PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT (PISA) RESULTS FROM PISA 2018

21st-century readers: Developing literacy skills in a digital world

The Programme for International Student Assessment (PISA) is a triennial survey of 15-year-old students around the world that assesses the extent to which they have acquired the key knowledge and skills essential for full participation in societies. The assessment in 2018 focuses on reading, mathematics, science and the innovative domain of global competence. Reading was the main subject assessed in PISA 2018, and the reading framework was devised to include essential reading skills in a digital world.

The thematic report **21st-century readers: Developing literacy skills in a digital world** provides important insights into how 15-year-old students are developing reading skills that help them navigate through information in a technology-rich 21st century. This report focuses on policies and practices that can harness digitalisation to create better learning opportunities. It also looks at ways to counter digitalisation's disruptive effects in and for education.

Portugal

Summary of key findings

- In PISA 2018, having a strictly focused navigation and being able to actively explore single- and multiple-source items were strongly correlated with knowledge of effective reading strategies and reading performance. In Portugal, around one every four students showed these navigation behaviours.

- Students in Portugal, scored the same as the OECD average in the index of reading strategies for assessing the credibility of sources (0.03 points) but showed the fifth largest socio-economic gap (0.65 points).

- In Portugal, approximately three quarters of the gender differences in reading performance can be accounted for by the difference between boys' and girls' knowledge of effective reading strategies - understanding and memorising a text, summarising information, and assessing the credibility of sources.

- Although Portugal is one of the 24 countries and economies in showing a decline in the index of enjoyment of reading between 2009 and 2018 (0.13), their level of enjoyment remains positive (0.08 points). The gender gap in this index is also one of the largest among all participating countries and economies in PISA 2018.

- Compared to students who rarely or never read books, print-book readers in Portugal scored 44 points more in reading, while digital-book readers scored 11 points more after accounting for students' and schools' socio-economic profile and students' gender.

- Students in Portugal, as well as in Austria, Hungary, 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).

Digital divide

- In Portugal, 93% of students (OECD average-31[1]: 89%) had both a connection to the Internet at home and a computer they could use for schoolwork in PISA 2018. This was 46 percentage points more than in PISA 2003 (OECD average-31: 28 percentage points more), but only 2 percentage points more than in PISA 2009 (OECD average-31: 1.4 percentage points more).

- In Portugal, some 87% (OECD average: 79%) of students attending disadvantaged schools[2] compared to 96% (OECD average: 94%) of students attending advantaged schools reported having access to the Internet and a computer they can use for schoolwork at home. In Denmark, Iceland and Poland, over 95% of students attending disadvantaged schools report 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.

Opportunity to learn

- In Portugal, 55% of students reported being trained at school on how to recognise whether information is biased (OECD average: 54%). More than 75% of students had access to this school training in Albania, Singapore and the United States. However, less than 40% of students did so in Argentina, Brunei Darussalam, Costa Rica, Latvia, Morocco and Viet Nam.

- The percentage difference between students from advantaged[3] and disadvantaged backgrounds who were taught how to detect biased information on the Internet across OECD countries was 8 percentage points in favour of advantaged students; it is above 17 percentage points in Belgium, Denmark and Luxembourg. In contrast, Portugal, as well as Belarus, Hungary and Malaysia, show a different pattern as disadvantaged students are more likely to report to learn this digital literacy skills at school than advantaged students (this difference is around 5 percentage points or higher).

- Education systems with a higher proportion of students who were taught digital skills in school and who have digital access at home were more likely to correctly distinguish fact from opinion in the PISA reading assessment even after accounting for country per capita GDP. In Portugal, the PISA reading released item of distinguishing fact from opinion was estimated to be 50% correct[4] (OECD average 47%).

Navigating digital environments

- Almost one in five students on average across OECD countries reported feeling lost in the PISA test when navigating through different pages. Portugal show a similar share (17%) of students reporting these difficulties. Less than 15% of students reported these difficulties in Beijing, Shanghai, Jiangsu and Zhejiang (China) (hereafter "B-S-J-Z [China]"), Belarus, Denmark, Finland, Germany, Hungary, Ireland, Italy, Lithuania, the Russian Federation, and Spain, while approximately one out of two students did so in Indonesia, the Philippines, and Thailand.

- In Portugal, approximately 28% of students followed item instructions in the PISA reading assessment by carefully selecting pages relevant to the tasks and 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. In comparison, more than half of the students showed those navigation behaviours in B-S-J-Z (China), Hong Kong (China), Korea, Singapore and Chinese Taipei, and at least 40% in Canada, Japan, Macao (China), New Zealand, the United Kingdom, and the United States.

- Students in Portugal show similar levels (0.03 points) of knowledge of reading strategies for assessing the credibility of sources than the OECD average. The highest levels of this index (higher than 0.20 points) were reached by students in Denmark, Germany, Ireland, Japan, the Netherlands, and the United Kingdom. Students in Portugal, as well as in Germany, Luxembourg, Switzerland and the United States, in particular, reported the largest socio-economic gap (around 0.65 points or higher) in this index of knowledge of strategies for assessing the credibility of sources.

Strategies to tackle inequality and gender gaps

- In Portugal, students scored around the OECD average in reading performance (492, OECD average: 487) and reported similar levels of perception of difficulty of the PISA reading assessment (0.05) than the OECD average. As in 69 other countries/economies, disadvantaged students in Portugal perceived the PISA reading assessment as more difficult than advantaged students, even after accounting for students' reading scores. This perception-of-difficulty gap between advantaged and disadvantaged students was the largest in B-S-J-Z (China), Luxembourg, and Singapore – close to a half standard deviation after accounting for reading performance (approximately -0.50). This gap in Portugal was -0.17 (OECD average: -0.22).

- On average across OECD countries, more boys reported they felt the PISA reading test was easier than girls did even though boys scored 25 points lower than girls did in reading after accounting for students' socio-economic backgrounds. On the contrary, in Portugal boys reported they felt the PISA reading test was more complicated than girls did; boys scored 22 points lower than girls did in reading after accounting for students' socio-economic backgrounds.

- In Portugal 29% (OECD average: 29%) 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.

- Compared to almost two-thirds on average across OECD countries, approximately three quarters of gender differences in reading performance in Portugal can be accounted for by the difference between boys' and girls' knowledge of effective reading strategies - understanding and memorising a text, summarising information, and assessing the credibility of sources.

- In Portugal, approximately three quarters of the gender differences in reading performance can be accounted for by the difference between boys' and girls' knowledge of effective reading strategies – i.e. understanding and memorising a text, summarising information, and assessing the credibility of sources).

Print reading in a digital world

- Compared to students who rarely or never read books, print-book readers in Portugal scored 44 points more in reading (OECD average: 49 points more); digital-book readers scored 11 points more (OECD average: 15 points more); and those who balance print and digital reading scored 36 points more (OECD average: 37 points more) after accounting for students' and schools' socio-economic profile, and students' gender.

- Compared to students who rarely or never read books, digital-book and print-book readers in Portugal read about 3 hours and a half more a week (OECD average: 3 hours and 4 hours, respectively); and those who balance both formats about 5 hours or more a week after accounting for students' and schools' socio-economic profile, and students' gender (OECD average: 5 hours).

- The index of enjoyment of reading decreased between 2009 and 2018 on average across OECD countries, and in one-third of countries and economies with available data on this index. 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. In Portugal this decline was also observed and it represented a decrease of 0.13 of a standard deviation.

- In addition, students Portugal, as well as in Austria, Hungary, 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.

- Girls and students from a higher socio-economic background typically report higher levels of enjoyment of reading. However, this gap between boys and girls was large in Portugal – 0.74 points (OECD average: 0.60 points). The gap in the index of enjoyment of reading between disadvantaged and advantaged in Portugal was around the same level of the OECD average (0.43 and 0.45 points, respectively).

Figure 1. Average time of reading for enjoyment by the format of reading

Difference between students who read books in the following way and those who "rarely or never read books", after accounting for students' and schools' socio-economic profile, and students' gender


Teachers' practices

- Students in Portugal perceived positively teacher's stimulation of reading engagement (0.12; OECD average: 0.00). More than 60% of students in this country reported that in most or all lessons, the teacher: encourages students to express their opinion (61%); shows students how the information in texts builds on what they already know (62%) and; poses questions that motivate students to participate actively (63%).

- Disadvantaged students 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. However, in Portugal, no differences were observed between boys and girls, or between disadvantaged and advantaged students in their perception of teachers' stimulation of reading engagement. In Portugal, girls scored 24 points more than boys in reading performance (OECD average: 30 points), and advantaged students 95 points more than disadvantaged (OECD average: 89).

- The association between teachers' stimulation of reading engagement and students' enjoyment of reading is positive in all participating countries and economies in PISA 2018. It is positive, as well, with reading performance in 61 countries and economies after accounting for students' and schools' socio-economic profile. Portugal is one of the 14 countries and economies – out of 77 with available data in this index – in which teachers' stimulation of reading engagement is not associated with reading performance.

- Reading fiction texts and reading long texts for school more frequently was positively associated with reading performance in most countries/economies, after accounting for students' and schools' socio-economic profile. However, in Portugal, students who reported reading fiction books two or more times during the last month did not score differently than students who did not report so, after accounting for students' and schools' socio-economic profile (OECD average: 9 points). Students who had to read longer pieces of texts for school (101 pages or more) achieved 16 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 profile and students' gender (OECD average: 31).

Figure 2. Indicators of reading in a digital world
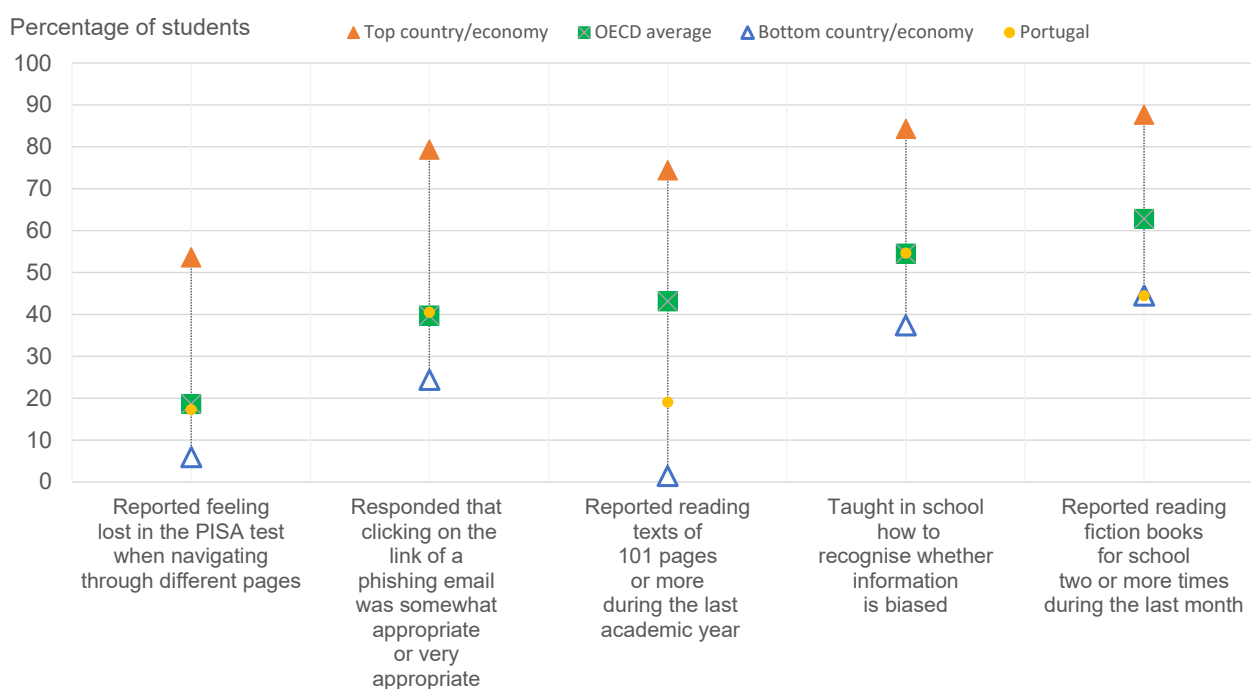
Box 1. Note about PISA Response Rates in Portugal

In 2018, Portugal's sample did not meet the PISA standard for students' response rate: overall, 76% of the sampled students responded (the PISA standard requires a minimum of 80%). Based on a complementary analysis prepared by the Instituto de Avaliação Educativa, it was found that nonresponding students performed worse on a national mathematics examination, and were more likely to be enrolled in lower grades (grades 7, 8 or 9), than responding students. A significant proportion of the performance differences could be accounted for by variables considered in non-response adjustments (including grade level), and the resulting bias could therefore be eliminated by using non-response adjusted weights (i.e. weights that are inflated for those cases in the sample that are "similar", in terms of observable characteristics, to non-responding students). Nevertheless, a residual upward bias (typically, of less than ten PISA score points) in mean performance could not be excluded, because even amongst apparently "similar" students, non-responding students tended to score lower than responding students on the national examination. However, a data-adjudication panel also considered that trend and performance comparisons with other countries may not be particularly affected, because an upward bias of that size cannot be excluded even in countries that met the response-rate standard or for previous cycles of PISA (in 2015, the student response rate in Portugal was 82%).

Key features of PISA 2018

The content

- The PISA 2018 survey focused on reading, with mathematics, science and global competence as minor areas of assessment. PISA 2018 also included an assessment of young people's financial literacy, which was optional for countries and economies.

The students

- Some 600 000 students completed the assessment in 2018, representing about 32 million 15-year-olds in the schools of the 79 participating countries and economies.

The assessment

- Computer-based tests were used in most countries with assessments lasting a total of two hours. In reading, a multi-stage adaptive approach was applied in computer-based tests whereby students were assigned a block of test items based on their performance in preceding blocks.

- Test items were a mixture of multiple-choice questions and questions requiring students to construct their own responses. The items were organised into groups based on a passage of text describing a real-life situation. About 930 minutes of test items for reading, mathematics, science and global competence were covered, with different students taking different combinations of test items.

- Students also answered a background questionnaire, which took about 35 minutes to complete. The questionnaire sought information about the students themselves, their attitudes, dispositions and beliefs, their homes, and their school and learning experiences. School principals completed a questionnaire that covered school management and organisation, and the learning environment.

- Some countries/economies also distributed additional questionnaires to elicit more information. These included: in 19 countries/economies, a questionnaire for teachers asking about themselves and their teaching practices; and in 17 countries/economies, a questionnaire for parents asking them to provide information about their perceptions of and involvement in their child's school and learning.

- Countries/economies could also choose to distribute three other optional questionnaires for students: 52 countries/ economies distributed a questionnaire about students' familiarity with computers; 32 countries/economies distributed a questionnaire about students' expectations for further education; and 9 countries/economies distributed a questionnaire, developed for PISA 2018, about students' well-being.

What is unique about PISA?

PISA is unique because of its:

- policy orientation, which links data on student learning outcomes with data on students' backgrounds and attitudes towards learning, and with key factors that shape their learning in and outside of school; by doing so, PISA can highlight differences in performance and identify the characteristics of students, schools and education systems that perform well.

- innovative concept of "literacy", which refers to students' capacity to apply their knowledge and skills in key areas, and to analyse, reason and communicate effectively as they identify, interpret and solve problems in a variety of situations.

- relevance to lifelong learning as PISA asks students to report on their motivation to learn, their beliefs about themselves, and their learning strategies.

- regularity, which enables countries to monitor their progress in meeting key learning objectives.

- breadth of coverage, which, in PISA 2018, encompassed all 37 OECD countries and 42 partner countries and economies.

Map of PISA countries and economies
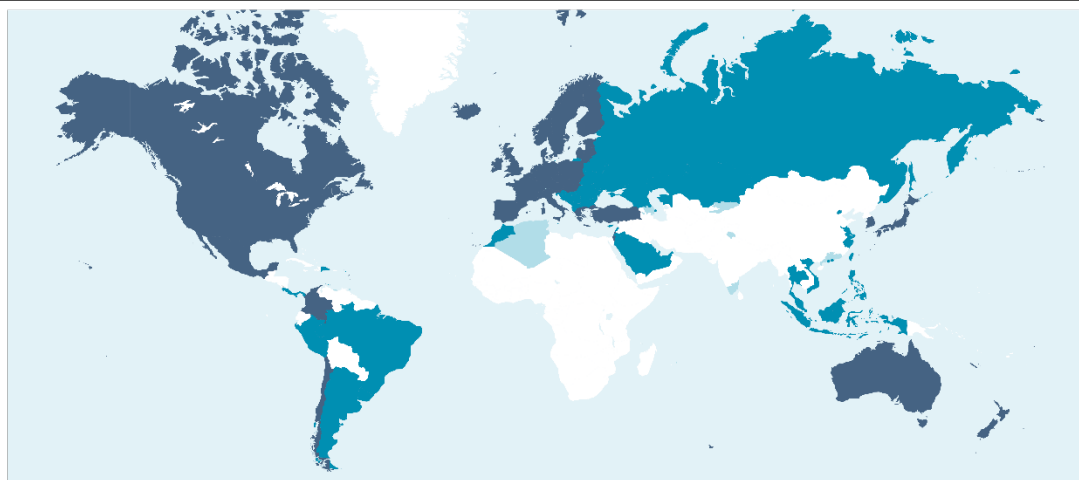
OECD member countries

Australia	Lithuania
Austria	Luxembourg
Belgium	Mexico
Canada	Netherlands
Chile	New Zealand
Colombia	Norway
Czech Republic	Poland
Denmark	Portugal
Estonia	Slovak Republic
Finland	Slovenia
France	Spain
Germany	Sweden
Greece	Switzerland
Hungary	Turkey
Iceland	United Kingdom
Ireland	United States*
Israel	
Italy	
Japan	
Korea	
Latvia	

Partner countries and economies in PISA 2018

Albania	Malaysia
Argentina	Malta
Baku (Azerbaijan)	Republic of Moldova
Belarus	Montenegro
Bosnia and Herzegovina	Morocco
Brazil	Republic of North Macedonia
Brunei Darussalam	Panama
B-S-J-Z (China)**	Peru
Bulgaria	Philippines
Costa Rica	Qatar
Croatia	Romania
Cyprus¹	Russian Federation
Dominican Republic	Saudi Arabia
Georgia	Serbia
Hong Kong (China)	Singapore
Indonesia	Chinese Taipei
Jordan	Thailand
Kazakhstan	Ukraine
Kosovo	United Arab Emirates
Lebanon	Uruguay
Macao (China)	Viet Nam

Partner countries and economies in previous cycles

Algeria
Azerbaijan
Guangdong (China)
Himachal Pradesh (India)
Kyrgyzstan
Liechtenstein
Mauritius
Miranda (Venezuela)
Tamil Nadu (India)
Trinidad and Tobago
Tunisia

* Puerto Rico participated in the PISA 2015 assessment (as an unincorporated territory of the United States).

** B-S-J-Z (China) refers to four PISA 2018 participating Chinese provinces: Beijing, Shanghai, Jiangsu and Zhejiang. In PISA 2015, the four PISA participating Chinese provinces were: Beijing, Shanghai, Jiangsu and Guangdong.

1. Note 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".

   Note 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.

References

OECD (2021), *21st-century readers: Developing literacy skills in a digital world*, PISA, OECD Publishing, Paris,

https://doi.org/10.1787/a83d84cb-en

For more information on PISA 2018 visit http://www.oecd.org/pisa/

Data can also be found on line by following the *StatLinks* 📊 under the tables and charts in the publication.

[1] OECD average-31 refers to the arithmetic mean of the 31 OECD countries that participated in both PISA 2003 and PISA 2018 assessments.

[2] 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.

[3] 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.

[4] 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])).