as used in PISA 2009, so that values can be directly compared to those included in the PISA 2009 database.

References

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ANNEX A2
Technical notes on analyses in this report

STANDARD ERRORS, CONFIDENCE INTERVALS AND SIGNIFICANCE TESTS

The statistics in this report represent estimates based on samples of students, rather than values that could be calculated if every student in every country had answered every question. Consequently, it is important to measure the degree of uncertainty of the estimates. In PISA, each estimate has an associated degree of uncertainty, which is expressed through a standard error. The use of confidence intervals provides a way to make inferences about the population parameters (e.g. means and proportions) in a manner that reflects the uncertainty associated with the sample estimates. If numerous different samples were drawn from the same population, according to the same procedures as the original sample, then in 95 out of 100 samples the calculated confidence interval would encompass the true population parameter. For many parameters, sample estimators follow a normal distribution and the 95% confidence interval can be constructed as the estimated parameter, plus or minus 1.96 times the associated standard error.

In many cases, readers are primarily interested in whether a given value in a particular country is different from a second value in the same or another country, e.g. whether girls in a country perform better than boys in the same country. In the tables and figures used in this report, differences are labelled as statistically significant when a difference of that size or larger, in either direction, would be observed less than 5% of the time, if there were actually no difference in corresponding population values. Similarly, the risk of reporting an association as significant if there is, in fact, no correlation between two measures, is contained at 5%.

Throughout the report, significance tests were undertaken to assess the statistical significance of the comparisons made.

Statistical significance of gender differences and differences between subgroup means

Gender differences in student performance or other indices were tested for statistical significance. Positive differences indicate higher scores for girls while negative differences indicate higher scores for boys. Generally, differences marked in bold in the tables in this report are statistically significant at the 95% confidence level.

Similarly, differences between other groups of students (e.g. non-immigrant students and students with an immigrant background, or socio-economically advantaged and disadvantaged students) were tested for statistical significance. The definitions of the subgroups can, in general, be found in the tables and the text accompanying the analysis. All differences marked in bold in the tables presented in Annex B of this report are statistically significant at the 95% level.

Statistical significance of differences between subgroup means, after accounting for other variables

For many tables, subgroup comparisons were performed both on the observed difference ("before accounting for other variables") and after accounting for other variables, such as the PISA index of economic, social and cultural status of students. The adjusted differences were estimated using linear regression and tested for significance at the 95% confidence level. Significant differences are marked in bold.

Statistical significance of performance differences between the top and bottom quarters of PISA indices and scales

Differences in average performance between the top and bottom quarters of the PISA indices and scales were tested for statistical significance. Figures marked in bold indicate that performance between the top and bottom quarters of students on the respective index is statistically significantly different at the 95% confidence level.

USE OF STUDENT, SCHOOL AND TEACHER WEIGHTS

The target population in PISA is 15-year-old students, but a two-stage sampling procedure was used. After the population was defined, school samples were selected with a probability proportional to the expected number of eligible students in each school. Only in a second sampling stage were students drawn from amongst the eligible students in each selected school.

Although the student samples were drawn from within a sample of schools, the school sample was designed to optimise the resulting sample of students, rather than to give an optimal sample of schools. It is therefore preferable to analyse the school-level variables as attributes of students (e.g. in terms of the share of 15-year-old students affected), rather than as elements in their own right.

Most analyses of student and school characteristics are therefore weighted by student final weights (or their sum, in the case of school characteristics), and use student replicate weights for estimating standard errors.

In PISA 2018, as in PISA 2012 and 2015, multilevel models weights are used at both the student and school levels. The purpose of these weights is to account for differences in the probabilities of students being selected in the sample. Since PISA applies a two-stage sampling procedure, these differences are due to factors at both the school and the student levels. For the multilevel models, student final weights (W_FSTUWT) were used. Within-school weights correspond to student final weights, rescaled to amount to the sample size within each school. Between-school weights correspond to the sum of final student weights (W_FSTUWT) within each school.

Analyses based on teacher responses to the teacher questionnaires are weighted by student weights. In particular, in order to compute averages and shares based on teacher responses, final teacher weights were generated so that the sum of teacher weights within each school was equal to the sum of student weights within the same school. The same procedure was used to generate replicate teacher weights in analogy with the student replicate weights in the database. All teachers within a school have the same weight. For the computation of means, this is equivalent to aggregating teacher responses to the school level through simple, unweighted means, and then applying student weights to these school-level aggregates.

ANNEX B

Results for countries and economies

All tables in Annex B are available on line

Chapter 1: https://doi.org/10.1787/888934240617

Chapter 2: https://doi.org/10.1787/888934240636

Chapter 3: https://doi.org/10.1787/888934240655

Chapter 4: https://doi.org/10.1787/888934240674

Chapter 5: https://doi.org/10.1787/888934240693

Chapter 6: https://doi.org/10.1787/888934240712

ANNEX B
Results for countries and economies

Table B.1.3 [1/2] **Time spent on the Internet in total in 2012, 2015, 2018**
Based on students' reports

		Time (in hours per week[1]) spent on the Internet						Change in time (in hours per week) spent on the Internet between:					
								PISA 2015 and ...		PISA 2018 and ...			
		PISA 2012		PISA 2015		PISA 2018		PISA 2012		PISA 2012		PISA 2015	
		Hours	S.E.	Hours	S.E.	Hours	S.E.	Dif.	S.E.	Dif.	S.E.	Dif.	S.E.
OECD	Australia	28	(0.2)	35	(0.3)	40	(0.3)	**7**	(0.4)	**12**	(0.3)	**5**	(0.4)
	Austria	20	(0.3)	30	(0.4)	35	(0.5)	**10**	(0.5)	**14**	(0.6)	**5**	(0.6)
	Belgium	20	(0.2)	28	(0.2)	35	(0.4)	**8**	(0.3)	**15**	(0.5)	**7**	(0.5)
	Canada	m	m	m	m	m	m	m	m	m	m	m	m
	Chile	22	(0.3)	37	(0.4)	42	(0.5)	**15**	(0.5)	**20**	(0.6)	**5**	(0.6)
	Colombia	m	m	28	(0.5)	m	m	m	m	m	m	m	m
	Czech Republic	23	(0.4)	31	(0.4)	31	(0.4)	**8**	(0.5)	**8**	(0.5)	0	(0.5)
	Denmark	29	(0.4)	37	(0.5)	47	(0.4)	**9**	(0.7)	**19**	(0.6)	**10**	(0.7)
	Estonia	26	(0.3)	33	(0.4)	36	(0.3)	**8**	(0.5)	**10**	(0.4)	**3**	(0.5)
	Finland	19	(0.2)	29	(0.3)	36	(0.4)	**9**	(0.4)	**17**	(0.5)	**7**	(0.5)
	France	m	m	26	(0.3)	33	(0.4)	m	m	m	m	**8**	(0.5)
	Germany	21	(0.3)	m	m	m	m	m	m	m	m	m	m
	Greece	23	(0.4)	27	(0.4)	32	(0.3)	**4**	(0.5)	**9**	(0.5)	**5**	(0.5)
	Hungary	23	(0.3)	32	(0.4)	36	(0.4)	**9**	(0.5)	**13**	(0.5)	**4**	(0.6)
	Iceland	24	(0.3)	31	(0.3)	37	(0.4)	**7**	(0.4)	**13**	(0.4)	**6**	(0.5)
	Ireland	16	(0.3)	26	(0.4)	33	(0.4)	**11**	(0.5)	**17**	(0.5)	**6**	(0.6)
	Israel	21	(0.4)	27	(0.7)	33	(0.4) †	**6**	(0.8)	**13**	(0.6) †	**7**	(0.8) †
	Italy	18	(0.2)	30	(0.4)	35	(0.4)	**13**	(0.4)	**18**	(0.4)	**5**	(0.5)
	Japan	15	(0.2)	19	(0.5)	23	(0.3)	**5**	(0.5)	**8**	(0.4)	**4**	(0.6)
	Korea	11	(0.2)	14	(0.2)	22	(0.3)	**3**	(0.3)	**11**	(0.4)	**8**	(0.4)
	Latvia	22	(0.3)	28	(0.3)	37	(0.3)	**6**	(0.5)	**15**	(0.5)	**8**	(0.5)
	Lithuania	m	m	26	(0.3)	36	(0.3)	m	m	m	m	**10**	(0.4)
	Luxembourg	m	m	30	(0.3)	36	(0.3)	m	m	m	m	**6**	(0.4)
	Mexico	17	(0.2)	23	(0.5)	28	(0.6)	**6**	(0.5)	**11**	(0.6)	**6**	(0.7)
	Netherlands	23	(0.4)	34	(0.4)	m	m	**11**	(0.5)	m	m	m	m
	New Zealand	20	(0.3)	33	(0.4)	42	(0.4)	**13**	(0.5)	**22**	(0.5)	**9**	(0.6)
	Norway	26	(0.3)	m	m	m	m	m	m	m	m	m	m
	Poland	22	(0.3)	29	(0.4)	36	(0.4)	**7**	(0.5)	**14**	(0.5)	**7**	(0.6)
	Portugal	21	(0.4)	30	(0.4)	m	m	**9**	(0.6)	m	m	m	m
	Slovak Republic	24	(0.3)	32	(0.4)	35	(0.4)	**8**	(0.5)	**11**	(0.5)	**3**	(0.5)
	Slovenia	22	(0.3)	25	(0.3)	30	(0.3)	**3**	(0.4)	**8**	(0.4)	**5**	(0.4)
	Spain	23	(0.3)	31	(0.4)	35	(0.3)	**8**	(0.5)	**12**	(0.4)	**3**	(0.5)
	Sweden	28	(0.5)	39	(0.5)	46	(0.6)	**11**	(0.7)	**18**	(0.8)	**8**	(0.8)
	Switzerland	18	(0.3)	25	(0.4)	31	(0.4)	**7**	(0.5)	**13**	(0.5)	**6**	(0.6)
	Turkey	12	(0.2)	m	m	28	(0.5)	m	m	**16**	(0.6)	m	m
	United Kingdom	m	m	35	(0.5)	36	(0.4)	m	m	m	m	1	(0.6)
	United States	m	m	m	m	41	(0.5)	m	m	m	m	m	m
	OECD average	21	(0.1)	29	(0.1)	35	(0.1)	**8**	(0.1)	**14**	(0.1)	**6**	(0.1)
	OECD average-25	21	(0.1)	29	(0.1)	35	(0.1)	**8**	(0.1)	**14**	(0.1)	**6**	(0.1)

1. Students were allowed to respond in intervals of no time, between 1-30 minutes per day, between 31-60 minutes per day, between 1 hour and 2 hours per day, between 2 hours and 4 hours per day, between 4 hours and 6 hours per day, and more than 6 hours per day. These responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5, 300.5, 420.5), then multiplied by 5 if they refer to a school day and by 2 if they refer to a weekend day, and divided by 60 to convert them into hours. As such, the numbers in this table are the number of hours per week students spent on the Internet in total (outside and inside of school).

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.1.3 [2/2] **Time spent on the Internet in total in 2012, 2015, 2018**

Based on students' reports

	Time (in hours per week[1]) spent on the Internet						Change in time (in hours per week) spent on the Internet between:					
							PISA 2015 and ...		PISA 2018 and ...			
	PISA 2012		PISA 2015		PISA 2018		PISA 2012		PISA 2012		PISA 2015	
	Hours	S.E.	Hours	S.E.	Hours	S.E.	Dif.	S.E.	Dif.	S.E.	Dif.	S.E.
Partners												
Albania	m	m	m	m	25	(0.4)	m	m	m	m	m	m
Argentina	m	m	m	m	m	m	m	m	m	m	m	m
Baku (Azerbaijan)	m	m	m	m	m	m	m	m	m	m	m	m
Belarus	m	m	m	m	m	m	m	m	m	m	m	m
Bosnia and Herzegovina	m	m	m	m	m	m	m	m	m	m	m	m
Brazil	m	m	33	(0.4) †	36	(0.4)	m	m	m	m	**3**	(0.5) †
Brunei Darussalam	m	m	m	m	31	(0.3)	m	m	m	m	m	m
B-S-J-Z (China)	m	m	m	m	m	m	m	m	m	m	m	m
Bulgaria	m	m	37	(0.4)	40	(0.4)	m	m	m	m	**3**	(0.6)
Costa Rica	19	(0.4)	36	(0.5)	41	(0.5)	**17**	(0.6)	**22**	(0.6)	**5**	(0.7)
Croatia	21	(0.3)	29	(0.4)	36	(0.4)	**8**	(0.5)	**15**	(0.5)	**7**	(0.5)
Cyprus	m	m	m	m	m	m	m	m	m	m	m	m
Dominican Republic	m	m	24	(0.4)	28	(0.6)	m	m	m	m	**4**	(0.7)
Georgia	m	m	m	m	29	(0.4)	m	m	m	m	m	m
Hong Kong (China)	21	(0.3)	23	(0.3)	29	(0.4)	**2**	(0.4)	**8**	(0.5)	**6**	(0.5)
Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
Jordan	16	(0.3)	m	m	m	m	m	m	m	m	m	m
Kazakhstan	m	m	m	m	26	(0.3)	m	m	m	m	m	m
Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
Macao (China)	22	(0.2)	26	(0.2)	30	(0.2)	**4**	(0.3)	**8**	(0.3)	**4**	(0.3)
Malaysia	m	m	m	m	m	m	m	m	m	m	m	m
Malta	m	m	m	m	34	(0.3)	m	m	m	m	m	m
Moldova	m	m	m	m	m	m	m	m	m	m	m	m
Montenegro	m	m	m	m	m	m	m	m	m	m	m	m
Morocco	m	m	m	m	20	(0.5)	m	m	m	m	m	m
North Macedonia	m	m	m	m	m	m	m	m	m	m	m	m
Panama	m	m	m	m	26	(0.5)	m	m	m	m	m	m
Peru	m	m	18	(0.4)	m	m	m	m	m	m	m	m
Philippines	m	m	m	m	m	m	m	m	m	m	m	m
Qatar	m	m	m	m	m	m	m	m	m	m	m	m
Romania	m	m	m	m	m	m	m	m	m	m	m	m
Russia	25	(0.4)	32	(0.5)	35	(0.5)	**7**	(0.7)	**10**	(0.6)	**3**	(0.7)
Saudi Arabia	m	m	m	m	m	m	m	m	m	m	m	m
Serbia	21	(0.3)	m	m	38	(0.4)	m	m	**17**	(0.5)	m	m
Singapore	21	(0.3)	29	(0.4)	35	(0.3)	**9**	(0.5)	**15**	(0.4)	**6**	(0.5)
Chinese Taipei	18	(0.3)	26	(0.4)	30	(0.4)	**8**	(0.5)	**12**	(0.5)	**4**	(0.6)
Thailand	m	m	28	(0.5)	37	(0.4)	m	m	m	m	**8**	(0.6)
Ukraine	m	m	m	m	m	m	m	m	m	m	m	m
United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
Uruguay	23	(0.3)	35	(0.4)	42	(0.4) †	**12**	(0.5)	**19**	(0.5) †	**7**	(0.6) †
Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m

1. Students were allowed to respond in intervals of no time, between 1-30 minutes per day, between 31-60 minutes per day, between 1 hour and 2 hours per day, between 2 hours and 4 hours per day, between 4 hours and 6 hours per day, and more than 6 hours per day. These responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5, 300.5, 420.5), then multiplied by 5 if they refer to a school day and by 2 if they refer to a weekend day, and divided by 60 to convert them into hours. As such, the numbers in this table are the number of hours per week students spent on the Internet in total (outside and inside of school).

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.2 [1/6] **Change between 2009 and 2018 in the percentage of students with access to the Internet and having a computer that they can use for schoolwork at home**

Results based on students' self-reports

	Percentage of students who reported having:																							
	A computer that can be used for schoolwork at home																							
	PISA 2003			PISA 2006			PISA 2009			PISA 2018			Change between 2003 and 2018 (PISA 2018 - PISA 2003)			Change between 2006 and 2018 (PISA 2018 - PISA 2006)			Change between 2009 and 2018 (PISA 2018 - PISA 2009)		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s
OECD																								
Australia	94.0	(0.3)		96.3	(0.3)		97.5	(0.2)		93.9	(0.4)		-0.1	(0.5)		**-2.4**	(0.5)		**-3.5**	(0.4)	
Austria	93.0	(0.5)		95.7	(0.3)		97.5	(0.2)		95.5	(0.3)		**2.5**	(0.6)		-0.2	(0.5)		**-2.0**	(0.4)	
Belgium	87.2	(0.5)		93.4	(0.3)		96.6	(0.2)		93.0	(0.3)		**5.9**	(0.6)		-0.4	(0.5)		**-3.5**	(0.4)	
Canada	93.3	(0.3)		96.3	(0.2)		97.1	(0.2)		93.6	(0.2)		0.3	(0.4)		**-2.7**	(0.3)		**-3.5**	(0.3)	
Chile	m	m		54.3	(2.1)		74.0	(1.2)		82.5	(0.7)		m	m		**28.2**	(2.2)		**8.5**	(1.4)	
Colombia	m	m		31.0	(2.1)		47.0	(1.7)		62.0	(1.3)		m	m		**31.0**	(2.4)		**15.0**	(2.1)	
Czech Republic	76.7	(0.8)		86.8	(0.8)		95.4	(0.3)		94.6	(0.4)		**18.0**	(0.9)		**7.8**	(0.9)		-0.8	(0.6)	
Denmark	93.3	(0.5)		98.3	(0.2)		99.0	(0.1)		98.3	(0.2)		**5.1**	(0.5)		0.0	(0.3)		**-0.7**	(0.3)	
Estonia	m	m		82.9	(0.7)		88.2	(0.5)		86.9	(0.5)		m	m		**4.0**	(0.9)		-1.3	(0.7)	
Finland	87.9	(0.6)		95.3	(0.3)		98.6	(0.2)		94.2	(0.3)		**6.3**	(0.6)		**-1.2**	(0.4)		**-4.4**	(0.4)	
France	78.6	(0.9)		86.1	(0.7)		93.8	(0.4)		90.8	(0.4)		**12.2**	(1.0)		**4.7**	(0.9)		**-3.0**	(0.6)	
Germany	91.0	(0.6)		95.4	(0.4)		97.0	(0.3)		92.0	(0.6)		1.0	(0.8)		**-3.4**	(0.7)		**-5.0**	(0.6)	
Greece	52.8	(1.4)		74.0	(0.9)		87.7	(0.8)		89.1	(0.5)		**36.3**	(1.5)		**15.1**	(1.0)		1.4	(0.9)	
Hungary	67.6	(0.9)		85.3	(0.8)		92.4	(0.7)		91.4	(0.5)		**23.8**	(1.0)		**6.1**	(1.0)		-1.0	(0.9)	
Iceland	96.8	(0.3)		98.1	(0.2)		98.5	(0.2)		96.1	(0.4)		-0.7	(0.4)		**-2.0**	(0.4)		**-2.5**	(0.4)	
Ireland	79.9	(0.9)		87.9	(0.6)		93.1	(0.5)		86.0	(0.6)		**6.2**	(1.1)		**-1.8**	(0.8)		**-7.1**	(0.8)	
Israel	m	m		90.0	(0.9)		92.7	(0.7)		93.3	(0.5)		m	m		**3.3**	(1.0)		0.6	(0.8)	
Italy	78.0	(0.8)		89.4	(0.5)		94.9	(0.2)		90.0	(0.5)		**12.0**	(1.0)		0.7	(0.7)		**-4.9**	(0.5)	
Japan	46.2	(1.0)		62.5	(0.9)		69.1	(0.9)		61.3	(0.9)		**15.2**	(1.4)		-1.2	(1.3)		**-7.7**	(1.3)	
Korea	95.1	(0.4)		97.2	(0.3)		95.7	(0.3)		90.3	(0.5)		**-4.8**	(0.6)		**-6.9**	(0.6)		**-5.4**	(0.6)	
Latvia	44.0	(1.6)		72.6	(1.0)		89.5	(0.8)		94.3	(0.4)		**50.3**	(1.6)		**21.6**	(1.1)		**4.8**	(0.9)	
Lithuania	m	m		80.1	(0.7)		93.0	(0.5)		96.2	(0.3)		m	m		**16.1**	(0.8)		**3.2**	(0.6)	
Luxembourg	90.1	(0.4)		93.2	(0.4)		97.2	(0.3)		92.7	(0.3)		**2.6**	(0.5)		-0.4	(0.5)		**-4.5**	(0.4)	
Mexico	33.2	(1.8)		42.0	(1.3)		48.2	(0.9)		56.8	(1.2)		**23.6**	(2.2)		**14.8**	(1.8)		**8.7**	(1.5)	
Netherlands	95.9	(0.4)		97.4	(0.3)		98.4	(0.2)		95.2	(0.4)		-0.7	(0.6)		**-2.1**	(0.5)		**-3.2**	(0.5)	
New Zealand	87.3	(0.6)		93.3	(0.5)		94.1	(0.4)		91.9	(0.5)		**4.6**	(0.8)		**-1.4**	(0.7)		**-2.2**	(0.6)	
Norway	93.6	(0.4)		96.8	(0.3)		98.1	(0.2)		96.6	(0.3)		**3.0**	(0.5)		-0.2	(0.4)		**-1.4**	(0.3)	
Poland	60.3	(1.2)		79.6	(0.8)		94.0	(0.4)		96.5	(0.3)		**36.2**	(1.2)		**16.8**	(0.9)		**2.4**	(0.5)	
Portugal	74.7	(1.2)		86.1	(0.8)		97.1	(0.3)		93.5	(0.4)		**18.8**	(1.3)		**7.4**	(1.0)		**-3.6**	(0.5)	
Slovak Republic	57.1	(1.3)		77.1	(1.0)		91.9	(0.6)		91.9	(0.5)		**34.8**	(1.4)		**14.8**	(1.1)		0.0	(0.8)	
Slovenia	m	m		96.8	(0.3)		98.4	(0.2)		96.8	(0.3)		m	m		0.0	(0.4)		**-1.6**	(0.3)	
Spain	79.0	(0.9)		88.1	(0.6)		93.4	(0.4)		91.4	(0.3)		**12.5**	(0.9)		**3.4**	(0.7)		**-2.0**	(0.5)	
Sweden	94.9	(0.4)		97.8	(0.2)		98.4	(0.2)		94.9	(0.4)		0.0	(0.5)		**-2.9**	(0.4)		**-3.5**	(0.4)	
Switzerland	86.6	(0.6)		96.0	(0.2)		97.4	(0.2)		95.3	(0.4)		**8.8**	(0.7)		-0.7	(0.4)		**-2.1**	(0.4)	
Turkey	23.3	(1.9)		38.2	(1.7)		60.6	(1.2)		67.2	(1.2)		**44.0**	(2.2)		29.0	(2.1)		**6.6**	(1.8)	
United Kingdom	91.4	(0.5)		95.2	(0.5)		97.7	(0.2)		91.9	(0.4)		0.5	(0.6)		**-3.2**	(0.6)		**-5.7**	(0.5)	
United States	87.5	(0.7)		88.8	(1.1)		90.1	(0.7)		88.1	(0.8)		0.6	(1.1)		-0.7	(1.4)		-2.0	(1.1)	
OECD average-31	77.7	(0.2)		86.5	(0.1)		91.9	(0.1)		90.0	(0.1)		**12.2**	(0.2)		**3.5**	(0.2)		**-2.0**	(0.1)	
OECD average-37	m	m		84.2	(0.1)		90.4	(0.1)		89.4	(0.1)		m	m		**5.2**	(0.2)		**-1.0**	(0.1)	

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

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.2 [2/6] **Change between 2009 and 2018 in the percentage of students with access to the Internet and having a computer that they can use for schoolwork at home**

Results based on students' self-reports

		Percentage of students who reported having:																							
		A computer that can be used for schoolwork at home																							
		PISA 2003			PISA 2006			PISA 2009			PISA 2018			Change between 2003 and 2018 (PISA 2018 - PISA 2003)			Change between 2006 and 2018 (PISA 2018 - PISA 2006)			Change between 2009 and 2018 (PISA 2018 - PISA 2009)		
		%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s
Partners	Albania	m	m		m	m		44.3	(1.5)		70.7	(1.1)		m	m		m	m		**26.4**	(1.9)	
	Argentina	m	m		48.6	(2.4)		65.4	(1.7)		71.6	(0.9)		m	m		**23.0**	(2.6)		**6.2**	(1.9)	
	Baku (Azerbaijan)	m	m		m	m		m	m		68.0	(0.8)		m	m		m	m		m	m	
	Belarus	m	m		m	m		m	m		93.6	(0.4)		m	m		m	m		m	m	
	Bosnia and Herzegovina	m	m		m	m		m	m		89.7	(0.5)		m	m		m	m		m	m	
	Brazil	27.2	(1.6)		36.0	(1.2)		52.6	(1.2)		59.4	(0.9)		**32.3**	(1.8)		**23.5**	(1.5)		**6.9**	(1.5)	
	Brunei Darussalam	m	m		m	m		m	m		67.6	(0.6)		m	m		m	m		m	m	
	B-S-J-Z (China)	m	m		m	m		m	m		74.3	(0.9)		m	m		m	m		m	m	
	Bulgaria	m	m		65.8	(1.7)		87.7	(1.2)		90.1	(0.6)		m	m		**24.3**	(1.8)		2.4	(1.3)	
	Costa Rica	m	m		m	m		62.8	(1.3)		73.1	(1.1)		m	m		m	m		**10.2**	(1.7)	
	Croatia	m	m		84.1	(0.8)		93.5	(0.5)		91.2	(0.4)		m	m		**7.1**	(0.8)		**-2.3**	(0.6)	
	Cyprus	m	m		m	m		m	m		89.8	(0.5)		m	m		m	m		m	m	
	Dominican Republic	m	m		m	m		m	m		44.5	(2.0)		m	m		m	m		m	m	
	Georgia	m	m		m	m		49.1	(1.4)		78.3	(0.7)		m	m		m	m		**29.2**	(1.5)	
	Hong Kong (China)	92.7	(0.5)		97.0	(0.3)		97.9	(0.3)		88.1	(0.6)		**-4.6**	(0.8)		**-8.9**	(0.7)		**-9.8**	(0.7)	
	Indonesia	7.9	(0.9)		14.4	(2.1)		19.9	(1.9)		33.5	(1.6)		**25.6**	(1.8)		**19.1**	(2.7)		**13.6**	(2.4)	
	Jordan	m	m		59.2	(1.2)		72.8	(1.1)		66.3	(0.9)		m	m		**7.1**	(1.5)		**-6.5**	(1.4)	
	Kazakhstan	m	m		m	m		52.7	(1.6)		74.2	(0.7)		m	m		m	m		**21.5**	(1.8)	
	Kosovo	m	m		m	m		m	m		82.1	(0.6)		m	m		m	m		m	m	
	Lebanon	m	m		m	m		m	m		68.7	(1.0)		m	m		m	m		m	m	
	Macao (China)	89.4	(1.0)		94.7	(0.4)		97.5	(0.2)		91.9	(0.4)		**2.6**	(1.1)		**-2.8**	(0.6)		**-5.5**	(0.5)	
	Malaysia	m	m		m	m		56.8	(1.5)		50.6	(1.3)		m	m		m	m		**-6.2**	(2.0)	
	Malta	m	m		m	m		97.1	(0.4)		93.7	(0.4)		m	m		m	m		**-3.4**	(0.5)	
	Moldova	m	m		m	m		52.6	(1.1)		84.3	(0.6)		m	m		m	m		**31.7**	(1.3)	
	Montenegro	m	m		59.9	(0.7)		84.3	(0.5)		88.6	(0.4)		m	m		**28.8**	(0.8)		**4.3**	(0.6)	
	Morocco	m	m		m	m		m	m		45.7	(1.5)		m	m		m	m		m	m	
	North Macedonia	m	m		m	m		m	m		92.3	(0.4)		m	m		m	m		m	m	
	Panama	m	m		m	m		46.3	(2.5)		60.4	(1.3)		m	m		m	m		**14.1**	(2.8)	
	Peru	m	m		m	m		37.7	(1.8)		52.8	(1.3)		m	m		m	m		**15.1**	(2.2)	
	Philippines	m	m		m	m		m	m		40.8	(1.2)		m	m		m	m		m	m	
	Qatar	m	m		87.7	(0.4)		92.2	(0.3)		81.9	(0.3)		m	m		**-5.8**	(0.5)		**-10.3**	(0.4)	
	Romania	m	m		61.0	(1.7)		83.4	(1.1)		88.4	(0.9)		m	m		**27.4**	(1.9)		**5.0**	(1.4)	
	Russia	29.1	(1.7)		58.7	(1.6)		79.0	(1.4)		93.5	(0.5)		**64.5**	(1.7)		**34.8**	(1.7)		**14.6**	(1.5)	
	Saudi Arabia	m	m		m	m		m	m		73.5	(1.1)		m	m		m	m		m	m	
	Serbia	m	m		72.3	(1.1)		88.6	(0.7)		93.4	(0.4)		m	m		**21.1**	(1.2)		**4.9**	(0.8)	
	Singapore	m	m		m	m		94.4	(0.3)		88.2	(0.4)		m	m		m	m		**-6.2**	(0.5)	
	Chinese Taipei	m	m		89.2	(0.6)		90.7	(0.5)		80.6	(0.5)		m	m		**-8.7**	(0.8)		**-10.2**	(0.7)	
	Thailand	26.3	(1.0)		40.6	(1.1)		54.5	(1.3)		53.5	(1.5)		**27.2**	(1.8)		**12.9**	(1.8)		-1.0	(2.0)	
	Ukraine	m	m		m	m		m	m		89.2	(0.7)		m	m		m	m		m	m	
	United Arab Emirates	m	m		m	m		92.5	(0.4)		88.3	(0.3)		m	m		m	m		**-4.2**	(0.5)	
	Uruguay	45.6	(1.1)		56.7	(1.1)		75.0	(0.7)		81.5	(0.8)		**35.9**	(1.4)		**24.9**	(1.4)		**6.5**	(1.1)	
	Viet Nam	m	m		m	m		m	m		41.6	(1.8)		m	m		m	m		m	m	

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

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.2 [3/6] **Change between 2009 and 2018 in the percentage of students with access to the Internet and having a computer that they can use for schoolwork at home**

Results based on students' self-reports

		Percentage of students who reported having:																					
		Access to the Internet at home																					
		PISA 2003			PISA 2006			PISA 2009			PISA 2018			Change between 2003 and 2018 (PISA 2018 - PISA 2003)			Change between 2006 and 2018 (PISA 2018 - PISA 2006)			Change between 2009 and 2018 (PISA 2018 - PISA 2009)		
		%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s
OECD	Australia	84.6	(0.6)		91.9	(0.4)		96.0	(0.2)		97.9	(0.2)		**13.4**	(0.6)		**6.0**	(0.4)		**1.9**	(0.3)	
	Austria	69.4	(1.0)		80.0	(0.8)		95.4	(0.4)		98.0	(0.2)		**28.6**	(1.0)		**18.0**	(0.8)		**2.6**	(0.4)	
	Belgium	74.8	(0.8)		89.1	(0.5)		96.4	(0.3)		99.0	(0.1)		**24.2**	(0.8)		**9.9**	(0.5)		**2.6**	(0.3)	
	Canada	88.8	(0.3)		94.0	(0.3)		96.8	(0.2)		98.4	(0.1)		**9.6**	(0.3)		**4.4**	(0.3)		**1.6**	(0.2)	
	Chile	m	m		30.2	(1.8)		55.5	(1.5)		88.4	(0.6)		m	m		**58.2**	(1.9)		**32.9**	(1.6)	
	Colombia	m	m		15.6	(1.0)		31.4	(1.5)		67.1	(1.3)		m	m		**51.5**	(1.7)		**35.7**	(2.0)	
	Czech Republic	49.1	(0.9)		66.4	(0.9)		92.3	(0.5)		99.0	(0.2)		**49.9**	(0.9)		**32.5**	(0.9)		**6.7**	(0.5)	
	Denmark	83.4	(0.8)		95.7	(0.3)		98.9	(0.2)		99.7	(0.1)		**16.3**	(0.8)		**4.0**	(0.4)		**0.8**	(0.2)	
	Estonia	m	m		80.7	(1.1)		96.2	(0.4)		99.5	(0.1)		m	m		**18.8**	(1.1)		**3.2**	(0.4)	
	Finland	76.7	(0.8)		92.6	(0.4)		99.0	(0.1)		99.6	(0.1)		**22.9**	(0.8)		**7.0**	(0.4)		**0.7**	(0.2)	
	France	55.9	(1.3)		73.0	(1.0)		92.2	(0.6)		98.5	(0.2)		**42.5**	(1.3)		**25.5**	(1.1)		**6.3**	(0.6)	
	Germany	73.5	(0.8)		87.5	(0.6)		95.8	(0.3)		98.0	(0.2)		**24.5**	(0.9)		**10.5**	(0.7)		**2.2**	(0.4)	
	Greece	35.3	(1.4)		53.4	(1.2)		71.4	(1.1)		95.7	(0.4)		**60.4**	(1.5)		**42.3**	(1.2)		**24.3**	(1.1)	
	Hungary	26.0	(0.9)		50.7	(1.3)		85.7	(0.9)		98.5	(0.2)		**72.5**	(0.9)		**47.8**	(1.3)		**12.8**	(0.9)	
	Iceland	92.3	(0.5)		97.7	(0.2)		98.7	(0.2)		99.4	(0.1)		**7.2**	(0.5)		**1.8**	(0.3)		**0.8**	(0.2)	
	Ireland	66.2	(1.2)		80.5	(0.8)		92.8	(0.5)		98.8	(0.2)		**32.6**	(1.2)		**18.3**	(0.8)		**6.0**	(0.5)	
	Israel	m	m		84.1	(0.8)		85.6	(1.0)		96.2	(0.4)		m	m		**12.1**	(0.9)		**10.6**	(1.0)	
	Italy	62.4	(1.0)		72.2	(0.6)		87.5	(0.3)		97.2	(0.2)		**34.8**	(1.0)		**24.9**	(0.6)		**9.7**	(0.4)	
	Japan	60.5	(1.1)		74.9	(1.1)		81.5	(0.8)		95.3	(0.3)		**34.8**	(1.2)		**20.4**	(1.1)		**13.8**	(0.9)	
	Korea	93.1	(0.5)		96.5	(0.3)		96.9	(0.4)		97.4	(0.2)		**4.3**	(0.5)		**0.9**	(0.4)		0.5	(0.4)	
	Latvia	16.3	(0.9)		52.3	(1.2)		81.4	(1.1)		98.9	(0.2)		**82.6**	(0.9)		**46.6**	(1.3)		**17.6**	(1.1)	
	Lithuania	m	m		56.7	(1.1)		85.8	(0.7)		98.7	(0.2)		m	m		**41.9**	(1.1)		**12.9**	(0.7)	
	Luxembourg	75.4	(0.7)		86.7	(0.5)		97.4	(0.2)		96.8	(0.2)		**21.5**	(0.7)		**10.2**	(0.5)		-0.6	(0.3)	
	Mexico	18.4	(1.6)		23.3	(1.1)		35.4	(0.9)		67.9	(1.5)		**49.6**	(2.2)		**44.7**	(1.9)		**32.5**	(1.8)	
	Netherlands	89.0	(0.8)		96.5	(0.4)		99.1	(0.2)		98.9	(0.2)		**9.9**	(0.8)		**2.4**	(0.4)		-0.2	(0.2)	
	New Zealand	82.1	(0.8)		89.4	(0.6)		91.7	(0.5)		97.4	(0.2)		**15.3**	(0.8)		**8.0**	(0.7)		**5.7**	(0.5)	
	Norway	87.6	(0.7)		95.6	(0.5)		99.0	(0.2)		99.3	(0.1)		**11.6**	(0.7)		**3.7**	(0.5)		0.3	(0.2)	
	Poland	34.2	(0.9)		51.3	(1.1)		85.4	(0.8)		99.4	(0.1)		**65.2**	(0.9)		**48.1**	(1.1)		**14.0**	(0.8)	
	Portugal	47.5	(1.3)		58.1	(1.4)		91.1	(0.7)		98.3	(0.2)		**50.8**	(1.3)		**40.2**	(1.4)		**7.2**	(0.7)	
	Slovak Republic	17.4	(0.7)		40.2	(1.1)		85.4	(0.8)		97.9	(0.3)		**80.5**	(0.8)		**57.7**	(1.2)		**12.5**	(0.9)	
	Slovenia	m	m		85.9	(0.5)		96.6	(0.3)		99.4	(0.1)		m	m		**13.4**	(0.6)		**2.8**	(0.3)	
	Spain	49.8	(1.4)		65.8	(1.0)		84.8	(0.8)		97.9	(0.1)		**48.1**	(1.4)		**32.1**	(1.0)		**13.1**	(0.8)	
	Sweden	89.6	(0.5)		96.7	(0.3)		98.5	(0.2)		99.0	(0.2)		**9.4**	(0.6)		**2.3**	(0.3)		0.5	(0.3)	
	Switzerland	79.1	(0.9)		93.4	(0.3)		98.1	(0.2)		98.7	(0.2)		**19.6**	(0.9)		**5.4**	(0.4)		**0.7**	(0.3)	
	Turkey	14.4	(1.4)		24.6	(1.3)		53.0	(1.2)		76.6	(1.2)		**62.2**	(1.8)		**52.0**	(1.8)		**23.6**	(1.7)	
	United Kingdom	80.7	(0.6)		90.4	(0.6)		97.2	(0.2)		99.2	(0.1)		**18.5**	(0.7)		**8.8**	(0.6)		**2.0**	(0.3)	
	United States	81.8	(0.9)		85.1	(1.2)		89.3	(0.7)		96.4	(0.3)		**14.6**	(0.9)		**11.2**	(1.2)		**7.1**	(0.8)	
	OECD average-31	63.1	(0.2)		75.7	(0.2)		89.2	(0.1)		96.6	(0.1)		**33.5**	(0.2)		**20.9**	(0.2)		**7.4**	(0.1)	
	OECD average-37	m	m		72.9	(0.1)		86.9	(0.1)		95.7	(0.1)		m	m		**22.8**	(0.2)		**8.8**	(0.1)	

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

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.2 [4/6] **Change between 2009 and 2018 in the percentage of students with access to the Internet and having a computer that they can use for schoolwork at home**

Results based on students' self-reports

	Percentage of students who reported having:																							
	Access to the Internet at home																							
	PISA 2003			PISA 2006			PISA 2009			PISA 2018			Change between 2003 and 2018 (PISA 2018 - PISA 2003)			Change between 2006 and 2018 (PISA 2018 - PISA 2006)			Change between 2009 and 2018 (PISA 2018 - PISA 2009)					
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s			
Partners																								
Albania	m	m		m	m		28.5	(1.4)		81.2	(0.8)		m	m		m	m		**52.7**	(1.6)			
Argentina	m	m		29.9	(2.2)		50.9	(2.0)		83.4	(0.7)		m	m		**53.5**	(2.3)		**32.5**	(2.1)			
Baku (Azerbaijan)	m	m		m	m		m	m		85.5	(0.6)		m	m		m	m		m	m			
Belarus	m	m		m	m		m	m		98.4	(0.2)		m	m		m	m		m	m			
Bosnia and Herzegovina	m	m		m	m		m	m		96.4	(0.3)		m	m		m	m		m	m			
Brazil	23.3	(1.5)		38.8	(1.1)		58.3	(1.1)		90.8	(0.5)		**67.6**	(1.6)		**52.0**	(1.2)		**32.5**	(1.2)			
Brunei Darussalam	m	m		m	m		m	m		80.8	(0.5)		m	m		m	m		m	m			
B-S-J-Z (China)	m	m		m	m		m	m		93.0	(0.5)		m	m		m	m		m	m			
Bulgaria	m	m		59.0	(1.7)		85.5	(1.1)		97.4	(0.3)		m	m		**38.3**	(1.8)		11.9	(1.2)			
Costa Rica	m	m		m	m		40.3	(1.4)		83.0	(0.8)		m	m		m	m		**42.7**	(1.6)			
Croatia	m	m		71.1	(0.9)		86.8	(0.7)		99.1	(0.1)		m	m		**28.1**	(0.9)		**12.3**	(0.7)			
Cyprus	m	m		m	m		m	m		97.7	(0.2)		m	m		m	m		m	m			
Dominican Republic	m	m		m	m		m	m		78.4	(1.0)		m	m		m	m		m	m			
Georgia	m	m		m	m		50.3	(1.3)		93.2	(0.5)		m	m		m	m		**42.9**	(1.4)			
Hong Kong (China)	88.4	(0.8)		96.9	(0.3)		98.0	(0.3)		97.6	(0.2)		**9.2**	(0.8)		0.6	(0.3)		-0.4	(0.3)			
Indonesia	2.6	(0.4)		4.3	(0.6)		8.3	(0.9)		46.8	(1.5)		**44.2**	(1.5)		**42.5**	(1.6)		**38.5**	(1.7)			
Jordan	m	m		29.7	(1.1)		30.2	(1.1)		83.9	(0.7)		m	m		**54.2**	(1.3)		**53.6**	(1.3)			
Kazakhstan	m	m		m	m		35.2	(1.5)		89.0	(0.6)		m	m		m	m		**53.8**	(1.6)			
Kosovo	m	m		m	m		m	m		92.9	(0.4)		m	m		m	m		m	m			
Lebanon	m	m		m	m		m	m		84.6	(0.8)		m	m		m	m		m	m			
Macao (China)	67.0	(1.5)		89.4	(0.5)		97.1	(0.2)		98.8	(0.2)		**31.8**	(1.5)		**9.4**	(0.5)		**1.7**	(0.3)			
Malaysia	m	m		m	m		45.1	(1.7)		76.8	(1.0)		m	m		m	m		**31.7**	(1.9)			
Malta	m	m		m	m		97.9	(0.3)		97.6	(0.3)		m	m		m	m		-0.4	(0.4)			
Moldova	m	m		m	m		50.3	(1.1)		93.0	(0.5)		m	m		m	m		**42.7**	(1.2)			
Montenegro	m	m		54.3	(0.7)		69.9	(0.7)		95.5	(0.3)		m	m		**41.1**	(0.8)		**25.6**	(0.7)			
Morocco	m	m		m	m		m	m		54.1	(1.6)		m	m		m	m		m	m			
North Macedonia	m	m		m	m		m	m		98.8	(0.2)		m	m		m	m		m	m			
Panama	m	m		m	m		37.6	(3.0)		67.8	(1.1)		m	m		m	m		**30.2**	(3.2)			
Peru	m	m		m	m		25.0	(1.5)		57.0	(1.2)		m	m		m	m		**31.9**	(1.9)			
Philippines	m	m		m	m		m	m		49.3	(1.4)		m	m		m	m		m	m			
Qatar	m	m		81.3	(0.5)		89.4	(0.3)		95.0	(0.2)		m	m		**13.7**	(0.5)		**5.5**	(0.4)			
Romania	m	m		32.1	(1.9)		69.9	(1.5)		96.4	(0.4)		m	m		**64.3**	(1.9)		**26.5**	(1.6)			
Russia	13.9	(1.0)		34.4	(1.6)		56.0	(1.5)		98.3	(0.2)		**84.4**	(1.0)		**63.9**	(1.6)		**42.3**	(1.5)			
Saudi Arabia	m	m		m	m		m	m		95.4	(0.4)		m	m		m	m		m	m			
Serbia	m	m		51.6	(1.2)		64.1	(1.0)		97.9	(0.2)		m	m		**46.3**	(1.2)		**33.8**	(1.1)			
Singapore	m	m		m	m		95.4	(0.3)		98.3	(0.1)		m	m		m	m		**2.9**	(0.3)			
Chinese Taipei	m	m		91.8	(0.5)		93.0	(0.4)		95.6	(0.2)		m	m		**3.8**	(0.6)		**2.7**	(0.5)			
Thailand	18.7	(1.1)		23.3	(1.2)		35.8	(1.3)		82.4	(0.8)		**63.7**	(1.3)		**59.0**	(1.4)		**46.5**	(1.5)			
Ukraine	m	m		m	m		m	m		97.7	(0.3)		m	m		m	m		m	m			
United Arab Emirates	m	m		m	m		91.0	(0.5)		95.5	(0.2)		m	m		m	m		**4.5**	(0.5)			
Uruguay	35.6	(1.2)		40.3	(1.1)		60.5	(0.8)		87.5	(0.8)		**51.9**	(1.4)		**47.2**	(1.3)		**27.0**	(1.1)			
Viet Nam	m	m		m	m		m	m		76.9	(1.4)		m	m		m	m		m	m			

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

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.2 [5/6] **Change between 2009 and 2018 in the percentage of students with access to the Internet and having a computer that they can use for schoolwork at home**

Results based on students' self-reports

		Percentage of students who reported having:																					
		Access to the Internet and a computer that can be used for schoolwork at home																					
		PISA 2003			PISA 2006			PISA 2009			PISA 2018			Change between 2003 and 2018 (PISA 2018 - PISA 2003)			Change between 2006 and 2018 (PISA 2018 - PISA 2006)			Change between 2009 and 2018 (PISA 2018 - PISA 2009)		
		%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s
OECD	Australia	84.0	(0.6)		91.3	(0.4)		95.2	(0.3)		92.9	(0.4)		**8.9**	(0.7)		**1.6**	(0.5)		**-2.3**	(0.5)	
	Austria	68.4	(1.1)		79.0	(0.8)		94.4	(0.4)		94.1	(0.3)		**25.7**	(1.1)		**15.1**	(0.9)		-0.3	(0.5)	
	Belgium	73.6	(0.8)		87.9	(0.5)		95.2	(0.3)		92.5	(0.3)		**18.9**	(0.9)		**4.6**	(0.6)		**-2.7**	(0.5)	
	Canada	88.0	(0.3)		93.4	(0.3)		95.8	(0.2)		92.9	(0.2)		**4.9**	(0.4)		-0.5	(0.4)		**-2.9**	(0.3)	
	Chile	m	m		29.5	(1.8)		55.0	(1.5)		75.4	(0.8)		m	m		**45.9**	(2.0)		**20.4**	(1.7)	
	Colombia	m	m		14.9	(1.1)		30.4	(1.5)		54.4	(1.3)		m	m		**39.4**	(1.7)		**23.9**	(2.0)	
	Czech Republic	48.4	(0.9)		65.9	(1.0)		91.5	(0.5)		94.3	(0.4)		**45.9**	(1.0)		**28.4**	(1.1)		**2.8**	(0.6)	
	Denmark	81.8	(0.8)		95.1	(0.4)		98.4	(0.2)		98.1	(0.2)		**16.3**	(0.8)		**3.0**	(0.4)		-0.3	(0.3)	
	Estonia	m	m		75.4	(1.1)		86.7	(0.6)		86.6	(0.5)		m	m		**11.2**	(1.2)		-0.1	(0.8)	
	Finland	75.9	(0.8)		92.0	(0.4)		98.2	(0.2)		94.1	(0.3)		**18.2**	(0.8)		**2.1**	(0.6)		**-4.2**	(0.4)	
	France	54.8	(1.3)		71.4	(1.0)		90.4	(0.6)		90.1	(0.5)		**35.4**	(1.3)		**18.8**	(1.1)		-0.2	(0.7)	
	Germany	72.7	(0.8)		86.3	(0.6)		94.4	(0.4)		90.9	(0.6)		**18.3**	(1.0)		**4.7**	(0.8)		**-3.5**	(0.7)	
	Greece	33.3	(1.4)		51.7	(1.2)		70.1	(1.1)		87.4	(0.6)		**54.1**	(1.5)		**35.8**	(1.3)		**17.3**	(1.3)	
	Hungary	25.4	(0.9)		49.6	(1.3)		84.8	(0.9)		90.7	(0.5)		**65.3**	(1.0)		**41.1**	(1.4)		**5.9**	(1.1)	
	Iceland	91.9	(0.5)		96.7	(0.3)		98.1	(0.2)		95.8	(0.4)		**3.9**	(0.6)		**-0.9**	(0.5)		**-2.3**	(0.4)	
	Ireland	64.0	(1.2)		78.0	(0.9)		89.8	(0.6)		85.5	(0.6)		**21.6**	(1.4)		**7.5**	(1.0)		**-4.3**	(0.8)	
	Israel	m	m		82.9	(0.9)		84.8	(1.0)		91.6	(0.5)		m	m		**8.7**	(1.0)		**6.8**	(1.1)	
	Italy	61.1	(1.0)		71.2	(0.6)		86.3	(0.3)		88.6	(0.5)		**27.5**	(1.1)		**17.4**	(0.8)		**2.3**	(0.6)	
	Japan	39.9	(1.0)		59.1	(0.9)		66.6	(1.0)		60.2	(0.9)		**20.3**	(1.4)		1.1	(1.3)		**-6.4**	(1.3)	
	Korea	91.3	(0.5)		95.7	(0.4)		94.1	(0.4)		89.3	(0.5)		**-2.0**	(0.7)		**-6.4**	(0.6)		**-4.9**	(0.7)	
	Latvia	15.6	(0.9)		50.5	(1.2)		80.5	(1.1)		93.7	(0.4)		**78.1**	(1.0)		**43.2**	(1.3)		**13.2**	(1.2)	
	Lithuania	m	m		56.3	(1.1)		85.2	(0.7)		95.7	(0.3)		m	m		**39.3**	(1.2)		**10.4**	(0.8)	
	Luxembourg	74.1	(0.7)		84.8	(0.5)		95.9	(0.3)		90.9	(0.4)		**16.8**	(0.8)		**6.1**	(0.6)		**-5.1**	(0.5)	
	Mexico	17.3	(1.6)		22.6	(1.1)		34.3	(0.9)		50.5	(1.3)		**33.2**	(2.1)		**27.8**	(1.7)		**16.2**	(1.6)	
	Netherlands	87.7	(0.9)		94.9	(0.5)		97.7	(0.3)		94.5	(0.5)		**6.8**	(1.0)		-0.4	(0.7)		**-3.2**	(0.6)	
	New Zealand	80.9	(0.8)		88.4	(0.7)		90.4	(0.5)		90.9	(0.5)		**10.0**	(1.0)		**2.5**	(0.8)		0.5	(0.7)	
	Norway	86.2	(0.7)		94.6	(0.5)		97.7	(0.2)		96.4	(0.3)		**10.2**	(0.7)		**1.9**	(0.6)		**-1.2**	(0.4)	
	Poland	33.6	(0.9)		50.0	(1.1)		84.4	(0.8)		96.1	(0.3)		**62.5**	(1.0)		**46.1**	(1.2)		**11.7**	(0.9)	
	Portugal	47.0	(1.3)		57.8	(1.4)		90.7	(0.7)		92.7	(0.5)		**45.8**	(1.3)		**34.9**	(1.4)		**2.0**	(0.8)	
	Slovak Republic	16.9	(0.7)		37.5	(1.1)		83.2	(0.9)		91.3	(0.6)		**74.4**	(0.9)		**53.8**	(1.3)		**8.1**	(1.1)	
	Slovenia	m	m		85.1	(0.6)		95.8	(0.3)		96.4	(0.3)		m	m		**11.3**	(0.6)		0.7	(0.4)	
	Spain	48.9	(1.4)		65.1	(1.0)		83.5	(0.8)		90.6	(0.3)		**41.7**	(1.4)		**25.6**	(1.0)		**7.1**	(0.8)	
	Sweden	88.9	(0.6)		95.8	(0.3)		97.7	(0.3)		94.2	(0.4)		**5.3**	(0.7)		**-1.6**	(0.5)		**-3.5**	(0.5)	
	Switzerland	74.3	(0.9)		91.7	(0.3)		96.4	(0.2)		94.6	(0.4)		**20.3**	(1.0)		**2.8**	(0.5)		**-1.8**	(0.4)	
	Turkey	14.0	(1.4)		21.9	(1.4)		50.9	(1.3)		61.5	(1.4)		**47.5**	(1.9)		**39.5**	(1.9)		**10.6**	(1.8)	
	United Kingdom	80.0	(0.7)		89.8	(0.6)		96.3	(0.3)		91.7	(0.4)		**11.7**	(0.8)		**1.9**	(0.7)		**-4.6**	(0.5)	
	United States	80.9	(0.9)		83.8	(1.3)		87.2	(0.8)		86.6	(0.9)		**5.7**	(1.3)		2.7	(1.5)		-0.6	(1.2)	
	OECD average-31	61.3	(0.2)		74.0	(0.2)		87.4	(0.1)		88.8	(0.1)		**27.5**	(0.2)		**14.8**	(0.2)		**1.4**	(0.2)	
	OECD average-37	m	m		71.3	(0.1)		85.1	(0.1)		87.9	(0.1)		m	m		**16.6**	(0.2)		**2.9**	(0.2)	

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

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.2 [6/6] **Change between 2009 and 2018 in the percentage of students with access to the Internet and having a computer that they can use for schoolwork at home**

Results based on students' self-reports

	Percentage of students who reported having:																							
	Access to the Internet and a computer that can be used for schoolwork at home																							
	PISA 2003			PISA 2006			PISA 2009			PISA 2018			Change between 2003 and 2018 (PISA 2018 - PISA 2003)			Change between 2006 and 2018 (PISA 2018 - PISA 2006)			Change between 2009 and 2018 (PISA 2018 - PISA 2009)					
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s			
Partners																								
Albania	m	m		m	m		25.6	(1.4)		65.5	(1.1)		m	m		m	m		**40.0**	(1.8)			
Argentina	m	m		28.2	(2.1)		50.1	(2.0)		65.6	(0.9)		m	m		**37.4**	(2.3)		**15.5**	(2.2)			
Baku (Azerbaijan)	m	m		m	m		m	m		63.2	(0.9)		m	m		m	m		m	m			
Belarus	m	m		m	m		m	m		92.9	(0.4)		m	m		m	m		m	m			
Bosnia and Herzegovina	m	m		m	m		m	m		88.4	(0.5)		m	m		m	m		m	m			
Brazil	22.4	(1.5)		31.1	(1.2)		46.0	(1.2)		58.1	(0.9)		**35.7**	(1.8)		**27.0**	(1.5)		**12.1**	(1.6)			
Brunei Darussalam	m	m		m	m		m	m		59.3	(0.6)		m	m		m	m		m	m			
B-S-J-Z (China)	m	m		m	m		m	m		72.6	(1.0)		m	m		m	m		m	m			
Bulgaria	m	m		55.5	(1.9)		84.0	(1.2)		89.5	(0.6)		m	m		**34.0**	(2.0)		**5.5**	(1.4)			
Costa Rica	m	m		m	m		39.9	(1.4)		66.6	(1.2)		m	m		m	m		**26.6**	(1.9)			
Croatia	m	m		69.1	(0.9)		85.0	(0.7)		90.9	(0.4)		m	m		**21.8**	(1.0)		**5.8**	(0.8)			
Cyprus	m	m		m	m		m	m		89.0	(0.5)		m	m		m	m		m	m			
Dominican Republic	m	m		m	m		m	m		41.4	(1.8)		m	m		m	m		m	m			
Georgia	m	m		m	m		44.2	(1.4)		76.8	(0.7)		m	m		m	m		**32.7**	(1.6)			
Hong Kong (China)	86.3	(0.8)		95.8	(0.3)		97.1	(0.3)		87.6	(0.7)		1.3	(1.1)		**-8.2**	(0.7)		**-9.5**	(0.7)			
Indonesia	1.9	(0.4)		3.2	(0.5)		6.4	(0.8)		23.6	(1.5)		**21.7**	(1.6)		**20.4**	(1.6)		**17.2**	(1.7)			
Jordan	m	m		26.7	(1.1)		29.5	(1.1)		61.3	(1.0)		m	m		**34.6**	(1.5)		**31.8**	(1.4)			
Kazakhstan	m	m		m	m		31.0	(1.6)		69.9	(0.8)		m	m		m	m		**38.8**	(1.8)			
Kosovo	m	m		m	m		m	m		77.9	(0.8)		m	m		m	m		m	m			
Lebanon	m	m		m	m		m	m		62.2	(1.2)		m	m		m	m		m	m			
Macao (China)	66.4	(1.4)		87.8	(0.6)		95.8	(0.3)		91.3	(0.4)		**24.9**	(1.5)		**3.5**	(0.7)		**-4.5**	(0.5)			
Malaysia	m	m		m	m		41.8	(1.7)		45.5	(1.4)		m	m		m	m		3.7	(2.2)			
Malta	m	m		m	m		95.7	(0.4)		92.5	(0.4)		m	m		m	m		**-3.2**	(0.6)			
Moldova	m	m		m	m		46.7	(1.2)		83.1	(0.7)		m	m		m	m		**36.4**	(1.4)			
Montenegro	m	m		52.3	(0.7)		68.7	(0.7)		86.9	(0.4)		m	m		**34.6**	(0.8)		**18.1**	(0.8)			
Morocco	m	m		m	m		m	m		35.3	(1.6)		m	m		m	m		m	m			
North Macedonia	m	m		m	m		m	m		91.9	(0.4)		m	m		m	m		m	m			
Panama	m	m		m	m		36.1	(3.1)		51.9	(1.4)		m	m		m	m		**15.8**	(3.4)			
Peru	m	m		m	m		22.6	(1.6)		44.7	(1.3)		m	m		m	m		**22.1**	(2.0)			
Philippines	m	m		m	m		m	m		30.5	(1.3)		m	m		m	m		m	m			
Qatar	m	m		77.7	(0.5)		86.3	(0.4)		79.7	(0.3)		m	m		**2.0**	(0.6)		**-6.6**	(0.5)			
Romania	m	m		31.3	(1.9)		68.6	(1.5)		87.3	(0.9)		m	m		**56.0**	(2.1)		**18.7**	(1.8)			
Russia	13.2	(1.0)		32.2	(1.6)		53.6	(1.5)		92.7	(0.6)		**79.5**	(1.2)		**60.5**	(1.7)		**39.1**	(1.6)			
Saudi Arabia	m	m		m	m		m	m		72.3	(1.1)		m	m		m	m		m	m			
Serbia	m	m		50.9	(1.2)		63.6	(1.0)		92.7	(0.4)		m	m		**41.7**	(1.3)		**29.0**	(1.1)			
Singapore	m	m		m	m		93.5	(0.3)		87.7	(0.5)		m	m		m	m		**-5.8**	(0.5)			
Chinese Taipei	m	m		86.5	(0.6)		88.7	(0.6)		79.1	(0.6)		m	m		**-7.4**	(0.8)		**-9.6**	(0.8)			
Thailand	16.5	(0.9)		23.1	(1.2)		35.4	(1.3)		50.2	(1.5)		**33.7**	(1.8)		**27.1**	(1.9)		**14.9**	(2.0)			
Ukraine	m	m		m	m		m	m		88.4	(0.8)		m	m		m	m		m	m			
United Arab Emirates	m	m		m	m		87.4	(0.6)		85.8	(0.4)		m	m		m	m		**-1.6**	(0.7)			
Uruguay	34.8	(1.1)		37.7	(1.1)		58.6	(0.9)		76.3	(1.0)		**41.5**	(1.5)		**38.6**	(1.5)		**17.7**	(1.3)			
Viet Nam	m	m		m	m		m	m		39.4	(1.9)		m	m		m	m		m	m			

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

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.6 [1/4] **Frequency of opportunity to learn digital literacy skills at school**

Results based on students' self-reports

	Students reported that during their entire school experince they were taught the following:																							
	All students																							
	How to use keywords when using a search engine such as <Google©>, <Yahoo©>, etc.			How to decide whether to trust information from the Internet			How to compare different web pages and decide what information is more relevant for your schoolwork			To understand the consequences of making information publicly available online on <Facebook©>, <Instagram©>, etc.			How to use the short description below the links in the list of results of a search			How to detect whether the information is subjective or biased			How to detect phishing or spam emails		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD Australia	70.1	(0.5)		83.7	(0.4)		77.9	(0.5)		87.6	(0.3)		63.3	(0.5)		74.5	(0.5)		53.2	(0.5)	
Austria	55.6	(0.9)		66.6	(1.1)		55.4	(1.0)		78.6	(0.6)		44.7	(0.7)		50.7	(0.8)		45.2	(1.0)	
Belgium	56.1	(0.9)		75.0	(0.6)		63.3	(0.7)		74.8	(0.7)		42.9	(0.6)		62.2	(0.7)		32.4	(0.9)	
Canada	61.8	(0.6)		78.7	(0.5)		72.5	(0.7)		81.4	(0.4)		54.5	(0.7)		70.2	(0.7)		38.4	(0.6)	
Chile	48.2	(1.0)		65.2	(0.9)		62.2	(0.9)		69.9	(0.9)		46.3	(0.9)		49.7	(0.9)		33.3	(0.9)	
Colombia	56.3	(1.0)		71.9	(0.6)		65.1	(0.8)		79.6	(0.8)		56.4	(0.9)		45.0	(1.0)		41.8	(1.0)	
Czech Republic	59.7	(0.9)		65.7	(1.0)		59.0	(0.9)		66.7	(0.8)		50.3	(0.7)		50.2	(0.8)		47.3	(1.2)	
Denmark	73.6	(0.9)		90.4	(0.6)		84.5	(0.7)		85.9	(0.6)		56.6	(0.9)		73.6	(0.8)		37.9	(0.9)	
Estonia	63.0	(0.9)		74.8	(0.7)		67.1	(0.9)		78.2	(0.7)		56.5	(0.9)		54.1	(0.8)		53.0	(0.8)	
Finland	70.6	(0.8)		83.3	(0.7)		78.4	(0.7)		85.6	(0.6)		52.2	(0.8)		60.5	(0.9)		47.2	(0.8)	
France	68.0	(0.8)		74.5	(0.7)		69.2	(0.8)		78.6	(0.7)		50.1	(0.6)		49.9	(0.6)		36.3	(0.7)	
Germany	49.4	(1.0)		54.3	(0.8)		46.5	(0.9)		73.9	(0.8)		37.2	(0.8)		48.7	(0.8)		25.3	(0.8)	
Greece	58.5	(0.9)		66.5	(0.9)		60.1	(0.8)		71.9	(0.7)		49.7	(0.8)		51.3	(0.8)		47.6	(0.8)	
Hungary	57.9	(1.0)		61.7	(0.9)		52.8	(0.9)		81.8	(0.7)		52.8	(0.8)		46.2	(0.9)		49.4	(1.0)	
Iceland	57.6	(0.8)		70.5	(0.7)		66.8	(0.9)		76.1	(0.7)		54.5	(0.9)		51.5	(0.8)		41.5	(0.9)	
Ireland	44.3	(0.9)		58.2	(0.9)		45.7	(0.8)		83.1	(0.7)		35.1	(0.8)		59.1	(0.9)		28.0	(0.9)	
Israel	48.7	(1.0)		58.4	(1.0)		53.0	(1.1)		77.2	(0.8)		41.8	(1.0)		43.3	(0.9)		38.1	(0.8)	
Italy	44.2	(0.9)		57.9	(0.8)		57.3	(0.8)		60.4	(0.9)		31.7	(0.9)		49.0	(0.7)		27.3	(0.8)	
Japan	74.2	(0.9)		88.9	(0.5)		64.2	(1.0)		86.9	(0.5)		42.8	(1.0)		66.2	(0.8)		57.5	(1.2)	
Korea	49.7	(0.9)		55.0	(1.0)		51.3	(0.7)		46.2	(0.8)		42.6	(0.7)		49.1	(0.8)		34.7	(0.8)	
Latvia	47.9	(0.8)		56.5	(0.9)		54.2	(0.9)		74.7	(0.8)		47.3	(0.7)		38.4	(0.8)		48.3	(0.7)	
Lithuania	62.1	(0.7)		67.2	(0.7)		56.7	(0.8)		74.2	(0.6)		57.3	(0.7)		54.7	(0.8)		54.1	(0.7)	
Luxembourg	54.3	(0.7)		63.3	(0.6)		58.2	(0.7)		77.0	(0.6)		45.1	(0.6)		46.6	(0.7)		37.2	(0.7)	
Mexico	67.5	(0.9)		83.2	(0.7)		78.1	(0.8)		81.3	(0.7)		68.0	(0.8)		62.3	(0.9)		45.6	(0.9)	
Netherlands	58.4	(1.0)		72.1	(1.1)		61.6	(1.1)		67.6	(0.9)		44.8	(1.0)		61.3	(1.1)		28.4	(1.0)	
New Zealand	66.8	(0.9)		78.0	(0.7)		74.1	(0.7)		81.8	(0.6)		58.5	(0.8)		65.0	(0.7)		46.4	(0.7)	
Norway	40.9	(0.9)		82.4	(0.8)		73.3	(0.8)		78.0	(0.8)		42.3	(0.8)		47.7	(1.0)		21.6	(0.7)	
Poland	35.8	(1.1)		39.5	(0.9)		40.5	(1.0)		78.5	(0.8)		39.0	(0.9)		48.4	(0.9)		48.7	(1.0)	
Portugal	56.8	(1.0)		64.4	(1.0)		62.6	(0.9)		78.3	(0.7)		54.3	(1.0)		54.6	(0.9)		54.1	(0.9)	
Slovak Republic	49.6	(0.9)		63.2	(1.0)		55.3	(0.9)		58.4	(0.8)		44.6	(0.8)		43.5	(0.9)		44.4	(1.0)	
Slovenia	47.7	(0.6)		55.0	(0.7)		52.4	(0.7)		75.9	(0.7)		45.5	(0.8)		40.2	(0.7)		48.6	(0.7)	
Spain	40.4	(0.5)		67.3	(0.5)		58.1	(0.6)		82.4	(0.4)		36.2	(0.4)		45.9	(0.5)		35.8	(0.6)	
Sweden	51.7	(1.1)		92.5	(0.5)		87.3	(0.6)		76.5	(0.7)		52.0	(1.0)		62.9	(1.0)		34.4	(1.0)	
Switzerland	54.2	(1.1)		59.7	(1.0)		53.6	(1.1)		73.6	(0.8)		42.6	(1.1)		44.2	(1.1)		32.8	(1.0)	
Turkey	33.9	(1.2)		56.2	(1.3)		53.0	(1.2)		47.5	(1.3)		37.2	(1.3)		48.9	(1.0)		27.1	(1.2)	
United Kingdom	57.0	(0.9)		74.9	(0.7)		61.8	(0.8)		89.8	(0.4)		51.9	(0.9)		67.6	(0.8)		52.9	(1.2)	
United States	75.0	(0.9)		87.5	(0.7)		82.5	(0.9)		84.4	(0.7)		66.5	(0.8)		78.8	(0.8)		49.0	(1.0)	
OECD average	55.9	(0.1)		69.3	(0.1)		62.6	(0.1)		75.8	(0.1)		48.5	(0.1)		54.5	(0.1)		41.2	(0.1)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. Countries which administered the paper-based form had no available data in this item: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.6 [2/4] **Frequency of opportunity to learn digital literacy skills at school**

Results based on students' self-reports

		Students reported that during their entire school experince they were taught the following:																							
		All students																							
		How to use keywords when using a search engine such as <Google©>, <Yahoo©>, etc.			How to decide whether to trust information from the Internet			How to compare different web pages and decide what information is more relevant for your schoolwork			To understand the consequences of making information publicly available online on <Facebook©>, <Instagram©>, etc.			How to use the short description below the links in the list of results of a search			How to detect whether the information is subjective or biased			How to detect phishing or spam emails		
		%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners	Albania	74.8	(0.8)		71.9	(0.8)		80.2	(0.6)		74.9	(0.7)		72.9	(0.6)		79.6	(0.6)		57.2	(1.0)				
	Argentina	48.9	(0.8)		64.9	(0.7)		56.4	(0.9)		64.4	(0.8)		40.0	(0.8)		37.8	(0.8)		29.1	(0.7)				
	Baku (Azerbaijan)	57.2	(0.9)		63.7	(0.8)		63.3	(0.9)		50.4	(0.7)		62.8	(0.8)		61.5	(0.8)		45.5	(0.9)				
	Belarus	52.1	(1.2)		64.2	(1.0)		55.2	(0.9)		68.6	(1.1)		52.2	(1.0)		53.3	(0.9)		54.3	(1.0)				
	Bosnia and Herzegovina	56.0	(0.9)		63.1	(0.8)		56.0	(0.8)		67.2	(0.8)		51.4	(0.8)		49.1	(0.8)		53.5	(0.9)				
	Brazil	41.9	(0.6)		52.0	(0.6)		57.0	(0.7)		48.9	(0.8)		41.3	(0.7)		45.7	(0.6)		22.4	(0.7)				
	Brunei Darussalam	71.8	(0.5)		70.4	(0.5)		62.9	(0.6)		66.0	(0.5)		57.2	(0.6)		37.4	(0.6)		40.9	(0.5)				
	B-S-J-Z (China)	59.3	(1.1)		72.0	(1.0)		58.1	(1.1)		72.8	(0.8)		56.1	(1.1)		58.6	(0.8)		57.2	(1.1)				
	Bulgaria	60.7	(1.1)		68.3	(0.7)		64.1	(0.9)		65.4	(0.8)		58.7	(0.9)		57.4	(0.7)		57.0	(1.0)				
	Costa Rica	49.7	(0.8)		70.0	(0.9)		63.2	(0.8)		75.7	(0.6)		52.2	(0.9)		39.9	(0.7)		32.7	(0.7)				
	Croatia	57.2	(0.9)		71.6	(0.7)		62.9	(0.8)		80.0	(0.7)		50.2	(0.8)		54.4	(0.8)		53.2	(0.9)				
	Cyprus	62.7	(0.6)		76.9	(0.5)		60.7	(0.7)		73.7	(0.6)		54.6	(0.7)		55.8	(0.6)		62.0	(0.7)				
	Dominican Republic	63.1	(0.9)		68.9	(0.9)		65.9	(0.9)		66.5	(0.8)		54.5	(0.8)		52.5	(0.8)		46.0	(0.9)				
	Georgia	64.8	(0.9)		60.6	(1.0)		51.9	(0.8)		44.6	(0.9)		52.1	(0.8)		50.3	(0.7)		38.0	(0.8)				
	Hong Kong (China)	67.8	(0.9)		77.4	(0.7)		67.8	(0.8)		72.3	(0.9)		61.7	(0.9)		70.2	(0.9)		53.9	(1.0)				
	Indonesia	61.7	(1.3)		70.8	(1.2)		62.9	(1.1)		63.9	(1.2)		55.7	(1.2)		56.7	(0.8)		45.1	(1.1)				
	Jordan	84.1	(0.5)		74.1	(0.7)		73.7	(0.6)		75.8	(0.7)		66.6	(0.8)		63.1	(0.7)		73.6	(0.7)				
	Kazakhstan	62.8	(0.6)		66.7	(0.6)		58.6	(0.6)		49.4	(0.6)		66.6	(0.6)		62.7	(0.6)		51.8	(0.6)				
	Kosovo	64.5	(0.7)		69.2	(0.7)		62.2	(0.8)		64.5	(0.9)		59.1	(0.8)		56.7	(0.9)		41.4	(0.8)				
	Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m				
	Macao (China)	58.5	(0.7)		76.2	(0.6)		61.3	(0.8)		63.0	(0.8)		48.4	(0.8)		58.3	(0.8)		44.6	(0.8)				
	Malaysia	73.9	(0.8)		65.3	(0.8)		65.0	(0.8)		65.4	(0.8)		58.0	(0.8)		47.7	(0.9)		37.4	(0.9)				
	Malta	73.5	(0.9)		86.7	(0.5)		72.0	(0.9)		87.4	(0.6)		65.0	(0.9)		61.2	(0.9)		75.7	(0.7)				
	Moldova	51.1	(1.0)		70.8	(0.7)		55.8	(1.1)		70.1	(0.9)		47.5	(1.0)		53.8	(1.0)		41.9	(1.0)				
	Montenegro	54.8	(0.6)		63.3	(0.6)		59.1	(0.7)		67.6	(0.5)		53.7	(0.7)		57.9	(0.7)		59.0	(0.6)				
	Morocco	52.9	(1.0)		48.8	(0.9)		44.1	(0.8)		46.6	(0.8)		43.3	(0.8)		39.3	(0.8)		33.9	(0.8)				
	North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m				
	Panama	60.2	(1.1)		66.0	(1.0)		63.3	(1.0)		71.5	(0.8)		58.6	(1.0)		48.5	(0.9)		39.8	(0.9)				
	Peru	45.9	(0.7)		65.4	(0.8)		54.4	(0.8)		68.5	(0.8)		47.7	(0.7)		45.1	(0.8)		26.0	(0.6)				
	Philippines	72.7	(0.7)		75.1	(0.7)		69.9	(0.6)		76.0	(0.7)		73.1	(0.5)		61.0	(0.7)		47.9	(0.7)				
	Qatar	67.9	(0.4)		67.0	(0.4)		64.8	(0.4)		61.7	(0.4)		58.1	(0.4)		58.5	(0.4)		59.1	(0.4)				
	Romania	60.6	(1.0)		62.7	(0.9)		57.8	(1.0)		65.5	(0.9)		48.6	(1.0)		44.2	(0.9)		39.7	(1.1)				
	Russia	55.7	(1.0)		61.7	(1.2)		58.3	(1.0)		57.9	(1.3)		56.7	(1.0)		59.0	(0.8)		47.9	(1.1)				
	Saudi Arabia	83.7	(0.6)		76.3	(0.7)		68.6	(0.7)		64.7	(0.7)		60.3	(0.9)		58.6	(0.7)		60.8	(0.7)				
	Serbia	54.2	(0.9)		60.0	(0.7)		56.8	(0.8)		71.2	(0.7)		52.6	(0.8)		50.5	(0.8)		55.3	(0.8)				
	Singapore	66.3	(0.6)		90.4	(0.4)		77.8	(0.5)		92.9	(0.4)		63.8	(0.6)		84.3	(0.5)		64.5	(0.7)				
	Chinese Taipei	78.3	(0.6)		84.2	(0.5)		76.8	(0.7)		81.6	(0.6)		73.7	(0.7)		74.4	(0.6)		62.7	(0.7)				
	Thailand	87.6	(0.5)		88.1	(0.4)		78.8	(0.6)		77.6	(0.7)		73.2	(0.6)		70.8	(0.6)		56.9	(0.8)				
	Ukraine	66.0	(1.0)		68.2	(0.9)		57.3	(0.9)		66.4	(0.8)		57.4	(0.9)		55.8	(0.8)		47.3	(1.0)				
	United Arab Emirates	66.6	(0.5)		73.3	(0.5)		68.4	(0.7)		70.9	(0.6)		60.8	(0.7)		65.0	(0.5)		62.9	(0.6)				
	Uruguay	45.4	(1.3)		73.3	(0.8)		65.3	(0.9)		70.0	(0.9)		47.2	(1.1)		43.5	(0.9)		30.4	(0.8)				
	Viet Nam	62.6	(1.5)		63.8	(1.1)		41.5	(1.3)		81.2	(0.9)		47.9	(1.2)		39.1	(1.0)		43.8	(1.1)				

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. Countries which administered the paper-based form had no available data in this item: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.2.6 [3/4] **Frequency of opportunity to learn digital literacy skills at school**

Results based on students' self-reports

	Students reported that during their entire school experience were taught the following:																														Item 'Capacity to distinguish facts from opinions' - Equated P+ (CR551Q06)[2]	
	Top-bottom quarter of student's ESCS[1]																															
	How to use keywords when using a search engine such as <Google©>, <Yahoo©>, etc.			How to decide whether to trust information from the Internet			How to compare different web pages and decide what information is more relevant for your schoolwork			To understand the consequences of making information publicly available online on <Facebook©>, <Instagram©>, etc.			How to use the short description below the links in the list of results of a search			How to detect whether the information is subjective or biased			How to detect phishing or spam emails				
	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	%	S.E.
OECD Australia	1.8	(1.3)		**7.7**	(1.1)		**7.4**	(1.2)		**8.4**	(1.0)		0.7	(1.3)		**12.0**	(1.3)		**6.3**	(1.7)		60.6	(0.3)
Austria	**-4.4**	(2.0)		2.9	(1.8)		**4.1**	(1.9)		**3.9**	(1.5)		-3.9	(2.0)		**12.5**	(2.0)		4.4	(2.6)		44.9	(0.5)
Belgium	3.2	(2.0)		**7.1**	(1.7)		**6.1**	(1.7)		**6.5**	(1.6)		**-4.5**	(1.9)		**19.9**	(1.8)		0.4	(2.1)		57.5	(0.4)
Canada	1.9	(1.4)		**5.8**	(1.1)		**6.2**	(1.2)		**4.8**	(1.1)		-1.4	(1.4)		**10.5**	(1.2)		**3.4**	(1.7)		62.1	(0.3)
Chile	**-9.6**	(2.1)		-1.0	(2.1)		-0.8	(2.3)		**3.7**	(1.8)		**-10.0**	(2.1)		**6.4**	(1.8)		**-5.0**	(1.9)		45.8	(0.4)
Colombia	**-7.0**	(2.2)		**8.5**	(1.8)		**6.0**	(1.9)		**6.9**	(1.5)		-1.7	(2.7)		**8.9**	(2.3)		2.1	(2.3)		27.4	(0.5)
Czech Republic	**-5.1**	(2.5)		0.6	(2.2)		-2.8	(2.3)		3.0	(2.2)		**-7.4**	(2.1)		2.4	(2.1)		0.0	(2.4)		30.9	(0.2)
Denmark	1.5	(1.9)		**4.9**	(1.1)		**6.9**	(1.3)		2.2	(1.4)		2.1	(2.1)		**17.6**	(1.6)		**3.9**	(1.9)		60.2	(0.3)
Estonia	-3.6	(1.9)		3.1	(1.7)		3.2	(1.9)		2.5	(1.9)		-2.9	(2.3)		**4.5**	(2.0)		0.9	(2.3)		57.1	(0.3)
Finland	-1.1	(1.6)		**8.3**	(1.6)		**6.3**	(1.7)		-0.2	(1.5)		-1.0	(1.8)		**8.5**	(2.0)		1.6	(1.8)		51.3	(0.4)
France	3.5	(1.9)		**9.2**	(1.8)		**4.5**	(1.7)		**4.4**	(1.7)		**-4.3**	(1.8)		**7.0**	(2.0)		**-3.8**	(1.6)		36.9	(0.4)
Germany	-8.0	(2.3)		4.5	(2.3)		-2.2	(2.0)		-1.0	(2.0)		**-10.3**	(2.3)		**15.8**	(2.2)		-3.5	(2.0)		45.2	(0.5)
Greece	**-9.3**	(2.0)		**-5.0**	(1.9)		-1.5	(2.0)		1.5	(1.7)		-2.1	(1.9)		1.4	(2.0)		0.4	(2.0)		40.4	(0.6)
Hungary	**-12.2**	(2.6)		**-10.9**	(2.5)		**-12.4**	(2.4)		-0.7	(1.9)		**-13.5**	(2.1)		**-5.9**	(2.4)		-2.6	(2.6)		43.0	(0.4)
Iceland	**-5.1**	(2.3)		**4.8**	(2.1)		1.3	(2.3)		**6.3**	(2.2)		-1.0	(2.4)		3.9	(2.7)		-2.7	(2.7)		44.7	(0.3)
Ireland	**-5.9**	(2.1)		-1.3	(2.1)		0.0	(2.0)		2.8	(1.7)		**-4.3**	(1.8)		**7.3**	(1.7)		-1.9	(2.0)		57.6	(0.4)
Israel	**-10.7**	(2.6)	†	0.9	(2.3)	†	**-5.6**	(2.5)	†	**4.1**	(1.8)	†	**-8.9**	(2.7)	†	0.7	(2.6)	†	**-12.5**	(2.1)	†	53.0	(0.6)
Italy	**-13.3**	(2.0)		-3.5	(2.2)		-3.6	(2.0)		0.5	(2.0)		**-8.2**	(2.1)		**6.4**	(2.1)		-3.9	(2.2)		40.0	(0.4)
Japan	1.9	(1.6)		**3.3**	(1.2)		**5.1**	(1.9)		**3.8**	(1.4)		0.9	(2.1)		**5.3**	(1.7)		-3.0	(2.4)		47.9	(0.5)
Korea	2.7	(1.9)		**9.2**	(1.9)		**5.1**	(1.9)		**6.9**	(1.9)		3.0	(2.0)		**8.9**	(1.9)		3.1	(1.8)		25.6	(0.4)
Latvia	**-6.2**	(2.1)		0.0	(2.0)		**-4.2**	(2.1)		1.6	(2.0)		-3.3	(2.0)		**5.6**	(2.0)		**3.7**	(1.8)		39.8	(0.3)
Lithuania	**-5.4**	(2.0)		-1.2	(1.9)		-0.1	(1.9)		**4.6**	(1.6)		**-6.7**	(1.9)		1.4	(2.0)		-3.1	(2.1)		39.6	(0.3)
Luxembourg	0.5	(1.8)		**5.8**	(1.7)		**4.5**	(2.0)		**5.3**	(1.7)		**-4.0**	(1.9)		**17.8**	(1.8)		**5.1**	(1.8)		38.4	(0.2)
Mexico	0.9	(2.6)		**6.9**	(2.1)		**11.5**	(1.8)		**7.0**	(2.2)		2.1	(2.3)		**9.8**	(2.7)		**12.1**	(2.4)		34.8	(0.5)
Netherlands	-1.6	(2.1)		**6.7**	(2.2)		**8.7**	(2.6)		0.1	(2.2)		0.2	(2.4)		**10.9**	(2.5)		-1.3	(2.1)		62.9	(0.5)
New Zealand	0.5	(1.9)		**3.4**	(1.5)		1.1	(1.9)		**5.8**	(1.4)		**-6.6**	(1.9)		**12.5**	(1.6)		-0.1	(1.9)		60.7	(0.3)
Norway	-0.4	(2.2)		**7.2**	(1.6)		**5.7**	(1.9)		3.1	(2.0)		-1.9	(1.8)		**11.8**	(2.2)		-0.4	(1.7)		36.6	(0.4)
Poland	**-6.3**	(2.1)		**-4.8**	(2.1)		**-9.3**	(2.1)		**4.0**	(1.9)		**-8.1**	(2.1)		4.4	(2.3)		-0.8	(2.4)		46.8	(0.5)
Portugal	**-9.8**	(2.4)		**-8.9**	(2.2)		**-6.2**	(1.9)		-0.3	(1.5)		**-12.1**	(2.2)		**-6.8**	(2.3)		**-8.1**	(2.1)		50.4	(0.4)
Slovak Republic	**-9.1**	(2.6)		2.9	(2.4)		**-6.2**	(2.5)		-1.3	(2.2)		**-11.3**	(2.6)		1.3	(2.3)		4.3	(2.2)		28.1	(0.3)
Slovenia	**-6.9**	(2.1)		**5.0**	(2.0)		1.8	(1.9)		1.4	(1.8)		**-4.9**	(1.8)		**7.0**	(2.0)		-3.5	(2.4)		46.8	(0.2)
Spain	**-2.7**	(1.4)		-1.3	(1.1)		-1.3	(1.2)		**4.5**	(0.9)		**-8.0**	(1.2)		**8.4**	(1.2)		-1.3	(1.3)		41.5	(0.3)
Sweden	**-6.6**	(1.9)		**3.7**	(0.9)		**4.0**	(1.3)		2.0	(2.0)		**-5.0**	(2.2)		**15.1**	(1.9)		**-5.3**	(2.1)		54.1	(0.5)
Switzerland	**-5.9**	(2.3)		2.3	(2.3)		1.1	(2.3)		1.8	(1.9)		**-9.2**	(2.2)		**8.4**	(1.9)		-1.3	(1.9)		43.6	(0.5)
Turkey	-0.7	(2.8)		4.9	(2.6)		1.0	(2.9)		**10.4**	(2.8)		1.1	(2.8)		3.3	(2.4)		**5.9**	(2.7)		63.3	(0.4)
United Kingdom	-0.3	(1.7)		2.4	(1.5)		1.5	(1.9)		**4.0**	(1.2)		-2.8	(1.8)		**13.8**	(1.8)		**4.4**	(2.2)		65.2	(0.4)
United States	3.6	(2.4)		**6.9**	(1.6)		**5.7**	(2.0)		**7.7**	(1.8)		-1.7	(2.1)		**14.4**	(2.0)		1.1	(2.3)		69.0	(0.6)
OECD average	**-3.7**	(0.3)		**2.7**	(0.3)		**1.4**	(0.3)		**3.6**	(0.3)		**-4.3**	(0.3)		**7.9**	(0.3)		0.0	(0.3)		47.4	(0.1)

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. Countries which administered the paper-based form had no available data in this item: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

StatLink https://doi.org/10.1787/888934240636

Table B.2.6 [4/4] **Frequency of opportunity to learn digital literacy skills at school**

Results based on students' self-reports

	Students reported that during their entire school experience were taught the following:																								Item 'Capacity to distinguish facts from opinions' - Equated P+ (CR551Q06)[2]	
	Top-bottom quarter of student's ESCS[1]																									
	How to use keywords when using a search engine such as <Google©>, <Yahoo©>, etc.			How to decide whether to trust information from the Internet			How to compare different web pages and decide what information is more relevant for your schoolwork			To understand the consequences of making information publicly available online on <Facebook©>, <Instagram©>, etc.			How to use the short description below the links in the list of results of a search			How to detect whether the information is subjective or biased			How to detect phishing or spam emails				
	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	% dif.	S.E.	s	%	S.E.
Partners																										
Albania	2.4	(2.1)		**-4.5**	(1.7)		0.2	(1.6)		**6.5**	(1.8)		**4.1**	(1.9)		2.1	(1.5)		**7.7**	(2.2)		29.1	(0.3)
Argentina	2.5	(1.9)		**10.1**	(2.0)		**9.0**	(1.9)		**13.1**	(2.0)		-2.6	(2.0)		**7.5**	(1.9)		3.2	(1.8)		m	m
Baku (Azerbaijan)	**10.2**	(2.2)		**7.1**	(2.1)		**8.4**	(2.2)		**9.7**	(1.7)		**6.0**	(2.0)		**6.9**	(2.0)		**13.1**	(2.1)		21.5	(0.3)
Belarus	**-12.7**	(2.5)		**-7.0**	(2.0)		**-8.3**	(2.1)		**-4.5**	(1.9)		**-8.1**	(2.1)		**-5.5**	(2.0)		-2.4	(2.2)		30.7	(0.4)
Bosnia and Herzegovina	-3.3	(2.1)		-0.1	(2.0)		-3.5	(2.1)		3.6	(2.0)		-0.6	(2.2)		-0.3	(2.0)		3.3	(2.0)		22.1	(0.5)
Brazil	**6.6**	(1.8)		**11.6**	(1.8)		**9.7**	(1.6)		**16.9**	(1.8)		**7.7**	(1.4)		**12.0**	(1.7)		**3.6**	(1.4)		32.7	(0.3)
Brunei Darussalam	1.0	(1.5)		**11.9**	(1.5)		3.2	(1.7)		**20.4**	(1.4)		1.3	(1.9)		**15.8**	(1.7)		**14.9**	(1.6)		39.9	(0.1)
B-S-J-Z (China)	**4.4**	(2.0)		1.0	(1.9)		**7.0**	(2.2)		**6.8**	(1.8)		**5.8**	(1.9)		**4.1**	(1.9)		**6.2**	(2.1)		46.6	(0.5)
Bulgaria	**-12.5**	(2.3)		**-4.4**	(1.9)		**-7.3**	(2.3)		-2.6	(2.0)		**-6.2**	(2.3)		-2.4	(2.4)		-1.0	(2.6)		29.9	(0.6)
Costa Rica	3.5	(2.1)		**13.9**	(1.8)		**11.9**	(1.8)		**8.7**	(1.6)		2.6	(2.4)		**6.3**	(2.1)		**7.9**	(1.9)		28.7	(0.4)
Croatia	**-4.4**	(2.0)		**-4.6**	(1.8)		**-3.8**	(1.8)		-0.2	(1.5)		-1.8	(1.9)		3.4	(1.8)		-0.6	(1.9)		33.1	(0.5)
Cyprus	-1.7	(2.0)		-0.4	(1.9)		1.2	(1.8)		3.0	(1.8)		0.3	(2.0)		**8.8**	(1.9)		-1.5	(2.0)		32.1	(0.2)
Dominican Republic	-2.1	(2.3)		**8.9**	(2.0)		3.0	(2.4)		**11.9**	(1.9)		0.2	(2.1)		0.5	(2.1)		1.2	(2.4)		20.4	(0.4)
Georgia	**-6.8**	(1.7)		**-7.6**	(1.7)		**-9.9**	(2.2)		**-5.9**	(1.9)		**-6.4**	(2.1)		-1.1	(2.1)		-2.6	(2.2)		14.5	(0.3)
Hong Kong (China)	3.4	(2.3)		**8.7**	(1.6)		**10.3**	(2.2)		**8.3**	(1.9)		**5.0**	(1.9)		**11.5**	(2.0)		3.3	(2.0)		51.0	(0.5)
Indonesia	1.8	(2.8)		0.7	(3.0)		4.0	(2.5)		3.3	(2.8)		**6.1**	(2.7)		1.8	(2.3)		2.8	(2.4)		15.9	(0.3)
Jordan	**9.3**	(1.4)		**13.1**	(2.1)		**7.6**	(1.9)		**13.3**	(1.8)		**6.2**	(1.8)		**10.0**	(2.1)		**10.4**	(1.6)		m	m
Kazakhstan	**-2.7**	(1.3)		-2.3	(1.5)		**3.3**	(1.5)		1.2	(1.4)		-2.3	(1.4)		0.0	(1.4)		0.8	(1.5)		21.7	(0.2)
Kosovo	**-5.5**	(2.2)		-1.2	(2.2)		-4.1	(2.1)		3.0	(2.5)		0.2	(2.3)		-1.3	(2.3)		3.8	(2.4)		13.3	(0.1)
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m
Macao (China)	2.6	(2.6)		**6.6**	(2.1)		**7.4**	(2.4)		**17.9**	(2.2)		**9.5**	(2.4)		**10.2**	(2.4)		**9.1**	(2.4)		48.8	(0.2)
Malaysia	-1.2	(2.4)		-3.5	(1.8)		-4.0	(2.2)		**9.0**	(2.0)		-3.6	(2.0)		**-7.8**	(1.9)		-0.6	(1.7)		25.8	(0.4)
Malta	-3.1	(2.1)		-1.4	(1.6)		-4.8	(2.7)		**4.2**	(1.6)		**-5.3**	(2.4)		2.5	(2.9)		-1.1	(2.0)		39.4	(0.3)
Moldova	**-13.3**	(2.3)		**-4.7**	(1.8)		**-7.7**	(2.3)		**7.8**	(1.9)		**-8.6**	(2.0)		-2.2	(2.0)		-3.3	(2.6)		m	m
Montenegro	**-5.4**	(1.7)		0.5	(1.7)		**-3.9**	(1.9)		-0.8	(1.6)		-3.7	(2.0)		2.3	(1.8)		-0.6	(1.7)		21.0	(0.2)
Morocco	**12.5**	(2.3)		**14.9**	(2.0)		**12.1**	(2.0)		**11.8**	(1.8)		**5.7**	(1.8)		**5.9**	(2.1)		**10.7**	(1.6)		17.3	(0.4)
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m
Panama	-4.5	(2.8)		**5.4**	(2.7)		0.0	(2.7)		**13.3**	(2.2)		-2.6	(2.8)		0.8	(2.8)		3.7	(3.0)		19.1	(0.4)
Peru	2.2	(1.9)		**16.7**	(1.9)		**14.8**	(2.1)		**22.0**	(2.2)		2.7	(2.2)		**13.1**	(2.1)		**11.4**	(2.0)		23.9	(0.3)
Philippines	**9.2**	(1.8)		**18.6**	(1.7)		**14.1**	(1.6)		**16.2**	(1.5)		**5.3**	(1.5)		**11.4**	(1.5)		**11.3**	(1.7)		17.4	(0.5)
Qatar	-1.4	(1.1)		**9.6**	(1.1)		**4.2**	(1.2)		**11.7**	(1.2)		0.7	(1.2)		**8.9**	(1.1)		**2.3**	(1.1)		39.5	(0.1)
Romania	-0.2	(2.3)		**-5.3**	(2.1)		**-5.0**	(2.2)		2.8	(2.2)		-2.7	(2.3)		1.6	(2.5)		-4.0	(2.3)		m	m
Russia	-2.4	(1.7)		-2.9	(1.9)		-1.0	(2.4)		0.1	(2.2)		-2.0	(1.7)		-3.2	(2.0)		1.4	(2.3)		42.8	(1.3)
Saudi Arabia	**8.1**	(1.5)		**8.1**	(1.5)		**6.8**	(1.8)		**9.5**	(1.8)		**4.1**	(1.9)		**7.4**	(1.7)		**8.6**	(1.8)		m	m
Serbia	-1.9	(2.4)		-3.4	(2.0)		0.8	(2.2)		0.0	(2.1)		-3.5	(2.4)		4.4	(2.3)		2.7	(2.2)		29.8	(0.5)
Singapore	**4.7**	(1.6)		**3.9**	(0.9)		2.2	(1.2)		**3.4**	(1.0)		**-4.8**	(1.6)		**8.6**	(1.5)		0.9	(1.7)		57.7	(0.2)
Chinese Taipei	-2.9	(1.9)		2.3	(1.4)		-0.8	(1.7)		1.5	(1.4)		0.1	(1.4)		**6.7**	(1.7)		1.4	(2.0)		38.1	(0.5)
Thailand	-2.2	(1.3)		**4.9**	(1.0)		**4.5**	(1.8)		0.6	(1.8)		0.6	(1.7)		**6.5**	(1.9)		-0.4	(2.2)		32.2	(0.5)
Ukraine	**-5.0**	(2.3)		1.3	(1.9)		-3.0	(2.2)		-2.6	(1.9)		**-4.5**	(2.2)		-3.1	(2.1)		-2.3	(2.1)		m	m
United Arab Emirates	**-5.7**	(1.3)		**4.9**	(1.4)		2.8	(1.5)		**6.6**	(1.6)		-3.3	(1.8)		**6.5**	(1.2)		**-8.4**	(1.5)		41.5	(0.3)
Uruguay	**-5.7**	(2.8)		1.4	(2.0)		4.0	(2.2)		**5.1**	(2.3)		**-9.1**	(2.3)		4.7	(2.7)		3.0	(2.3)		31.4	(0.5)
Viet Nam	-0.9	(2.8)		2.2	(3.0)		-2.0	(2.6)		**5.3**	(2.0)		-3.6	(2.8)		-1.1	(1.9)		0.9	(2.4)		m	m

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. Countries which administered the paper-based form had no available data in this item: Argentina, Jordan, Lebanon, the Republic of Moldova, the Republic of North Macedonia, Romania, Saudi Arabia, Ukraine and Viet Nam.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.3.9 [1/4] **Task-oriented navigation behaviours**

	Percentage of students who self activated the multiple-source by clicking hyperlink		Percentage of students, by navigation group behaviour							
			Strictly focused navigation		Actively explorative navigation		Limited navigation		No navigation	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD Australia	26.4	(1.0)	24.5	(0.9)	14.4	(0.8)	13.6	(0.7)	47.5	(1.1)
Austria	22.4	(1.5)	22.6	(1.3)	11.2	(0.9)	11.4	(1.1)	54.7	(1.5)
Belgium	26.6	(1.0)	19.9	(1.3)	11.2	(1.0)	13.5	(0.9)	55.3	(1.5)
Canada	25.8	(1.1)	26.1	(0.8)	14.8	(0.7)	12.5	(0.8)	46.6	(1.2)
Chile	25.3	(1.4)	13.8	(1.5)	9.8	(1.0)	14.3	(1.2)	62.1	(1.8)
Colombia	22.1	(1.5)	8.4	(0.9)	4.5	(0.6)	11.1	(1.1)	76.0	(1.4)
Czech Republic	27.3	(1.4)	20.5	(1.2)	9.5	(0.9)	12.6	(1.0)	57.4	(1.5)
Denmark	15.6	(1.4)	19.9	(1.4)	5.1	(0.7)	10.2	(1.0)	64.8	(1.6)
Estonia	23.7	(1.4)	22.8	(1.4)	11.4	(1.2)	10.1	(0.9)	55.6	(1.8)
Finland	20.1	(1.3)	25.9	(1.5)	12.4	(1.1)	9.6	(0.8)	52.0	(1.7)
France	28.1	(1.3)	20.0	(1.3)	9.5	(1.0)	11.9	(1.1)	58.6	(1.8)
Germany	21.8	(1.5)	21.6	(1.5)	9.8	(1.0)	12.1	(1.2)	56.5	(1.8)
Greece	18.3	(1.3)	13.6	(1.4)	7.8	(0.9)	13.0	(1.2)	65.6	(1.8)
Hungary	25.5	(1.5)	18.5	(1.3)	9.8	(0.9)	15.6	(1.3)	56.1	(1.6)
Iceland	30.7	(2.3)	14.4	(1.7)	6.8	(1.1)	10.3	(1.3)	68.5	(2.2)
Ireland	20.3	(1.3)	24.3	(1.3)	13.9	(1.2)	9.2	(0.9)	52.6	(1.5)
Israel	17.1	(1.3)	26.2	(1.5)	12.0	(1.4)	8.0	(0.8)	53.9	(1.6)
Italy	25.3	(1.3)	17.1	(1.3)	9.6	(1.1)	13.8	(1.1)	59.5	(1.6)
Japan	34.0	(1.4)	30.5	(1.6)	12.0	(0.9)	8.5	(1.0)	49.0	(1.7)
Korea	39.1	(1.2)	29.8	(1.3)	33.4	(1.3)	13.3	(1.0)	23.6	(1.2)
Latvia	18.3	(1.4)	23.0	(1.7)	6.4	(1.0)	9.4	(1.3)	61.1	(1.9)
Lithuania	22.3	(1.5)	20.9	(1.3)	9.2	(0.9)	10.3	(0.9)	59.6	(1.7)
Luxembourg	28.4	(1.8)	14.6	(1.4)	10.3	(1.2)	10.8	(1.2)	64.2	(1.9)
Mexico	15.3	(1.6)	13.2	(1.3)	7.1	(0.9)	12.9	(1.2)	66.8	(1.8)
Netherlands	22.2	(2.0)	23.8	(1.8)	15.3	(1.3)	14.0	(1.5)	46.8	(2.1)
New Zealand	29.5	(1.3)	23.0	(1.4)	17.4	(1.2)	16.0	(1.2)	43.6	(1.6)
Norway	16.3	(1.2)	18.5	(1.3)	6.0	(0.8)	7.8	(1.0)	67.8	(1.6)
Poland	28.5	(1.3)	21.2	(1.3)	14.6	(1.1)	16.6	(1.3)	47.6	(1.6)
Portugal	25.5	(1.6)	17.2	(1.3)	10.5	(1.1)	10.9	(1.2)	61.3	(1.9)
Slovak Republic	19.0	(1.2)	15.1	(1.4)	8.1	(0.9)	12.8	(1.2)	64.0	(1.9)
Slovenia	19.8	(1.6)	22.2	(1.6)	15.0	(1.3)	12.9	(1.3)	49.9	(1.9)
Spain[1]	22.6	(0.8)	13.0	(0.6)	10.7	(0.5)	18.2	(0.8)	58.1	(1.0)
Sweden	17.9	(1.3)	15.3	(1.2)	8.1	(0.9)	12.0	(1.0)	64.6	(1.7)
Switzerland	23.1	(1.5)	17.5	(1.4)	8.6	(1.1)	13.4	(1.4)	60.5	(2.2)
Turkey	35.6	(1.5)	14.9	(1.0)	13.9	(1.4)	15.4	(1.2)	55.8	(1.7)
United Kingdom	22.3	(1.2)	27.8	(1.5)	19.1	(1.0)	11.3	(1.0)	41.8	(1.8)
United States	29.7	(2.0)	26.5	(1.6)	15.4	(1.3)	10.4	(1.1)	47.7	(2.1)
OECD average	24.1	(0.2)	20.2	(0.2)	11.5	(0.2)	12.2	(0.2)	56.1	(0.3)

1. In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

Notes: The computation is based on 10 plausible values with student weights 80 replicates.

The process (log) data analysed in this report focuses on a total of 76 270 students from 70 countries and economies who responded to the "Rapa Nui" reading unit (CR551) with an overall average reading performance score of 517 points, marginally higher than the average reading score of the full sample 460 points from the 70 countries and economies.

Source: OECD, PISA 2018 Database.

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Table B.3.9 [2/4] **Task-oriented navigation behaviours**

	Percentage of students who self activated the multiple-source by clicking hyperlink		Percentage of students, by navigation group behaviour							
			Strictly focused navigation		Actively explorative navigation		Limited navigation		No navigation	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
Partners										
Albania	11.4	(1.5)	19.4	(2.1)	5.8	(1.1)	6.5	(1.2)	68.3	(2.4)
Baku (Azerbaijan)	15.0	(1.5)	7.0	(1.2)	3.5	(0.9)	9.1	(1.5)	80.4	(2.4)
Belarus	27.4	(1.8)	22.2	(1.4)	9.7	(1.2)	14.3	(1.1)	53.8	(2.0)
Bosnia and Herzegovina	12.2	(1.6)	10.7	(1.2)	4.0	(0.9)	9.8	(1.3)	75.5	(1.8)
Brazil	14.5	(1.3)	13.8	(1.2)	6.4	(0.8)	6.3	(1.0)	73.5	(1.7)
Brunei Darussalam	26.3	(1.8)	21.0	(1.6)	14.7	(1.5)	11.6	(1.4)	52.7	(2.2)
B-S-J-Z (China)	39.4	(1.5)	30.5	(1.4)	31.2	(1.3)	8.8	(0.8)	29.5	(1.4)
Bulgaria	14.4	(1.7)	15.2	(1.6)	9.2	(1.1)	9.5	(1.2)	66.1	(1.8)
Costa Rica	21.1	(2.3)	15.3	(1.8)	7.1	(1.3)	9.3	(1.0)	68.3	(2.3)
Croatia	18.7	(1.3)	23.4	(1.3)	11.5	(1.2)	10.3	(1.0)	54.8	(1.8)
Cyprus	11.0	(1.2)	15.6	(1.3)	7.1	(1.1)	11.4	(1.5)	65.9	(1.7)
Dominican Republic	9.0	(2.0)	8.4	(2.1)	2.9	(1.0)	3.7	(1.0)	85.0	(2.5)
Georgia	15.4	(2.0)	11.3	(1.5)	4.9	(1.1)	8.8	(1.4)	75.0	(2.3)
Hong Kong (China)	34.3	(1.5)	36.3	(1.2)	21.8	(1.2)	8.2	(0.8)	33.7	(1.4)
Indonesia	13.8	(1.9)	13.5	(1.6)	10.6	(1.6)	12.3	(2.0)	63.5	(2.4)
Kazakhstan	20.2	(1.4)	11.9	(1.0)	7.4	(0.9)	11.1	(1.1)	69.6	(1.7)
Kosovo	6.7	(1.5)	6.2	(1.7)	2.8	(1.0)	8.7	(1.6)	82.3	(2.2)
Macao (China)	38.8	(2.1)	23.9	(1.7)	25.8	(1.6)	12.5	(1.1)	37.8	(2.0)
Malaysia	27.2	(1.9)	23.2	(1.8)	10.4	(1.5)	10.8	(1.6)	55.7	(2.3)
Malta	18.1	(1.5)	23.5	(1.9)	12.0	(1.4)	9.1	(1.3)	55.4	(2.2)
Montenegro	13.7	(1.1)	10.4	(1.0)	6.7	(0.7)	11.2	(1.1)	71.7	(1.4)
Morocco	5.9	(1.3)	5.8	(1.3)	2.6	(1.0)	5.3	(1.2)	86.2	(2.0)
Panama	16.6	(2.9)	10.8	(1.9)	2.5	(0.9)	9.6	(2.1)	77.1	(2.3)
Peru	18.4	(1.7)	7.1	(1.3)	5.9	(1.4)	15.9	(1.8)	71.0	(2.3)
Philippines	19.3	(2.8)	16.0	(2.1)	6.9	(1.3)	10.1	(1.6)	67.0	(2.9)
Qatar	22.8	(1.0)	16.5	(0.8)	12.1	(0.8)	10.6	(0.7)	60.8	(1.2)
Russia	22.1	(1.3)	28.0	(1.2)	8.1	(0.8)	8.9	(1.0)	55.1	(1.5)
Serbia	17.7	(1.6)	13.3	(1.2)	7.8	(1.0)	12.3	(1.1)	66.5	(1.8)
Singapore	38.4	(1.2)	32.1	(1.2)	31.9	(1.3)	9.5	(0.8)	26.5	(1.0)
Chinese Taipei	45.6	(1.4)	27.1	(1.2)	26.3	(1.4)	13.6	(1.0)	33.0	(1.5)
Thailand	23.9	(1.9)	14.5	(1.4)	14.1	(1.6)	13.0	(1.4)	58.4	(2.4)
United Arab Emirates	24.8	(1.2)	20.8	(1.1)	17.0	(1.2)	12.0	(1.0)	50.2	(1.4)
Uruguay	7.7	(1.2)	9.6	(1.4)	3.7	(0.8)	7.3	(1.2)	79.5	(1.7)
Overall Average	22.3	(0.2)	18.8	(0.2)	11.1	(0.1)	11.2	(0.1)	59.0	(0.2)

1. In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

Notes: The computation is based on 10 plausible values with student weights 80 replicates.

The process (log) data analysed in this report focuses on a total of 76 270 students from 70 countries and economies who responded to the "Rapa Nui" reading unit (CR551) with an overall average reading performance score of 517 points, marginally higher than the average reading score of the full sample 460 points from the 70 countries and economies.

Source: OECD, PISA 2018 Database.

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Table B.3.9 [3/4] **Task-oriented navigation behaviours**

	Reading performance, by navigation group behaviour							
	Strictly focused navigation		Actively explorative navigation		Limited navigation		No navigation	
	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD Australia	590	(3.7)	611	(5.2)	552	(4.9)	532	(3.0)
Austria	570	(5.6)	583	(8.2)	534	(8.9)	524	(3.6)
Belgium	579	(5.3)	590	(6.1)	546	(6.7)	544	(3.5)
Canada	596	(2.7)	603	(5.1)	568	(5.1)	545	(3.0)
Chile	542	(8.5)	558	(9.0)	504	(7.7)	495	(5.2)
Colombia	526	(13.5)	545	(14.0)	503	(10.5)	470	(4.0)
Czech Republic	575	(5.0)	583	(8.3)	533	(7.7)	525	(3.9)
Denmark	582	(5.6)	583	(10.1)	535	(8.0)	532	(3.7)
Estonia	578	(6.3)	604	(7.9)	559	(9.5)	547	(4.0)
Finland	600	(5.3)	601	(7.3)	563	(8.6)	548	(3.7)
France	575	(6.4)	580	(8.1)	551	(8.4)	534	(4.1)
Germany	578	(6.3)	589	(8.9)	559	(8.5)	544	(4.1)
Greece	538	(8.1)	552	(10.6)	521	(7.6)	502	(4.6)
Hungary	557	(7.2)	562	(9.0)	522	(7.0)	516	(4.0)
Iceland	554	(11.0)	573	(18.0)	546	(14.5)	519	(5.0)
Ireland	592	(5.1)	604	(7.3)	563	(7.7)	543	(3.5)
Israel	581	(5.1)	612	(8.1)	553	(14.1)	507	(5.2)
Italy	560	(6.7)	580	(8.7)	541	(7.3)	517	(3.9)
Japan	584	(4.8)	588	(7.1)	552	(10.4)	539	(4.3)
Korea	574	(4.0)	592	(3.9)	543	(6.9)	508	(5.7)
Latvia	554	(5.7)	565	(12.6)	514	(11.7)	514	(3.9)
Lithuania	552	(6.0)	573	(8.5)	528	(8.6)	515	(3.2)
Luxembourg	570	(9.4)	582	(9.4)	517	(11.2)	527	(4.2)
Mexico	507	(8.2)	529	(10.1)	505	(8.2)	466	(5.1)
Netherlands	578	(7.3)	587	(8.6)	541	(10.5)	521	(5.1)
New Zealand	601	(5.0)	600	(6.1)	553	(6.3)	529	(4.4)
Norway	583	(6.8)	589	(10.4)	548	(7.9)	542	(3.9)
Poland	587	(6.5)	588	(7.5)	547	(6.1)	542	(5.3)
Portugal	560	(6.1)	574	(7.7)	541	(8.8)	537	(3.6)
Slovak Republic	556	(7.2)	569	(11.2)	518	(12.1)	511	(3.6)
Slovenia	564	(6.1)	575	(8.2)	545	(7.6)	526	(4.3)
Spain[1]	548	(4.0)	564	(4.1)	527	(3.4)	515	(2.2)
Sweden	596	(6.1)	604	(9.4)	564	(7.9)	546	(4.7)
Switzerland	571	(8.0)	574	(10.1)	535	(10.5)	530	(5.9)
Turkey	554	(6.7)	555	(8.5)	506	(7.6)	498	(3.9)
United Kingdom	576	(5.4)	598	(5.0)	546	(6.8)	529	(4.2)
United States	598	(5.7)	610	(8.4)	568	(9.0)	540	(5.3)
OECD average	570	(1.1)	582	(1.5)	539	(1.4)	524	(0.7)

1. In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

Notes: The computation is based on 10 plausible values with student weights 80 replicates.

The process (log) data analysed in this report focuses on a total of 76 270 students from 70 countries and economies who responded to the "Rapa Nui" reading unit (CR551) with an overall average reading performance score of 517 points, marginally higher than the average reading score of the full sample 460 points from the 70 countries and economies.

Source: OECD, PISA 2018 Database.

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Table B.3.9 [4/4] **Task-oriented navigation behaviours**

	Reading performance, by navigation group behaviour							
	Strictly focused navigation		Actively explorative navigation		Limited navigation		No navigation	
	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
Partners								
Albania	515	(7.4)	524	(14.0)	479	(13.0)	454	(3.6)
Baku (Azerbaijan)	465	(10.4)	505	(19.7)	457	(10.6)	434	(4.9)
Belarus	545	(6.1)	563	(10.6)	522	(7.2)	504	(4.0)
Bosnia and Herzegovina	502	(9.5)	507	(13.2)	468	(11.6)	457	(4.3)
Brazil	530	(7.8)	566	(11.1)	546	(14.2)	468	(4.0)
Brunei Darussalam	523	(8.1)	549	(8.0)	472	(11.4)	458	(5.1)
B-S-J-Z (China)	592	(4.1)	618	(4.4)	573	(7.4)	548	(3.5)
Bulgaria	536	(9.4)	532	(9.9)	512	(12.6)	483	(5.2)
Costa Rica	515	(10.2)	525	(13.1)	482	(16.5)	472	(6.5)
Croatia	558	(5.5)	560	(8.1)	543	(7.7)	507	(4.4)
Cyprus	520	(8.8)	556	(12.9)	508	(8.8)	475	(4.2)
Dominican Republic	518	(19.4)	528	(26.9)	467	(23.0)	406	(6.7)
Georgia	499	(13.4)	511	(16.3)	477	(14.6)	438	(5.4)
Hong Kong (China)	585	(3.8)	601	(4.5)	567	(9.2)	535	(5.5)
Indonesia	478	(8.6)	482	(9.9)	449	(11.0)	398	(5.1)
Kazakhstan	490	(7.5)	508	(11.5)	450	(8.8)	427	(4.1)
Kosovo	447	(15.7)	495	(22.8)	418	(13.2)	394	(4.9)
Macao (China)	585	(7.2)	599	(5.7)	536	(9.5)	538	(5.0)
Malaysia	501	(7.1)	520	(9.5)	461	(11.6)	444	(3.8)
Malta	561	(6.7)	572	(9.6)	540	(12.8)	504	(6.5)
Montenegro	514	(9.1)	540	(11.0)	490	(7.4)	470	(3.3)
Morocco	442	(16.1)	468	(27.2)	430	(22.7)	403	(4.5)
Panama	493	(16.6)	488	(26.8)	498	(18.0)	434	(10.6)
Peru	514	(19.7)	549	(14.4)	479	(10.9)	457	(6.7)
Philippines	478	(11.1)	466	(21.0)	454	(17.9)	396	(7.4)
Qatar	556	(4.9)	570	(6.9)	509	(7.6)	468	(2.9)
Russia	554	(4.4)	575	(8.8)	527	(10.0)	508	(4.2)
Serbia	545	(7.4)	568	(7.6)	496	(8.5)	482	(4.8)
Singapore	615	(3.7)	635	(3.8)	578	(6.9)	549	(5.2)
Chinese Taipei	565	(4.7)	589	(6.1)	548	(7.5)	515	(4.7)
Thailand	463	(9.1)	493	(7.7)	458	(10.9)	431	(4.7)
United Arab Emirates	569	(4.6)	571	(5.7)	511	(7.7)	477	(3.6)
Uruguay	532	(11.7)	540	(17.0)	511	(12.1)	483	(4.6)
Overall average	548	(1.0)	563	(1.4)	520	(1.3)	497	(0.6)

1. In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

Notes: The computation is based on 10 plausible values with student weights 80 replicates.

The process (log) data analysed in this report focuses on a total of 76 270 students from 70 countries and economies who responded to the "Rapa Nui" reading unit (CR551) with an overall average reading performance score of 517 points, marginally higher than the average reading score of the full sample 460 points from the 70 countries and economies.

Source: OECD, PISA 2018 Database.

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Table B.4.1 [1/6] **Enjoyment of reading**

Based on students' reports

	Index of enjoyment of reading			Change in reading performance associated with a one-unit increase in the index of enjoyment of reading, after accounting for students' and schools' socio-economic profile[1] and gender			Percentage of students who reported that: I read only if I have to										
							Strongly disagree			Disagree			Agree			Strongly agree		
	Mean index	S.E.	s	Score dif.	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD																		
Australia	-0.13	(0.01)		**28**	(0.9)		18.3	(0.4)		27.9	(0.4)		32.2	(0.5)		21.6	(0.4)	
Austria	-0.28	(0.02)		**19**	(0.9)		25.5	(0.7)		21.9	(0.6)		25.6	(0.6)		27.0	(0.7)	
Belgium	-0.44	(0.02)		**19**	(0.9)		17.6	(0.5)		24.6	(0.5)		29.4	(0.6)		28.4	(0.6)	
Canada	0.01	(0.01)		**28**	(0.9)		20.5	(0.4)		31.5	(0.5)		30.3	(0.5)		17.6	(0.4)	
Chile	0.04	(0.02)		**20**	(1.2)		16.6	(0.6)		22.2	(0.5)		38.1	(0.7)		23.1	(0.6)	
Colombia	0.38	(0.01)		**24**	(1.4)		21.3	(0.6)		36.9	(0.6)		33.2	(0.8)		8.6	(0.4)	
Czech Republic	-0.05	(0.02)		**18**	(1.1)		21.5	(0.6)		29.2	(0.6)		28.5	(0.6)		20.8	(0.6)	
Denmark	-0.37	(0.02)		**20**	(1.4)		13.7	(0.5)		29.2	(0.7)		34.0	(0.7)		23.1	(0.6)	
Estonia	0.00	(0.01)		**26**	(1.9)		21.7	(0.7)		34.9	(0.7)		29.7	(0.8)		13.7	(0.6)	
Finland	-0.25	(0.02)		**29**	(1.2)		17.3	(0.6)		32.1	(0.7)		30.4	(0.7)		20.3	(0.6)	
France	-0.12	(0.02)		**24**	(1.1)		27.1	(0.7)		29.9	(0.6)		22.5	(0.6)		20.6	(0.6)	
Germany	-0.29	(0.02)		**19**	(1.2)		25.4	(0.7)		24.2	(0.8)		26.4	(0.7)		23.9	(0.8)	
Greece	0.11	(0.01)		**26**	(1.6)		18.6	(0.6)		33.6	(0.8)		36.8	(0.7)		11.0	(0.5)	
Hungary	0.03	(0.02)		**20**	(1.2)		26.8	(0.8)		32.7	(0.7)		27.4	(0.8)		13.1	(0.5)	
Iceland	-0.22	(0.02)		**28**	(1.8)		14.5	(0.6)		29.0	(0.8)		34.6	(0.9)		22.0	(0.7)	
Ireland	-0.07	(0.02)		**31**	(1.1)		18.3	(0.6)		30.2	(0.7)		32.4	(0.8)		19.1	(0.6)	
Israel	0.09	(0.02)		**13**	(1.7)		26.8	(0.7)		28.9	(0.6)		29.2	(0.8)		15.1	(0.5)	
Italy	0.09	(0.02)		**15**	(1.1)		28.5	(0.8)		33.1	(0.9)		23.6	(0.6)		14.8	(0.5)	
Japan	0.30	(0.02)		**26**	(0.9)		28.6	(0.6)		32.1	(0.6)		21.0	(0.5)		18.3	(0.5)	
Korea	0.23	(0.01)		**26**	(1.7)		14.2	(0.4)		31.8	(0.7)		44.3	(0.8)		9.7	(0.4)	
Latvia	0.02	(0.01)		**25**	(1.5)		20.7	(0.6)		34.7	(0.7)		29.8	(0.6)		14.7	(0.5)	
Lithuania	-0.11	(0.02)		**11**	(1.1)		20.0	(0.5)		20.5	(0.6)		35.5	(0.6)		24.0	(0.7)	
Luxembourg	-0.24	(0.01)		**20**	(1.3)		23.0	(0.6)		23.6	(0.6)		26.5	(0.6)		26.9	(0.6)	
Mexico	0.35	(0.01)		**22**	(1.4)		19.7	(0.6)		33.6	(0.7)		37.7	(0.8)		9.1	(0.4)	
Netherlands	-0.57	(0.02)		**23**	(1.5)		12.5	(0.6)		24.6	(0.6)		34.1	(0.9)		28.8	(0.7)	
New Zealand	-0.08	(0.02)		**29**	(1.2)		18.2	(0.5)		29.6	(0.6)		32.2	(0.5)		20.0	(0.6)	
Norway	-0.51	(0.02)		**21**	(1.2)		14.3	(0.4)		27.7	(0.6)		30.7	(0.6)		27.2	(0.6)	
Poland	0.18	(0.02)		**28**	(1.3)		27.3	(0.8)		33.2	(0.6)		26.8	(0.7)		12.7	(0.5)	
Portugal	0.08	(0.02)		**23**	(1.4)		29.5	(0.7)		40.0	(0.8)		21.0	(0.6)		9.6	(0.5)	
Slovak Republic	0.11	(0.02)		**21**	(1.3)		25.2	(0.7)		30.3	(0.7)		28.6	(0.7)		15.9	(0.6)	
Slovenia	-0.22	(0.02)		**14**	(1.3)		16.2	(0.6)		27.0	(0.7)		33.8	(0.7)		23.0	(0.6)	
Spain[2]	0.08	(0.01)		**22**	(0.7)		27.2	(0.4)		29.8	(0.3)		23.6	(0.3)		19.4	(0.3)	
Sweden	-0.31	(0.02)		**20**	(1.6)		15.5	(0.6)		27.6	(0.8)		32.1	(0.7)		24.8	(0.7)	
Switzerland	-0.32	(0.02)		**21**	(1.3)		22.4	(0.7)		24.2	(0.7)		26.1	(0.6)		27.2	(0.8)	
Turkey	0.68	(0.02)		**17**	(1.4)		39.8	(0.7)		36.2	(0.6)		17.7	(0.5)		6.3	(0.4)	
United Kingdom	-0.21	(0.02)		**26**	(1.2)		16.5	(0.5)		29.3	(0.6)		32.8	(0.6)		21.4	(0.6)	
United States	-0.07	(0.02)		**25**	(1.6)		15.2	(0.6)		29.8	(0.7)		33.5	(0.6)		21.4	(0.6)	
OECD average	-0.06	(0.00)		22	(0.2)		21.3	(0.1)		29.7	(0.1)		30.1	(0.1)		19.0	(0.1)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).
2. For the comparability of Spain's data see Note 1 under Table B.3.9.
3. Jordan and Morocco have reliabilities lower than 0.60 on the index of enjoyment of reading.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.1 [2/6] **Enjoyment of reading**

Based on students' reports

	Index of enjoyment of reading			Change in reading performance associated with a one-unit increase in the index of enjoyment of reading, after accounting for students' and schools' socio-economic profile[1] and gender			Percentage of students who reported that: I read only if I have to											
							Strongly disagree			Disagree			Agree			Strongly agree		
	Mean index	S.E.	s	Score dif.	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners																		
Albania	0.69	(0.01)		**17**	(1.6)		28.4	(0.7)		32.7	(0.6)		28.1	(0.6)		10.8	(0.4)	
Argentina	0.02	(0.01)		**21**	(1.2)		16.9	(0.5)		21.4	(0.5)		42.5	(0.8)		19.3	(0.5)	
Baku (Azerbaijan)	0.43	(0.01)		**20**	(1.3)		20.8	(0.6)		26.5	(0.6)		35.0	(0.7)		17.7	(0.5)	
Belarus	0.30	(0.02)		**23**	(1.6)		16.1	(0.7)		38.0	(0.6)		38.9	(0.9)		7.1	(0.3)	
Bosnia and Herzegovina	-0.03	(0.02)		**16**	(1.3)		19.3	(0.7)		28.9	(0.7)		35.1	(0.7)		16.8	(0.6)	
Brazil	0.37	(0.01)		**22**	(1.3)		33.5	(0.6)		42.2	(0.6)		17.9	(0.5)		6.4	(0.3)	
Brunei Darussalam	0.25	(0.01)		**26**	(1.1)		14.4	(0.4)		26.5	(0.5)		43.2	(0.5)		16.0	(0.5)	
B-S-J-Z (China)	0.97	(0.02)		**22**	(1.3)		46.1	(0.9)		42.0	(0.8)		9.6	(0.5)		2.3	(0.3)	
Bulgaria	0.23	(0.02)		**18**	(1.7)		27.1	(0.8)		26.3	(0.7)		34.5	(0.8)		12.0	(0.5)	
Costa Rica	0.10	(0.02)		**14**	(1.1)		18.3	(0.7)		24.3	(0.6)		37.1	(0.7)		20.3	(0.6)	
Croatia	-0.28	(0.02)		**14**	(1.3)		14.2	(0.5)		28.5	(0.7)		37.6	(0.6)		19.7	(0.6)	
Cyprus	-0.21	(0.01)		**19**	(1.2)		15.9	(0.5)		29.9	(0.6)		38.6	(0.8)		15.6	(0.5)	
Dominican Republic	0.40	(0.01)		**16**	(1.6)		24.2	(0.6)		26.9	(0.7)		33.7	(0.7)		15.1	(0.7)	
Georgia	0.43	(0.01)		**28**	(1.8)		25.9	(0.7)		36.0	(0.8)		31.3	(0.8)		6.8	(0.4)	
Hong Kong (China)	0.29	(0.01)		**26**	(1.4)		16.2	(0.5)		37.7	(0.7)		34.9	(0.7)		11.2	(0.5)	
Indonesia	0.50	(0.01)		**16**	(2.1)		19.3	(0.8)		48.9	(0.9)		27.7	(1.0)		4.1	(0.3)	
Jordan	0.47	(0.01)		**21**	(1.5)		42.4	(0.7)		31.5	(0.7)		20.2	(0.6)		5.9	(0.3)	
Kazakhstan	0.53	(0.01)		**10**	(1.3)		30.0	(0.6)		51.4	(0.5)		15.1	(0.4)		3.4	(0.1)	
Kosovo	0.61	(0.01)		**18**	(1.6)		25.2	(0.8)		32.8	(0.8)		33.2	(0.8)		8.8	(0.4)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	0.26	(0.01)		**31**	(1.8)		15.4	(0.6)		38.0	(0.8)		35.2	(0.8)		11.5	(0.5)	
Malaysia	0.40	(0.01)		**24**	(1.7)		21.5	(0.7)		46.7	(0.8)		26.7	(0.8)		5.1	(0.3)	
Malta	0.04	(0.02)		**30**	(1.5)		23.6	(0.7)		30.7	(0.8)		30.8	(0.9)		14.9	(0.7)	
Moldova	0.24	(0.01)		**19**	(1.6)		19.7	(0.6)		39.6	(0.8)		34.3	(0.8)		6.3	(0.4)	
Montenegro	0.15	(0.01)		**17**	(1.1)		25.5	(0.6)		31.6	(0.6)		29.2	(0.6)		13.7	(0.4)	
Morocco[3]	0.38	(0.01)		**9**	(1.4)		29.1	(0.6)		40.4	(0.7)		24.1	(0.7)		6.3	(0.4)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m	
Panama	0.32	(0.02)		**17**	(1.3)		19.7	(0.7)		27.1	(0.7)		38.1	(0.8)		15.1	(0.5)	
Peru	0.46	(0.01)		**19**	(1.5)		17.2	(0.6)		38.2	(0.8)		35.8	(0.8)		8.8	(0.4)	
Philippines	0.53	(0.01)		**27**	(1.4)		9.7	(0.5)		27.3	(0.5)		53.9	(0.7)		9.2	(0.4)	
Qatar	0.27	(0.01)		**26**	(0.9)		23.5	(0.4)		29.8	(0.4)		34.5	(0.5)		12.2	(0.3)	
Romania	0.10	(0.03)		**15**	(1.5)		17.0	(0.7)		29.9	(1.0)		41.7	(1.2)		11.4	(0.6)	
Russia	0.33	(0.01)		**27**	(1.3)		24.5	(0.7)		42.2	(0.6)		26.4	(0.7)		6.9	(0.4)	
Saudi Arabia	0.33	(0.01)		**18**	(1.4)		24.8	(0.7)		27.5	(0.7)		39.3	(0.7)		8.3	(0.4)	
Serbia	-0.02	(0.02)		**15**	(1.5)		19.9	(0.6)		29.3	(0.6)		33.6	(0.8)		17.3	(0.5)	
Singapore	0.19	(0.01)		**26**	(1.2)		20.4	(0.5)		33.9	(0.6)		31.3	(0.6)		14.4	(0.4)	
Chinese Taipei	0.34	(0.02)		**31**	(1.4)		15.9	(0.6)		34.4	(0.6)		38.3	(0.7)		11.4	(0.5)	
Thailand	0.27	(0.01)		**19**	(1.6)		10.2	(0.5)		34.7	(0.7)		47.1	(0.7)		8.1	(0.4)	
Ukraine	0.28	(0.01)		**24**	(1.3)		26.1	(0.7)		47.3	(0.7)		20.9	(0.6)		5.8	(0.3)	
United Arab Emirates	0.38	(0.01)		**27**	(1.1)		24.2	(0.5)		27.6	(0.3)		34.6	(0.5)		13.7	(0.4)	
Uruguay	0.24	(0.02)		**25**	(1.4)		30.2	(0.8)		33.3	(0.7)		23.8	(0.7)		12.8	(0.5)	
Viet Nam	0.49	(0.02)		m	m		22.0	(0.8)		52.5	(0.9)		23.2	(0.9)		2.4	(0.2)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

3. Jordan and Morocco have reliabilities lower than 0.60 on the index of enjoyment of reading.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.1 [3/6] **Enjoyment of reading**

Based on students' reports

	Percentage of students who reported that:																							
	Reading is one of my favourite hobbies												I like talking about books with other people											
	Strongly disagree			Disagree			Agree			Strongly agree			Strongly disagree			Disagree			Agree			Strongly agree		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD **Australia**	31.6	(0.5)		35.2	(0.5)		21.7	(0.4)		11.5	(0.3)		32.3	(0.5)		33.6	(0.5)		25.1	(0.5)		9.0	(0.3)	
Austria	46.7	(0.8)		24.9	(0.6)		17.3	(0.4)		11.1	(0.5)		48.3	(0.8)		25.4	(0.7)		15.9	(0.5)		10.4	(0.5)	
Belgium	47.8	(0.8)		30.6	(0.6)		14.8	(0.4)		6.8	(0.3)		44.9	(0.7)		29.6	(0.6)		20.6	(0.5)		5.0	(0.3)	
Canada	26.9	(0.5)		36.5	(0.4)		24.0	(0.4)		12.6	(0.4)		27.8	(0.5)		33.0	(0.5)		29.4	(0.5)		9.8	(0.3)	
Chile	27.5	(0.6)		34.5	(0.6)		24.1	(0.6)		13.9	(0.5)		26.6	(0.7)		31.0	(0.6)		28.9	(0.6)		13.5	(0.6)	
Colombia	9.7	(0.4)		34.5	(0.6)		40.6	(0.7)		15.1	(0.6)		10.8	(0.5)		36.6	(0.8)		39.9	(0.8)		12.6	(0.4)	
Czech Republic	28.9	(0.8)		34.3	(0.7)		24.1	(0.7)		12.7	(0.5)		28.3	(0.8)		32.8	(0.7)		28.8	(0.7)		10.0	(0.5)	
Denmark	50.5	(0.7)		32.8	(0.7)		11.6	(0.5)		5.1	(0.3)		37.9	(0.8)		33.0	(0.7)		22.2	(0.7)		6.9	(0.4)	
Estonia	28.3	(0.7)		40.3	(0.8)		23.0	(0.6)		8.4	(0.4)		25.4	(0.6)		35.0	(0.8)		31.6	(0.7)		7.9	(0.4)	
Finland	37.6	(0.8)		37.0	(0.7)		18.1	(0.5)		7.3	(0.4)		35.3	(0.8)		34.0	(0.8)		23.1	(0.6)		7.5	(0.4)	
France	40.1	(0.8)		29.3	(0.6)		20.1	(0.6)		10.5	(0.4)		38.3	(0.9)		26.3	(0.7)		26.6	(0.8)		8.8	(0.4)	
Germany	46.8	(0.9)		26.7	(0.7)		16.0	(0.7)		10.5	(0.5)		47.9	(1.0)		28.1	(0.7)		14.8	(0.7)		9.1	(0.4)	
Greece	21.6	(0.6)		42.8	(0.8)		27.3	(0.7)		8.4	(0.4)		25.8	(0.6)		36.1	(0.7)		28.1	(0.6)		10.0	(0.4)	
Hungary	26.6	(0.8)		38.5	(0.7)		23.5	(0.7)		11.3	(0.5)		30.6	(0.8)		34.3	(0.7)		24.8	(0.7)		10.3	(0.5)	
Iceland	37.9	(0.7)		38.4	(0.7)		16.5	(0.6)		7.3	(0.5)		35.7	(0.8)		29.1	(0.7)		26.1	(0.7)		9.1	(0.5)	
Ireland	29.2	(0.7)		40.0	(0.6)		20.0	(0.5)		10.8	(0.5)		28.7	(0.7)		37.9	(0.7)		24.9	(0.7)		8.5	(0.4)	
Israel	26.5	(0.7)		31.7	(0.7)		26.6	(0.8)		15.2	(0.5)		30.8	(0.7)		29.4	(0.6)		28.3	(0.7)		11.6	(0.5)	
Italy	29.2	(0.7)		31.6	(0.6)		25.9	(0.6)		13.3	(0.5)		28.1	(0.7)		31.2	(0.8)		30.0	(0.7)		10.8	(0.5)	
Japan	23.8	(0.7)		31.0	(0.6)		26.2	(0.6)		19.1	(0.6)		23.5	(0.7)		33.3	(0.7)		29.5	(0.6)		13.7	(0.5)	
Korea	16.6	(0.6)		41.2	(0.7)		30.4	(0.6)		11.7	(0.4)		16.4	(0.6)		38.4	(0.7)		33.0	(0.7)		12.3	(0.4)	
Latvia	24.1	(0.6)		42.6	(0.7)		23.4	(0.6)		9.9	(0.4)		21.0	(0.6)		39.0	(0.7)		30.9	(0.6)		9.1	(0.4)	
Lithuania	36.7	(0.8)		29.1	(0.7)		23.8	(0.7)		10.4	(0.4)		32.3	(0.7)		27.0	(0.6)		27.3	(0.7)		13.5	(0.4)	
Luxembourg	42.0	(0.7)		30.6	(0.7)		17.3	(0.5)		10.1	(0.4)		42.0	(0.6)		29.5	(0.7)		20.0	(0.5)		8.4	(0.4)	
Mexico	10.4	(0.4)		33.0	(0.7)		41.0	(0.8)		15.6	(0.5)		12.2	(0.5)		36.3	(0.7)		38.2	(0.7)		13.4	(0.5)	
Netherlands	52.1	(0.9)		29.7	(0.7)		12.8	(0.5)		5.4	(0.4)		51.6	(0.9)		29.5	(0.8)		15.2	(0.5)		3.8	(0.4)	
New Zealand	30.0	(0.8)		36.2	(0.7)		21.8	(0.6)		11.9	(0.5)		31.4	(0.7)		35.0	(0.8)		24.4	(0.6)		9.2	(0.4)	
Norway	49.8	(0.7)		29.9	(0.7)		13.2	(0.5)		7.1	(0.4)		48.3	(0.8)		28.1	(0.6)		17.6	(0.6)		6.0	(0.3)	
Poland	22.4	(0.6)		37.0	(0.6)		26.7	(0.6)		13.8	(0.6)		19.2	(0.7)		36.1	(0.7)		33.4	(0.7)		11.3	(0.5)	
Portugal	28.8	(0.7)		39.2	(0.8)		22.9	(0.6)		9.2	(0.5)		24.9	(0.7)		37.1	(0.7)		30.1	(0.7)		8.0	(0.5)	
Slovak Republic	21.6	(0.7)		37.7	(0.7)		26.6	(0.7)		14.1	(0.5)		23.2	(0.7)		37.8	(0.7)		28.6	(0.7)		10.4	(0.5)	
Slovenia	36.9	(0.7)		37.3	(0.8)		16.9	(0.6)		8.9	(0.5)		31.6	(0.7)		34.9	(0.7)		24.9	(0.7)		8.6	(0.4)	
Spain[2]	31.2	(0.4)		33.0	(0.5)		22.3	(0.3)		13.5	(0.3)		29.5	(0.4)		29.3	(0.4)		28.5	(0.3)		12.7	(0.3)	
Sweden	40.0	(0.9)		35.6	(0.7)		16.9	(0.6)		7.6	(0.5)		34.7	(0.8)		33.1	(0.7)		23.9	(0.7)		8.3	(0.4)	
Switzerland	47.4	(1.0)		26.7	(0.8)		16.4	(0.5)		9.5	(0.5)		46.2	(0.9)		27.1	(0.7)		18.2	(0.7)		8.5	(0.5)	
Turkey	10.6	(0.4)		25.1	(0.6)		40.3	(0.6)		23.9	(0.7)		10.9	(0.5)		26.0	(0.6)		39.7	(0.6)		23.4	(0.6)	
United Kingdom	35.2	(0.9)		37.3	(0.8)		18.8	(0.5)		8.6	(0.3)		34.0	(0.8)		35.4	(0.6)		23.1	(0.6)		7.4	(0.4)	
United States	28.9	(0.7)		38.1	(0.8)		22.3	(0.6)		10.7	(0.5)		24.6	(0.7)		35.4	(0.8)		30.4	(0.8)		9.7	(0.5)	
OECD average	31.9	(0.1)		34.3	(0.1)		22.6	(0.1)		11.2	(0.1)		30.8	(0.1)		32.6	(0.1)		26.6	(0.1)		10.0	(0.1)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).
2. For the comparability of Spain's data see Note 1 under Table B.3.9.
3. Jordan and Morocco have reliabilities lower than 0.60 on the index of enjoyment of reading.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.1 [4/6] **Enjoyment of reading**

Based on students' reports

	Percentage of students who reported that:																							
	Reading is one of my favourite hobbies												I like talking about books with other people											
	Strongly disagree			Disagree			Agree			Strongly agree			Strongly disagree			Disagree			Agree			Strongly agree		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners																								
Albania	4.5	(0.3)		18.7	(0.5)		50.6	(0.7)		26.2	(0.7)		5.5	(0.3)		18.1	(0.6)		53.5	(0.6)		22.9	(0.7)	
Argentina	23.5	(0.5)		36.5	(0.7)		26.2	(0.6)		13.8	(0.4)		26.7	(0.7)		35.5	(0.8)		26.4	(0.6)		11.4	(0.5)	
Baku (Azerbaijan)	10.7	(0.4)		20.5	(0.6)		45.5	(0.7)		23.3	(0.5)		12.3	(0.5)		24.6	(0.7)		41.6	(0.9)		21.6	(0.5)	
Belarus	7.6	(0.4)		45.5	(0.9)		35.7	(0.7)		11.3	(0.5)		8.1	(0.4)		36.7	(0.9)		42.5	(0.7)		12.7	(0.6)	
Bosnia and Herzegovina	26.1	(0.7)		39.5	(0.8)		25.1	(0.6)		9.3	(0.5)		24.9	(0.8)		33.7	(0.7)		31.6	(0.7)		9.8	(0.5)	
Brazil	14.5	(0.4)		38.5	(0.6)		33.1	(0.6)		13.9	(0.4)		14.7	(0.4)		36.9	(0.5)		35.6	(0.5)		12.8	(0.4)	
Brunei Darussalam	10.3	(0.4)		33.0	(0.6)		40.0	(0.6)		16.7	(0.5)		12.7	(0.4)		41.2	(0.6)		34.1	(0.6)		12.0	(0.4)	
B-S-J-Z (China)	2.3	(0.2)		14.5	(0.6)		52.8	(0.9)		30.4	(0.7)		3.0	(0.2)		21.3	(0.5)		53.0	(0.8)		22.7	(0.8)	
Bulgaria	16.4	(0.6)		35.4	(0.8)		32.8	(0.8)		15.5	(0.6)		20.1	(0.7)		32.3	(0.7)		33.6	(0.8)		14.0	(0.6)	
Costa Rica	23.7	(0.6)		34.3	(0.6)		25.3	(0.5)		16.7	(0.6)		24.6	(0.7)		36.4	(0.6)		26.1	(0.5)		12.9	(0.5)	
Croatia	36.7	(0.8)		40.8	(0.6)		16.0	(0.5)		6.6	(0.3)		35.1	(0.7)		35.8	(0.6)		22.0	(0.6)		7.1	(0.4)	
Cyprus	38.3	(0.7)		38.4	(0.7)		17.2	(0.6)		6.1	(0.3)		32.9	(0.6)		32.0	(0.7)		26.4	(0.6)		8.6	(0.4)	
Dominican Republic	12.0	(0.5)		26.1	(0.7)		40.9	(0.9)		21.0	(0.7)		13.1	(0.5)		28.3	(0.7)		41.3	(0.8)		17.4	(0.6)	
Georgia	9.3	(0.5)		29.7	(0.7)		43.2	(0.7)		17.7	(0.6)		9.3	(0.5)		26.5	(0.6)		45.4	(0.6)		18.9	(0.6)	
Hong Kong (China)	9.9	(0.5)		30.8	(0.6)		43.5	(0.8)		15.8	(0.5)		12.0	(0.5)		39.3	(0.6)		39.7	(0.6)		8.9	(0.4)	
Indonesia	3.9	(0.3)		22.4	(0.8)		57.6	(0.8)		16.1	(0.8)		4.2	(0.4)		26.1	(0.9)		59.9	(0.9)		9.9	(0.5)	
Jordan	11.9	(0.4)		21.7	(0.7)		44.5	(0.9)		21.8	(0.7)		14.2	(0.5)		27.1	(0.8)		41.5	(0.8)		17.3	(0.6)	
Kazakhstan	5.7	(0.3)		19.9	(0.4)		57.4	(0.5)		17.0	(0.4)		7.4	(0.3)		30.7	(0.5)		49.6	(0.6)		12.2	(0.3)	
Kosovo	7.0	(0.4)		18.2	(0.6)		53.7	(0.8)		21.2	(0.7)		7.2	(0.4)		19.6	(0.7)		53.0	(0.9)		20.2	(0.8)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	9.1	(0.5)		34.1	(0.8)		41.6	(0.7)		15.2	(0.5)		11.0	(0.5)		43.1	(0.8)		38.4	(0.8)		7.5	(0.4)	
Malaysia	6.5	(0.3)		31.0	(0.7)		47.4	(0.8)		15.1	(0.6)		7.8	(0.3)		39.6	(0.9)		42.4	(0.9)		10.2	(0.5)	
Malta	25.4	(0.8)		35.9	(0.8)		25.4	(0.8)		13.3	(0.6)		27.4	(0.8)		34.4	(0.8)		28.9	(0.8)		9.3	(0.5)	
Moldova	11.2	(0.5)		41.8	(0.9)		35.6	(0.8)		11.4	(0.4)		11.6	(0.6)		37.6	(0.6)		40.0	(0.7)		10.8	(0.5)	
Montenegro	22.4	(0.5)		37.9	(0.6)		28.7	(0.6)		11.0	(0.3)		21.2	(0.5)		31.5	(0.6)		35.0	(0.6)		12.2	(0.4)	
Morocco[3]	14.5	(0.5)		24.5	(0.6)		43.3	(0.7)		17.7	(0.6)		15.8	(0.5)		27.6	(0.7)		43.5	(0.8)		13.2	(0.5)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Panama	13.7	(0.6)		29.0	(0.6)		35.9	(0.8)		21.3	(0.6)		16.5	(0.8)		32.3	(0.8)		34.2	(0.9)		17.0	(0.7)	
Peru	6.3	(0.4)		30.7	(0.7)		46.2	(0.7)		16.7	(0.7)		6.6	(0.4)		33.3	(0.8)		45.8	(0.6)		14.3	(0.5)	
Philippines	4.8	(0.3)		22.3	(0.5)		51.6	(0.6)		21.3	(0.5)		5.9	(0.4)		26.8	(0.7)		50.8	(0.7)		16.5	(0.5)	
Qatar	15.8	(0.3)		29.8	(0.4)		35.4	(0.4)		19.0	(0.4)		17.8	(0.3)		30.9	(0.4)		36.5	(0.4)		14.7	(0.3)	
Romania	18.6	(0.7)		38.1	(0.9)		31.2	(0.8)		12.1	(0.7)		18.5	(0.8)		37.2	(0.9)		32.7	(1.0)		11.6	(0.6)	
Russia	10.5	(0.5)		39.3	(0.7)		36.8	(0.8)		13.5	(0.4)		11.2	(0.5)		35.6	(0.6)		40.5	(0.8)		12.7	(0.5)	
Saudi Arabia	14.4	(0.4)		25.6	(0.7)		39.3	(0.6)		20.7	(0.7)		18.0	(0.6)		28.0	(0.7)		36.7	(0.6)		17.3	(0.6)	
Serbia	25.1	(0.7)		40.7	(0.7)		24.4	(0.7)		9.8	(0.4)		24.5	(0.7)		33.6	(0.7)		31.3	(0.7)		10.6	(0.4)	
Singapore	16.1	(0.5)		35.0	(0.5)		33.0	(0.6)		15.9	(0.4)		20.6	(0.5)		38.2	(0.6)		29.2	(0.6)		11.9	(0.4)	
Chinese Taipei	7.9	(0.4)		31.9	(0.6)		42.4	(0.7)		17.8	(0.6)		9.4	(0.4)		37.3	(0.7)		41.5	(0.6)		11.8	(0.5)	
Thailand	4.8	(0.3)		28.6	(0.7)		55.0	(0.7)		11.6	(0.5)		7.3	(0.4)		38.2	(0.7)		48.1	(0.8)		6.3	(0.4)	
Ukraine	13.0	(0.5)		43.1	(0.7)		33.2	(0.8)		10.7	(0.5)		12.8	(0.5)		32.2	(0.8)		42.6	(0.8)		12.4	(0.5)	
United Arab Emirates	13.0	(0.3)		26.2	(0.4)		38.0	(0.5)		22.8	(0.4)		14.4	(0.3)		25.6	(0.6)		39.8	(0.6)		20.2	(0.4)	
Uruguay	22.2	(0.7)		33.1	(0.7)		28.5	(0.7)		16.2	(0.7)		24.1	(0.6)		36.2	(0.7)		26.8	(0.7)		12.9	(0.6)	
Viet Nam	3.2	(0.3)		24.3	(0.9)		58.9	(0.9)		13.5	(0.6)		6.3	(0.4)		43.3	(0.9)		41.2	(0.9)		9.1	(0.5)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

3. Jordan and Morocco have reliabilities lower than 0.60 on the index of enjoyment of reading.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.1 [5/6] **Enjoyment of reading**

Based on students' reports

	Percentage of students who reported that:																							
	For me, reading is a waste of time												I read only to get information that I need											
	Strongly disagree			Disagree			Agree			Strongly agree			Strongly disagree			Disagree			Agree			Strongly agree		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD																								
Australia	30.3	(0.5)		38.2	(0.5)		19.1	(0.4)		12.4	(0.3)		16.5	(0.3)		30.3	(0.4)		35.0	(0.5)		18.1	(0.4)	
Austria	38.9	(0.8)		26.0	(0.6)		20.0	(0.5)		15.1	(0.5)		23.8	(0.7)		22.7	(0.6)		28.3	(0.6)		25.2	(0.7)	
Belgium	23.7	(0.6)		34.2	(0.6)		21.9	(0.6)		20.2	(0.6)		17.8	(0.4)		27.3	(0.6)		38.4	(0.6)		16.5	(0.5)	
Canada	32.9	(0.5)		40.7	(0.4)		16.5	(0.4)		10.0	(0.3)		19.0	(0.4)		34.0	(0.5)		31.4	(0.5)		15.6	(0.4)	
Chile	40.3	(0.9)		39.9	(0.7)		14.0	(0.5)		5.8	(0.4)		16.5	(0.6)		25.1	(0.5)		39.1	(0.7)		19.3	(0.5)	
Colombia	40.0	(0.8)		47.6	(0.7)		9.5	(0.5)		3.0	(0.2)		17.5	(0.6)		36.4	(0.8)		36.2	(0.8)		9.9	(0.4)	
Czech Republic	27.2	(0.7)		34.5	(0.6)		21.2	(0.6)		17.2	(0.6)		19.9	(0.5)		34.1	(0.8)		35.3	(0.7)		10.8	(0.4)	
Denmark	26.5	(0.6)		42.5	(0.7)		18.4	(0.5)		12.6	(0.5)		13.9	(0.5)		31.9	(0.8)		36.5	(0.7)		17.8	(0.6)	
Estonia	31.8	(0.7)		41.2	(0.7)		17.0	(0.6)		10.0	(0.5)		16.0	(0.5)		37.5	(0.7)		36.8	(0.7)		9.7	(0.5)	
Finland	25.7	(0.7)		36.7	(0.6)		21.7	(0.6)		16.0	(0.6)		15.0	(0.5)		33.1	(0.7)		36.7	(0.7)		15.2	(0.6)	
France	32.4	(0.8)		36.0	(0.6)		17.7	(0.5)		14.0	(0.5)		23.0	(0.7)		29.0	(0.7)		31.9	(0.7)		16.1	(0.6)	
Germany	37.4	(0.9)		28.3	(0.7)		19.6	(0.6)		14.7	(0.6)		22.2	(0.7)		23.3	(0.7)		30.3	(0.7)		24.1	(0.7)	
Greece	40.1	(0.8)		43.9	(0.6)		10.6	(0.6)		5.4	(0.3)		21.0	(0.7)		41.8	(0.8)		27.5	(0.7)		9.7	(0.4)	
Hungary	33.5	(0.9)		36.6	(0.8)		20.2	(0.8)		9.8	(0.5)		19.8	(0.6)		31.5	(0.7)		34.7	(0.8)		14.0	(0.6)	
Iceland	27.3	(0.8)		42.0	(0.9)		19.1	(0.8)		11.5	(0.5)		16.4	(0.7)		32.6	(0.8)		34.7	(0.8)		16.3	(0.7)	
Ireland	32.5	(0.7)		40.7	(0.7)		17.7	(0.6)		9.1	(0.4)		15.1	(0.5)		32.9	(0.8)		37.5	(0.8)		14.5	(0.5)	
Israel	37.4	(0.8)		35.6	(0.5)		17.4	(0.5)		9.6	(0.4)		22.8	(0.7)		28.2	(0.6)		33.1	(0.8)		15.9	(0.5)	
Italy	36.8	(0.7)		37.1	(0.8)		16.3	(0.6)		9.7	(0.4)		18.8	(0.6)		33.6	(0.6)		34.4	(0.7)		13.2	(0.5)	
Japan	46.5	(0.8)		37.9	(0.7)		9.7	(0.4)		5.9	(0.3)		30.9	(0.7)		41.1	(0.6)		20.0	(0.5)		7.9	(0.3)	
Korea	39.0	(0.8)		45.5	(0.7)		12.6	(0.5)		3.0	(0.2)		23.6	(0.6)		41.8	(0.7)		28.3	(0.6)		6.3	(0.3)	
Latvia	29.2	(0.6)		43.7	(0.8)		17.1	(0.6)		10.0	(0.5)		13.5	(0.5)		35.1	(0.7)		38.1	(0.7)		13.3	(0.5)	
Lithuania	37.6	(0.7)		28.1	(0.7)		21.5	(0.5)		12.9	(0.5)		18.8	(0.6)		22.5	(0.6)		39.5	(0.6)		19.3	(0.6)	
Luxembourg	33.3	(0.6)		33.0	(0.6)		18.6	(0.6)		15.0	(0.5)		23.1	(0.6)		27.4	(0.6)		30.3	(0.5)		19.1	(0.5)	
Mexico	43.0	(0.8)		44.1	(0.8)		10.1	(0.5)		2.8	(0.2)		15.6	(0.5)		30.7	(0.8)		40.6	(0.8)		13.1	(0.5)	
Netherlands	21.2	(0.6)		36.3	(0.8)		22.1	(0.6)		20.4	(0.6)		13.6	(0.5)		27.2	(0.7)		41.4	(1.0)		17.9	(0.6)	
New Zealand	32.6	(0.6)		39.6	(0.6)		17.8	(0.5)		10.0	(0.5)		16.1	(0.5)		32.0	(0.6)		33.8	(0.6)		18.1	(0.5)	
Norway	23.1	(0.7)		36.4	(0.8)		20.6	(0.5)		19.9	(0.6)		12.3	(0.4)		26.0	(0.6)		37.3	(0.7)		24.4	(0.6)	
Poland	35.0	(0.8)		40.0	(0.7)		16.3	(0.5)		8.7	(0.4)		18.9	(0.6)		35.8	(0.7)		35.7	(0.7)		9.7	(0.5)	
Portugal	35.1	(0.8)		43.3	(0.7)		14.7	(0.6)		6.9	(0.4)		17.9	(0.6)		35.7	(0.8)		34.2	(0.7)		12.3	(0.6)	
Slovak Republic	32.8	(0.8)		39.3	(0.7)		18.1	(0.7)		9.8	(0.5)		19.7	(0.6)		33.4	(0.7)		35.9	(0.8)		10.9	(0.4)	
Slovenia	25.9	(0.8)		37.4	(0.8)		21.5	(0.6)		15.2	(0.5)		16.5	(0.6)		30.5	(0.7)		38.2	(0.8)		14.8	(0.5)	
Spain[2]	39.4	(0.4)		38.1	(0.4)		14.0	(0.3)		8.5	(0.2)		23.0	(0.4)		31.7	(0.4)		32.5	(0.4)		12.8	(0.2)	
Sweden	24.7	(0.8)		37.5	(0.7)		21.4	(0.6)		16.3	(0.5)		14.6	(0.5)		28.3	(0.6)		37.0	(0.8)		20.0	(0.7)	
Switzerland	34.5	(0.9)		30.0	(0.6)		19.5	(0.6)		16.1	(0.6)		21.7	(0.6)		25.8	(0.7)		30.5	(0.8)		22.0	(0.7)	
Turkey	55.7	(0.8)		32.1	(0.6)		7.7	(0.4)		4.5	(0.3)		30.2	(0.7)		36.2	(0.6)		23.5	(0.6)		10.1	(0.4)	
United Kingdom	28.8	(0.7)		40.4	(0.6)		18.9	(0.5)		11.9	(0.5)		14.9	(0.5)		28.3	(0.6)		37.9	(0.6)		18.9	(0.6)	
United States	30.2	(0.7)		41.8	(0.7)		18.3	(0.6)		9.7	(0.4)		14.6	(0.6)		31.9	(0.7)		36.4	(0.7)		17.1	(0.6)	
OECD average	33.6	(0.1)		38.0	(0.1)		17.3	(0.1)		11.2	(0.1)		18.8	(0.1)		31.5	(0.1)		34.3	(0.1)		15.4	(0.1)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

3. Jordan and Morocco have reliabilities lower than 0.60 on the index of enjoyment of reading.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.1 [6/6] **Enjoyment of reading**

Based on students' reports

	Percentage of students who reported that:																							
	For me, reading is a waste of time												I read only to get information that I need											
	Strongly disagree			Disagree			Agree			Strongly agree			Strongly disagree			Disagree			Agree			Strongly agree		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners																								
Albania	57.0	(0.7)		29.4	(0.6)		9.2	(0.4)		4.3	(0.3)		19.6	(0.6)		35.1	(0.8)		31.5	(0.7)		13.8	(0.4)	
Argentina	37.4	(0.7)		41.8	(0.7)		14.0	(0.4)		6.8	(0.4)		15.1	(0.5)		20.8	(0.7)		42.4	(0.8)		21.8	(0.6)	
Baku (Azerbaijan)	45.5	(0.6)		34.6	(0.7)		13.0	(0.5)		6.9	(0.3)		19.3	(0.5)		27.9	(0.7)		34.2	(0.6)		18.6	(0.5)	
Belarus	36.6	(1.0)		49.5	(0.9)		11.0	(0.4)		2.9	(0.2)		10.2	(0.5)		34.8	(0.7)		42.5	(0.8)		12.5	(0.5)	
Bosnia and Herzegovina	28.4	(0.7)		42.6	(0.8)		18.5	(0.5)		10.5	(0.5)		16.0	(0.6)		27.7	(0.6)		41.0	(0.6)		15.3	(0.5)	
Brazil	44.3	(0.7)		45.5	(0.6)		7.0	(0.3)		3.2	(0.2)		16.1	(0.4)		32.2	(0.5)		38.1	(0.5)		13.5	(0.4)	
Brunei Darussalam	43.8	(0.5)		43.3	(0.5)		10.3	(0.3)		2.5	(0.2)		10.6	(0.4)		24.4	(0.4)		40.9	(0.5)		24.1	(0.5)	
B-S-J-Z (China)	63.2	(0.9)		31.5	(0.8)		3.9	(0.3)		1.4	(0.2)		26.1	(0.7)		46.6	(0.6)		22.3	(0.6)		5.1	(0.3)	
Bulgaria	37.8	(0.9)		38.2	(0.9)		15.5	(0.6)		8.5	(0.5)		18.6	(0.7)		27.3	(0.7)		37.9	(0.8)		16.2	(0.6)	
Costa Rica	38.8	(1.0)		42.6	(0.8)		12.6	(0.5)		5.9	(0.3)		18.4	(0.5)		25.9	(0.8)		36.8	(0.7)		18.9	(0.7)	
Croatia	21.8	(0.7)		39.8	(0.6)		24.1	(0.6)		14.3	(0.5)		13.8	(0.5)		27.8	(0.5)		42.0	(0.7)		16.5	(0.5)	
Cyprus	24.0	(0.6)		45.3	(0.6)		18.3	(0.5)		12.4	(0.4)		13.5	(0.5)		31.4	(0.6)		39.3	(0.7)		15.8	(0.5)	
Dominican Republic	43.4	(0.8)		41.3	(0.8)		10.2	(0.5)		5.1	(0.3)		18.8	(0.6)		26.7	(0.7)		37.3	(0.7)		17.2	(0.5)	
Georgia	38.8	(0.8)		43.7	(0.8)		12.2	(0.5)		5.3	(0.4)		11.7	(0.5)		30.6	(0.7)		41.3	(0.9)		16.3	(0.6)	
Hong Kong (China)	35.1	(0.6)		43.7	(0.7)		15.7	(0.5)		5.5	(0.4)		15.3	(0.5)		38.1	(0.7)		35.9	(0.8)		10.7	(0.4)	
Indonesia	39.8	(0.9)		46.0	(0.8)		11.6	(0.8)		2.6	(0.3)		8.9	(0.5)		35.5	(0.9)		44.8	(1.0)		10.8	(0.6)	
Jordan	42.8	(0.8)		33.5	(0.6)		15.9	(0.6)		7.7	(0.4)		15.5	(0.4)		28.1	(0.7)		37.9	(0.7)		18.5	(0.5)	
Kazakhstan	37.1	(0.6)		51.3	(0.6)		8.7	(0.3)		2.8	(0.1)		10.9	(0.3)		34.5	(0.5)		41.9	(0.5)		12.7	(0.3)	
Kosovo	56.4	(0.8)		31.1	(0.7)		9.4	(0.5)		3.1	(0.2)		17.9	(0.6)		37.3	(0.8)		33.1	(0.8)		11.7	(0.5)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	34.5	(0.7)		47.1	(0.8)		13.9	(0.5)		4.5	(0.3)		13.2	(0.6)		36.4	(0.9)		36.4	(0.7)		13.9	(0.6)	
Malaysia	51.1	(0.9)		39.1	(0.8)		7.7	(0.4)		2.1	(0.3)		6.8	(0.4)		26.2	(0.8)		45.7	(0.8)		21.4	(0.6)	
Malta	35.5	(0.8)		37.9	(0.7)		16.4	(0.6)		10.2	(0.6)		17.7	(0.7)		32.9	(0.8)		33.0	(0.8)		16.4	(0.7)	
Moldova	31.8	(0.7)		47.0	(0.9)		17.5	(0.7)		3.6	(0.3)		11.1	(0.5)		29.6	(0.8)		44.6	(0.8)		14.7	(0.6)	
Montenegro	39.1	(0.6)		39.3	(0.6)		12.9	(0.4)		8.7	(0.3)		18.1	(0.5)		32.1	(0.6)		35.4	(0.6)		14.4	(0.5)	
Morocco[3]	37.8	(0.7)		49.1	(0.7)		9.5	(0.4)		3.6	(0.3)		13.9	(0.5)		30.8	(0.7)		40.0	(0.7)		15.3	(0.5)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Panama	40.1	(0.8)		44.5	(0.8)		11.1	(0.6)		4.3	(0.3)		16.9	(0.6)		26.6	(0.8)		37.7	(0.8)		18.7	(0.6)	
Peru	42.0	(0.8)		49.3	(0.8)		6.7	(0.4)		1.9	(0.2)		15.1	(0.6)		38.2	(0.6)		37.7	(0.7)		9.0	(0.4)	
Philippines	35.1	(0.8)		40.6	(0.7)		20.2	(0.7)		4.2	(0.3)		9.0	(0.4)		28.6	(0.6)		48.7	(0.8)		13.7	(0.5)	
Qatar	36.3	(0.5)		36.7	(0.4)		19.1	(0.3)		7.9	(0.2)		17.3	(0.4)		30.6	(0.5)		35.1	(0.5)		17.0	(0.3)	
Romania	32.6	(1.1)		39.9	(0.8)		20.0	(0.8)		7.5	(0.5)		12.4	(0.6)		26.7	(1.0)		42.3	(1.0)		18.7	(0.7)	
Russia	36.2	(0.9)		45.7	(0.8)		13.2	(0.5)		4.9	(0.3)		12.2	(0.4)		35.2	(0.7)		38.3	(0.7)		14.3	(0.4)	
Saudi Arabia	45.8	(0.8)		31.1	(0.7)		16.4	(0.5)		6.7	(0.4)		16.2	(0.6)		24.4	(0.6)		39.0	(0.7)		20.4	(0.6)	
Serbia	30.1	(0.6)		40.3	(0.7)		18.9	(0.6)		10.7	(0.4)		14.5	(0.5)		28.5	(0.6)		39.8	(0.6)		17.2	(0.5)	
Singapore	37.0	(0.6)		41.0	(0.5)		16.1	(0.4)		5.9	(0.3)		17.8	(0.5)		34.3	(0.6)		29.3	(0.6)		18.5	(0.5)	
Chinese Taipei	33.6	(0.8)		43.8	(0.8)		17.4	(0.6)		5.2	(0.3)		16.8	(0.7)		35.0	(0.7)		36.9	(0.6)		11.3	(0.5)	
Thailand	26.6	(0.8)		48.9	(0.8)		21.0	(0.8)		3.5	(0.3)		9.4	(0.4)		32.4	(0.7)		46.6	(0.7)		11.7	(0.4)	
Ukraine	35.1	(0.8)		49.0	(0.6)		11.5	(0.5)		4.5	(0.3)		11.1	(0.4)		29.4	(0.8)		42.5	(0.7)		17.1	(0.5)	
United Arab Emirates	41.2	(0.5)		33.6	(0.4)		17.0	(0.4)		8.2	(0.3)		17.9	(0.3)		29.8	(0.4)		33.6	(0.5)		18.8	(0.4)	
Uruguay	44.8	(0.9)		39.7	(0.7)		10.1	(0.4)		5.4	(0.4)		22.9	(0.8)		29.8	(0.7)		30.3	(0.8)		17.0	(0.6)	
Viet Nam	42.3	(1.2)		50.0	(1.0)		5.8	(0.5)		1.8	(0.2)		12.6	(0.6)		41.2	(0.9)		37.9	(0.9)		8.3	(0.5)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).
2. For the comparability of Spain's data see Note 1 under Table B.3.9.
3. Jordan and Morocco have reliabilities lower than 0.60 on the index of enjoyment of reading.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.16 [1/6] **Average time of reading for enjoyment, reading performance, and enjoyment of reading, by the format of reading**

	Average time of reading for enjoyment (in hours)[1], by the format of reading											
	I rarely or never read books			I read books more often in paper format			I read books more often on digital devices			I read books equally often in paper format and on digital devices		
	Hours	S.E.	s	Hours	S.E.	s	Hours	S.E.	s	Hours	S.E.	s
OECD												
Australia	0.4	(0.03)		4.7	(0.11)		4.7	(0.18)		6.4	(0.15)	
Austria	0.6	(0.05)		4.9	(0.16)		4.1	(0.22)		5.9	(0.24)	
Belgium	0.6	(0.04)		4.5	(0.10)		4.6	(0.29)		6.7	(0.29)	
Canada	0.5	(0.04)		4.7	(0.09)		4.6	(0.16)		6.3	(0.15)	
Chile	1.1	(0.07)		5.0	(0.15)		5.9	(0.19)		7.6	(0.22)	
Colombia	1.8	(0.10)		5.5	(0.16)		5.0	(0.16)		6.2	(0.22)	
Czech Republic	0.6	(0.07)		5.4	(0.13)		3.5	(0.22)		6.7	(0.21)	
Denmark	0.5	(0.05)		3.3	(0.11)		2.7	(0.15)		3.9	(0.21)	
Estonia	1.2	(0.09)		5.8	(0.12)		5.0	(0.28)		6.6	(0.27)	
Finland	1.2	(0.07)		5.2	(0.12)		3.8	(0.22)		7.5	(0.33)	
France	0.6	(0.04)		5.1	(0.14)		4.6	(0.25)		7.2	(0.28)	
Germany	0.6	(0.06)		5.1	(0.14)		3.7	(0.28)		5.9	(0.29)	
Greece	3.3	(0.14)		7.7	(0.18)		6.2	(0.19)		8.3	(0.18)	
Hungary	1.3	(0.10)		7.6	(0.18)		5.0	(0.19)		8.0	(0.25)	
Iceland	0.5	(0.07)		3.2	(0.12)		3.1	(0.25)		4.9	(0.31)	
Ireland	0.4	(0.04)		4.7	(0.13)		3.9	(0.20)		6.3	(0.26)	
Israel	1.3	(0.08)		6.7	(0.15)		4.3	(0.27)		7.4	(0.30)	
Italy	1.1	(0.06)		6.5	(0.12)		4.9	(0.26)		9.0	(0.36)	
Japan	0.4	(0.05)		4.8	(0.12)		2.9	(0.22)		7.1	(0.24)	
Korea	0.3	(0.04)		4.8	(0.11)		3.6	(0.14)		6.9	(0.27)	
Latvia	1.3	(0.11)		6.8	(0.15)		5.2	(0.26)		7.6	(0.25)	
Lithuania	1.4	(0.09)		5.7	(0.11)		4.5	(0.28)		5.9	(0.21)	
Luxembourg	0.6	(0.05)		4.6	(0.14)		4.5	(0.26)		6.0	(0.25)	
Mexico	1.4	(0.09)		5.1	(0.14)		5.1	(0.16)		7.1	(0.21)	
Netherlands	0.5	(0.06)		3.9	(0.10)		4.5	(0.34)		4.9	(0.30)	
New Zealand	0.5	(0.05)		4.6	(0.11)		4.9	(0.20)		6.5	(0.24)	
Norway	0.6	(0.04)		3.8	(0.11)		2.9	(0.15)		5.4	(0.30)	
Poland	1.3	(0.09)		7.6	(0.13)		5.1	(0.23)		7.9	(0.26)	
Portugal	0.8	(0.06)		5.0	(0.14)		4.7	(0.27)		6.7	(0.26)	
Slovak Republic	1.1	(0.08)		7.1	(0.16)		4.4	(0.23)		6.9	(0.27)	
Slovenia	0.7	(0.07)		4.6	(0.12)		3.3	(0.25)		5.2	(0.28)	
Spain[3]	0.6	(0.03)		5.0	(0.08)		4.7	(0.12)		7.3	(0.13)	
Sweden	0.7	(0.05)		3.9	(0.11)		3.6	(0.21)		5.1	(0.25)	
Switzerland	0.5	(0.05)		4.1	(0.11)		3.6	(0.31)		5.9	(0.31)	
Turkey	1.9	(0.11)		6.3	(0.13)		5.2	(0.26)		8.1	(0.32)	
United Kingdom	0.4	(0.04)		4.1	(0.11)		3.6	(0.18)		5.9	(0.22)	
United States	0.5	(0.05)		4.5	(0.18)		4.5	(0.25)		5.8	(0.19)	
OECD average	0.9	(0.01)		5.2	(0.02)		4.3	(0.04)		6.6	(0.04)	

1. Students were allowed to respond in intervals of no time, I do not read for enjoyment, 30 minutes or less a day, more than 30 minutes to less than 60 minutes a day, 1 to 2 hours a day, and more than 2 hours a day. The responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.16 [2/6] **Average time of reading for enjoyment, reading performance, and enjoyment of reading, by the format of reading**

	Average time of reading for enjoyment (in hours)[1], by the format of reading											
	I rarely or never read books			I read books more often in paper format			I read books more often on digital devices			I read books equally often in paper format and on digital devices		
	Hours	S.E.	s	Hours	S.E.	s	Hours	S.E.	s	Hours	S.E.	s
Partners												
Albania	2.7	(0.20)		8.4	(0.17)		5.9	(0.19)		8.8	(0.16)	
Argentina	1.2	(0.06)		6.1	(0.22)		5.9	(0.26)		7.4	(0.20)	
Baku (Azerbaijan)	4.0	(0.25)		6.8	(0.15)		6.5	(0.23)		7.5	(0.20)	
Belarus	1.5	(0.12)		8.2	(0.19)		6.1	(0.18)		8.7	(0.18)	
Bosnia and Herzegovina	1.4	(0.09)		6.9	(0.18)		4.4	(0.14)		7.1	(0.18)	
Brazil	1.4	(0.06)		6.7	(0.14)		5.3	(0.14)		8.3	(0.20)	
Brunei Darussalam	2.1	(0.14)		5.9	(0.18)		6.9	(0.14)		8.6	(0.17)	
B-S-J-Z (China)	2.9	(0.31)		6.6	(0.14)		7.8	(0.16)		8.3	(0.16)	
Bulgaria	1.7	(0.10)		7.6	(0.19)		5.3	(0.18)		8.8	(0.32)	
Costa Rica	0.8	(0.08)		6.0	(0.25)		5.9	(0.20)		7.7	(0.21)	
Croatia	0.8	(0.06)		5.2	(0.12)		3.5	(0.12)		6.0	(0.21)	
Cyprus	2.0	(0.08)		5.7	(0.16)		5.3	(0.17)		7.8	(0.29)	
Dominican Republic	2.2	(0.18)		4.5	(0.18)		6.2	(0.19)		6.3	(0.26)	
Georgia	4.1	(0.17)		10.7	(0.18)		7.0	(0.26)		10.0	(0.22)	
Hong Kong (China)	2.2	(0.17)		6.6	(0.16)		7.4	(0.15)		9.2	(0.22)	
Indonesia	2.9	(0.23)		5.3	(0.26)		5.0	(0.14)		6.4	(0.24)	
Jordan	2.2	(0.15)		4.7	(0.17)		4.7	(0.16)		7.1	(0.21)	
Kazakhstan	3.7	(0.14)		8.5	(0.12)		7.1	(0.13)		8.9	(0.12)	
Kosovo	3.1	(0.34)		8.7	(0.17)		6.9	(0.19)		9.6	(0.22)	
Lebanon	m	m		m	m		m	m		m	m	
Macao (China)	2.0	(0.19)		6.6	(0.28)		7.7	(0.21)		8.5	(0.19)	
Malaysia	2.6	(0.18)		6.8	(0.18)		6.5	(0.14)		8.4	(0.18)	
Malta	0.7	(0.06)		5.0	(0.15)		3.9	(0.20)		6.4	(0.29)	
Moldova	2.3	(0.13)		7.6	(0.17)		5.8	(0.19)		8.8	(0.18)	
Montenegro	1.6	(0.10)		7.4	(0.12)		4.7	(0.14)		7.3	(0.18)	
Morocco	2.8	(0.13)		5.2	(0.14)		5.0	(0.14)		5.8	(0.20)	
North Macedonia	m	m		m	m		m	m		m	m	
Panama	1.6	(0.11)		5.4	(0.18)		6.2	(0.21)		8.2	(0.27)	
Peru	2.3	(0.12)		5.5	(0.15)		5.7	(0.19)		6.9	(0.17)	
Philippines	3.9	(0.19)		5.9	(0.16)		7.9	(0.13)		8.7	(0.17)	
Qatar	1.7	(0.08)		5.8	(0.10)		5.2	(0.13)		7.2	(0.13)	
Romania	1.6	(0.11)		8.0	(0.21)		4.8	(0.22)		8.6	(0.22)	
Russia	2.3	(0.14)		8.5	(0.18)		7.3	(0.21)		8.8	(0.21)	
Saudi Arabia	2.1	(0.12)		5.9	(0.17)		5.4	(0.17)		6.5	(0.24)	
Serbia	1.5	(0.08)		6.7	(0.15)		4.6	(0.19)		7.7	(0.22)	
Singapore	1.0	(0.09)		4.7	(0.14)		5.4	(0.15)		6.5	(0.18)	
Chinese Taipei	2.1	(0.14)		8.3	(0.22)		6.0	(0.13)		8.8	(0.21)	
Thailand	2.4	(0.19)		4.9	(0.16)		6.1	(0.13)		7.8	(0.19)	
Ukraine	1.9	(0.09)		8.1	(0.16)		6.3	(0.15)		8.1	(0.18)	
United Arab Emirates	1.8	(0.09)		5.9	(0.16)		5.3	(0.14)		7.5	(0.13)	
Uruguay	0.9	(0.08)		6.6	(0.21)		5.9	(0.23)		8.0	(0.23)	
Viet Nam	1.5	(0.12)		5.2	(0.17)		5.4	(0.14)		7.3	(0.23)	

1. Students were allowed to respond in intervals of no time, I do not read for enjoyment, 30 minutes or less a day, more than 30 minutes to less than 60 minutes a day, 1 to 2 hours a day, and more than 2 hours a day. The responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.16 [3/6] **Average time of reading for enjoyment, reading performance, and enjoyment of reading, by the format of reading**

	Difference between students who read books in the following way and those who "rarely or never read books"																	
	Time of reading for enjoyment (in hours)[1]																	
	Before accounting for students' and school's socio-economic profile[2], and gender									After accounting for students' and school's socio-economic profile, and gender								
	I read books more often in paper format			I read books more often on digital devices			I read books equally often in paper format and on digital devices			I read books more often in paper format			I read books more often on digital services			I read books equally often in paper format and on digital devices		
	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s
OECD Australia	**4.3**	(0.12)		**4.3**	(0.18)		**6.0**	(0.16)		**4.1**	(0.12)		**4.2**	(0.18)		**5.8**	(0.15)	
Austria	**4.3**	(0.16)		**3.6**	(0.23)		**5.3**	(0.25)		**3.9**	(0.17)		**3.4**	(0.23)		**4.9**	(0.24)	
Belgium	**3.9**	(0.11)		**4.0**	(0.29)		**6.0**	(0.30)		**3.7**	(0.11)		**3.8**	(0.28)		**5.8**	(0.29)	
Canada	**4.2**	(0.10)		**4.1**	(0.17)		**5.8**	(0.15)		**3.9**	(0.10)		**4.0**	(0.16)		**5.5**	(0.15)	
Chile	**4.0**	(0.16)		**4.9**	(0.19)		**6.5**	(0.22)		**3.6**	(0.16)		**4.5**	(0.19)		**6.0**	(0.21)	
Colombia	**3.7**	(0.15)		**3.3**	(0.17)		**4.5**	(0.23)		**3.5**	(0.15)		**3.0**	(0.17)		**4.1**	(0.22)	
Czech Republic	**4.8**	(0.14)		**2.9**	(0.24)		**6.1**	(0.23)		**4.1**	(0.17)		**2.5**	(0.25)		**5.5**	(0.24)	
Denmark	**2.8**	(0.12)		**2.2**	(0.16)		**3.4**	(0.22)		**2.6**	(0.12)		**2.1**	(0.16)		**3.2**	(0.22)	
Estonia	**4.7**	(0.16)		**3.9**	(0.29)		**5.5**	(0.26)		**4.0**	(0.17)		**3.6**	(0.28)		**4.9**	(0.26)	
Finland	**4.1**	(0.14)		**2.6**	(0.21)		**6.3**	(0.33)		**3.7**	(0.15)		**2.6**	(0.21)		**6.0**	(0.33)	
France	**4.5**	(0.15)		**3.9**	(0.25)		**6.6**	(0.29)		**4.3**	(0.15)		**3.7**	(0.25)		**6.3**	(0.30)	
Germany	**4.5**	(0.16)		**3.0**	(0.30)		**5.2**	(0.30)		**4.2**	(0.17)		**2.9**	(0.29)		**4.9**	(0.30)	
Greece	**4.4**	(0.22)		**3.0**	(0.21)		**5.1**	(0.24)		**3.8**	(0.23)		**2.8**	(0.21)		**4.5**	(0.25)	
Hungary	**6.3**	(0.20)		**3.7**	(0.21)		**6.6**	(0.28)		**5.4**	(0.21)		**3.3**	(0.21)		**5.9**	(0.27)	
Iceland	**2.7**	(0.15)		**2.6**	(0.26)		**4.4**	(0.31)		**2.6**	(0.15)		**2.6**	(0.26)		**4.3**	(0.31)	
Ireland	**4.3**	(0.14)		**3.5**	(0.21)		**5.9**	(0.27)		**4.2**	(0.15)		**3.4**	(0.20)		**5.8**	(0.26)	
Israel	**5.4**	(0.17)		**3.1**	(0.27)		**6.2**	(0.32)		**5.2**	(0.17)		**3.0**	(0.27)		**6.0**	(0.33)	
Italy	**5.5**	(0.14)		**3.8**	(0.27)		**7.9**	(0.36)		**4.8**	(0.15)		**3.5**	(0.26)		**7.2**	(0.36)	
Japan	**4.3**	(0.12)		**2.5**	(0.23)		**6.6**	(0.25)		**4.4**	(0.12)		**2.4**	(0.23)		**6.6**	(0.25)	
Korea	**4.5**	(0.13)		**3.3**	(0.14)		**6.6**	(0.28)		**4.4**	(0.12)		**3.2**	(0.14)		**6.4**	(0.28)	
Latvia	**5.6**	(0.21)		**4.0**	(0.29)		**6.3**	(0.28)		**4.8**	(0.24)		**3.6**	(0.30)		**5.6**	(0.29)	
Lithuania	**4.3**	(0.15)		**3.2**	(0.28)		**4.5**	(0.22)		**3.7**	(0.15)		**3.0**	(0.27)		**4.0**	(0.23)	
Luxembourg	**4.0**	(0.16)		**3.9**	(0.28)		**5.5**	(0.26)		**3.6**	(0.16)		**3.8**	(0.27)		**5.1**	(0.24)	
Mexico	**3.6**	(0.16)		**3.6**	(0.20)		**5.7**	(0.23)		**3.5**	(0.16)		**3.4**	(0.19)		**5.2**	(0.22)	
Netherlands	**3.4**	(0.12)		**4.0**	(0.34)		**4.4**	(0.31)		**3.1**	(0.15)		**3.8**	(0.32)		**4.0**	(0.31)	
New Zealand	**4.1**	(0.11)		**4.4**	(0.20)		**6.1**	(0.25)		**3.9**	(0.13)		**4.3**	(0.20)		**5.8**	(0.25)	
Norway	**3.2**	(0.12)		**2.2**	(0.16)		**4.8**	(0.31)		**3.0**	(0.12)		**2.1**	(0.17)		**4.6**	(0.30)	
Poland	**6.3**	(0.16)		**3.7**	(0.25)		**6.6**	(0.28)		**5.5**	(0.16)		**3.4**	(0.24)		**5.8**	(0.28)	
Portugal	**4.2**	(0.15)		**3.9**	(0.27)		**5.8**	(0.26)		**3.5**	(0.17)		**3.6**	(0.25)		**5.1**	(0.25)	
Slovak Republic	**5.9**	(0.18)		**3.2**	(0.25)		**5.8**	(0.26)		**5.2**	(0.20)		**3.0**	(0.24)		**5.3**	(0.26)	
Slovenia	**3.9**	(0.14)		**2.7**	(0.25)		**4.6**	(0.31)		**3.3**	(0.15)		**2.5**	(0.25)		**4.2**	(0.30)	
Spain[3]	**4.4**	(0.09)		**4.1**	(0.13)		**6.6**	(0.13)		**4.1**	(0.09)		**3.8**	(0.13)		**6.2**	(0.13)	
Sweden	**3.2**	(0.12)		**2.9**	(0.21)		**4.4**	(0.26)		**3.0**	(0.12)		**2.8**	(0.20)		**4.2**	(0.26)	
Switzerland	**3.6**	(0.12)		**3.2**	(0.32)		**5.5**	(0.33)		**3.3**	(0.13)		**3.0**	(0.32)		**5.2**	(0.32)	
Turkey	**4.4**	(0.16)		**3.3**	(0.25)		**6.2**	(0.31)		**3.6**	(0.16)		**3.0**	(0.23)		**5.3**	(0.27)	
United Kingdom	**3.7**	(0.12)		**3.2**	(0.20)		**5.5**	(0.23)		**3.6**	(0.13)		**3.0**	(0.19)		**5.3**	(0.23)	
United States	**4.0**	(0.19)		**4.1**	(0.27)		**5.4**	(0.20)		**3.8**	(0.18)		**3.9**	(0.26)		**5.2**	(0.20)	
OECD average	**4.3**	(0.02)		**3.5**	(0.04)		**5.7**	(0.04)		**3.9**	(0.03)		**3.3**	(0.04)		**5.3**	(0.04)	

1. Students were allowed to respond in intervals of no time, I do not read for enjoyment, 30 minutes or less a day, more than 30 minutes to less than 60 minutes a day, 1 to 2 hours a day, and more than 2 hours a day. The responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.16 [4/6] **Average time of reading for enjoyment, reading performance, and enjoyment of reading, by the format of reading**

	Difference between students who read books in the following way and those who "rarely or never read books"																	
	Time of reading for enjoyment (in hours)[1]																	
	Before accounting for students' and school's socio-economic profile[2], and gender									After accounting for students' and school's socio-economic profile, and gender								
	I read books more often in paper format			I read books more often on digital devices			I read books equally often in paper format and on digital devices			I read books more often in paper format			I read books more often on digital services			I read books equally often in paper format and on digital devices		
	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s	Dif.	S.E.	s
Partners																		
Albania	**5.7**	(0.26)		**3.2**	(0.28)		**6.1**	(0.26)		**4.5**	(0.28)		**2.7**	(0.27)		**4.9**	(0.27)	
Argentina	**4.9**	(0.24)		**4.7**	(0.26)		**6.3**	(0.23)		**4.6**	(0.24)		**4.5**	(0.25)		**5.8**	(0.23)	
Baku (Azerbaijan)	**2.8**	(0.30)		**2.6**	(0.34)		**3.5**	(0.30)		**2.7**	(0.31)		**2.4**	(0.34)		**3.4**	(0.31)	
Belarus	**6.7**	(0.21)		**4.6**	(0.22)		**7.1**	(0.21)		**5.4**	(0.19)		**3.8**	(0.20)		**5.9**	(0.20)	
Bosnia and Herzegovina	**5.5**	(0.20)		**3.0**	(0.16)		**5.7**	(0.19)		**4.9**	(0.20)		**2.7**	(0.16)		**5.1**	(0.18)	
Brazil	**5.3**	(0.16)		**3.8**	(0.15)		**6.9**	(0.21)		**4.7**	(0.15)		**3.6**	(0.15)		**6.3**	(0.21)	
Brunei Darussalam	**3.8**	(0.23)		**4.7**	(0.21)		**6.5**	(0.22)		**3.0**	(0.23)		**3.7**	(0.22)		**5.0**	(0.22)	
B-S-J-Z (China)	**3.7**	(0.32)		**4.9**	(0.38)		**5.4**	(0.35)		**4.0**	(0.35)		**5.0**	(0.39)		**5.7**	(0.37)	
Bulgaria	**5.9**	(0.20)		**3.6**	(0.21)		**7.1**	(0.34)		**5.0**	(0.19)		**3.2**	(0.22)		**6.2**	(0.31)	
Costa Rica	**5.2**	(0.25)		**5.0**	(0.21)		**6.9**	(0.23)		**4.8**	(0.23)		**4.7**	(0.20)		**6.3**	(0.23)	
Croatia	**4.5**	(0.13)		**2.7**	(0.13)		**5.3**	(0.20)		**3.8**	(0.12)		**2.4**	(0.14)		**4.8**	(0.20)	
Cyprus	**3.6**	(0.17)		**3.3**	(0.20)		**5.8**	(0.29)		**3.3**	(0.18)		**3.2**	(0.20)		**5.5**	(0.30)	
Dominican Republic	**2.3**	(0.26)		**4.0**	(0.27)		**4.1**	(0.31)		**2.5**	(0.26)		**3.6**	(0.26)		**3.8**	(0.30)	
Georgia	**6.5**	(0.24)		**2.9**	(0.35)		**5.9**	(0.28)		**5.2**	(0.25)		**2.5**	(0.33)		**4.7**	(0.27)	
Hong Kong (China)	**4.4**	(0.21)		**5.2**	(0.21)		**7.0**	(0.29)		**4.3**	(0.21)		**5.0**	(0.21)		**6.8**	(0.28)	
Indonesia	**2.4**	(0.33)		**2.1**	(0.27)		**3.5**	(0.33)		**2.2**	(0.32)		**1.6**	(0.28)		**3.2**	(0.33)	
Jordan	**2.5**	(0.19)		**2.4**	(0.23)		**4.9**	(0.28)		**2.2**	(0.18)		**2.1**	(0.22)		**4.5**	(0.27)	
Kazakhstan	**4.9**	(0.16)		**3.4**	(0.18)		**5.2**	(0.18)		**4.2**	(0.16)		**2.8**	(0.17)		**4.5**	(0.18)	
Kosovo	**5.6**	(0.36)		**3.8**	(0.39)		**6.5**	(0.36)		**4.7**	(0.37)		**3.2**	(0.39)		**5.5**	(0.35)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	**4.6**	(0.35)		**5.8**	(0.30)		**6.5**	(0.25)		**4.6**	(0.35)		**5.7**	(0.31)		**6.3**	(0.26)	
Malaysia	**4.2**	(0.25)		**4.0**	(0.24)		**5.8**	(0.28)		**3.5**	(0.24)		**3.2**	(0.26)		**4.7**	(0.29)	
Malta	**4.3**	(0.16)		**3.2**	(0.20)		**5.6**	(0.30)		**4.0**	(0.16)		**3.0**	(0.19)		**5.3**	(0.30)	
Moldova	**5.2**	(0.23)		**3.5**	(0.24)		**6.4**	(0.22)		**4.2**	(0.21)		**2.8**	(0.24)		**5.0**	(0.25)	
Montenegro	**5.8**	(0.17)		**3.1**	(0.19)		**5.7**	(0.21)		**5.1**	(0.16)		**2.7**	(0.20)		**5.0**	(0.20)	
Morocco	**2.4**	(0.17)		**2.2**	(0.18)		**3.0**	(0.25)		**2.2**	(0.18)		**1.9**	(0.17)		**2.7**	(0.23)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m	
Panama	**3.8**	(0.23)		**4.6**	(0.24)		**6.6**	(0.28)		**3.7**	(0.23)		**4.4**	(0.24)		**6.3**	(0.27)	
Peru	**3.2**	(0.19)		**3.4**	(0.21)		**4.7**	(0.21)		**3.1**	(0.18)		**3.3**	(0.21)		**4.3**	(0.21)	
Philippines	**2.0**	(0.27)		**4.0**	(0.24)		**4.8**	(0.24)		**1.6**	(0.28)		**2.8**	(0.25)		**3.5**	(0.23)	
Qatar	**4.0**	(0.12)		**3.4**	(0.14)		**5.4**	(0.16)		**3.7**	(0.12)		**3.3**	(0.15)		**5.1**	(0.16)	
Romania	**6.3**	(0.22)		**3.2**	(0.25)		**6.9**	(0.25)		**5.2**	(0.23)		**2.6**	(0.25)		**5.8**	(0.26)	
Russia	**6.2**	(0.21)		**5.0**	(0.27)		**6.5**	(0.24)		**5.3**	(0.23)		**4.5**	(0.26)		**5.7**	(0.25)	
Saudi Arabia	**3.7**	(0.20)		**3.2**	(0.19)		**4.3**	(0.26)		**3.3**	(0.21)		**2.8**	(0.20)		**3.7**	(0.27)	
Serbia	**5.3**	(0.16)		**3.1**	(0.20)		**6.2**	(0.24)		**4.7**	(0.15)		**2.9**	(0.20)		**5.6**	(0.23)	
Singapore	**3.7**	(0.15)		**4.3**	(0.16)		**5.5**	(0.19)		**3.4**	(0.15)		**4.1**	(0.16)		**5.1**	(0.20)	
Chinese Taipei	**6.2**	(0.27)		**3.9**	(0.21)		**6.7**	(0.25)		**5.8**	(0.25)		**3.7**	(0.20)		**6.3**	(0.26)	
Thailand	**2.5**	(0.26)		**3.8**	(0.22)		**5.4**	(0.27)		**2.2**	(0.26)		**3.0**	(0.21)		**4.2**	(0.27)	
Ukraine	**6.1**	(0.17)		**4.3**	(0.17)		**6.2**	(0.21)		**5.1**	(0.18)		**3.7**	(0.17)		**5.1**	(0.22)	
United Arab Emirates	**4.1**	(0.19)		**3.5**	(0.17)		**5.7**	(0.15)		**3.7**	(0.18)		**3.3**	(0.17)		**5.2**	(0.15)	
Uruguay	**5.7**	(0.23)		**5.0**	(0.26)		**7.1**	(0.26)		**5.1**	(0.23)		**4.6**	(0.26)		**6.4**	(0.26)	
Viet Nam	**3.8**	(0.18)		**3.9**	(0.15)		**5.8**	(0.25)		**3.5**	(0.18)		**3.4**	(0.16)		**5.2**	(0.25)	

1. Students were allowed to respond in intervals of no time, I do not read for enjoyment, 30 minutes or less a day, more than 30 minutes to less than 60 minutes a day, 1 to 2 hours a day, and more than 2 hours a day. The responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.16 [5/6] **Average time of reading for enjoyment, reading performance, and enjoyment of reading, by the format of reading**

	Difference between students who read books in the following way and those who "rarely or never read books"																	
	Reading performance																	
	Before accounting for students' and school's socio-economic profile[2], and gender									After accounting for students' and school's socio-economic profile, and gender								
	I read books more often in paper format			I read books more often on digital devices			I read books equally often in paper format and on digital devices			I read books more often in paper format			I read books more often on digital services			I read books equally often in paper format and on digital devices		
	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s
OECD Australia	**86**	(2.7)		**42**	(3.5)		**76**	(3.3)		**68**	(2.7)		**37**	(3.4)		**63**	(3.1)	
Austria	**80**	(3.3)		**19**	(4.3)		**51**	(5.7)		**52**	(2.9)		**15**	(4.0)		**35**	(4.8)	
Belgium	**76**	(2.8)		**-24**	(4.1)		**30**	(4.9)		**51**	(2.2)		-7	(3.7)		**27**	(4.3)	
Canada	**77**	(2.3)		**35**	(3.0)		**63**	(2.9)		**65**	(2.3)		**30**	(2.9)		**52**	(2.8)	
Chile	**62**	(3.7)		**36**	(3.5)		**54**	(4.1)		**42**	(3.6)		**30**	(3.1)		**43**	(3.6)	
Colombia	**44**	(3.6)		**33**	(3.6)		**34**	(3.6)		**39**	(3.4)		**23**	(3.2)		**28**	(3.3)	
Czech Republic	**80**	(3.4)		**32**	(4.5)		**58**	(3.8)		**43**	(2.8)		**19**	(4.1)		**31**	(3.4)	
Denmark	**63**	(3.3)		6	(3.5)		**38**	(4.7)		**50**	(3.3)		4	(3.2)		**29**	(4.7)	
Estonia	**71**	(3.8)		**12**	(5.5)		**42**	(4.9)		**55**	(3.9)		5	(5.1)		**28**	(4.9)	
Finland	**85**	(3.2)		**12**	(5.3)		**60**	(5.8)		**67**	(3.0)		7	(5.2)		**43**	(5.3)	
France	**82**	(3.5)		**15**	(3.6)		**59**	(5.5)		**54**	(2.9)		**18**	(3.1)		**46**	(4.4)	
Germany	**77**	(3.9)		7	(6.4)		**55**	(5.0)		**44**	(3.5)		3	(5.4)		**34**	(4.2)	
Greece	**61**	(3.9)		**11**	(4.0)		**44**	(4.3)		**37**	(3.1)		**9**	(3.3)		**28**	(3.7)	
Hungary	**78**	(4.0)		**31**	(4.2)		**58**	(5.1)		**37**	(2.9)		**19**	(3.3)		**30**	(3.5)	
Iceland	**81**	(4.4)		**12**	(6.3)		**51**	(6.6)		**66**	(4.4)		10	(6.1)		**40**	(6.5)	
Ireland	**82**	(2.9)		**32**	(3.8)		**63**	(4.1)		**67**	(2.9)		**26**	(4.0)		**49**	(3.9)	
Israel	**38**	(4.2)		**-40**	(5.3)		**-20**	(6.0)		**15**	(4.6)		**-20**	(4.8)		-2	(5.5)	
Italy	**57**	(3.0)		**9**	(4.7)		**38**	(4.9)		**33**	(3.0)		8	(4.3)		**27**	(4.1)	
Japan	**77**	(3.3)		**17**	(4.3)		**62**	(3.9)		**61**	(2.8)		**23**	(4.3)		**58**	(3.4)	
Korea	**68**	(4.2)		**30**	(4.3)		**79**	(5.6)		**51**	(4.1)		**24**	(4.2)		**63**	(5.7)	
Latvia	**63**	(3.2)		**29**	(4.1)		**34**	(4.1)		**43**	(3.2)		**19**	(4.0)		**20**	(4.2)	
Lithuania	**61**	(2.9)		**22**	(4.3)		**56**	(3.9)		**33**	(2.9)		**9**	(4.0)		**31**	(3.5)	
Luxembourg	**85**	(3.1)		**23**	(5.1)		**67**	(5.6)		**49**	(3.3)		**16**	(4.5)		**36**	(5.2)	
Mexico	**30**	(4.0)		**25**	(3.6)		**40**	(4.5)		**33**	(3.6)		**20**	(3.2)		**34**	(3.7)	
Netherlands	**83**	(4.1)		**34**	(6.8)		**64**	(5.8)		**53**	(4.5)		**28**	(6.3)		**45**	(5.7)	
New Zealand	**80**	(3.9)		**35**	(4.5)		**63**	(3.8)		**61**	(3.6)		**29**	(4.1)		**48**	(3.4)	
Norway	**81**	(3.8)		**11**	(3.9)		**46**	(6.4)		**64**	(3.8)		6	(3.7)		**35**	(5.9)	
Poland	**76**	(4.1)		**17**	(4.1)		**60**	(4.5)		**56**	(3.9)		**12**	(3.9)		**44**	(4.3)	
Portugal	**65**	(3.6)		**17**	(4.6)		**46**	(6.1)		**44**	(3.2)		**11**	(4.3)		**36**	(4.8)	
Slovak Republic	**68**	(3.7)		**13**	(4.3)		**40**	(4.8)		**40**	(3.0)		**11**	(3.7)		**23**	(4.2)	
Slovenia	**76**	(3.3)		**13**	(5.6)		**44**	(5.0)		**42**	(3.0)		9	(5.2)		**27**	(4.5)	
Spain[3]	**57**	(1.9)		**30**	(2.7)		**53**	(2.7)		**46**	(1.8)		**26**	(2.7)		**44**	(2.6)	
Sweden	**70**	(3.6)		4	(4.7)		**39**	(6.8)		**53**	(3.4)		1	(4.3)		**28**	(5.9)	
Switzerland	**84**	(3.7)		**15**	(6.2)		**53**	(5.8)		**56**	(3.2)		10	(5.7)		**33**	(5.4)	
Turkey	**43**	(3.2)		5	(3.7)		**36**	(5.8)		**31**	(3.0)		7	(3.6)		**25**	(4.6)	
United Kingdom	**72**	(2.9)		**29**	(4.2)		**52**	(4.5)		**58**	(2.7)		**25**	(3.8)		**43**	(3.9)	
United States	**78**	(3.9)		**28**	(6.2)		**60**	(4.7)		**61**	(3.6)		**25**	(5.3)		**49**	(5.0)	
OECD average	**70**	(0.6)		**18**	(0.8)		**50**	(0.8)		**49**	(0.5)		**15**	(0.7)		**37**	(0.7)	

1. Students were allowed to respond in intervals of no time, I do not read for enjoyment, 30 minutes or less a day, more than 30 minutes to less than 60 minutes a day, 1 to 2 hours a day, and more than 2 hours a day. The responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.4.16 [6/6] **Average time of reading for enjoyment, reading performance, and enjoyment of reading, by the format of reading**

	Difference between students who read books in the following way and those who "rarely or never read books"																	
	Reading performance																	
	Before accounting for students' and school's socio-economic profile[2], and gender									After accounting for students' and school's socio-economic profile, and gender								
	I read books more often in paper format			I read books more often on digital devices			I read books equally often in paper format and on digital devices			I read books more often in paper format			I read books more often on digital services			I read books equally often in paper format and on digital devices		
	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s
Partners																		
Albania	**57**	(4.4)		**30**	(4.7)		**46**	(4.4)		**41**	(4.3)		**18**	(4.5)		**28**	(4.3)	
Argentina	**57**	(4.7)		**40**	(4.0)		**52**	(3.4)		**40**	(3.4)		**31**	(3.3)		**44**	(2.9)	
Baku (Azerbaijan)	**50**	(3.9)		**19**	(3.7)		**42**	(3.7)		**43**	(3.7)		**13**	(3.4)		**34**	(3.5)	
Belarus	**60**	(4.1)		**54**	(4.4)		**67**	(4.1)		**37**	(3.9)		**35**	(3.6)		**43**	(3.6)	
Bosnia and Herzegovina	**63**	(3.6)		**31**	(3.1)		**48**	(3.5)		**45**	(3.1)		**23**	(3.0)		**33**	(3.2)	
Brazil	**49**	(3.3)		**23**	(3.0)		**33**	(3.3)		**38**	(2.9)		**21**	(2.6)		**29**	(3.1)	
Brunei Darussalam	**35**	(4.6)		**20**	(3.9)		**65**	(4.1)		**28**	(3.4)		**14**	(2.9)		**43**	(3.3)	
B-S-J-Z (China)	**89**	(9.9)		**51**	(8.9)		**103**	(9.8)		**68**	(7.0)		**44**	(7.0)		**78**	(7.3)	
Bulgaria	**68**	(4.7)		**18**	(4.3)		**66**	(4.9)		**32**	(4.7)		5	(3.7)		**32**	(4.7)	
Costa Rica	**35**	(3.6)		**21**	(3.6)		**33**	(4.9)		**23**	(2.7)		**18**	(3.0)		**26**	(3.2)	
Croatia	**68**	(3.6)		**25**	(3.0)		**44**	(4.3)		**40**	(3.3)		**16**	(2.8)		**25**	(3.5)	
Cyprus	**57**	(3.9)		**16**	(4.1)		**42**	(3.9)		**43**	(3.3)		**13**	(3.8)		**27**	(3.8)	
Dominican Republic	**-16**	(4.4)		**25**	(4.9)		**14**	(5.0)		-1	(3.8)		**23**	(3.7)		**19**	(3.7)	
Georgia	**66**	(3.8)		**22**	(4.4)		**35**	(3.4)		**47**	(3.6)		**16**	(4.3)		**23**	(3.4)	
Hong Kong (China)	**62**	(4.8)		**39**	(5.0)		**75**	(5.4)		**46**	(4.5)		**35**	(4.5)		**58**	(5.1)	
Indonesia	**35**	(4.7)		**47**	(4.1)		**55**	(4.6)		**31**	(4.4)		**35**	(3.5)		**46**	(3.9)	
Jordan	**28**	(3.2)		**38**	(3.7)		**41**	(3.8)		**22**	(3.0)		**30**	(3.6)		**30**	(3.6)	
Kazakhstan	**33**	(2.9)		**27**	(2.7)		**37**	(3.0)		**25**	(2.7)		**19**	(2.7)		**27**	(2.8)	
Kosovo	**40**	(4.5)		**39**	(4.6)		**43**	(5.1)		**32**	(4.0)		**32**	(4.3)		**35**	(4.5)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	**40**	(5.7)		**35**	(4.8)		**62**	(4.7)		**32**	(5.6)		**34**	(4.8)		**56**	(4.7)	
Malaysia	**46**	(5.6)		**35**	(4.4)		**66**	(4.7)		**35**	(4.9)		**23**	(4.0)		**43**	(3.9)	
Malta	**71**	(4.5)		**19**	(4.9)		**58**	(5.4)		**58**	(4.5)		**13**	(5.1)		**48**	(4.8)	
Moldova	**62**	(4.3)		**48**	(4.1)		**67**	(4.4)		**38**	(3.4)		**33**	(4.2)		**42**	(3.8)	
Montenegro	**70**	(2.8)		**31**	(3.2)		**45**	(3.1)		**49**	(2.7)		**23**	(3.0)		**31**	(2.9)	
Morocco	-1	(3.2)		**22**	(2.7)		**25**	(3.2)		1	(2.9)		**10**	(2.6)		**16**	(3.0)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m	
Panama	**11**	(3.9)		**20**	(3.8)		**31**	(4.3)		**19**	(3.6)		**18**	(3.3)		**30**	(3.6)	
Peru	**16**	(3.6)		-3	(4.2)		**25**	(3.7)		**31**	(3.0)		4	(3.2)		**25**	(2.9)	
Philippines	**29**	(3.1)		**44**	(3.2)		**71**	(3.5)		**27**	(3.0)		**26**	(2.9)		**53**	(3.0)	
Qatar	**43**	(2.5)		**12**	(3.1)		**55**	(3.0)		**33**	(2.4)		**13**	(2.6)		**39**	(2.5)	
Romania	**75**	(4.9)		**42**	(4.2)		**66**	(5.1)		**38**	(4.2)		**25**	(3.7)		**35**	(4.2)	
Russia	**52**	(3.7)		**36**	(3.8)		**54**	(4.3)		**35**	(3.2)		**27**	(3.3)		**42**	(4.1)	
Saudi Arabia	**23**	(3.5)		**41**	(3.5)		**58**	(3.4)		**12**	(2.9)		**28**	(3.0)		**40**	(3.2)	
Serbia	**69**	(3.2)		**26**	(3.8)		**51**	(4.3)		**43**	(3.6)		**19**	(3.6)		**31**	(3.9)	
Singapore	**65**	(3.6)		**39**	(3.8)		**67**	(4.3)		**47**	(3.5)		**26**	(3.6)		**46**	(4.0)	
Chinese Taipei	**100**	(4.3)		**41**	(3.9)		**108**	(5.0)		**70**	(3.9)		**32**	(3.5)		**79**	(3.9)	
Thailand	**26**	(4.4)		**53**	(3.9)		**81**	(5.4)		**21**	(4.0)		**34**	(3.2)		**51**	(3.4)	
Ukraine	**64**	(3.9)		**57**	(3.8)		**73**	(4.2)		**37**	(3.3)		**39**	(2.8)		**46**	(3.3)	
United Arab Emirates	**52**	(3.6)		**16**	(3.5)		**51**	(3.4)		**42**	(2.9)		**19**	(3.1)		**44**	(3.1)	
Uruguay	**54**	(4.5)		**41**	(4.9)		**43**	(3.7)		**37**	(3.5)		**37**	(3.9)		**37**	(3.6)	
Viet Nam	m	m		m	m		m	m		m	m		m	m		m	m	

1. Students were allowed to respond in intervals of no time, I do not read for enjoyment, 30 minutes or less a day, more than 30 minutes to less than 60 minutes a day, 1 to 2 hours a day, and more than 2 hours a day. The responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5, 180.5), multiply by 7 and divided by 60 to reflect the total number of hours a week reading for enjoyment.

2. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

3. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.1 [1/4] **Student's perception of difficulty in taking the reading assessment**

Based on students' reports

	Index of perception of difficulty of the PISA test			Percentage of students who reported that in the PISA test: There were many words I could not understand											
				Strongly disagree			Disagree			Agree			Strongly agree		
	Mean index	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD Australia	-0.05	(0.01)		35.3	(0.5)		47.7	(0.5)		14.4	(0.4)		2.6	(0.2)	
Austria	-0.35	(0.02)		54.9	(0.8)		33.9	(0.8)		8.7	(0.4)		2.5	(0.3)	
Belgium	0.16	(0.01)		26.2	(0.5)		54.0	(0.7)		16.8	(0.5)		3.0	(0.2)	
Canada	-0.14	(0.01)		38.7	(0.5)		47.3	(0.4)		12.0	(0.3)		2.1	(0.1)	
Chile	0.17	(0.02)		28.0	(0.7)		45.2	(0.8)		23.2	(0.8)		3.7	(0.3)	
Colombia	0.59	(0.02)		13.4	(0.6)		45.2	(0.8)		37.2	(0.8)		4.1	(0.3)	
Czech Republic	0.30	(0.02)		26.3	(0.8)		55.9	(0.8)		14.9	(0.6)		2.9	(0.3)	
Denmark	-0.35	(0.01)		44.0	(0.8)		47.2	(0.8)		7.4	(0.4)		1.4	(0.2)	
Estonia	-0.09	(0.01)		37.1	(0.7)		51.7	(0.7)		10.0	(0.4)		1.2	(0.2)	
Finland	-0.25	(0.02)		44.0	(0.8)		44.8	(0.8)		9.3	(0.4)		1.9	(0.2)	
France	0.13	(0.02)		33.3	(0.8)		41.8	(0.7)		20.8	(0.6)		4.1	(0.3)	
Germany	-0.36	(0.02)		51.3	(0.9)		38.6	(0.8)		8.3	(0.4)		1.8	(0.2)	
Greece	0.13	(0.02)		34.8	(0.7)		46.7	(0.7)		16.4	(0.7)		2.1	(0.2)	
Hungary	-0.07	(0.02)		37.1	(0.8)		47.5	(0.9)		13.8	(0.6)		1.6	(0.2)	
Iceland	0.04	(0.02)		35.9	(0.8)		43.3	(0.8)		16.8	(0.6)		4.0	(0.4)	
Ireland	-0.02	(0.02)		32.6	(0.7)		49.0	(0.6)		15.9	(0.5)		2.5	(0.2)	
Israel	0.05	(0.02)		38.7	(0.9)		41.0	(0.6)		17.0	(0.6)		3.3	(0.2)	
Italy	-0.13	(0.02)		40.0	(0.7)		46.3	(0.7)		11.4	(0.5)		2.3	(0.2)	
Japan	0.32	(0.02)		24.4	(0.8)		51.7	(0.7)		19.2	(0.5)		4.8	(0.3)	
Korea	0.08	(0.02)		36.0	(0.9)		43.6	(0.8)		17.4	(0.6)		3.0	(0.2)	
Latvia	0.08	(0.01)		31.4	(0.7)		55.5	(0.7)		11.4	(0.5)		1.7	(0.2)	
Lithuania	-0.32	(0.01)		49.2	(0.6)		31.1	(0.7)		16.4	(0.5)		3.3	(0.2)	
Luxembourg	-0.18	(0.01)		44.9	(0.7)		39.9	(0.7)		12.3	(0.5)		2.9	(0.2)	
Mexico	0.33	(0.02)		19.2	(0.7)		49.1	(0.8)		28.6	(0.8)		3.0	(0.2)	
Netherlands	-0.07	(0.02)		36.0	(0.8)		50.3	(0.8)		11.6	(0.6)		2.1	(0.2)	
New Zealand	0.01	(0.01)		33.5	(0.6)		47.2	(0.6)		16.8	(0.5)		2.6	(0.2)	
Norway	0.01	(0.02)		37.2	(0.8)		47.2	(0.7)		12.4	(0.5)		3.2	(0.3)	
Poland	0.16	(0.02)		29.4	(0.7)		52.8	(0.7)		15.7	(0.5)		2.0	(0.2)	
Portugal	0.05	(0.02)		34.5	(0.9)		46.9	(0.8)		16.9	(0.8)		1.6	(0.2)	
Slovak Republic	0.24	(0.02)		29.3	(0.8)		52.6	(0.8)		15.1	(0.5)		2.9	(0.2)	
Slovenia	-0.02	(0.02)		34.1	(0.7)		52.4	(0.8)		11.3	(0.5)		2.1	(0.2)	
Spain	-0.06	(0.01)		35.8	(0.5)		46.2	(0.5)		15.4	(0.3)		2.7	(0.1)	
Sweden	0.10	(0.02)		30.9	(0.8)		49.6	(0.8)		16.3	(0.6)		3.2	(0.3)	
Switzerland	-0.08	(0.02)		39.1	(1.0)		44.1	(0.8)		14.1	(0.7)		2.7	(0.2)	
Turkey	0.21	(0.02)		27.1	(0.7)		46.1	(0.7)		22.3	(0.6)		4.5	(0.3)	
United Kingdom	-0.01	(0.02)		35.1	(0.8)		44.8	(0.7)		16.7	(0.5)		3.3	(0.2)	
United States	-0.06	(0.02)		34.5	(0.9)		48.0	(0.7)		15.1	(0.7)		2.3	(0.3)	
OECD average	0.01	(0.00)		35.0	(0.1)		46.7	(0.1)		15.7	(0.1)		2.7	(0.0)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.1 [2/4] **Student's perception of difficulty in taking the reading assessment**

Based on students' reports

	Index of perception of difficulty of the PISA test			Percentage of students who reported that in the PISA test: There were many words I could not understand											
				Strongly disagree			Disagree			Agree			Strongly agree		
	Mean index	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners															
Albania	0.30	(0.01)		26.2	(0.7)		44.7	(0.6)		25.8	(0.7)		3.3	(0.3)	
Argentina	0.36	(0.02)		26.5	(0.8)		39.0	(0.6)		27.3	(0.7)		7.2	(0.4)	
Baku (Azerbaijan)	0.38	(0.02)		25.1	(0.9)		45.0	(0.8)		24.4	(0.8)		5.5	(0.4)	
Belarus	0.07	(0.02)		24.9	(0.9)		61.3	(0.8)		12.8	(0.6)		1.0	(0.1)	
Bosnia and Herzegovina	0.17	(0.02)		31.0	(0.8)		43.1	(0.7)		22.4	(0.6)		3.5	(0.3)	
Brazil	0.44	(0.01)		19.6	(0.5)		45.9	(0.5)		31.3	(0.6)		3.2	(0.2)	
Brunei Darussalam	0.75	(0.01)		10.4	(0.3)		42.0	(0.6)		40.5	(0.6)		7.0	(0.3)	
B-S-J-Z (China)	0.13	(0.02)		24.0	(0.8)		55.3	(0.7)		19.4	(0.7)		1.4	(0.2)	
Bulgaria	-0.15	(0.03)		51.1	(1.0)		32.8	(0.9)		11.4	(0.7)		4.7	(0.4)	
Costa Rica	0.32	(0.02)		22.9	(0.8)		42.3	(0.7)		29.8	(0.8)		5.1	(0.3)	
Croatia	0.14	(0.01)		28.1	(0.5)		52.9	(0.7)		16.0	(0.5)		3.0	(0.2)	
Cyprus	0.31	(0.02)		25.6	(0.6)		47.9	(0.6)		21.7	(0.6)		4.9	(0.3)	
Dominican Republic	0.48	(0.02)	†	20.5	(0.6)		38.4	(1.0)		35.4	(0.8)		5.6	(0.4)	
Georgia	0.12	(0.02)		31.1	(0.8)		50.9	(0.8)		15.4	(0.6)		2.5	(0.2)	
Hong Kong (China)	0.24	(0.02)		21.1	(0.6)		60.0	(0.7)		16.7	(0.6)		2.2	(0.2)	
Indonesia	0.83	(0.02)		8.5	(0.5)		41.3	(0.8)		47.1	(0.8)		3.1	(0.3)	
Jordan	0.48	(0.02)		26.2	(0.8)		38.1	(0.7)		30.3	(0.7)		5.5	(0.3)	
Kazakhstan	0.34	(0.01)		18.5	(0.4)		55.6	(0.6)		23.8	(0.5)		2.2	(0.1)	
Kosovo	0.27	(0.02)		24.3	(0.7)		46.1	(0.7)		26.5	(0.8)		3.1	(0.3)	
Lebanon	m	m		m	m		m	m		m	m		m	m	
Macao (China)	0.45	(0.02)		15.9	(0.6)		55.0	(0.8)		24.8	(0.7)		4.3	(0.3)	
Malaysia	0.73	(0.02)		12.1	(0.5)		48.6	(0.8)		35.7	(0.9)		3.6	(0.2)	
Malta	0.05	(0.02)		32.6	(0.8)		47.5	(0.8)		16.8	(0.6)		3.1	(0.3)	
Moldova	0.21	(0.02)		23.6	(0.8)		47.1	(0.8)		26.5	(0.8)		2.8	(0.2)	
Montenegro	0.00	(0.01)		39.4	(0.6)		41.6	(0.6)		15.7	(0.5)		3.4	(0.2)	
Morocco	m	m		20.3	(0.6)		36.1	(0.7)		38.7	(0.8)		4.8	(0.3)	
North Macedonia	m	m		m	m		m	m		m	m		m	m	
Panama	0.61	(0.02)		16.0	(0.7)		36.4	(0.9)		40.8	(1.0)		6.8	(0.4)	
Peru	0.45	(0.02)		14.2	(0.6)		48.0	(0.7)		35.7	(0.7)		2.2	(0.2)	
Philippines	0.87	(0.02)		9.2	(0.5)		38.9	(0.7)		47.7	(0.8)		4.3	(0.3)	
Qatar	0.42	(0.01)		24.3	(0.4)		36.8	(0.5)		33.6	(0.4)		5.3	(0.2)	
Romania	0.26	(0.03)		28.0	(1.0)		45.2	(0.8)		24.5	(1.1)		2.3	(0.3)	
Russia	-0.06	(0.02)		37.8	(0.9)		49.5	(0.7)		10.9	(0.5)		1.8	(0.2)	
Saudi Arabia	0.51	(0.02)		25.0	(0.7)		32.5	(0.7)		34.2	(0.7)		8.3	(0.4)	
Serbia	0.02	(0.02)		36.6	(0.5)		44.7	(0.7)		16.0	(0.6)		2.8	(0.2)	
Singapore	0.18	(0.01)		27.0	(0.6)		48.5	(0.7)		20.7	(0.5)		3.8	(0.2)	
Chinese Taipei	0.33	(0.02)		25.6	(0.7)		52.3	(0.7)		19.9	(0.6)		2.2	(0.2)	
Thailand	1.04	(0.01)		7.2	(0.4)		31.7	(0.7)		56.8	(0.8)		4.2	(0.3)	
Ukraine	-0.05	(0.02)		35.0	(0.9)		52.3	(0.8)		10.6	(0.5)		2.1	(0.2)	
United Arab Emirates	0.36	(0.01)		25.9	(0.5)		40.7	(0.6)		28.9	(0.5)		4.6	(0.2)	
Uruguay	0.25	(0.02)		25.7	(0.7)		45.3	(0.7)		25.0	(0.7)		3.9	(0.3)	
Viet Nam	0.90	(0.02)		7.8	(0.5)		43.9	(0.9)		44.7	(1.0)		3.6	(0.3)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.1 [3/4] **Student's perception of difficulty in taking the reading assessment**

Based on students' reports

	Percentage of students who reported that in the PISA test:																							
	Many texts were too difficult for me												I was lost when I had to navigate between different pages											
	Strongly disagree			Disagree			Agree			Strongly agree			Strongly disagree			Disagree			Agree			Strongly agree		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD Australia	35.7	(0.5)		50.8	(0.5)		11.3	(0.3)		2.2	(0.2)		39.8	(0.5)		44.0	(0.5)		13.6	(0.3)		2.6	(0.1)	
Austria	51.0	(0.8)		37.9	(0.9)		9.1	(0.4)		2.0	(0.2)		52.7	(0.7)		30.2	(0.7)		13.7	(0.5)		3.4	(0.3)	
Belgium	26.2	(0.6)		57.4	(0.6)		13.6	(0.5)		2.8	(0.2)		28.9	(0.6)		48.0	(0.6)		19.5	(0.6)		3.6	(0.2)	
Canada	39.5	(0.5)		49.3	(0.4)		9.4	(0.3)		1.8	(0.1)		41.5	(0.5)		43.0	(0.5)		13.0	(0.3)		2.6	(0.2)	
Chile	27.9	(0.7)		52.2	(0.7)		17.2	(0.6)		2.6	(0.2)		33.0	(0.7)		46.5	(0.6)		17.4	(0.6)		3.0	(0.2)	
Colombia	12.2	(0.5)		53.4	(0.8)		31.2	(0.9)		3.2	(0.3)		18.1	(0.6)		55.2	(0.9)		23.2	(0.7)		3.6	(0.3)	
Czech Republic	19.5	(0.6)		55.4	(0.7)		21.6	(0.6)		3.5	(0.3)		21.9	(0.7)		50.0	(0.7)		23.5	(0.5)		4.6	(0.3)	
Denmark	40.1	(0.8)		51.3	(0.8)		7.6	(0.4)		1.0	(0.2)		63.7	(0.7)		30.4	(0.7)		4.3	(0.3)		1.6	(0.2)	
Estonia	32.7	(0.7)		55.1	(0.8)		11.1	(0.5)		1.1	(0.2)		39.3	(0.7)		43.5	(0.7)		15.3	(0.5)		1.8	(0.2)	
Finland	40.5	(0.7)		47.0	(0.7)		10.1	(0.5)		2.4	(0.2)		54.2	(0.7)		38.3	(0.7)		5.9	(0.4)		1.7	(0.2)	
France	31.5	(0.7)		45.3	(0.7)		18.8	(0.6)		4.4	(0.3)		38.0	(0.8)		39.5	(0.8)		17.6	(0.5)		5.0	(0.3)	
Germany	46.5	(0.9)		42.5	(0.8)		9.4	(0.5)		1.6	(0.2)		57.2	(0.9)		30.7	(0.8)		10.0	(0.5)		2.2	(0.2)	
Greece	28.0	(0.7)		52.4	(0.7)		17.3	(0.7)		2.3	(0.2)		28.7	(0.6)		42.4	(0.6)		24.0	(0.6)		4.9	(0.3)	
Hungary	34.3	(0.8)		50.7	(0.9)		13.2	(0.6)		1.8	(0.2)		41.0	(0.8)		45.1	(0.8)		11.9	(0.5)		2.0	(0.2)	
Iceland	35.2	(0.8)		43.7	(0.8)		16.8	(0.7)		4.3	(0.3)		41.2	(0.8)		39.3	(0.9)		15.4	(0.7)		4.0	(0.3)	
Ireland	32.5	(0.7)		54.4	(0.6)		11.4	(0.4)		1.7	(0.1)		37.4	(0.8)		48.0	(0.7)		12.5	(0.5)		2.1	(0.2)	
Israel	34.1	(0.8)		43.3	(0.6)		18.2	(0.6)		4.4	(0.3)		40.4	(0.8)		36.8	(0.6)		18.0	(0.6)		4.7	(0.3)	
Italy	37.1	(0.7)		50.2	(0.6)		10.7	(0.5)		2.1	(0.2)		41.2	(0.9)		44.3	(0.8)		12.1	(0.5)		2.4	(0.3)	
Japan	21.9	(0.7)		48.2	(0.7)		23.9	(0.6)		6.1	(0.3)		31.6	(0.8)		46.2	(0.6)		17.0	(0.6)		5.2	(0.3)	
Korea	32.1	(0.9)		45.5	(0.7)		19.7	(0.6)		2.8	(0.2)		33.4	(0.9)		46.4	(0.8)		17.8	(0.6)		2.4	(0.2)	
Latvia	27.0	(0.7)		57.9	(0.7)		13.1	(0.5)		1.9	(0.2)		28.1	(0.6)		48.8	(0.6)		20.1	(0.5)		2.9	(0.2)	
Lithuania	47.1	(0.7)		35.6	(0.7)		14.3	(0.5)		3.1	(0.3)		76.3	(0.5)		13.5	(0.4)		7.1	(0.4)		3.1	(0.3)	
Luxembourg	43.5	(0.7)		42.7	(0.7)		11.5	(0.4)		2.3	(0.2)		45.6	(0.7)		35.9	(0.6)		15.1	(0.5)		3.4	(0.2)	
Mexico	20.8	(0.7)		58.2	(0.7)		18.7	(0.6)		2.3	(0.2)		23.8	(0.7)		53.0	(0.7)		19.8	(0.7)		3.4	(0.3)	
Netherlands	33.3	(1.0)		54.9	(1.0)		9.4	(0.5)		2.3	(0.2)		39.1	(0.7)		44.3	(0.8)		14.4	(0.5)		2.2	(0.2)	
New Zealand	32.5	(0.7)		52.9	(0.7)		12.6	(0.5)		2.0	(0.2)		37.4	(0.7)		45.6	(0.7)		14.8	(0.5)		2.2	(0.2)	
Norway	34.1	(0.7)		48.9	(0.7)		13.7	(0.5)		3.2	(0.2)		35.7	(0.7)		42.7	(0.7)		17.5	(0.5)		4.1	(0.3)	
Poland	25.2	(0.7)		57.8	(0.7)		15.1	(0.6)		1.9	(0.2)		25.7	(0.7)		49.3	(0.7)		21.2	(0.7)		3.8	(0.3)	
Portugal	28.9	(1.0)		53.3	(0.9)		16.1	(0.7)		1.7	(0.2)		33.8	(0.9)		48.9	(0.8)		15.2	(0.6)		2.1	(0.2)	
Slovak Republic	22.0	(0.7)		52.2	(0.6)		22.7	(0.7)		3.2	(0.2)		26.6	(0.7)		49.5	(0.7)		19.4	(0.6)		4.6	(0.3)	
Slovenia	33.2	(0.7)		54.9	(0.7)		9.9	(0.4)		1.9	(0.2)		32.7	(0.9)		48.5	(0.8)		15.9	(0.6)		2.9	(0.3)	
Spain	34.4	(0.5)		51.0	(0.4)		12.3	(0.3)		2.3	(0.1)		43.0	(0.5)		44.1	(0.5)		10.7	(0.3)		2.2	(0.1)	
Sweden	30.8	(0.9)		52.8	(0.9)		13.4	(0.6)		3.0	(0.3)		31.3	(0.8)		45.1	(0.8)		19.2	(0.6)		4.5	(0.4)	
Switzerland	37.7	(0.9)		47.0	(0.9)		12.9	(0.6)		2.5	(0.3)		43.2	(0.9)		37.1	(0.7)		16.3	(0.6)		3.4	(0.3)	
Turkey	23.2	(0.6)		52.1	(0.8)		21.4	(0.7)		3.3	(0.2)		39.1	(0.7)		45.1	(0.5)		12.5	(0.5)		3.3	(0.2)	
United Kingdom	34.3	(0.8)		49.8	(0.7)		13.1	(0.4)		2.8	(0.2)		40.2	(0.8)		43.4	(0.6)		13.2	(0.5)		3.1	(0.2)	
United States	36.5	(1.0)		50.8	(0.8)		11.0	(0.6)		1.7	(0.2)		38.5	(1.0)		45.7	(0.9)		13.2	(0.6)		2.6	(0.3)	
OECD average	32.5	(0.1)		50.2	(0.1)		14.7	(0.1)		2.6	(0.0)		38.5	(0.1)		42.9	(0.1)		15.4	(0.1)		3.2	(0.0)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.1 [4/4] **Student's perception of difficulty in taking the reading assessment**

Based on students' reports

	Percentage of students who reported that in the PISA test:																							
	Many texts were too difficult for me												I was lost when I had to navigate between different pages											
	Strongly disagree			Disagree			Agree			Strongly agree			Strongly disagree			Disagree			Agree			Strongly agree		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners																								
Albania	22.2	(0.7)		49.6	(0.8)		24.4	(0.6)		3.8	(0.3)		31.4	(0.6)		45.6	(0.7)		18.2	(0.6)		4.7	(0.3)	
Argentina	24.6	(0.8)		44.7	(0.8)		24.6	(0.8)		6.1	(0.4)		31.8	(0.8)		40.5	(0.7)		21.5	(0.6)		6.2	(0.3)	
Baku (Azerbaijan)	22.3	(0.7)		48.8	(0.7)		23.3	(0.7)		5.6	(0.4)		26.9	(0.7)		42.7	(0.7)		22.7	(0.6)		7.6	(0.4)	
Belarus	23.0	(0.8)		62.5	(0.8)		13.5	(0.6)		1.1	(0.1)		30.0	(0.9)		59.2	(0.8)		9.5	(0.5)		1.3	(0.1)	
Bosnia and Herzegovina	27.1	(0.7)		52.0	(0.7)		17.5	(0.6)		3.5	(0.3)		31.1	(0.8)		47.6	(0.8)		17.3	(0.5)		4.0	(0.3)	
Brazil	17.6	(0.5)		54.1	(0.6)		25.7	(0.6)		2.6	(0.2)		21.2	(0.6)		50.6	(0.6)		24.7	(0.6)		3.4	(0.2)	
Brunei Darussalam	11.1	(0.4)		51.1	(0.5)		33.3	(0.5)		4.4	(0.2)		13.5	(0.4)		45.9	(0.5)		35.1	(0.5)		5.5	(0.3)	
B-S-J-Z (China)	25.4	(0.7)		57.9	(0.6)		15.3	(0.5)		1.4	(0.2)		29.3	(0.8)		56.1	(0.7)		13.3	(0.6)		1.3	(0.2)	
Bulgaria	40.9	(1.1)		40.0	(0.8)		14.6	(0.8)		4.5	(0.4)		48.9	(1.0)		32.3	(0.8)		13.0	(0.6)		5.7	(0.4)	
Costa Rica	24.7	(0.8)		51.6	(0.6)		19.7	(0.6)		4.0	(0.3)		29.1	(0.8)		46.0	(0.6)		20.4	(0.6)		4.5	(0.2)	
Croatia	24.3	(0.5)		54.2	(0.6)		18.6	(0.6)		2.9	(0.2)		34.3	(0.6)		49.6	(0.6)		13.4	(0.4)		2.7	(0.2)	
Cyprus	22.7	(0.6)		52.7	(0.8)		20.6	(0.6)		4.0	(0.2)		26.9	(0.7)		46.2	(0.7)		22.0	(0.6)		5.0	(0.3)	
Dominican Republic	20.4	(0.7)		48.7	(0.9)		25.7	(0.8)		5.2	(0.3)		24.2	(0.7)	†	47.6	(0.9)	†	22.3	(0.8)	†	5.8	(0.4)	†
Georgia	26.3	(0.8)		53.2	(0.8)		17.8	(0.6)		2.7	(0.3)		30.3	(0.8)		48.1	(0.9)		18.2	(0.6)		3.4	(0.3)	
Hong Kong (China)	20.3	(0.6)		60.1	(0.7)		16.8	(0.6)		2.7	(0.2)		24.5	(0.6)		56.0	(0.8)		16.5	(0.6)		2.9	(0.2)	
Indonesia	7.9	(0.6)		51.0	(0.9)		37.8	(0.9)		3.3	(0.3)		9.0	(0.5)		44.1	(1.0)		41.4	(0.9)		5.5	(0.4)	
Jordan	21.3	(0.7)		46.6	(0.7)		26.3	(0.7)		5.8	(0.3)		24.4	(0.7)		36.5	(0.7)		29.5	(0.7)		9.6	(0.4)	
Kazakhstan	17.6	(0.4)		61.1	(0.5)		19.6	(0.4)		1.7	(0.1)		20.2	(0.4)		56.4	(0.5)		21.1	(0.5)		2.3	(0.1)	
Kosovo	24.2	(0.7)		52.3	(0.8)		20.6	(0.7)		2.9	(0.3)		28.6	(0.8)		48.4	(0.8)		18.9	(0.7)		4.1	(0.4)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	15.5	(0.6)		59.5	(0.8)		21.4	(0.7)		3.6	(0.3)		18.2	(0.6)		54.4	(0.7)		23.7	(0.7)		3.7	(0.3)	
Malaysia	9.5	(0.5)		48.1	(0.8)		38.8	(0.8)		3.5	(0.2)		13.1	(0.6)		45.9	(0.8)		35.2	(0.8)		5.8	(0.4)	
Malta	33.3	(0.8)		50.7	(0.9)		13.2	(0.6)		2.8	(0.3)		35.3	(0.9)		43.7	(0.9)		17.3	(0.7)		3.7	(0.3)	
Moldova	25.1	(0.9)		54.8	(0.7)		18.1	(0.6)		1.9	(0.2)		29.7	(1.0)		50.1	(0.9)		18.1	(0.7)		2.1	(0.2)	
Montenegro	34.4	(0.7)		48.3	(0.6)		14.1	(0.4)		3.1	(0.2)		36.4	(0.7)		41.9	(0.6)		17.5	(0.5)		4.2	(0.3)	
Morocco[3]	17.9	(0.6)		46.2	(0.9)		31.0	(0.8)		5.0	(0.4)		20.8	(0.7)		46.2	(0.8)		27.6	(0.7)		5.4	(0.4)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Panama	17.1	(0.6)		47.4	(0.8)		30.1	(0.8)		5.4	(0.4)		22.0	(0.7)		44.5	(1.0)		27.3	(0.8)		6.2	(0.4)	
Peru	15.3	(0.6)		61.5	(0.6)		21.4	(0.7)		1.8	(0.2)		19.7	(0.6)		55.4	(0.7)		22.3	(0.7)		2.7	(0.3)	
Philippines	8.6	(0.4)		42.8	(0.8)		44.1	(0.9)		4.4	(0.3)		10.7	(0.5)		43.5	(0.7)		41.1	(0.7)		4.7	(0.3)	
Qatar	23.8	(0.4)		47.2	(0.4)		24.5	(0.4)		4.5	(0.2)		27.3	(0.4)		40.0	(0.4)		26.1	(0.4)		6.7	(0.2)	
Romania	25.8	(1.0)		51.7	(0.9)		20.4	(0.9)		2.1	(0.2)		26.3	(0.9)		40.8	(0.8)		27.7	(1.0)		5.2	(0.4)	
Russia	31.1	(0.7)		51.9	(0.7)		15.4	(0.4)		1.7	(0.2)		39.4	(0.9)		48.2	(0.8)		10.6	(0.4)		1.8	(0.2)	
Saudi Arabia	24.2	(0.7)		42.0	(0.7)		26.7	(0.7)		7.1	(0.4)		26.7	(0.7)		34.4	(0.7)		29.6	(0.8)		9.3	(0.4)	
Serbia	32.3	(0.6)		50.8	(0.8)		14.0	(0.6)		2.9	(0.3)		37.2	(0.8)		42.9	(0.8)		15.6	(0.6)		4.2	(0.3)	
Singapore	27.7	(0.6)		53.3	(0.6)		16.1	(0.4)		2.9	(0.2)		30.8	(0.7)		46.9	(0.7)		18.7	(0.5)		3.7	(0.2)	
Chinese Taipei	20.8	(0.6)		47.0	(0.6)		28.6	(0.7)		3.7	(0.3)		25.8	(0.6)		49.5	(0.7)		21.1	(0.5)		3.7	(0.2)	
Thailand	6.8	(0.3)		34.3	(0.7)		53.6	(0.7)		5.2	(0.2)		8.9	(0.4)		37.5	(0.7)		46.8	(0.7)		6.8	(0.3)	
Ukraine	32.2	(0.9)		54.4	(0.6)		11.5	(0.6)		1.9	(0.2)		35.9	(0.8)		49.0	(0.7)		12.8	(0.6)		2.3	(0.2)	
United Arab Emirates	26.8	(0.5)		46.4	(0.6)		22.5	(0.5)		4.4	(0.2)		26.9	(0.4)		36.8	(0.5)		29.0	(0.4)		7.4	(0.3)	
Uruguay	24.4	(0.7)		53.4	(0.8)		19.4	(0.7)		2.8	(0.3)		27.6	(0.7)		48.9	(0.8)		19.8	(0.7)		3.7	(0.3)	
Viet Nam	5.7	(0.4)		39.7	(0.9)		50.3	(1.0)		4.3	(0.4)		9.9	(0.6)		49.0	(0.9)		36.6	(0.9)		4.4	(0.3)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.11 [1/4] **Student's knowledge of reading strategies for assessing the credibility of sources**

Based on students' reports

		Index of knowledge of reading strategies for assessing the credibility of sources			Percentage of students who reported about the usefulness of the following strategies for assessing credibility:														
					Answer the email and ask for more information about the smartphone									Check the sender's email address					
					Not very appropriate			Somewhat appropriate			Very appropriate			Not very appropriate			Somewhat appropriate			Very appropriate		
		%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD	Australia	0.14	(0.01)		58.9	(0.6)		26.6	(0.5)		14.6	(0.3)		18.1	(0.5)		30.6	(0.5)		51.2	(0.5)	
	Austria	0.15	(0.02)		49.0	(0.7)		33.2	(0.7)		17.8	(0.6)		15.6	(0.5)		30.5	(0.7)		53.8	(0.8)	
	Belgium	0.04	(0.02)		46.6	(0.7)		34.4	(0.6)		19.0	(0.5)		19.0	(0.5)		34.0	(0.6)		46.9	(0.7)	
	Canada	0.02	(0.01)		46.9	(0.5)		32.7	(0.5)		20.4	(0.5)		17.6	(0.4)		32.1	(0.5)		50.4	(0.6)	
	Chile	-0.37	(0.02)		42.1	(0.6)		32.4	(0.7)		25.5	(0.7)		25.5	(0.7)		31.0	(0.6)		43.5	(0.8)	
	Colombia	-0.29	(0.02)		49.2	(0.8)		31.7	(0.7)		19.0	(0.7)		28.8	(0.9)		32.9	(0.6)		38.4	(1.0)	
	Czech Republic	-0.02	(0.02)		47.5	(0.8)		32.6	(0.6)		19.9	(0.6)		26.4	(0.7)		33.9	(0.7)		39.7	(0.8)	
	Denmark	0.21	(0.02)		51.3	(0.9)		30.9	(0.8)		17.8	(0.6)		15.2	(0.6)		31.5	(0.7)		53.3	(0.8)	
	Estonia	0.05	(0.02)		37.1	(0.7)		39.0	(0.7)		23.9	(0.6)		12.0	(0.5)		33.1	(0.8)		54.9	(0.8)	
	Finland	0.19	(0.02)		53.4	(0.7)		31.6	(0.7)		15.0	(0.5)		13.4	(0.5)		33.8	(0.6)		52.8	(0.7)	
	France	0.07	(0.02)		54.6	(0.7)		26.1	(0.6)		19.3	(0.5)		21.3	(0.6)		27.4	(0.6)		51.3	(0.7)	
	Germany	0.24	(0.02)		51.4	(0.9)		31.4	(0.8)		17.2	(0.7)		16.4	(0.6)		30.0	(0.8)		53.5	(1.0)	
	Greece	0.10	(0.02)		56.6	(0.8)		27.3	(0.6)		16.1	(0.6)		25.4	(0.7)		30.5	(0.6)		44.1	(0.8)	
	Hungary	-0.27	(0.02)		28.7	(0.7)		43.5	(0.8)		27.9	(0.7)		14.6	(0.6)		38.1	(0.6)		47.2	(0.7)	
	Iceland	-0.20	(0.02)		35.0	(0.8)		35.6	(0.9)		29.4	(0.9)		18.8	(0.7)		30.1	(0.9)		51.1	(0.9)	
	Ireland	0.21	(0.01)		49.7	(0.7)		28.6	(0.6)		21.7	(0.6)		15.2	(0.5)		26.7	(0.6)		58.1	(0.8)	
	Israel	-0.20	(0.02)	†	48.5	(0.7)		28.1	(0.7)		23.4	(0.7)		25.7	(0.7)		31.0	(0.6)		43.3	(1.0)	
	Italy	-0.05	(0.02)		48.1	(0.7)		30.9	(0.6)		21.0	(0.6)		22.0	(0.7)		31.1	(0.7)		47.0	(0.7)	
	Japan	0.28	(0.02)		58.2	(0.7)		26.8	(0.7)		15.0	(0.4)		18.6	(0.5)		31.9	(0.7)		49.5	(0.8)	
	Korea	-0.30	(0.02)		24.4	(0.5)		46.1	(0.6)		29.5	(0.7)		11.0	(0.4)		42.0	(0.7)		47.0	(0.8)	
	Latvia	0.03	(0.01)		42.2	(0.8)		37.2	(0.7)		20.5	(0.6)		20.6	(0.6)		34.3	(0.7)		45.1	(0.8)	
	Lithuania	-0.09	(0.02)		42.1	(0.7)		31.8	(0.6)		26.0	(0.6)		20.3	(0.6)		30.7	(0.6)		48.9	(0.7)	
	Luxembourg	-0.10	(0.01)		48.7	(0.8)		33.2	(0.7)		18.1	(0.5)		23.7	(0.6)		33.1	(0.7)		43.2	(0.6)	
	Mexico	-0.40	(0.02)		42.5	(0.8)		34.9	(0.8)		22.6	(0.6)		24.1	(0.8)		33.1	(0.6)		42.7	(1.0)	
	Netherlands	0.21	(0.02)		45.1	(0.8)		35.7	(0.8)		19.1	(0.7)		12.5	(0.6)		30.4	(0.7)		57.0	(0.9)	
	New Zealand	0.12	(0.02)		49.9	(0.9)		31.2	(0.7)		18.8	(0.5)		16.1	(0.5)		30.2	(0.8)		53.7	(0.8)	
	Norway	-0.03	(0.02)		53.8	(0.8)		30.3	(0.6)		15.9	(0.5)		22.6	(0.6)		32.0	(0.7)		45.5	(0.7)	
	Poland	-0.03	(0.02)		42.4	(0.6)		35.4	(0.7)		22.2	(0.6)		21.0	(0.7)		36.3	(0.8)		42.7	(0.9)	
	Portugal	0.03	(0.02)		43.1	(0.7)		32.0	(0.6)		24.9	(0.7)		13.4	(0.6)		30.3	(0.8)		56.2	(0.9)	
	Slovak Republic	-0.20	(0.02)		42.5	(0.7)		34.6	(0.8)		22.9	(0.5)		24.0	(0.7)		34.2	(0.6)		41.7	(0.9)	
	Slovenia	-0.02	(0.01)		46.3	(0.7)		36.3	(0.7)		17.3	(0.6)		18.1	(0.6)		38.6	(0.8)		43.3	(0.9)	
	Spain	-0.01	(0.01)		42.4	(0.4)		34.8	(0.4)		22.8	(0.4)		17.1	(0.4)		33.0	(0.4)		49.9	(0.5)	
	Sweden	0.07	(0.02)		54.7	(0.8)		30.1	(0.8)		15.2	(0.6)		19.5	(0.7)		32.8	(0.7)		47.7	(1.0)	
	Switzerland	0.04	(0.02)		44.3	(1.0)		33.6	(0.8)		22.0	(0.7)		16.3	(0.6)		32.5	(0.8)		51.2	(1.0)	
	Turkey	-0.23	(0.02)		47.7	(0.7)		27.3	(0.6)		25.0	(0.5)		28.2	(0.7)		28.0	(0.6)		43.8	(0.8)	
	United Kingdom	0.29	(0.02)		56.8	(0.6)		26.3	(0.5)		16.9	(0.5)		17.4	(0.5)		27.8	(0.6)		54.9	(0.7)	
	United States	0.01	(0.02)		51.5	(0.9)		29.3	(0.6)		19.2	(0.7)		20.1	(0.9)		28.7	(0.7)		51.2	(1.2)	
	OECD average	-0.01	(0.00)		46.8	(0.1)		32.5	(0.1)		20.6	(0.1)		19.3	(0.1)		32.1	(0.1)		48.5	(0.1)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.11 [2/4] **Student's knowledge of reading strategies for assessing the credibility of sources**

Based on students' reports

	Index of knowledge of reading strategies for assessing the credibility of sources			Percentage of students who reported about the usefulness of the following strategies for assessing credibility:																	
				Answer the email and ask for more information about the smartphone									Check the sender's email address								
				Not very appropriate			Somewhat appropriate			Very appropriate			Not very appropriate			Somewhat appropriate			Very appropriate		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners																					
Albania	-0.63	(0.01)		40.6	(0.7)		27.4	(0.7)		32.0	(0.8)		28.2	(0.7)		26.6	(0.6)		45.2	(0.8)	
Argentina	-0.10	(0.02)		46.9	(0.8)		24.0	(0.6)		29.1	(0.7)		25.2	(0.8)		25.2	(0.6)		49.6	(0.8)	
Baku (Azerbaijan)	-0.70	(0.01)	†	41.1	(0.6)	†	27.8	(0.6)	†	31.1	(0.7)	†	36.0	(0.7)	†	29.7	(0.7)	†	34.3	(0.7)	†
Belarus	-0.14	(0.02)		39.4	(0.7)		36.7	(0.7)		23.9	(0.5)		20.8	(0.7)		36.0	(0.8)		43.1	(0.9)	
Bosnia and Herzegovina	-0.47	(0.02)		34.4	(0.8)		34.3	(0.6)		31.3	(0.7)		23.0	(0.7)		33.1	(0.6)		43.9	(0.8)	
Brazil	-0.38	(0.01)		54.3	(0.6)		21.6	(0.5)		24.1	(0.5)		35.5	(0.7)		22.7	(0.5)		41.7	(0.8)	
Brunei Darussalam	-0.26	(0.01)		46.9	(0.6)		33.8	(0.6)		19.3	(0.5)		30.3	(0.5)		30.2	(0.5)		39.5	(0.6)	
B-S-J-Z (China)	0.05	(0.02)		51.5	(0.8)		26.6	(0.6)		21.9	(0.6)		17.5	(0.6)		24.8	(0.7)		57.7	(0.8)	
Bulgaria	-0.49	(0.02)		38.1	(0.8)		30.5	(0.7)		31.4	(0.8)		27.2	(1.0)		32.5	(0.8)		40.3	(1.0)	
Costa Rica	-0.27	(0.03)		51.4	(0.7)		27.1	(0.6)		21.5	(0.6)		30.1	(0.9)		28.7	(0.6)		41.3	(0.9)	
Croatia	-0.18	(0.02)		37.3	(0.6)		37.1	(0.6)		25.6	(0.6)		17.4	(0.5)		33.1	(0.7)		49.5	(0.7)	
Cyprus	-0.16	(0.01)		46.8	(0.8)		29.6	(0.7)		23.7	(0.7)		22.5	(0.6)		31.1	(0.7)		46.4	(0.7)	
Dominican Republic	-0.56	(0.02)	†	45.3	(0.9)	†	23.9	(0.8)	†	30.8	(0.7)	†	35.5	(1.1)	†	25.0	(0.8)	†	39.5	(1.0)	†
Georgia	-0.48	(0.01)		44.0	(0.9)		26.9	(0.7)		29.1	(0.7)		31.3	(0.8)		30.3	(0.7)		38.5	(0.8)	
Hong Kong (China)	-0.15	(0.02)		44.3	(0.8)		40.5	(0.7)		15.2	(0.5)		18.6	(0.6)		42.0	(0.9)		39.3	(0.9)	
Indonesia	-0.71	(0.02)		51.3	(0.8)		21.7	(0.7)		27.0	(0.7)		40.9	(0.9)		22.8	(0.6)		36.3	(0.8)	
Jordan	-0.25	(0.02)		45.8	(0.8)		23.7	(0.5)		30.6	(0.7)		23.3	(0.7)		23.2	(0.6)		53.5	(0.9)	
Kazakhstan	-0.65	(0.01)		36.2	(0.5)		32.9	(0.4)		30.8	(0.5)		34.1	(0.4)		34.3	(0.4)		31.6	(0.5)	
Kosovo	-0.59	(0.01)		50.1	(0.9)		25.3	(0.8)		24.5	(0.7)		38.0	(0.9)		26.5	(0.8)		35.5	(0.9)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	-0.13	(0.02)		42.6	(0.7)		40.9	(0.7)		16.5	(0.6)		21.7	(0.6)		39.7	(0.7)		38.5	(0.9)	
Malaysia	-0.47	(0.02)		41.6	(0.7)		33.6	(0.7)		24.7	(0.7)		32.8	(0.8)		32.8	(0.6)		34.4	(0.9)	
Malta	-0.19	(0.02)		36.7	(0.9)		33.0	(0.9)		30.3	(0.9)		15.7	(0.6)		28.0	(0.8)		56.3	(0.8)	
Moldova	-0.11	(0.02)		40.3	(0.9)		29.5	(0.7)		30.2	(0.7)		22.9	(0.7)		21.7	(0.7)		55.4	(0.9)	
Montenegro	-0.47	(0.01)		40.8	(0.6)		33.4	(0.7)		25.8	(0.6)		24.5	(0.8)		34.3	(0.7)		41.3	(0.7)	
Morocco	-0.44	(0.01)	†	23.0	(0.7)		37.1	(0.6)		39.8	(0.6)		14.8	(0.7)		29.8	(0.7)		55.4	(1.0)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Panama	-0.40	(0.02)	†	44.6	(0.8)	†	27.8	(0.8)	†	27.6	(0.7)	†	30.8	(0.9)	†	29.4	(0.9)	†	39.8	(1.0)	†
Peru	-0.44	(0.02)		50.5	(0.8)		30.0	(0.7)		19.5	(0.6)		36.1	(1.0)		30.7	(0.7)		33.2	(0.9)	
Philippines	-0.65	(0.01)		48.1	(0.9)		29.0	(0.8)		22.9	(0.6)		40.3	(1.0)		29.4	(0.7)		30.3	(0.8)	
Qatar	-0.26	(0.01)		45.6	(0.5)		29.7	(0.5)		24.7	(0.4)		24.5	(0.4)		29.9	(0.4)		45.5	(0.5)	
Romania	-0.14	(0.03)		36.9	(0.8)		30.2	(0.7)		32.9	(0.8)		19.0	(0.9)		26.2	(0.8)		54.8	(1.0)	
Russia	-0.10	(0.02)		47.1	(0.6)		32.8	(0.6)		20.1	(0.5)		25.9	(0.6)		35.7	(0.5)		38.4	(0.6)	
Saudi Arabia	-0.15	(0.02)		45.4	(0.8)		28.4	(0.7)		26.2	(0.7)		20.6	(0.7)		24.9	(0.6)		54.5	(0.9)	
Serbia	-0.33	(0.02)		39.5	(0.8)		34.1	(0.6)		26.4	(0.7)		21.1	(0.9)		31.6	(0.6)		47.3	(1.0)	
Singapore	0.16	(0.01)		48.1	(0.6)		33.3	(0.6)		18.7	(0.5)		12.0	(0.4)		30.7	(0.5)		57.3	(0.5)	
Chinese Taipei	-0.35	(0.02)		44.6	(0.8)		35.1	(0.7)		20.4	(0.5)		24.6	(0.6)		37.3	(0.7)		38.1	(0.8)	
Thailand	-0.71	(0.01)		30.4	(0.6)		41.9	(0.6)		27.7	(0.7)		24.1	(0.8)		43.5	(0.7)		32.5	(1.0)	
Ukraine	0.04	(0.02)		40.6	(0.7)		31.4	(0.7)		28.0	(0.6)		18.4	(0.6)		29.8	(0.7)		51.8	(0.7)	
United Arab Emirates	-0.26	(0.01)		42.8	(0.5)		28.9	(0.5)		28.3	(0.5)		20.4	(0.4)		27.3	(0.4)		52.3	(0.6)	
Uruguay	-0.27	(0.02)	†	51.8	(0.9)		28.6	(0.7)		19.6	(0.7)		30.9	(0.9)		31.2	(0.7)		37.9	(0.8)	
Viet Nam	-0.15	(0.02)		30.7	(1.1)		36.2	(0.9)		33.1	(0.9)		14.0	(0.9)		30.4	(1.0)		55.6	(1.3)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.11 [3/4] **Student's knowledge of reading strategies for assessing the credibility of sources**

Based on students' reports

	Percentage of students who reported about the usefulness of the following strategies for assessing credibility:																							
	Click on the link to fill out the form as soon as possible									Delete the email without clicking on the link									Check the website of the mobile phone operator to see whether the smartphone offer is mentioned					
	Not very appropriate			Somewhat appropriate			Very appropriate			Not very appropriate			Somewhat appropriate			Very appropriate			Not very appropriate			Somewhat appropriate			Very appropriate		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD																											
Australia	69.2	(0.6)		21.7	(0.5)		9.1	(0.3)		29.7	(0.5)		25.1	(0.5)		45.2	(0.6)		31.0	(0.5)		31.9	(0.6)		37.1	(0.6)	
Austria	65.4	(0.9)		25.7	(0.7)		8.9	(0.5)		38.5	(0.7)		29.8	(0.6)		31.7	(0.8)		17.8	(0.6)		33.1	(0.7)		49.0	(0.8)	
Belgium	60.3	(0.7)		28.5	(0.6)		11.2	(0.4)		37.6	(0.6)		29.6	(0.7)		32.8	(0.7)		23.9	(0.5)		34.9	(0.6)		41.1	(0.8)	
Canada	61.8	(0.6)		26.2	(0.5)		12.0	(0.4)		34.2	(0.5)		29.5	(0.5)		36.3	(0.6)		24.8	(0.4)		34.2	(0.5)		41.0	(0.6)	
Chile	50.5	(0.8)		31.1	(0.6)		18.4	(0.6)		48.2	(0.7)		30.3	(0.5)		21.5	(0.6)		30.0	(0.7)		28.7	(0.6)		41.2	(0.9)	
Colombia	50.6	(0.8)		33.1	(0.7)		16.3	(0.8)		47.8	(0.8)		32.5	(0.7)		19.7	(0.7)		31.3	(0.9)		30.5	(0.6)		38.2	(1.0)	
Czech Republic	61.5	(0.8)		28.9	(0.7)		9.5	(0.5)		33.6	(0.7)		32.1	(0.8)		34.3	(0.7)		21.8	(0.6)		33.9	(0.8)		44.2	(0.8)	
Denmark	68.8	(0.8)		21.9	(0.7)		9.3	(0.4)		29.6	(0.8)		26.2	(0.7)		44.2	(0.8)		19.3	(0.7)		29.0	(0.7)		51.7	(0.8)	
Estonia	61.2	(0.8)		30.1	(0.7)		8.7	(0.5)		36.1	(0.8)		36.4	(0.7)		27.5	(0.7)		21.3	(0.6)		31.7	(0.7)		47.0	(0.7)	
Finland	70.0	(0.7)		23.9	(0.6)		6.0	(0.3)		40.1	(0.7)		30.9	(0.6)		29.0	(0.7)		15.9	(0.5)		32.3	(0.6)		51.8	(0.7)	
France	63.2	(0.8)		21.6	(0.7)		15.2	(0.5)		39.5	(0.6)		22.8	(0.5)		37.7	(0.7)		26.8	(0.6)		27.9	(0.6)		45.3	(0.7)	
Germany	68.9	(1.0)		22.6	(0.9)		8.6	(0.5)		36.4	(0.9)		26.4	(0.7)		37.2	(0.9)		19.8	(0.6)		30.3	(0.7)		49.9	(0.9)	
Greece	61.3	(0.9)		26.2	(0.8)		12.5	(0.5)		35.8	(0.6)		29.5	(0.7)		34.7	(0.8)		27.8	(0.7)		29.5	(0.7)		42.7	(0.9)	
Hungary	39.8	(0.8)		44.2	(0.8)		15.9	(0.6)		43.0	(0.8)		37.3	(0.7)		19.7	(0.6)		17.8	(0.6)		38.4	(0.8)		43.8	(0.7)	
Iceland	60.7	(0.9)		30.8	(0.9)		8.5	(0.5)		46.2	(1.1)		34.8	(1.0)		19.1	(0.7)		20.4	(0.7)		29.4	(0.9)		50.2	(0.9)	
Ireland	65.9	(0.7)		23.6	(0.7)		10.5	(0.4)		40.5	(0.7)		25.9	(0.6)		33.7	(0.8)		17.9	(0.5)		26.0	(0.6)		56.1	(0.8)	
Israel	53.5	(0.9)		29.9	(0.7)		16.6	(0.7)		38.5	(0.7)		32.1	(0.6)		29.4	(0.7)		30.1	(0.8)		26.2	(0.7)		43.8	(0.9)	
Italy	54.7	(0.9)		30.8	(0.8)		14.5	(0.6)		46.5	(0.8)		25.8	(0.7)		27.8	(0.7)		24.1	(0.7)		31.1	(0.7)		44.8	(0.8)	
Japan	75.6	(0.7)		18.6	(0.6)		5.8	(0.3)		29.3	(0.8)		28.7	(0.6)		42.1	(0.8)		19.3	(0.6)		26.6	(0.7)		54.1	(1.0)	
Korea	47.1	(0.8)		37.9	(0.8)		15.0	(0.5)		34.7	(0.6)		41.7	(0.7)		23.6	(0.5)		11.7	(0.4)		40.3	(0.8)		48.0	(0.9)	
Latvia	57.6	(0.8)		32.1	(0.7)		10.3	(0.4)		38.2	(0.6)		33.7	(0.6)		28.2	(0.6)		22.2	(0.6)		30.8	(0.7)		47.0	(0.7)	
Lithuania	61.2	(0.7)		27.0	(0.6)		11.8	(0.4)		40.7	(0.6)		30.9	(0.7)		28.4	(0.6)		24.4	(0.6)		25.2	(0.6)		50.4	(0.7)	
Luxembourg	59.9	(0.7)		29.3	(0.7)		10.8	(0.4)		39.3	(0.7)		28.4	(0.6)		32.2	(0.6)		29.0	(0.7)		34.0	(0.6)		37.0	(0.7)	
Mexico	39.7	(0.9)		38.7	(0.9)		21.6	(0.7)		46.6	(0.7)		32.6	(0.8)		20.8	(0.6)		30.3	(0.7)		31.8	(0.7)		38.0	(0.8)	
Netherlands	66.0	(0.9)		26.4	(0.9)		7.6	(0.4)		35.4	(0.8)		28.9	(0.9)		35.8	(0.9)		17.1	(0.8)		32.3	(0.8)		50.5	(1.1)	
New Zealand	67.1	(0.8)		25.0	(0.7)		7.9	(0.4)		35.4	(0.6)		29.2	(0.6)		35.3	(0.7)		24.7	(0.6)		32.1	(0.7)		43.2	(0.7)	
Norway	65.5	(0.8)		26.3	(0.6)		8.1	(0.4)		39.9	(0.8)		27.6	(0.6)		32.5	(0.8)		28.7	(0.7)		31.1	(0.7)		40.2	(0.8)	
Poland	56.2	(0.9)		32.1	(0.8)		11.8	(0.5)		35.2	(0.7)		34.4	(0.7)		30.4	(0.8)		19.5	(0.5)		32.6	(0.8)		48.0	(0.9)	
Portugal	59.5	(0.9)		28.8	(0.8)		11.7	(0.5)		38.9	(0.7)		31.3	(0.8)		29.8	(0.7)		17.8	(0.6)		28.3	(0.7)		54.0	(0.9)	
Slovak Republic	53.6	(0.8)		34.4	(0.8)		12.0	(0.5)		49.7	(0.6)		33.2	(0.7)		17.0	(0.5)		25.2	(0.6)		32.8	(0.6)		42.0	(0.8)	
Slovenia	56.5	(0.6)		33.6	(0.7)		10.0	(0.5)		43.3	(0.8)		33.2	(0.7)		23.5	(0.6)		21.3	(0.6)		33.7	(0.7)		45.0	(0.8)	
Spain	55.5	(0.5)		31.5	(0.4)		13.0	(0.3)		43.7	(0.4)		30.6	(0.4)		25.6	(0.3)		20.3	(0.4)		30.0	(0.4)		49.7	(0.4)	
Sweden	69.8	(0.9)		22.6	(0.8)		7.6	(0.4)		38.0	(0.8)		26.9	(0.7)		35.1	(0.7)		27.8	(0.8)		31.5	(0.6)		40.7	(0.9)	
Switzerland	58.4	(1.1)		28.3	(0.8)		13.3	(0.6)		37.0	(0.8)		28.4	(0.8)		34.7	(0.8)		20.7	(0.7)		33.8	(0.8)		45.5	(0.9)	
Turkey	57.4	(0.8)		27.1	(0.7)		15.5	(0.5)		54.9	(0.7)		25.3	(0.5)		19.8	(0.6)		28.2	(0.8)		26.0	(0.6)		45.9	(0.8)	
United Kingdom	72.6	(0.6)		19.5	(0.5)		8.0	(0.4)		32.2	(0.8)		26.8	(0.7)		41.0	(0.8)		23.2	(0.5)		28.9	(0.7)		47.9	(0.7)	
United States	63.5	(0.9)		25.6	(0.7)		10.8	(0.5)		36.2	(0.9)		27.7	(0.8)		36.1	(0.9)		30.3	(0.8)		31.8	(0.7)		37.9	(0.8)	
OECD average	60.3	(0.1)		28.3	(0.1)		11.5	(0.1)		39.2	(0.1)		30.2	(0.1)		30.6	(0.1)		23.3	(0.1)		31.2	(0.1)		45.5	(0.1)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.5.11 [4/4] **Student's knowledge of reading strategies for assessing the credibility of sources**

Based on students' reports

	Percentage of students who reported about the usefulness of the following strategies for assessing credibility:																							
	Click on the link to fill out the form as soon as possible									Delete the email without clicking on the link									Check the website of the mobile phone operator to see whether the smartphone offer is mentioned					
	Not very appropriate			Somewhat appropriate			Very appropriate			Not very appropriate			Somewhat appropriate			Very appropriate			Not very appropriate			Somewhat appropriate			Very appropriate		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners																											
Albania	34.1	(0.7)		32.3	(0.6)		33.5	(0.9)		61.4	(0.8)		22.5	(0.6)		16.1	(0.6)		29.8	(0.7)		29.0	(0.6)		41.2	(0.8)	
Argentina	59.8	(0.8)		24.1	(0.6)		16.1	(0.7)		37.3	(0.8)		29.6	(0.6)		33.1	(0.8)		28.8	(0.7)		23.2	(0.7)		48.0	(0.8)	
Baku (Azerbaijan)	40.0	(0.7)	†	34.1	(0.6)	†	25.8	(0.5)	†	48.4	(0.8)	†	29.6	(0.6)	†	22.0	(0.6)	†	31.1	(0.6)	†	30.8	(0.7)	†	38.1	(0.7)	†
Belarus	56.2	(0.8)		30.4	(0.7)		13.3	(0.5)		41.2	(0.7)		33.8	(0.6)		25.1	(0.6)		22.9	(0.7)		28.4	(0.7)		48.8	(0.9)	
Bosnia and Herzegovina	38.5	(0.6)		38.6	(0.7)		22.9	(0.6)		49.4	(0.7)		32.1	(0.6)		18.5	(0.5)		21.5	(0.7)		33.2	(0.6)		45.4	(0.8)	
Brazil	59.6	(0.6)		23.2	(0.6)		17.2	(0.4)		59.8	(0.6)		22.1	(0.5)		18.1	(0.5)		37.1	(0.7)		19.9	(0.5)		43.0	(0.8)	
Brunei Darussalam	51.5	(0.6)		33.8	(0.6)		14.7	(0.5)		52.0	(0.6)		29.1	(0.6)		18.9	(0.5)		28.3	(0.6)		34.6	(0.6)		37.1	(0.5)	
B-S-J-Z (China)	74.9	(0.8)		14.6	(0.5)		10.5	(0.4)		43.1	(0.8)		25.8	(0.5)		31.1	(0.7)		38.2	(0.8)		19.0	(0.5)		42.7	(0.7)	
Bulgaria	36.8	(1.0)		37.7	(0.9)		25.5	(0.7)		38.5	(0.8)		33.8	(0.8)		27.7	(0.8)		23.7	(0.8)		32.8	(0.6)		43.4	(0.8)	
Costa Rica	58.0	(0.8)		26.1	(0.6)		15.9	(0.6)		50.8	(0.8)		26.8	(0.5)		22.4	(0.7)		33.4	(0.8)		24.4	(0.6)		42.2	(0.9)	
Croatia	51.7	(0.8)		33.5	(0.7)		14.8	(0.5)		39.8	(0.7)		34.1	(0.6)		26.1	(0.6)		20.9	(0.5)		34.2	(0.6)		44.9	(0.6)	
Cyprus	49.5	(0.8)		32.8	(0.6)		17.7	(0.5)		35.6	(0.7)		33.1	(0.7)		31.3	(0.7)		27.2	(0.7)		29.9	(0.7)		42.9	(0.7)	
Dominican Republic	43.3	(0.9)	†	28.2	(0.9)	†	28.5	(0.9)	†	54.1	(0.9)	†	24.8	(0.8)	†	21.1	(0.8)	†	33.0	(0.9)	†	22.3	(0.7)	†	44.7	(0.9)	†
Georgia	41.9	(0.8)		34.1	(0.8)		24.0	(0.6)		49.2	(0.8)		30.3	(0.8)		20.5	(0.8)		28.1	(0.7)		27.6	(0.7)		44.3	(0.9)	
Hong Kong (China)	56.2	(0.9)		35.1	(0.9)		8.7	(0.4)		32.2	(0.8)		39.4	(0.7)		28.4	(0.8)		24.3	(0.6)		36.4	(0.8)		39.3	(0.8)	
Indonesia	43.6	(0.8)		26.0	(0.6)		30.4	(0.7)		56.2	(1.0)		23.4	(0.7)		20.4	(0.7)		41.7	(1.0)		20.4	(0.7)		37.9	(0.8)	
Jordan	34.4	(0.9)		35.2	(0.8)		30.5	(0.8)		34.8	(0.6)		34.9	(0.7)		30.3	(0.6)		21.0	(0.6)		27.7	(0.6)		51.4	(0.7)	
Kazakhstan	41.1	(0.6)		36.4	(0.6)		22.5	(0.4)		47.5	(0.5)		31.2	(0.5)		21.3	(0.4)		39.9	(0.5)		26.4	(0.4)		33.7	(0.5)	
Kosovo	44.5	(0.9)		32.4	(0.8)		23.1	(0.7)		67.8	(0.8)		19.9	(0.6)		12.2	(0.5)		38.2	(0.8)		27.0	(0.7)		34.8	(0.8)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	56.8	(0.8)		34.0	(0.8)		9.3	(0.4)		41.8	(0.8)		35.2	(0.7)		23.0	(0.7)		27.3	(0.7)		31.7	(0.7)		41.0	(0.9)	
Malaysia	43.6	(0.7)		37.7	(0.7)		18.7	(0.6)		50.4	(0.7)		33.1	(0.6)		16.6	(0.6)		27.1	(0.8)		33.0	(0.7)		39.9	(0.9)	
Malta	47.2	(0.9)		33.8	(0.9)		19.0	(0.6)		47.4	(1.0)		29.1	(0.8)		23.5	(0.8)		21.3	(0.7)		31.9	(0.8)		46.8	(0.8)	
Moldova	52.8	(0.8)		28.1	(0.7)		19.1	(0.6)		50.5	(0.6)		28.1	(0.7)		21.3	(0.6)		20.2	(0.6)		20.1	(0.6)		59.6	(0.8)	
Montenegro	37.6	(0.6)		38.9	(0.7)		23.5	(0.6)		47.6	(0.7)		31.1	(0.6)		21.4	(0.6)		28.7	(0.6)		34.4	(0.7)		36.8	(0.6)	
Morocco	20.7	(0.6)		45.3	(0.8)		34.0	(0.6)		25.8	(0.6)		51.0	(0.8)		23.2	(0.7)		13.8	(0.6)		31.6	(0.7)		54.6	(0.8)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m		m	m	
Panama	42.2	(1.0)	†	32.0	(0.7)	†	25.8	(0.9)	†	44.5	(0.9)	†	30.0	(0.8)	†	25.6	(0.7)	†	29.9	(0.8)	†	27.4	(0.7)	†	42.6	(0.9)	†
Peru	51.1	(0.7)		33.3	(0.6)		15.6	(0.5)		56.9	(0.8)		28.7	(0.7)		14.4	(0.5)		36.2	(0.8)		27.1	(0.7)		36.7	(0.8)	
Philippines	44.3	(0.9)		33.2	(0.7)		22.4	(0.7)		62.5	(0.6)		25.6	(0.5)		11.8	(0.4)		37.6	(0.8)		31.1	(0.7)		31.3	(0.8)	
Qatar	45.1	(0.4)		34.2	(0.5)		20.7	(0.4)		40.0	(0.5)		33.9	(0.5)		26.0	(0.4)		25.9	(0.4)		31.1	(0.4)		42.9	(0.5)	
Romania	48.8	(1.2)		29.5	(0.8)		21.7	(0.9)		47.9	(1.0)		27.9	(0.8)		24.2	(0.8)		20.2	(0.7)		25.8	(0.7)		54.1	(1.1)	
Russia	55.6	(0.8)		31.4	(0.7)		13.0	(0.4)		35.1	(0.7)		33.5	(0.6)		31.4	(0.7)		23.3	(0.6)		28.7	(0.7)		47.9	(0.8)	
Saudi Arabia	41.8	(0.8)		34.0	(0.6)		24.2	(0.7)		40.8	(0.7)		34.3	(0.7)		24.9	(0.7)		22.4	(0.7)		30.3	(0.7)		47.3	(0.7)	
Serbia	44.1	(0.9)		35.4	(0.8)		20.5	(0.7)		41.6	(0.8)		34.0	(0.7)		24.4	(0.7)		22.7	(0.8)		32.4	(0.7)		44.9	(1.0)	
Singapore	67.2	(0.7)		24.3	(0.5)		8.5	(0.3)		31.2	(0.7)		34.3	(0.6)		34.6	(0.6)		18.3	(0.4)		30.6	(0.6)		51.1	(0.6)	
Chinese Taipei	55.4	(0.7)		32.2	(0.7)		12.4	(0.4)		27.7	(0.5)		34.2	(0.7)		38.1	(0.7)		41.1	(0.7)		31.2	(0.7)		27.7	(0.7)	
Thailand	33.3	(0.8)		45.3	(0.7)		21.4	(0.6)		45.0	(0.8)		39.1	(0.6)		15.8	(0.5)		30.7	(0.7)		40.5	(0.7)		28.8	(0.7)	
Ukraine	57.0	(0.9)		27.8	(0.7)		15.2	(0.6)		39.8	(0.7)		28.6	(0.6)		31.6	(0.7)		18.9	(0.7)		19.8	(0.7)		61.3	(0.9)	
United Arab Emirates	42.8	(0.6)		32.1	(0.4)		25.1	(0.5)		38.5	(0.6)		31.4	(0.4)		30.2	(0.6)		23.7	(0.4)		31.2	(0.5)		45.1	(0.5)	
Uruguay	53.2	(0.8)		33.0	(0.8)		13.8	(0.6)		49.0	(0.9)		31.2	(0.7)		19.8	(0.7)		30.6	(1.0)		29.2	(0.7)		40.2	(1.0)	
Viet Nam	43.2	(1.2)		35.7	(0.9)		21.1	(0.8)		47.4	(1.0)		34.8	(0.9)		17.8	(0.9)		12.8	(0.7)		26.2	(0.9)		61.0	(1.2)	

Note: Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.11a [1/4] **Reading performance by the length of text read for school**

Based on students' reports

		Reading mean score																							
		All students			10 pages or less (A)			Between 11 and 100 pages (B)			101 pages or more (C)			Difference between B and A (B - A)			Difference between C and A (C - A)			Explained variance in reading performance (r-squared x 100)		
		Mean score	S.E.	s	Mean score	S.E.	s	Mean score	S.E.	s	Mean score	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	%	S.E.	s
OECD	Australia	503	(1.6)		445	(2.9)		469	(2.9)		533	(2.0)		**24**	(3.8)		**88**	(3.1)		11.9	(0.7)	
	Austria	484	(2.7)		460	(2.8)		472	(4.9)		522	(3.0)		**12**	(4.4)		**62**	(3.2)		9.2	(0.9)	
	Belgium	493	(2.3)		465	(3.3)		449	(5.7)		533	(2.5)		**-15**	(5.1)		**68**	(3.6)		13.6	(1.2)	
	Canada	520	(1.8)		477	(2.8)		484	(2.8)		542	(1.7)		**8**	(3.7)		**66**	(2.8)		8.0	(0.5)	
	Chile	452	(2.6)		407	(4.5)		419	(3.1)		476	(2.8)		**13**	(4.5)		**69**	(4.4)		10.6	(1.1)	
	Colombia	412	(3.3)		384	(3.3)		414	(3.4)		458	(5.0)		**30**	(3.6)		**74**	(5.3)		11.0	(1.4)	
	Czech Republic	490	(2.5)		470	(3.4)		493	(3.7)		530	(2.9)		**22**	(4.5)		**60**	(3.8)		7.3	(0.9)	
	Denmark	501	(1.8)		484	(6.8)		486	(3.4)		514	(2.0)		2	(7.4)		**30**	(7.0)		2.0	(0.5)	
	Estonia	523	(1.8)		497	(3.0)		500	(2.9)		550	(2.2)		3	(3.9)		**53**	(3.4)		7.9	(0.8)	
	Finland	520	(2.3)		464	(4.5)		474	(4.7)		543	(2.0)		9	(5.2)		**79**	(4.4)		11.5	(1.0)	
	France	493	(2.3)		443	(3.5)		446	(3.8)		531	(2.8)		4	(4.7)		**87**	(4.5)		18.0	(1.3)	
	Germany	498	(3.0)		473	(3.9)		515	(5.0)		536	(4.4)		**42**	(5.1)		**62**	(4.9)		7.4	(1.1)	
	Greece	457	(3.6)		463	(3.3)		439	(5.7)		461	(10.5)		**-24**	(4.8)		-2	(9.9)		0.8	(0.3)	
	Hungary	476	(2.3)		440	(3.2)		492	(3.5)		525	(3.8)		**52**	(4.3)		**85**	(4.9)		13.7	(1.4)	
	Iceland	474	(1.7)		451	(4.5)		477	(3.1)		494	(3.0)		**27**	(5.4)		**43**	(5.9)		2.3	(0.6)	
	Ireland	518	(2.2)		495	(2.6)		507	(3.4)		546	(2.6)		**12**	(3.3)		**52**	(2.8)		7.1	(0.7)	
	Israel	470	(3.7)		460	(3.8)		468	(5.7)		513	(7.0)		9	(6.0)		**53**	(7.4)		3.0	(0.9)	
	Italy	476	(2.4)		456	(2.9)		483	(3.6)		516	(3.9)		**27**	(4.2)		**60**	(4.7)		7.0	(1.0)	
	Japan	504	(2.7)		502	(2.8)		511	(3.6)		499	(10.0)		**9**	(3.5)		-4	(9.7)		0.2	(0.2)	
	Korea	514	(2.9)		511	(3.1)		519	(3.8)		516	(8.9)		7	(3.9)		5	(8.7)		0.1	(0.1)	
	Latvia	479	(1.6)		462	(2.6)		484	(2.1)		495	(3.1)		**22**	(3.3)		**32**	(3.9)		2.0	(0.5)	
	Lithuania	476	(1.5)		434	(2.5)		454	(3.0)		506	(1.9)		**20**	(3.8)		**72**	(3.4)		11.0	(0.9)	
	Luxembourg	470	(1.1)		448	(2.2)		440	(3.2)		502	(2.2)		**-8**	(4.2)		**55**	(3.4)		7.3	(0.7)	
	Mexico	420	(2.7)		415	(3.2)		415	(3.4)		466	(5.5)		1	(3.7)		**51**	(5.9)		4.6	(1.0)	
	Netherlands	485	(2.7)		466	(3.8)		463	(6.0)		531	(3.1)		-2	(5.9)		**65**	(4.7)		10.7	(1.4)	
	New Zealand	506	(2.0)		461	(3.4)		473	(3.7)		540	(2.0)		**11**	(4.6)		**78**	(3.2)		12.3	(0.7)	
	Norway	499	(2.2)		495	(3.0)		503	(2.8)		517	(3.4)		**8**	(3.5)		**23**	(4.1)		0.8	(0.3)	
	Poland	512	(2.7)		459	(3.1)		494	(4.8)		538	(3.1)		**35**	(5.5)		**80**	(4.8)		12.5	(1.3)	
	Portugal	492	(2.4)		489	(2.7)		484	(4.1)		523	(3.7)		-5	(3.7)		**34**	(4.3)		2.2	(0.5)	
	Slovak Republic	458	(2.2)		442	(2.6)		478	(5.6)		504	(3.8)		**37**	(5.5)		**62**	(4.9)		6.9	(1.0)	
	Slovenia	495	(1.2)		452	(3.1)		467	(3.7)		522	(1.6)		**15**	(4.8)		**71**	(3.7)		11.6	(1.0)	
	Spain[2]	477	(1.6)		458	(2.0)		457	(2.6)		498	(1.6)		-1	(2.4)		**40**	(2.0)		4.7	(0.4)	
	Sweden	506	(3.0)		495	(3.4)		498	(4.0)		528	(3.4)		3	(4.0)		**33**	(4.2)		2.2	(0.5)	
	Switzerland	484	(3.1)		455	(4.0)		474	(5.1)		508	(3.7)		**20**	(5.1)		**54**	(5.3)		5.4	(1.0)	
	Turkey	466	(2.2)		451	(2.8)		441	(3.6)		490	(3.0)		**-10**	(3.5)		**39**	(4.1)		6.0	(1.0)	
	United Kingdom	504	(2.6)		418	(9.3)		489	(2.9)		518	(2.8)		**70**	(10.0)		**98**	(9.4)		4.7	(0.7)	
	United States	505	(3.6)		465	(4.4)		482	(4.8)		538	(3.9)		**17**	(5.2)		**72**	(5.2)		9.1	(1.2)	
	OECD average	c	(0.4)		460	(0.6)		473	(0.7)		515	(0.7)		**14**	(0.8)		**55**	(0.9)		7.2	(0.1)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.11a [2/4] **Reading performance by the length of text read for school**

Based on students' reports

	Reading mean score																						
	All students			10 pages or less (A)			Between 11 and 100 pages (B)			101 pages or more (C)			Difference between B and A (B - A)			Difference between C and A (C - A)			Explained variance in reading performance (r-squared x 100)		
	Mean score	S.E.	s	Mean score	S.E.	s	Mean score	S.E.	s	Mean score	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	%	S.E.	s
Partners																					
Albania	405	(1.9)		407	(2.1)		395	(2.5)		421	(3.5)		**-13**	(2.8)		**14**	(3.6)		1.6	(0.4)	
Argentina	402	(3.0)		369	(3.9)		405	(3.2)		448	(4.1)		**35**	(4.3)		**78**	(4.9)		9.6	(1.2)	
Baku (Azerbaijan)	389	(2.5)		390	(2.3)		393	(2.9)		404	(4.5)		3	(2.6)		**14**	(3.9)		0.5	(0.3)	
Belarus	474	(2.4)		394	(5.3)		440	(2.8)		498	(2.6)		**46**	(5.7)		**104**	(5.8)		14.5	(1.1)	
Bosnia and Herzegovina	403	(2.9)		373	(2.8)		391	(3.3)		434	(3.2)		**18**	(3.3)		**61**	(3.2)		12.1	(1.1)	
Brazil	413	(2.1)		413	(2.0)		407	(3.3)		477	(6.9)		-6	(3.4)		**63**	(7.0)		3.9	(0.9)	
Brunei Darussalam	408	(0.9)		417	(1.2)		386	(2.0)		437	(4.0)		**-30**	(2.5)		**20**	(4.2)		2.8	(0.4)	
B-S-J-Z (China)	555	(2.7)		544	(2.9)		560	(3.8)		578	(4.0)		**16**	(3.0)		**34**	(4.2)		2.3	(0.5)	
Bulgaria	420	(3.9)		384	(4.1)		451	(4.1)		449	(6.9)		**67**	(4.4)		**65**	(7.3)		10.3	(1.2)	
Costa Rica	426	(3.4)		396	(3.2)		427	(3.4)		465	(6.7)		**31**	(3.8)		**68**	(7.0)		9.3	(1.9)	
Croatia	479	(2.7)		428	(3.5)		454	(3.4)		509	(2.5)		**27**	(3.9)		**81**	(3.5)		15.7	(1.0)	
Cyprus	424	(1.4)		422	(1.8)		439	(2.7)		428	(3.9)		**17**	(3.2)		5	(4.3)		0.6	(0.2)	
Dominican Republic	342	(2.9)		337	(2.9)		350	(3.8)		388	(8.2)		**13**	(3.5)		**51**	(8.5)		3.8	(1.3)	
Georgia	380	(2.2)		358	(2.2)		387	(3.4)		406	(3.1)		**29**	(3.5)		**48**	(3.3)		5.8	(0.7)	
Hong Kong (China)	524	(2.7)		522	(3.9)		510	(4.9)		539	(2.9)		**-12**	(4.9)		**18**	(4.4)		1.3	(0.4)	
Indonesia	371	(2.6)		352	(2.6)		378	(3.1)		398	(4.7)		**26**	(3.1)		**46**	(4.7)		5.0	(0.8)	
Jordan	419	(2.9)		432	(2.5)		390	(4.2)		408	(12.1)		**-42**	(3.9)		-24	(12.2)		3.5	(0.7)	
Kazakhstan	387	(1.5)		355	(1.5)		391	(1.4)		433	(3.4)		**35**	(1.8)		**78**	(3.7)		12.8	(1.0)	
Kosovo	353	(1.1)		357	(1.3)		343	(2.5)		357	(4.5)		**-13**	(2.8)		0	(4.6)		0.6	(0.3)	
Lebanon	353	(4.3)		m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	525	(1.2)		535	(1.8)		506	(3.2)		515	(4.2)		**-29**	(4.0)		**-20**	(4.6)		2.0	(0.5)	
Malaysia	415	(2.9)		408	(3.0)		411	(3.3)		443	(3.8)		3	(2.6)		**36**	(3.6)		2.4	(0.5)	
Malta	448	(1.7)		447	(2.7)		444	(3.8)		486	(4.8)		-2	(4.5)		**40**	(6.1)		2.1	(0.6)	
Moldova	424	(2.4)		393	(2.7)		438	(3.0)		485	(5.0)		**45**	(3.8)		**92**	(5.6)		15.5	(1.6)	
Montenegro	421	(1.1)		398	(1.8)		406	(2.7)		454	(1.6)		**8**	(3.0)		**56**	(2.7)		9.6	(0.8)	
Morocco	359	(3.1)		369	(3.3)		338	(3.4)		332	(5.4)		**-31**	(2.8)		**-38**	(4.5)		3.5	(0.5)	
North Macedonia	393	(1.1)		m	m		m	m		m	m		m	m		m	m		m	m	
Panama	377	(3.0)		369	(2.5)		389	(4.2)		427	(7.3)		**20**	(4.0)		**58**	(7.4)		5.0	(1.3)	
Peru	401	(3.0)		392	(3.0)		396	(2.8)		443	(5.5)		4	(2.9)		**51**	(5.8)		4.7	(1.0)	
Philippines	340	(3.3)		338	(3.8)		342	(3.4)		342	(5.3)		4	(2.6)		4	(5.3)		0.1	(0.1)	
Qatar	407	(0.8)		406	(1.2)		404	(1.8)		459	(2.9)		-1	(2.4)		**54**	(3.2)		3.3	(0.4)	
Romania	428	(5.1)		376	(4.1)		408	(4.9)		476	(4.7)		**32**	(4.4)		**100**	(5.5)		21.9	(1.8)	
Russia	479	(3.1)		419	(6.0)		462	(2.8)		509	(2.7)		**43**	(5.0)		**89**	(5.6)		11.4	(1.1)	
Saudi Arabia	399	(3.0)		410	(2.8)		372	(3.9)		350	(7.0)		**-39**	(3.5)		**-60**	(6.4)		4.5	(0.6)	
Serbia	439	(3.3)		396	(3.3)		433	(4.2)		477	(3.0)		**37**	(3.8)		**80**	(3.6)		12.8	(1.0)	
Singapore	549	(1.6)		543	(1.7)		527	(3.7)		604	(4.4)		**-17**	(4.2)		**61**	(4.7)		4.9	(0.7)	
Chinese Taipei	503	(2.8)		495	(3.2)		494	(3.1)		529	(4.6)		-1	(3.2)		**34**	(5.0)		2.2	(0.6)	
Thailand	393	(3.2)		385	(2.9)		405	(4.1)		401	(6.9)		**20**	(3.1)		**16**	(6.3)		1.6	(0.5)	
Ukraine	466	(3.5)		384	(5.0)		448	(3.4)		505	(3.1)		**65**	(4.5)		**122**	(5.4)		19.4	(1.4)	
United Arab Emirates	432	(2.3)		431	(3.5)		430	(2.2)		464	(3.7)		-1	(3.6)		**34**	(5.2)		1.3	(0.3)	
Uruguay	427	(2.8)		409	(3.1)		454	(3.7)		471	(6.8)		**45**	(4.2)		**62**	(7.6)		6.8	(1.2)	
Viet Nam	m	m		m	m		m	m		m	m		m	m		m	m		m	m	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.11a [3/4] **Reading performance by the length of text read for school**

Based on students' reports

	Reading mean score																	
	Difference between B and A, after accounting for students' and schools' socio-economic profile[1]			Difference between C and A, after accounting for students' and schools' socio-economic profile			Explained variance in reading performance (r-squared x 100)			Difference between B and A, after accounting for students' and schools' socio-economic profile and gender			Difference between C and A, after accounting for students' and schools' socio-economic profile and gender			Explained variance in reading performance (r-squared x 100)		
	Score dif.	S.E.	s	Score dif.	S.E.	s	%	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	%	S.E.	s
OECD **Australia**	**18**	(3.6)		**68**	(3.0)		20.6	(0.9)		**18**	(3.6)		**67**	(3.0)		22.1	(0.9)	
Austria	3	(3.7)		**29**	(3.4)		32.3	(1.8)		2	(3.7)		**29**	(3.5)		33.2	(1.8)	
Belgium	**-10**	(4.1)		**41**	(2.6)		34.9	(1.4)		**-9**	(4.1)		**41**	(2.7)		35.8	(1.4)	
Canada	6	(3.6)		**54**	(2.8)		13.7	(0.8)		6	(3.5)		**54**	(2.7)		15.2	(0.8)	
Chile	**11**	(4.0)		**43**	(3.9)		25.8	(1.5)		**10**	(4.0)		**42**	(3.8)		26.7	(1.5)	
Colombia	**18**	(2.9)		**44**	(3.8)		28.2	(2.6)		**18**	(2.9)		**44**	(3.8)		28.7	(2.6)	
Czech Republic	6	(3.5)		**23**	(3.4)		33.9	(2.2)		6	(3.4)		**21**	(3.4)		35.5	(2.1)	
Denmark	-4	(7.1)		**16**	(6.7)		12.4	(1.2)		-3	(7.1)		**18**	(6.7)		14.5	(1.1)	
Estonia	0	(3.9)		**40**	(3.3)		13.8	(1.3)		-1	(3.8)		**38**	(3.3)		16.0	(1.3)	
Finland	7	(5.1)		**68**	(4.5)		17.4	(1.2)		6	(5.0)		**63**	(4.4)		22.1	(1.1)	
France	0	(4.2)		**46**	(3.8)		37.7	(1.8)		0	(4.2)		**46**	(3.7)		38.3	(1.8)	
Germany	7	(3.8)		**16**	(3.8)		35.1	(1.9)		**8**	(3.8)		**17**	(3.7)		35.7	(1.8)	
Greece	**-26**	(3.5)		**-21**	(7.1)		22.9	(2.0)		**-24**	(3.6)		**-19**	(6.8)		26.0	(1.9)	
Hungary	**20**	(3.7)		**32**	(4.2)		42.1	(2.2)		**19**	(3.7)		**30**	(4.1)		42.7	(2.1)	
Iceland	**19**	(5.2)		**29**	(5.7)		8.6	(1.1)		**18**	(5.2)		**30**	(5.7)		11.6	(1.3)	
Ireland	**11**	(3.2)		**44**	(2.6)		19.0	(1.4)		**10**	(3.1)		**43**	(2.6)		19.8	(1.4)	
Israel	10	(5.1)		**30**	(5.8)		29.8	(2.0)		**13**	(5.0)		**34**	(5.7)		31.6	(1.9)	
Italy	**8**	(3.6)		**26**	(3.9)		28.5	(1.9)		**9**	(3.6)		**27**	(3.8)		29.6	(1.8)	
Japan	-4	(3.0)		**-21**	(7.7)		22.8	(2.1)		-3	(3.1)		**-20**	(7.7)		23.5	(2.2)	
Korea	1	(2.9)		-5	(6.9)		15.0	(2.3)		2	(2.9)		-2	(6.9)		15.9	(2.2)	
Latvia	**14**	(3.0)		**17**	(3.8)		13.7	(1.4)		**13**	(3.0)		**18**	(3.7)		17.0	(1.4)	
Lithuania	**11**	(3.7)		**41**	(3.4)		28.6	(1.5)		**11**	(3.6)		**38**	(3.2)		31.1	(1.4)	
Luxembourg	**-10**	(3.5)		**21**	(3.1)		32.1	(1.0)		**-8**	(3.4)		**22**	(3.0)		33.8	(1.0)	
Mexico	-3	(3.0)		**27**	(4.4)		23.4	(2.5)		-2	(3.0)		**27**	(4.4)		23.7	(2.5)	
Netherlands	**-10**	(4.5)		**31**	(4.7)		32.5	(2.7)		-7	(4.3)		**33**	(4.6)		33.8	(2.7)	
New Zealand	5	(4.4)		**57**	(3.3)		22.7	(1.1)		7	(4.4)		**57**	(3.3)		23.9	(1.2)	
Norway	2	(3.3)		**14**	(3.8)		8.6	(1.1)		4	(3.1)		**15**	(3.6)		13.1	(1.1)	
Poland	**27**	(5.3)		**61**	(3.5)		23.2	(2.2)		**25**	(5.3)		**58**	(3.6)		24.6	(2.1)	
Portugal	**-7**	(3.3)		**16**	(3.9)		19.5	(1.5)		-6	(3.2)		**16**	(3.9)		20.7	(1.4)	
Slovak Republic	**10**	(3.8)		**25**	(3.9)		30.2	(1.9)		**10**	(3.7)		**24**	(4.0)		32.2	(1.8)	
Slovenia	4	(4.1)		**29**	(3.4)		34.0	(1.4)		2	(4.0)		**27**	(3.4)		35.9	(1.5)	
Spain[2]	-2	(2.2)		**31**	(1.8)		13.5	(0.7)		-2	(2.2)		**31**	(1.8)		15.3	(0.7)	
Sweden	-2	(4.0)		**16**	(3.9)		14.6	(1.8)		-1	(4.0)		**18**	(3.9)		16.7	(1.8)	
Switzerland	**11**	(4.7)		**28**	(5.0)		28.0	(2.8)		**11**	(4.8)		**29**	(5.1)		29.4	(2.7)	
Turkey	**-11**	(3.1)		**21**	(3.4)		28.0	(2.8)		**-10**	(3.1)		**20**	(3.3)		29.9	(2.7)	
United Kingdom	**57**	(8.2)		**74**	(8.0)		16.2	(1.5)		**57**	(8.1)		**74**	(7.8)		17.1	(1.5)	
United States	8	(4.9)		**46**	(4.6)		18.3	(2.0)		**10**	(4.8)		**48**	(4.4)		19.8	(1.8)	
OECD average	**5**	(0.7)		**31**	(0.7)		23.8	(0.3)		**6**	(0.7)		**31**	(0.7)		25.5	(0.3)	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.11a [4/4] **Reading performance by the length of text read for school**

Based on students' reports

	Reading mean score														
	Difference between B and A, after accounting for students' and schools' socio-economic profile[1]			Difference between C and A, after accounting for students' and schools' socio-economic profile			Explained variance in reading performance (r-squared x 100)			Difference between B and A, after accounting for students' and schools' socio-economic profile and gender			Difference between C and A, after accounting for students' and schools' socio-economic profile and gender			Explained variance in reading performance (r-squared x 100)		
	Score dif.	S.E.	s	Score dif.	S.E.	s	%	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	%	S.E.	s
Partners																		
Albania	**-11**	(2.6)		**9**	(3.4)		14.0	(1.8)		**-11**	(2.6)		6	(3.3)		18.3	(1.7)	
Argentina	**14**	(3.2)		**30**	(3.6)		30.8	(2.1)		**14**	(3.2)		**30**	(3.6)		31.4	(2.1)	
Baku (Azerbaijan)	-3	(2.4)		1	(3.3)		8.0	(2.3)		-3	(2.4)		1	(3.4)		10.2	(2.3)	
Belarus	**32**	(5.0)		**71**	(4.5)		33.9	(1.8)		**31**	(5.0)		**69**	(4.6)		34.2	(1.8)	
Bosnia and Herzegovina	**14**	(3.2)		**47**	(2.8)		22.3	(2.1)		**12**	(3.1)		**44**	(2.7)		24.1	(2.1)	
Brazil	**-12**	(2.6)		**24**	(4.1)		26.6	(1.6)		**-11**	(2.6)		**24**	(4.2)		27.8	(1.6)	
Brunei Darussalam	**-21**	(2.2)		3	(3.3)		33.2	(0.7)		**-19**	(2.2)		3	(3.2)		34.7	(0.8)	
B-S-J-Z (China)	**12**	(2.6)		**22**	(3.4)		24.2	(2.2)		**13**	(2.7)		**23**	(3.4)		24.7	(2.2)	
Bulgaria	**30**	(4.4)		**19**	(6.3)		33.5	(3.8)		**29**	(4.4)		**19**	(6.1)		35.8	(3.6)	
Costa Rica	**17**	(3.0)		**39**	(4.2)		29.0	(2.8)		**17**	(3.0)		**38**	(4.1)		29.8	(2.8)	
Croatia	**23**	(3.6)		**54**	(3.7)		30.2	(1.7)		**22**	(3.5)		**52**	(3.5)		32.1	(1.7)	
Cyprus	**8**	(3.1)		**-12**	(4.4)		13.7	(1.4)		**9**	(2.9)		-7	(4.2)		17.9	(1.5)	
Dominican Republic	**6**	(2.8)		**23**	(5.8)		23.6	(3.0)		**7**	(2.7)		**22**	(5.8)		26.6	(2.9)	
Georgia	**18**	(3.1)		**31**	(3.2)		17.5	(1.7)		**19**	(3.0)		**30**	(3.2)		22.2	(1.7)	
Hong Kong (China)	**-12**	(3.9)		**9**	(4.2)		13.2	(2.0)		**-9**	(3.7)		**11**	(4.2)		14.8	(1.9)	
Indonesia	**17**	(2.9)		**32**	(4.4)		20.1	(3.0)		**18**	(2.9)		**32**	(4.3)		22.3	(2.9)	
Jordan	**-42**	(3.8)		**-38**	(8.0)		13.7	(1.7)		**-35**	(3.5)		**-32**	(7.1)		19.5	(1.9)	
Kazakhstan	**29**	(1.7)		**64**	(3.0)		19.1	(1.6)		**27**	(1.7)		**61**	(3.0)		20.9	(1.6)	
Kosovo	**-15**	(2.7)		-6	(4.1)		16.5	(1.1)		**-13**	(2.6)		-4	(4.1)		18.8	(1.2)	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	**-30**	(3.9)		**-26**	(4.8)		5.0	(0.7)		**-29**	(3.9)		**-23**	(4.8)		5.8	(0.7)	
Malaysia	3	(2.5)		**25**	(2.6)		23.1	(2.4)		3	(2.5)		**25**	(2.6)		25.2	(2.5)	
Malta	-3	(4.4)		**22**	(6.4)		11.9	(0.9)		0	(4.2)		**25**	(6.2)		16.7	(1.1)	
Moldova	**30**	(3.8)		**56**	(4.3)		28.9	(2.2)		**30**	(3.7)		**52**	(4.3)		32.3	(2.0)	
Montenegro	3	(3.0)		**32**	(2.5)		24.7	(1.2)		5	(3.0)		**33**	(2.5)		27.1	(1.3)	
Morocco	**-26**	(2.4)		**-34**	(4.4)		21.1	(2.2)		**-26**	(2.4)		**-34**	(4.3)		22.8	(2.1)	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m	
Panama	5	(3.0)		**26**	(4.8)		32.3	(2.7)		5	(3.0)		**26**	(4.8)		32.7	(2.7)	
Peru	3	(2.6)		**29**	(3.4)		31.6	(2.0)		4	(2.6)		**30**	(3.4)		31.9	(2.0)	
Philippines	3	(2.1)		5	(3.2)		29.0	(3.3)		3	(2.0)		4	(3.1)		32.0	(3.0)	
Qatar	**-14**	(2.0)		**16**	(2.8)		21.9	(0.7)		**-6**	(2.0)		**24**	(2.7)		28.4	(0.7)	
Romania	**16**	(3.9)		**57**	(4.3)		39.9	(2.5)		**15**	(3.8)		**54**	(4.2)		41.0	(2.4)	
Russia	**37**	(4.5)		**70**	(4.5)		20.9	(2.0)		**36**	(4.4)		**68**	(4.4)		22.0	(2.0)	
Saudi Arabia	**-38**	(3.1)		**-54**	(5.7)		21.1	(2.5)		**-30**	(3.1)		**-46**	(5.2)		28.4	(2.3)	
Serbia	**22**	(3.8)		**53**	(5.0)		29.2	(2.6)		**22**	(3.8)		**52**	(4.8)		30.3	(2.6)	
Singapore	**-28**	(3.8)		6	(4.2)		21.8	(1.2)		**-26**	(3.7)		8	(4.3)		22.3	(1.2)	
Chinese Taipei	-5	(2.7)		**14**	(3.1)		23.6	(2.1)		-4	(2.8)		**15**	(3.0)		24.4	(2.2)	
Thailand	**10**	(2.1)		3	(4.3)		25.9	(2.9)		**9**	(2.1)		4	(4.2)		30.9	(2.6)	
Ukraine	**47**	(4.1)		**86**	(4.3)		32.0	(2.2)		**45**	(3.9)		**81**	(4.1)		33.8	(2.2)	
United Arab Emirates	**-10**	(2.0)		2	(3.6)		23.6	(1.3)		**-6**	(1.8)		**9**	(3.2)		28.3	(1.1)	
Uruguay	**19**	(3.4)		5	(6.5)		26.1	(2.1)		**20**	(3.4)		6	(6.2)		27.0	(2.0)	
Viet Nam	m	m		m	m		m	m		m	m		m	m		m	m	

1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

2. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.15 [1/6] **Frequency of use and time using digital devices for teaching and learning during classroom lessons AND outside classroom lessons**

Based on students' reports

	Percentage of students who reported that during the last month a digital device has been used for learning and teaching during test language lessons:											
	Yes, both the teacher and students used it			Yes, but only students used it			Yes, but only the teacher used it			No		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
OECD												
Australia	69.1	(0.8)		9.3	(0.3)		16.0	(0.6)		5.6	(0.3)	
Austria	28.9	(1.1)		11.3	(0.6)		18.0	(0.7)		41.8	(1.4)	
Belgium	28.8	(0.8)		8.9	(0.4)		39.3	(1.0)		23.0	(0.7)	
Canada	m	m		m	m		m	m		m	m	
Chile	28.0	(0.8)		12.9	(0.6)		28.1	(1.0)		31.0	(1.1)	
Colombia	m	m		m	m		m	m		m	m	
Czech Republic	28.2	(0.8)		13.1	(0.6)		34.2	(1.0)		24.4	(0.9)	
Denmark	89.2	(0.5)		6.9	(0.4)		2.7	(0.3)		1.2	(0.2)	
Estonia	35.8	(0.8)		17.6	(0.5)		21.3	(0.8)		25.4	(0.8)	
Finland	59.1	(1.2)		14.1	(0.6)		16.9	(0.9)		10.0	(0.6)	
France	24.1	(0.9)		9.1	(0.6)		41.0	(1.0)		25.8	(0.8)	
Germany	20.2	(0.8)		9.8	(0.6)		19.4	(1.0)		50.6	(1.2)	
Greece	26.4	(0.7)		10.5	(0.4)		17.0	(1.0)		46.1	(1.3)	
Hungary	25.8	(0.8)		9.5	(0.5)		33.1	(1.3)		31.5	(1.4)	
Iceland	55.7	(0.9)		15.9	(0.7)		12.0	(0.6)		16.4	(0.7)	
Ireland	23.0	(1.3)		5.0	(0.4)		52.5	(1.3)		19.5	(0.7)	
Israel	37.2	(1.0)	†	18.5	(0.7)	†	16.6	(0.7)	†	27.7	(1.0)	†
Italy	37.1	(1.0)		10.7	(0.5)		19.6	(0.7)		32.6	(1.0)	
Japan	12.5	(0.7)		5.1	(0.5)		9.6	(1.1)		72.9	(1.4)	
Korea	16.8	(1.0)		3.9	(0.4)		57.1	(1.4)		22.2	(0.9)	
Latvia	29.1	(0.9)		20.4	(0.7)		20.9	(0.8)		29.6	(0.8)	
Lithuania	35.4	(0.6)		15.6	(0.6)		26.6	(0.6)		22.4	(0.7)	
Luxembourg	29.4	(0.7)		11.2	(0.5)		21.1	(0.6)		38.2	(0.7)	
Mexico	32.8	(1.0)		14.6	(0.6)		14.1	(0.7)		38.6	(1.2)	
Netherlands	m	m		m	m		m	m		m	m	
New Zealand	72.1	(0.9)		11.6	(0.4)		11.3	(0.6)		4.9	(0.4)	
Norway	m	m		m	m		m	m		m	m	
Poland	30.2	(0.7)		11.4	(0.6)		33.1	(0.8)		25.3	(0.9)	
Portugal	m	m		m	m		m	m		m	m	
Slovak Republic	32.1	(0.9)		14.3	(0.7)		23.8	(0.8)		29.8	(1.0)	
Slovenia	25.6	(0.8)		10.2	(0.5)		30.2	(0.7)		34.0	(0.7)	
Spain[5]	28.6	(0.8)		7.8	(0.3)		30.8	(0.7)		32.8	(0.8)	
Sweden	72.5	(1.4)		11.6	(0.6)		9.1	(0.7)		6.8	(0.6)	
Switzerland	36.3	(1.2)		14.7	(0.7)		25.2	(1.1)		23.8	(1.0)	
Turkey	37.7	(1.0)		10.9	(0.5)		17.8	(0.7)		33.6	(1.3)	
United Kingdom	28.0	(1.3)		6.6	(0.4)		54.2	(1.2)		11.2	(0.6)	
United States	61.8	(1.4)		13.2	(0.6)		15.2	(1.0)		9.8	(0.9)	
OECD average	37.4	(0.2)		11.5	(0.1)		24.6	(0.2)		26.5	(0.2)	

1. Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

2. Association after accounting for students' and schools' socio-economic profile, measured by the PISA index of economic, social and cultural status (ESCS).

3. Students enrolled in a programme whose curriculum is general.

4. Students enrolled in a programme whose curriculum is vocational.

5. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.15 [2/6] **Frequency of use and time using digital devices for teaching and learning during classroom lessons AND outside classroom lessons**

Based on students' reports

	Percentage of students who reported that during the last month a digital device has been used for learning and teaching during test language lessons:											
	Yes, both the teacher and students used it			Yes, but only students used it			Yes, but only the teacher used it			No		
	%	S.E.	s	%	S.E.	s	%	S.E.	s	%	S.E.	s
Partners												
Albania	33.9	(0.7)		12.5	(0.5)		9.8	(0.5)		43.8	(0.9)	
Argentina	m	m		m	m		m	m		m	m	
Baku (Azerbaijan)	m	m		m	m		m	m		m	m	
Belarus	m	m		m	m		m	m		m	m	
Bosnia and Herzegovina	m	m		m	m		m	m		m	m	
Brazil	27.2	(0.5)	†	12.5	(0.5)	†	15.2	(0.6)	†	45.2	(0.8)	†
Brunei Darussalam	28.2	(0.4)		9.5	(0.4)		32.7	(0.5)		29.6	(0.5)	
B-S-J-Z (China)	m	m		m	m		m	m		m	m	
Bulgaria	29.8	(0.8)	†	19.4	(0.7)	†	16.2	(0.8)	†	34.6	(1.3)	†
Costa Rica	30.2	(1.2)		13.8	(0.6)		12.8	(0.7)		43.2	(1.4)	
Croatia	26.2	(0.7)		10.9	(0.5)		28.9	(0.8)		34.1	(1.1)	
Cyprus	m	m		m	m		m	m		m	m	
Dominican Republic	32.4	(1.2)		16.1	(0.6)		11.1	(0.5)		40.4	(1.3)	
Georgia	26.7	(0.8)	†	15.3	(0.6)	†	6.2	(0.5)	†	51.9	(1.0)	†
Hong Kong (China)	30.8	(1.6)		4.4	(0.5)		43.4	(1.4)		21.4	(1.0)	
Indonesia	m	m		m	m		m	m		m	m	
Jordan	m	m		m	m		m	m		m	m	
Kazakhstan	43.0	(0.5)		21.1	(0.4)		13.4	(0.4)		22.4	(0.4)	
Kosovo	m	m		m	m		m	m		m	m	
Lebanon	m	m		m	m		m	m		m	m	
Macao (China)	27.8	(0.6)		4.7	(0.3)		55.5	(0.8)		12.0	(0.5)	
Malaysia	m	m		m	m		m	m		m	m	
Malta	21.9	(0.8)		6.9	(0.5)		53.8	(0.8)		17.5	(0.7)	
Moldova	m	m		m	m		m	m		m	m	
Montenegro	m	m		m	m		m	m		m	m	
Morocco	28.1	(0.8)		9.1	(0.5)		8.9	(0.4)		53.9	(1.2)	
North Macedonia	m	m		m	m		m	m		m	m	
Panama	23.3	(0.8)	†	12.0	(0.6)	†	11.0	(0.8)	†	53.7	(1.2)	†
Peru	m	m		m	m		m	m		m	m	
Philippines	m	m		m	m		m	m		m	m	
Qatar	m	m		m	m		m	m		m	m	
Romania	m	m		m	m		m	m		m	m	
Russia	29.7	(0.7)		22.4	(0.5)		18.9	(0.5)		28.9	(0.9)	
Saudi Arabia	m	m		m	m		m	m		m	m	
Serbia	24.8	(0.9)	†	14.4	(0.6)	†	14.0	(0.7)	†	46.8	(1.3)	†
Singapore	39.9	(1.0)		10.1	(0.5)		29.6	(0.6)		20.4	(0.6)	
Chinese Taipei	25.5	(0.7)		3.3	(0.2)		36.7	(1.0)		34.5	(1.1)	
Thailand	37.2	(0.8)		19.0	(0.7)		22.7	(0.9)		21.1	(0.9)	
Ukraine	m	m		m	m		m	m		m	m	
United Arab Emirates	m	m		m	m		m	m		m	m	
Uruguay	29.6	(1.0)	†	26.5	(1.2)	†	8.7	(0.7)	†	35.3	(1.2)	†
Viet Nam	m	m		m	m		m	m		m	m	

1. Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

2. Association after accounting for students' and schools' socio-economic profile, measured by the PISA index of economic, social and cultural status (ESCS).

3. Students enrolled in a programme whose curriculum is general.

4. Students enrolled in a programme whose curriculum is vocational.

5. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.15 [3/6] **Frequency of use and time using digital devices for teaching and learning during classroom lessons AND outside classroom lessons**

Based on students' reports

		Total time a week using digital devices for school during classroom and outside of classroom lessons[1]			Change in reading performance associated with a one-hour increase in the total time a week using digital devices for school[2]		
		Minutes	S.E.	s	Score dif.	S.E.	s
OECD	Australia	79.5	(1.0)		**9**	(1.5)	
	Austria	m	m		m	m	
	Belgium	32.8	(0.7)		**-4**	(2.0)	
	Canada	m	m		m	m	
	Chile	39.9	(0.9)		**-5**	(1.7)	
	Colombia	m	m		m	m	
	Czech Republic	29.8	(0.7)		**-8**	(1.7)	
	Denmark	122.6	(0.9)		**9**	(1.8)	
	Estonia	30.2	(0.6)		**-23**	(2.4)	
	Finland	37.4	(1.2)		-3	(2.6)	
	France	26.7	(0.7)		**-11**	(2.3)	
	Germany	25.7	(0.8)		**-27**	(2.7)	
	Greece	24.7	(0.7)		**-21**	(2.3)	
	Hungary	26.2	(0.7)		**-12**	(2.5)	
	Iceland	47.9	(0.8)		-1	(2.1)	
	Ireland	25.9	(1.2)		-1	(1.9)	
	Israel	31.1	(1.3)	†	**-16**	(3.4)	†
	Italy	42.1	(1.1)		**-6**	(2.0)	
	Japan	10.2	(0.7)		0	(3.6)	
	Korea	36.6	(1.2)		**9**	(2.4)	
	Latvia	31.4	(0.8)		**-10**	(2.1)	
	Lithuania	36.7	(0.7)		**-17**	(1.5)	
	Luxembourg	28.9	(0.6)		**-20**	(2.4)	
	Mexico	36.9	(0.8)		-2	(1.8)	
	Netherlands	m	m		m	m	
	New Zealand	83.5	(1.6)		**12**	(1.8)	
	Norway	m	m		m	m	
	Poland	36.0	(0.6)		**-5**	(2.4)	
	Portugal	m	m		m	m	
	Slovak Republic	31.6	(0.7)		**-17**	(2.3)	
	Slovenia	24.3	(0.5)		**-15**	(2.2)	
	Spain[5]	31.3	(0.9)		**-5**	(1.4)	
	Sweden	87.2	(2.4)		1	(2.2)	
	Switzerland	26.4	(0.9)		**-20**	(3.3)	
	Turkey	38.8	(1.1)		**-5**	(1.8)	
	United Kingdom	36.6	(0.8)		-1	(2.0)	
	United States	62.3	(2.1)		**9**	(1.9)	
	OECD average	40.7	(0.2)		**-7**	(0.4)	

1. Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

2. Association after accounting for students' and schools' socio-economic profile, measured by the PISA index of economic, social and cultural status (ESCS).

3. Students enrolled in a programme whose curriculum is general.

4. Students enrolled in a programme whose curriculum is vocational.

5. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.15 [4/6] **Frequency of use and time using digital devices for teaching and learning during classroom lessons AND outside classroom lessons**

Based on students' reports

		Total time a week using digital devices for school during classroom and outside of classroom lessons[1]			Change in reading performance associated with a one-hour increase in the total time a week using digital devices for school[2]		
		Minutes	S.E.	s	Score dif.	S.E.	s
Partners	Albania	34.3	(0.6)		**-11**	(1.8)	
	Argentina	m	m		m	m	
	Baku (Azerbaijan)	m	m		m	m	
	Belarus	m	m		m	m	
	Bosnia and Herzegovina	m	m		m	m	
	Brazil	30.5	(0.6)	†	**-6**	(2.1)	†
	Brunei Darussalam	34.7	(0.5)		**-11**	(1.6)	
	B-S-J-Z (China)	m	m		m	m	
	Bulgaria	39.7	(1.0)	†	**-14**	(2.3)	†
	Costa Rica	37.3	(1.0)		-2	(2.0)	
	Croatia	27.2	(0.6)		**-12**	(2.0)	
	Cyprus	m	m		m	m	
	Dominican Republic	34.1	(0.8)		**-10**	(1.5)	
	Georgia	24.7	(0.9)	†	**-13**	(2.7)	†
	Hong Kong (China)	26.8	(1.6)		**-13**	(2.7)	
	Indonesia	m	m		m	m	
	Jordan	m	m		m	m	
	Kazakhstan	56.2	(0.7)		**-11**	(1.0)	
	Kosovo	m	m		m	m	
	Lebanon	m	m		m	m	
	Macao (China)	43.6	(0.8)		3	(2.1)	
	Malaysia	m	m		m	m	
	Malta	36.1	(0.6)		**-6**	(2.2)	
	Moldova	m	m		m	m	
	Montenegro	m	m		m	m	
	Morocco	30.8	(0.9)		**-21**	(1.3)	
	North Macedonia	m	m		m	m	
	Panama	30.6	(0.8)	†	**-11**	(1.8)	†
	Peru	m	m		m	m	
	Philippines	m	m		m	m	
	Qatar	m	m		m	m	
	Romania	m	m		m	m	
	Russia	47.3	(0.9)		**-4**	(1.9)	
	Saudi Arabia	m	m		m	m	
	Serbia	31.9	(0.7)	†	**-13**	(1.9)	†
	Singapore	37.6	(0.7)		**-8**	(2.0)	
	Chinese Taipei	23.0	(0.7)		**-8**	(2.7)	
	Thailand	43.5	(0.8)		**-10**	(1.3)	
	Ukraine	m	m		m	m	
	United Arab Emirates	m	m		m	m	
	Uruguay	35.5	(0.9)	†	0	(2.2)	†
	Viet Nam	m	m		m	m	

1. Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

2. Association after accounting for students' and schools' socio-economic profile, measured by the PISA index of economic, social and cultural status (ESCS).

3. Students enrolled in a programme whose curriculum is general.

4. Students enrolled in a programme whose curriculum is vocational.

5. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.15 [5/6] **Frequency of use and time using digital devices for teaching and learning during classroom lessons AND outside classroom lessons**

Based on students' reports

	Total time a week using digital devices for school during classroom and outside of classroom lessons by programme orientation									Change in reading performance associated with a one-hour increase in the total time a week using digital devices for school[2]								
	General[3]			Vocational[4]			Vocational - General			General			Vocational			Vocational - General		
	Minutes	S.E.	s	Minutes	S.E.	s	Dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s
OECD																		
Australia	80.1	(1.1)		71.6	(8.6)		-8.5	(8.5)		**9**	(1.5)		-57	(36.0)		-66	(36.0)	
Austria	m	m		m	m		m	m		m	m		m	m		m	m	
Belgium	31.8	(0.9)		34.4	(1.4)	†	2.5	(1.7)	†	0	(2.1)		**-6**	(2.8)	†	-6	(3.5)	†
Canada	m	m		m	m		m	m		m	m		m	m		m	m	
Chile	40.0	(0.9)		33.7	(4.0)		-6.3	(4.0)		**-5**	(1.7)		-4	(10.4)		1	(10.6)	
Colombia	m	m		m	m		m	m		m	m		m	m		m	m	
Czech Republic	27.3	(0.9)		34.9	(1.6)		**7.6**	(2.0)		**-8**	(2.3)		**-8**	(3.2)		0	(4.1)	
Denmark	122.6	(0.9)		m	m		m	m		**9**	(1.8)		m	m		m	m	
Estonia	30.2	(0.6)		c	c		c	c		**-23**	(2.4)		m	m		m	m	
Finland	37.4	(1.2)		m	m		m	m		-3	(2.6)		m	m		m	m	
France	26.3	(0.7)		28.3	(1.5)		2.1	(1.7)		**-10**	(2.6)		**-13**	(4.0)		-3	(4.8)	
Germany	25.4	(0.8)		37.9	(6.9)	†	12.4	(7.0)	†	**-27**	(2.8)		-9	(8.6)	†	18	(9.3)	†
Greece	23.8	(0.7)		33.1	(2.3)	†	**9.3**	(2.4)	†	**-20**	(2.5)		**-11**	(4.6)	†	9	(5.0)	†
Hungary	24.7	(0.7)		34.1	(2.4)		**9.4**	(2.6)		**-12**	(3.1)		-7	(4.2)		5	(5.2)	
Iceland	47.9	(0.8)		m	m		m	m		-1	(2.1)		m	m		m	m	
Ireland	25.8	(1.2)		m	m		m	m		-1	(2.0)		m	m		m	m	
Israel	31.1	(1.3)	†	m	m		m	m		**-16**	(3.4)	†	m	m		m	m	
Italy	40.0	(1.5)		44.4	(1.6)		**4.4**	(2.2)		-2	(2.7)		**-9**	(2.7)		-7	(3.7)	
Japan	11.0	(0.8)		7.6	(1.2)		**-3.4**	(1.5)		3	(4.1)		**-14**	(6.8)		**-16**	(7.8)	
Korea	38.1	(1.3)		28.9	(2.8)		**-9.2**	(2.9)		**10**	(2.5)		1	(5.3)		-9	(5.9)	
Latvia	31.4	(0.7)		33.8	(10.0)		2.4	(9.9)		**-10**	(2.1)		-10	(32.7)		0	(32.8)	
Lithuania	36.7	(0.7)		35.5	(3.9)	†	-1.2	(4.0)	†	**-17**	(1.5)		-9	(9.2)	†	8	(9.1)	†
Luxembourg	28.2	(0.7)		24.0	(1.4)		**-4.1**	(1.6)		**-18**	(2.4)		-6	(5.4)		**11**	(5.6)	
Mexico	36.2	(1.0)		38.5	(1.1)		2.2	(1.5)		-1	(2.5)		-5	(2.7)		-4	(3.8)	
Netherlands	m	m		m	m		m	m		m	m		m	m		m	m	
New Zealand	83.5	(1.6)		m	m		m	m		**12**	(1.8)		m	m		m	m	
Norway	m	m		m	m		m	m		m	m		m	m		m	m	
Poland	36.1	(0.6)		c	c		c	c		**-5**	(2.4)		c	c		c	c	
Portugal	m	m		m	m		m	m		m	m		m	m		m	m	
Slovak Republic	30.1	(0.9)		42.1	(2.8)	†	**12.1**	(2.9)	†	**-17**	(2.8)		-8	(8.2)	†	9	(8.5)	†
Slovenia	22.8	(0.9)		30.9	(1.4)		**8.1**	(1.8)		-3	(4.5)		**-20**	(3.5)		**-17**	(6.0)	
Spain[5]	31.3	(0.9)		m	m		m	m		**-5**	(1.4)		m	m		m	m	
Sweden	87.2	(2.4)		m	m		m	m		1	(2.2)		m	m		m	m	
Switzerland	26.8	(1.0)		22.8	(1.9)		-4.0	(2.2)		**-20**	(3.6)		-11	(7.9)		9	(8.8)	
Turkey	40.2	(1.4)		36.1	(1.1)		**-4.1**	(1.8)		**-4**	(1.9)		**-8**	(3.0)		-4	(3.4)	
United Kingdom	36.7	(0.8)		33.2	(5.1)		-3.5	(5.1)		-1	(2.0)		26	(17.2)		27	(17.4)	
United States	62.3	(2.1)		m	m		m	m		**9**	(1.9)		m	m		m	m	
OECD average	40.4	(0.2)		34.3	(0.9)		1.4	(0.9)		**-6**	(0.5)		**-9**	(2.9)		-2	(2.9)	

1. Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

2. Association after accounting for students' and schools' socio-economic profile, measured by the PISA index of economic, social and cultural status (ESCS).

3. Students enrolled in a programme whose curriculum is general.

4. Students enrolled in a programme whose curriculum is vocational.

5. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

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Table B.6.15 [6/6] **Frequency of use and time using digital devices for teaching and learning during classroom lessons AND outside classroom lessons**

Based on students' reports

	Total time a week using digital devices for school during classroom and outside of classroom lessons by programme orientation									Change in reading performance associated with a one-hour increase in the total time a week using digital devices for school[2]								
	General[3]			Vocational[4]			Vocational - General			General			Vocational			Vocational - General		
	Minutes	S.E.	s	Minutes	S.E.	s	Dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s	Score dif.	S.E.	s
Partners																		
Albania	34.2	(1.0)		34.5	(0.8)		0.2	(1.2)		**-11**	(2.9)		**-10**	(2.3)		0	(3.7)	
Argentina	m	m		m	m		m	m		m	m		m	m		m	m	
Baku (Azerbaijan)	m	m		m	m		m	m		m	m		m	m		m	m	
Belarus	m	m		m	m		m	m		m	m		m	m		m	m	
Bosnia and Herzegovina	m	m		m	m		m	m		m	m		m	m		m	m	
Brazil	30.7	(0.6)	†	28.8	(1.2)		-1.9	(1.4)	†	**-7**	(2.0)	†	7	(8.6)		14	(8.7)	†
Brunei Darussalam	34.6	(0.5)		m	m		m	m		**-12**	(1.6)		m	m		m	m	
B-S-J-Z (China)	m	m		m	m		m	m		m	m		m	m		m	m	
Bulgaria	37.0	(1.3)	†	43.2	(1.5)	†	**6.3**	(2.0)	†	**-11**	(3.0)	†	**-13**	(2.8)	†	-2	(4.1)	†
Costa Rica	37.8	(1.1)		33.7	(1.5)		**-4.1**	(1.7)		-1	(2.1)		-6	(4.7)		-5	(5.0)	
Croatia	25.0	(0.9)		28.4	(0.8)		**3.4**	(1.3)		**-9**	(3.4)		**-11**	(2.1)		-2	(3.8)	
Cyprus	m	m		m	m		m	m		m	m		m	m		m	m	
Dominican Republic	33.5	(0.9)	†	37.5	(2.1)		4.0	(2.3)	†	**-12**	(1.5)	†	-4	(4.4)		8	(4.6)	†
Georgia	24.7	(0.9)	†	m	m		m	m		**-13**	(2.7)	†	m	m		m	m	
Hong Kong (China)	26.8	(1.6)		m	m		m	m		**-13**	(2.7)		m	m		m	m	
Indonesia	m	m		m	m		m	m		m	m		m	m		m	m	
Jordan	m	m		m	m		m	m		m	m		m	m		m	m	
Kazakhstan	54.0	(0.8)		65.6	(1.4)		**11.6**	(1.6)		**-12**	(1.1)		**-6**	(1.8)		5	(2.1)	
Kosovo	m	m		m	m		m	m		m	m		m	m		m	m	
Lebanon	m	m		m	m		m	m		m	m		m	m		m	m	
Macao (China)	43.6	(0.8)		m	m		m	m		3	(2.2)		m	m		m	m	
Malaysia	m	m		m	m		m	m		m	m		m	m		m	m	
Malta	36.1	(0.6)		m	m		m	m		**-6**	(2.2)		m	m		m	m	
Moldova	m	m		m	m		m	m		m	m		m	m		m	m	
Montenegro	m	m		m	m		m	m		m	m		m	m		m	m	
Morocco	30.8	(0.9)		m	m		m	m		**-21**	(1.3)		m	m		m	m	
North Macedonia	m	m		m	m		m	m		m	m		m	m		m	m	
Panama	30.8	(0.9)	†	35.3	(7.6)		4.5	(7.6)	†	**-12**	(2.2)	†	-16	(14.4)		-4	(14.6)	†
Peru	m	m		m	m		m	m		m	m		m	m		m	m	
Philippines	m	m		m	m		m	m		m	m		m	m		m	m	
Qatar	m	m		m	m		m	m		m	m		m	m		m	m	
Romania	m	m		m	m		m	m		m	m		m	m		m	m	
Russia	46.9	(1.0)		57.1	(4.5)		**10.2**	(5.0)		-4	(1.9)		-11	(6.8)		-7	(7.3)	
Saudi Arabia	m	m		m	m		m	m		m	m		m	m		m	m	
Serbia	31.5	(1.4)		32.1	(0.8)	†	0.6	(1.6)	†	**-14**	(4.9)		**-12**	(1.8)	†	1	(5.2)	†
Singapore	37.6	(0.7)		m	m		m	m		**-8**	(2.0)		m	m		m	m	
Chinese Taipei	22.6	(0.9)		23.8	(1.1)		1.2	(1.4)		-6	(3.9)		**-9**	(3.0)		-3	(4.8)	
Thailand	41.4	(0.9)		51.5	(2.0)		**10.0**	(2.3)		**-9**	(1.4)		**-8**	(2.5)		1	(2.9)	
Ukraine	m	m		m	m		m	m		m	m		m	m		m	m	
United Arab Emirates	m	m		m	m		m	m		m	m		m	m		m	m	
Uruguay	35.4	(0.9)	†	c	c		c	c		0	(2.4)	†	c	c		c	c	
Viet Nam	m	m		m	m		m	m		m	m		m	m		m	m	

1. Students were allowed to respond in intervals of no time, between 1-30 minutes a week, between 31-60 minutes a week, more than 60 minutes a week, and I do not study this subject. The subject selected was 'Test language lessons' and students who do not study the subject were excluded from the analysis. The rest of responses were converted to the average number of minutes in the interval (0, 15.5, 45.5, 90.5). The response time of items IC150 (during classroom lessons) and IC151 (outside of classroom lessons) were sum to reflect the total time a week using digital devices for school during classroom and outside of classroom lessons.

2. Association after accounting for students' and schools' socio-economic profile, measured by the PISA index of economic, social and cultural status (ESCS).

3. Students enrolled in a programme whose curriculum is general.

4. Students enrolled in a programme whose curriculum is vocational.

5. For the comparability of Spain's data see Note 1 under Table B.3.9.

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

Information regarding the proportion of the sample covered is shown next to the standard error. No symbol means at least 75% of the population was covered; one dagger (†) means at least 50% but less than 75%; and one double-dagger (‡) means less than 50% was covered.

StatLink https://doi.org/10.1787/888934240712

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PISA

ANNEX C

Technical notes on analysis in Chapter 3

All figures and tables in Annex C are available on line

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https://doi.org/10.1787/888934240731
https://doi.org/10.1787/888934240750

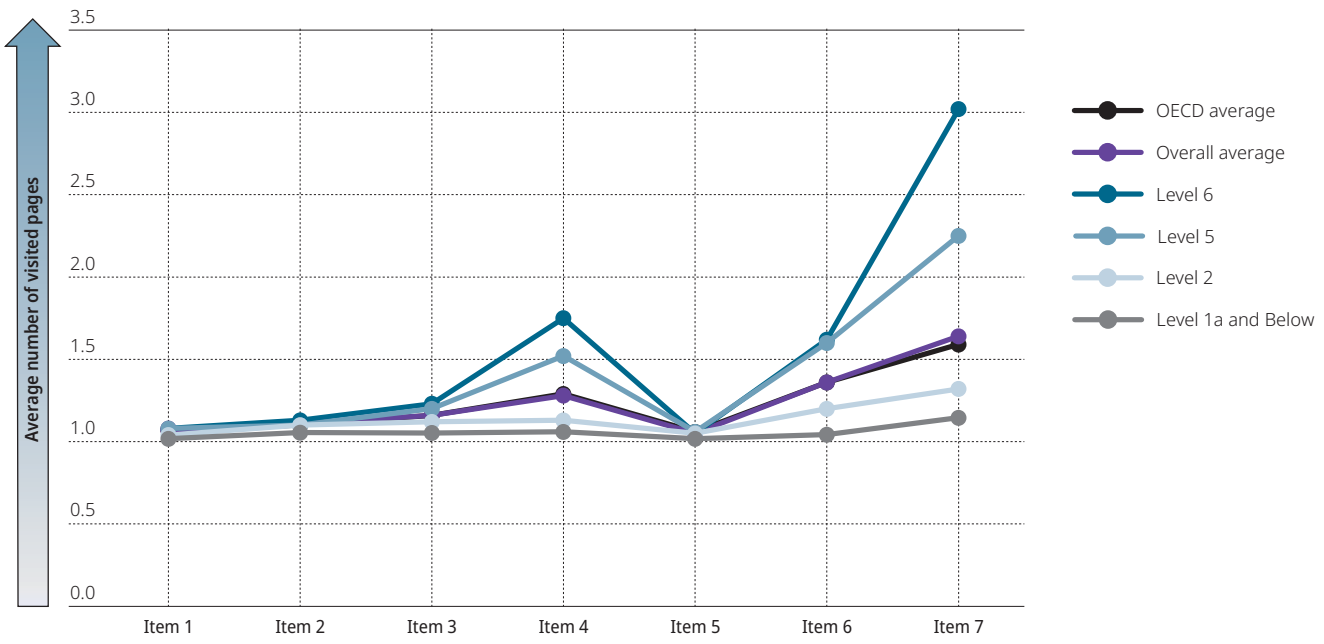
Annex C2: Algorithms for computing sequence distance by Dynamic Time Warping (DTW) Method

Annex C3: Consistency analysis for students' navigation behaviours in reading units within the same testlets with the Rapa Nui Unit
https://doi.org/10.1787/888934240769

ANNEX C1
Navigation activities and time allocation across the Rapa Nui reading unit

Figure C1.1 illustrates how students typically navigated through the whole Rapa Nuit unit. Limited navigation is observed in the first two single-source items. With the second and third page consequently being activated in item 3 and item 4, the number of navigations increased correspondingly. A first peak formed at item 4, especially for students above Level 2. The number of navigations temporarily dropped at item 5[1] and then rose sharply in the last two items where navigations to other pages were compulsory to complete the task. The curves of students at higher performance levels (Level 5 and Level 6) show big waves through the unit, signalling active navigations across the whole reading and navigation process. In contrast, the curves of students at lower performance levels (Level 2, and Level 1a and below) tend to be flat through all seven items, indicating few effective navigations were executed in these groups, thus the number of navigations remained at 1.

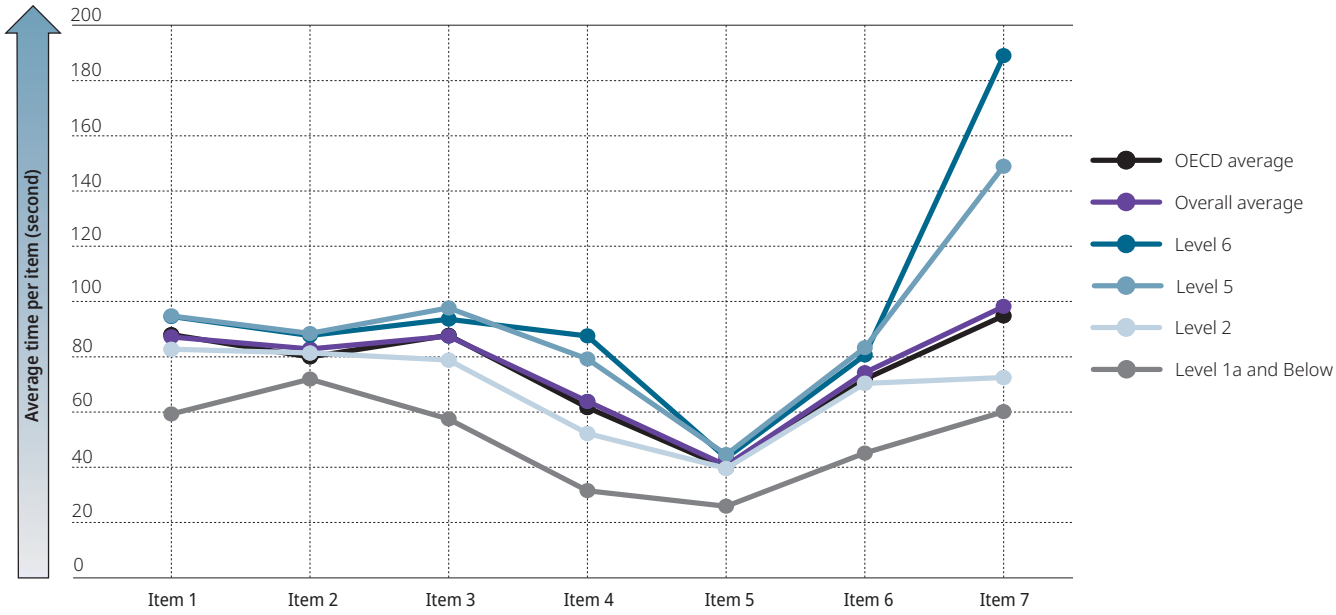
Figure C1.1 **Distribution of number of pages visited on sequential seven items through the Rapa Nui unit**



Source: OECD, PISA 2018 Database
StatLink https://doi.org/10.1787/888934240731

Figure C1.2 illustrates how students distributed their time in the seven items within the Rapa Nui unit by different reading performance level. The students in Level 5 and Level 6 – upper reading performance levels – spent the greatest amount of time on average in almost every item compared to their peers. Students at these levels especially maximised their time in the last item, which is an open-ended item with multiple-source requirements. The students in Level 6 on average spent over three minutes in the last item, twice as long as students in Level 3 and three times longer than students in Level 1a and below. These execution times suggest a high level of persistent engagement through the reading and navigation process. In contrast, students at lower performance levels (Level 1a and below) spent much less time on all the items. The time spent on items with multiple-source requirements was even shorter than the items with single requirements, suggesting a lack of motivation and unfamiliarity with multiple-source environments. These students might have gotten lost in the navigation or felt the items were too difficult and skipped the items towards the end of the test[2].

Figure C1.2 **Distribution of time spent on sequential seven items in the Rapa Nui unit**



Source: OECD, PISA 2018 Database

StatLink https://doi.org/10.1787/888934240750

Notes

1. Item 5 in Rapa Nui is a single-source item; thus, navigation is optional. The multiple-source texts are all activated in item 4, and thus, more navigation activities are expected. As most students may have already navigated to the new pages in item 4, navigation activities were expected to decrease in item 5.

2. It is noted that the unit CR551 locates at the second unit within the testlet, thus a higher rate of non-response was expected towards the end of the test.

ANNEX C2
Algorithms for computing sequence distance by Dynamic Time Warping (DTW) Method

Given sequences $X=\{x_1,x_2,...,x_n\}$ and $Y=\{y_1,y_2,...,y_m\}$ with the same or different lengths, a warping path W is an alignment between X and Y, involving one-to-many mappings for each pair of elements. The cost of a warping path is calculated by the sum of the cost of each mapping pair. Furthermore, a warping path contains three constraints: (1) endpoint constraint: The alignment starts at pair (1,1) and ends at pair (N,M); (2) monotonicity constraint: The order of elements in the path for both X and Y should be preserved in the same, original order of X and Y, respectively; (3) Step-size constraint: The difference of index for both X and Y between two adjacent pairs in the path needs to be no more than 1 step. In other words, pair (x_i, y_j) can be followed by three possible pairs including (x_{i+1}, y_j), (x_i, y_{j+1}) and (x_{i+1}, y_{j+1}).

DTW is a distance measure that searches the optimal warping path between two series. In particular, we first construct a cost matrix C, where each element $C(i,j)$ is a cost of the pair (x_i, y_j), specified by using Euclidean, Manhattan or other distance function. DTW is calculated based on dynamic programming. The initial step of DTW algorithm is defined as:

$$DTW(i,j) = \begin{cases} \infty & if\ (i = 0\ or\ j = 0)\ and\ i \neq j \\ 0 & if\ i = j = 0 \end{cases} \quad (1)$$

The recursive function of DTW is defined as

$$DTW(i,j) = min \begin{cases} DTW(i-1,j) + w_h C(i,j) \\ DTW(i,j-1) + w_v C(i,j) \\ DTW(i-1,j-1) + w_d C(i,j) \end{cases} \quad (2)$$

where (w_h, w_v, w_d) are weights for the horizontal, vertical and diagonal directions, respectively. $DTW(i, j)$ denotes the distance or cost between two sub-sequences $\{x_1, x_2,..., x_i\}$ and $\{y_1, y_2,...,y_j\}$, and $DTW(N,M)$ indicates the total cost of the optimal warping path.

ANNEX C3

Consistency analysis for students' navigation behaviours in reading units within the same testlets with the Rapa Nui Unit

With the aim to investigate whether students employed similar navigation strategies across multiple reading units, a consistency analysis was conducted on students' navigation quality using two reading units (CR543 – Alfred Nobel and CR544 – Nikola Tesla) that are in the same testlets (H21 and H25) of the Rapa Nui unit. Among the subsample (N=76 270) who were assigned to the unit Rapa Nui, 45.7% of students were routed to the H21 testlet (CR543 and CR551) while 54.3% students were routed to the H25 testlet (CR544 and CR551).

Both reading units (CR543 and CR544) involve two sources of reading materials. Within the reading unit CR543, four items are designed in the multiple-source environment, where two items are instructed to refer to a single-source while the other two items are instructed to use information from both sources to solve the task. Similarly, within the CR544 reading unit, four items are also designed in the multiple-source environment, where only the first item is instructed to refer to a single-source while the other three items are instructed to refer to information from both resources. It is noted that both CR543 and CR544 are in the high-difficulty testlet in the multistage adaptive testing in PISA 2018.[1]

The consistency analysis examined the confusion matrix between two units via the four categories of navigation behaviour, i.e., *(1) actively explorative navigation, (2) strictly focused navigation, (3) limited navigation,* and *(4) no navigation.* The goal was to identify the commonalities between the two units (CR543 and CR551; CR544 and CR551); that is, whether the students employed the same or different navigation strategies to solve the reading tasks in two units within the same testlet. The higher values along the diagonal line in the confusion matrix indicate that more students shared the same navigation behaviours between the two reading units.

As shown in Table C3.1, the exactly consistent navigation strategies in CR543 and CR551 in the categories of actively explorative, strictly focused, limited navigation and no navigation were 21%, 33%, 0 and 74%, respectively. The highest consistency was found in the no navigation group. It implied that 74% of students who did not navigate at all in CR551 showed no navigation behaviour in CR543 as well. The high consistency in the no navigation group might reflect the similar proficiency level between CR543 and CR551. No students employed the limited navigation strategy in CR543. Among the students who employed strictly focused strategy in the Rapa Nui, 33% employed the same strategy in the Alfred Nobel reading unit while a large proportion showed no navigation in the CR543. See more details of country-level consistency analysis results between CR543 and CR551 in Table C3.2.

Table C3.1 **Confusion matrix of overall average percentage of students in four navigation categories in CR543 and CR544 given their behaviour in the Rapa Nui unit (CR551)**

		CR551: navigation behaviour group							
		Actively Explorative		Strictly Focused		Limited Navigation		No Navigation	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.
CR543: navigation behaviour group	**Actively Explorative**	21.1	(1.1)	12.9	(0.6)	15.2	(0.8)	5.9	(0.2)
	Strictly Focused	34.3	(1.2)	33.0	(0.8)	28.4	(1.0)	20.5	(0.3)
	Limited Navigation	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
	No Navigation	44.5	(1.3)	54.2	(0.9)	56.4	(1.1)	73.6	(0.4)

		CR551: navigation behaviour group							
		Actively Explorative		Strictly Focused		Limited Navigation		No Navigation	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.
CR544: navigation behaviour group	**Actively Explorative**	18.0	(0.7)	13.6	(0.6)	14.5	(0.8)	6.4	(0.2)
	Strictly Focused	64.3	(1.1)	60.7	(0.9)	52.1	(1.1)	30.9	(0.4)
	Limited Navigation	3.0	(0.4)	3.5	(0.3)	7.1	(0.6)	4.0	(0.2)
	No Navigation	14.7	(1.0)	22.3	(0.8)	26.4	(0.9)	58.7	(0.4)

Note: No students employed the limited navigation strategy in CR543.

Source: OECD, PISA 2018 Database, Tables C3.2 and C3.3.

StatLink https://doi.org/10.1787/888934240769

Analogously, a consistency analysis was conducted between CR544 and CR551. It was interesting to find that student who employed the strictly focused strategy in the Rapa Nui reading unit (CR551) showed the highest consistency in using the same strategy in CR544. The active explorative group and limited navigation group in CR551 did not show a high consistency using the same strategies in the reading unit CR544; instead, over 60% of students who used these two strategies in CR551 switched to the strictly focused group. One possible reason could be that there was only one single-source requirement item in CR544, thus less variation in navigation strategy was expected from students in this reading unit. Another reason might come from the lower proficiency level of CR544 compared with CR551. The lower-difficulty items might have enabled students to exert navigations relatively more easily. Students who employed no navigation strategy in the Rapa Nui unit also showed high consistency in the Nikola Tesla reading unit (CR544), indicating students who did not use any navigation strategy were more likely to not navigate in other reading units either. This phenomenon is more obvious in low-performance countries than high-performance countries. See more details of country-level consistency analysis results between CR544 and CR551 in Table C3.3.

It is noted that the order of reading units within a testlet was fixed. The CR543 and CR544 locate at the first reading unit in the H21 and H25 testlets, respectively. The CR551 always locates at the second reading unit in both testlets. Considering the item location effect, the CR543 and CR544 might have triggered slightly different navigation behaviours from CR551 as students may have explored a bit more in the first reading unit within a testlet to gain experience and familiarity for the following reading tasks.

Tables available on line

https://doi.org/10.1787/888934240769

- Table C3.2 Crosstabs between the percentage of students in four categories of navigation strategies used in CR543 given their behaviour in the Rapa Nui unit (CR551)
- Table C3.3 Crosstabs between the percentage of students in four categories of navigation strategies used in CR544 given their behaviour in the Rapa Nui unit (CR551)

Note

1. Each reading unit is composed of items of different difficulties. For instance, in CR543, the proficiency level of the four items are Level 3, Level 4, Level 3 and Level 6, respectively. For further information about item difficulty level and parameters refer to the Annex A of the PISA 2018 Technical Report (OECD, forthcoming[1]), https://www.oecd.org/pisa/data/pisa2018technicalreport/PISA2018%20TechRep_Final-AnnexA.xlsx.

Reference

OECD (forthcoming), *PISA 2018 Technical Report*, OECD Publishing, Paris. [1]

21st-Century Readers

DEVELOPING LITERACY SKILLS IN A DIGITAL WORLD

Literacy in the 21st century is about constructing and validating knowledge. Digital technologies have enabled the spread of all kinds of information, displacing traditional formats of usually more carefully curated information such as encyclopaedias and newspapers. The massive information flow of the digital era demands that readers be able to distinguish between fact and opinion. Readers must learn strategies to detect biased information and malicious content like fake news and phishing emails.

This report examines how students' access to digital technologies and training on how to use them vary between and within countries. It also explores how 15-year-old students are developing reading skills to navigate the technology-rich 21st century. It sheds light on potential ways to strengthen students' capacity to navigate the new world of information.

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