



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.

Netherlands

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 the Netherlands, approximately two every five students showed these navigation behaviours.
- Students in the Netherlands, as well as in Denmark, Germany, Ireland, Japan, and the United Kingdom scored the highest in the index of knowledge of reading strategies for assessing the credibility of sources (higher than 0.20 points).
- In the Netherlands, all 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.
- The Netherlands is one of the 24 countries and economies in showing a decline in the index of enjoyment of reading between 2009 and 2018 (0.25); and shows the lowest level of enjoyment of reading (-0.57). However, the share of students in the Netherlands is the second largest from all participating countries and economies in PISA 2018 to report to read when they have to (63%) and one of the highest share to report reading only to get information that they need (59%).
- The Netherlands reported the highest share of students in reading e-mails (64%) and chatting online (97%) several times a week or more, among participating countries and economies in PISA 2018. Even if half of students in this country reported to rarely or never read books (44%), those who do, prefer reading on paper format (39%) rather than on digital devices (9%).

Compared to students who rarely or never read books, print-book readers in the Netherlands scored 53 points more in reading while digital-book readers scored 28 points more after accounting for students' and schools' socio-economic profile and students' gender.

- 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.

Digital divide

- In the Netherlands, 95% of students (OECD average-31¹: 89%) had both a connection to the Internet at home and a computer they could use for schoolwork in PISA 2018, which is one of the highest percentages among participating countries and economies. This percentage was also one of the highest in PISA 2003. This was 7 percentage points more than in PISA 2003 (OECD average-31: 28 percentage points more).
- In the Netherlands, some 87% (OECD average: 79%) of students attending disadvantaged schools² compared to 98% (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 the Netherlands, 61% 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 advantaged³ 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. In the Netherlands, this difference is around 11 percentage points; it is above 17 percentage points in Belgium, Denmark and Luxembourg.
- 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 the Netherlands, the PISA reading released item of distinguishing fact from opinion was estimated to be 63% correct⁴ (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. The Netherlands 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 the Netherlands, approximately 39% 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 the Netherlands, as well as in Denmark, Germany, Ireland, Japan, and the United Kingdom scored the highest in the index of knowledge of reading strategies for assessing the credibility of sources (higher than 0.20 points). 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, while this gap in the Netherlands was similar to the OECD average (0.45 points difference in favour of advantaged students).

Strategies to tackle inequality and gender gaps

- In the Netherlands, students scored around the OECD average in reading performance (485, OECD average: 487) and reported slightly lower levels of perception of difficulty of the PISA reading assessment (- 0.07) than the OECD average. As in 69 other countries/economies, disadvantaged students in the Netherlands 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 the Netherlands was -0.20 (OECD average: -0.22).
- On average across OECD countries, more boys reported that 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. Girls in the Netherlands, as well as in Iceland and Sweden, in particular, perceived the PISA reading test as more complicated compared to boys, even though boys in the Netherlands scored 25 points lower than girls did in reading after accounting for students' socio-economic backgrounds.
- In the Netherlands 25% (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, all gender differences in reading performance in the Netherlands 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.

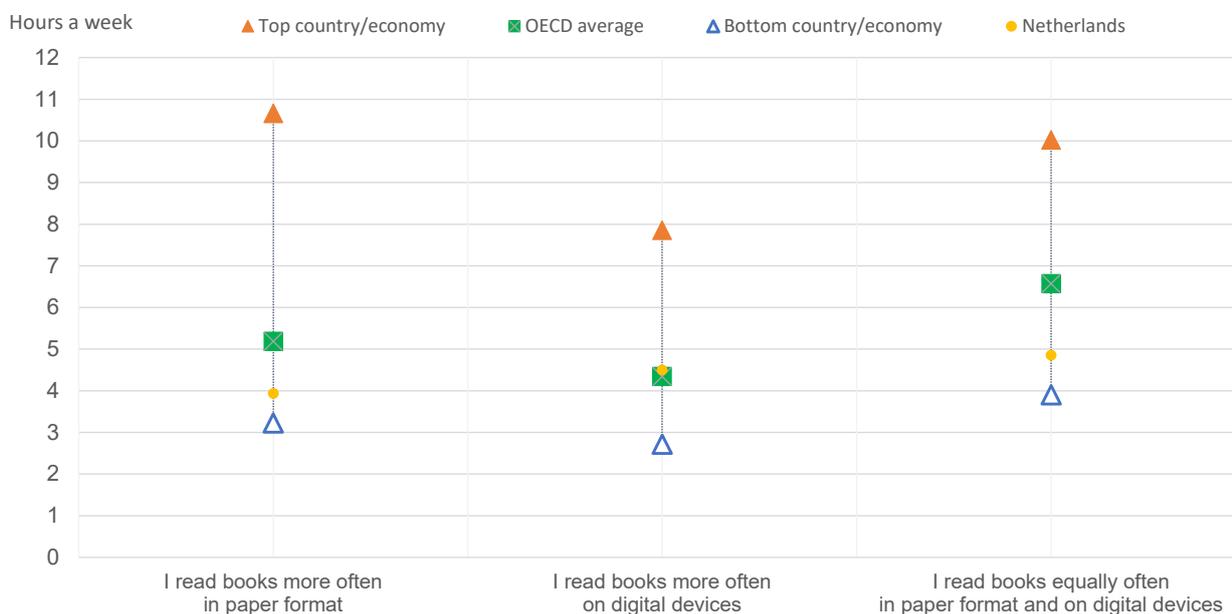
Print reading in a digital world

- 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 the Netherlands this decline was also observed and it represented a decrease of 0.25 of a standard deviation.
- Despite the Netherlands show the lowest level of enjoyment of reading (-0.57), students in this country do read for at least two purposes: to read when they have to (63% which is the second largest share of students among participating countries and economies in PISA 2018) and to read only to get information that they need (59% which is one of the largest share).

- The highest share of students reporting reading e-mails (64%) and chatting online (97%) several times a week or more is found in the Netherlands (OECD average: 37% and 88%, respectively). However, even if almost half of students in this country reported to rarely or never read books (44%), those who do, prefer reading on paper format (39%) rather than on digital devices (9%).
- Compared to students who rarely or never read books, print-book readers in the Netherlands scored 53 points more in reading (OECD average: 49 points more); digital-book readers scored 28 points more (OECD average: 15 points more); and those who balance print and digital reading scored 45 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 readers in the Netherlands read near to 4 hours more a week (OECD average: 3 hours); print-book readers 3 hours more a week (OECD average: 4 hours); and those who balance both formats 4 hours or more a week after accounting for students' and schools' socio-economic background and students' gender (OECD average: 5 hours).
- 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 the Netherlands – 0.66 points (OECD average: 0.60 points). The gap in the index of enjoyment of reading between disadvantaged and advantaged in the Netherlands was around the same level of the OECD average (0.40 and 0.45 points, respectively) while the gap in this index between immigrant and non-immigrant students was higher than the OECD average (0.22 and 0.07 points, respectively).

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

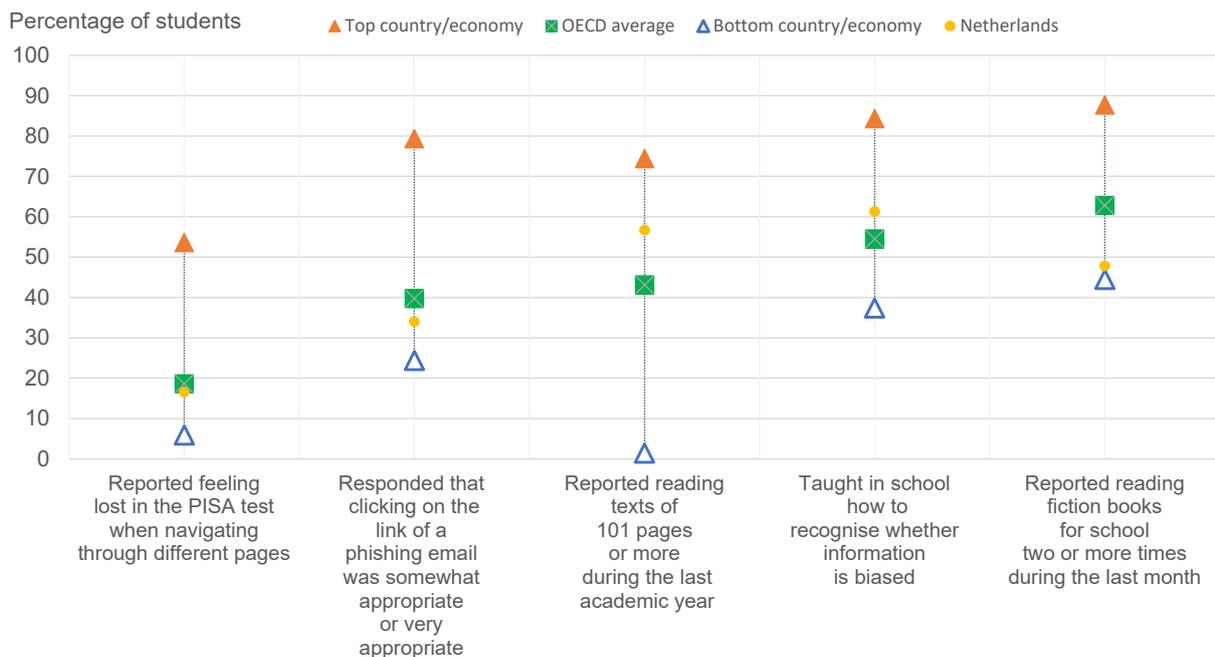
Difference between students who read books in the following way and those who "rarely or never read books", after accounting for students' and schools' socio-economic profile, and students' gender



Teachers' practices

- The Netherlands show the lowest level of teacher's stimulation of reading engagement perceived by student, among all participating countries and economies in PISA 2018 (-0.39; OECD average: 0.00), however compared to 2009, the share of students reporting that teacher shows them how the information in texts builds on what they already know increased by 11 percentage points (OECD average: 9 percentage points more).
- 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. In the Netherlands, the difference between disadvantaged and advantaged students in their perception of teachers' reading engagement stimulation was similar to OECD average (0.18 points and 0.15 points more in favour of advantaged students, respectively). However, unlike the OECD average, no differences were observed between boys and girls in their perception of teachers' reading engagement stimulation.
- 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. The Netherlands 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. In the Netherlands, students who reported reading fiction books two or more times during the last month scored 18 points more in reading than students who did not, 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 33 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



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

Partner countries and economies in PISA 2018

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

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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.

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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])).