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PISA in Focus

Are 15-year-olds prepared to deal with fake news and misinformation?

Programme for International Student Assessment

OECD
BETTER POLICIES FOR BETTER LIVES

Are 15-year-olds prepared to deal with fake news and misinformation?

- An average of 54% of students in OECD countries 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.
- Students from advantaged socio-economic backgrounds in all participating countries and economies 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.
- Education systems with a higher proportion of students who were taught whether information is subjective or biased were more likely to distinguish fact from opinion in the PISA reading assessment even after accounting for country per capita GDP or reading performance.

Digital technologies have changed how people interact with information. PISA data shows that 15-year-olds increasingly read online to fulfil information needs (e.g. online news versus newspapers). At the same time, technological changes in the digitalisation of communication continue to reshape people's habits (e.g. chats online versus emails). Fifteen-year-olds' total online consumption has risen from 21 hours a week in PISA 2012 to 35 hours per week in PISA 2018 – almost the equivalent of an average adult workweek in OECD countries. The massive information flow that characterises the digital era demands that readers be able to distinguish between fact and opinion, and learn strategies to detect biased information and malicious content such as phishing emails or fake news. Academic research is inconclusive about the prevalence and importance of misinformation and fake news[1]. Yet,the consequences of being poorly informed have been largely documented. It can lead to political polarisation, decreased trust in public institutions and undermined democracy.

Students' use of the Internet continues to increase while the opportunity to learn digital skills in school is far from universal.

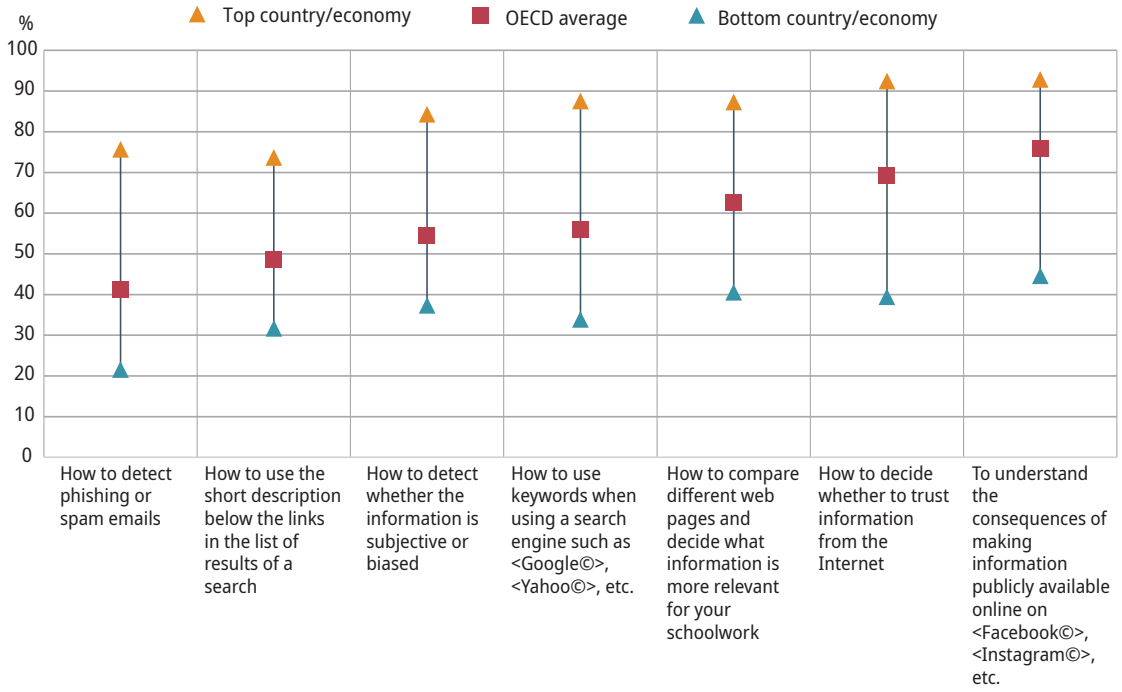
PISA 2018 asked students whether during their entire school experience they were taught a) how to use keywords when using a search engine such as <Google©>, <Yahoo©>, etc, b) how to decide whether to trust information from the Internet, c) how to compare different web pages and decide what information is more relevant for their schoolwork, d) to understand the consequences of making information publicly available online, e) how to use the short description below the links in the list of results of a search, f) how to detect whether information is subjective or biased, and g) how to detect phishing or spam emails.

The most common digital skill taught at school on average across OECD countries is understanding the consequences of making information publicly available online (Figure 1). The least common skill was how to detect phishing or spam emails (76% and 41% of students in OECD countries reported being taught this during their entire school experience). There are also considerable differences across and within countries. An average of 54% of students in OECD countries 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. The percentage difference in students who were taught how to detect biased information between students from socio-economic advantaged and disadvantaged backgrounds[2] across OECD countries was 8 percentage points in favour of advantaged students. In Belgium, Denmark, Germany, Luxembourg, Sweden, the United Kingdom and the United States, this difference is around 14 percentage points or higher.

Figure 1: Frequency of opportunity to learn digital literacy skills at school

Students reported that during their entire school experience were taught the following, OECD average



Items are ranked in ascending order of the percentage of students within OECD average.
Source: OECD, PISA 2018 Database, Table B.2.6.

PISA 2018 also included several scenario-based tasks where students were asked to rate how useful different strategies were to solve a particular reading situation. One of these scenarios asked students to click on the link of an email from a well-known mobile operator and fill out a form with their data to win a smartphone, also known as phishing emails. Approximately 40% of students on average across OECD countries responded that clicking on the link was somewhat appropriate or 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[3] (higher than 0.20 points) across all participating countries and economies in PISA 2018. In contrast, students in Baku (Azerbaijan), Indonesia, Kazakhstan, the Philippines, and Thailand had the lowest scores in this index (lower than -0.65 points) across all participating countries and economies in PISA 2018. Among OECD countries, students in Chile, Colombia, Hungary, Korea, Mexico, and Turkey had the lowest scores in this index (lower than -0.20 points).

Students from advantaged socio-economic backgrounds in all participating countries and economies 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 (Figure 2). 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 (lower than 0.35 points). Most importantly, PISA 2018 data shows that, on average across OECD countries, about one-third (32%[4]) 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' knowledge of effective reading strategies. Empirical studies have shown that classroom interventions aimed at developing students' assessment of information reliability are effective in improving students' critical thinking when comprehending multiple documents.

Figure 2: Students' knowledge of reading strategies for assessing the credibility of sources, by socio-economic status

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.

Note: All differences between socio-economically advantaged and disadvantaged students are statistically significant.

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

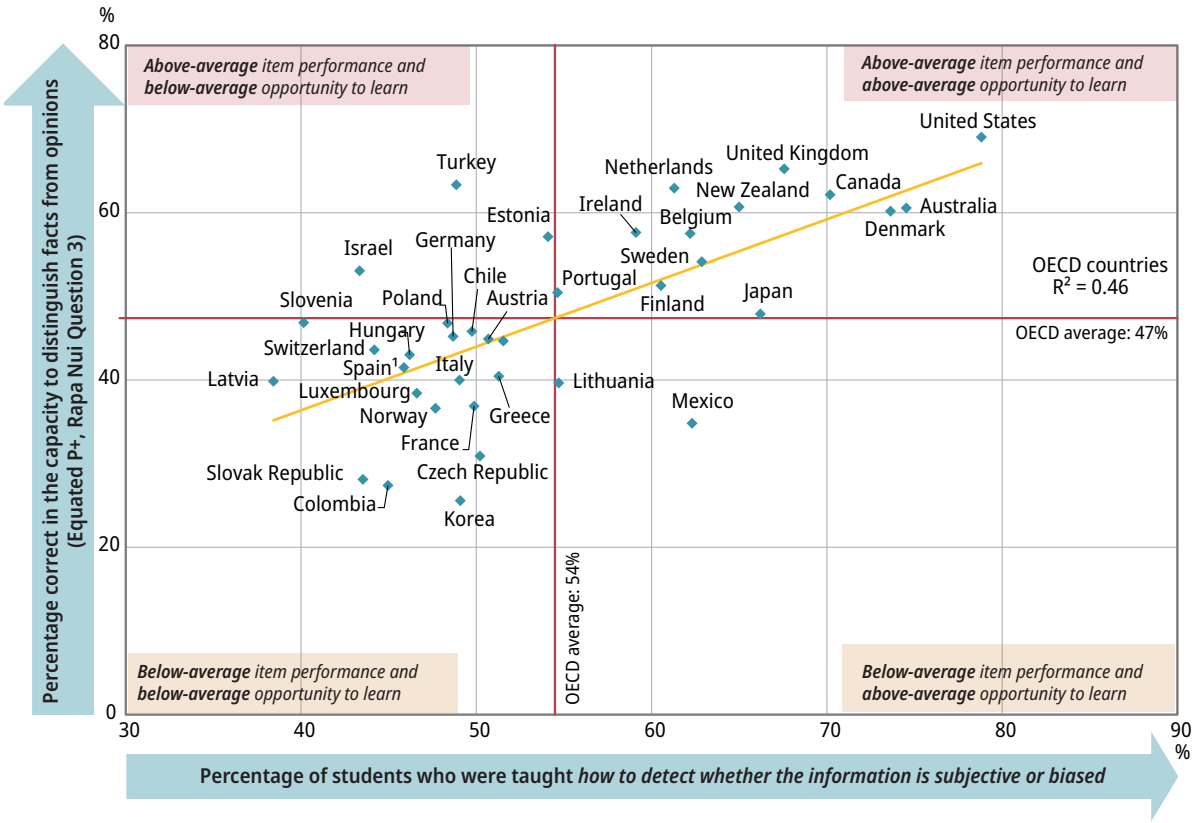
Source: OECD, PISA 2018 Database, Tables B.5.11 and B.5.12c

Education systems with a higher proportion of students taught how to detect biased information in school were more likely to distinguish fact from opinion in the PISA reading assessment.

The PISA 2018 reading assessment included one item-unit (i.e. Rapa Nui Question 3) that tested whether students can distinguish between facts and opinions. This question is a typical Level 5 task[5]. In this item, students must classify five separate statements taken from a review of a 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[6]). 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 whose proficiency is 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").

PISA 2018 data show that the opportunity students had to learn how to detect whether information was subjective or biased in school is strongly associated with the estimated percentage correct[7] in the item that focuses on distinguishing facts from opinions in the PISA reading assessment (R^2=0.46) in OECD countries (Figure 3). This relationship is still observed even after accounting for per capita GDP or reading performance[8]. This association is weaker among all participating countries and economies in PISA 2018 (R^2=0.15)[9]. In conclusion, when the education system provides students with in-school opportunities to learn how to detect biased information, it is this rather than overall reading performance or GDP per capita that is driving a strong association with the estimated percentage correct in the item on distinguishing fact from opinion. These results do not mean that opinions are not important for contextualising information, especially when the facts in question require some explanation. Rather, the results imply that being able to distinguish fact from opinion, assess the credibility of information sources, and learn strategies to detect biased or false information are necessary skills for reading in a digital world. Ultimately, the ability to distinguish good from bad information is important to preserving democratic values.

Figure 3: Reading item of distinguishing facts from opinions and access to training on how to detect biased information in school



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.

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

The bottom line

Preserving democratic values and reinforcing trust in public institutions relies on having well-informed citizens. Students must develop autonomous and advanced reading skills that include the ability to navigate ambiguity, and triangulate and validate viewpoints. Students' training in distinguishing between fact and opinion, and detecting biased information and malicious content such as phishing emails greatly varies between countries and students' socio-economic profiles. Schools can foster proficient readers in a digital world by closing these gaps and teaching students basic digital literacy.

Notes

1. Social platforms representing a big chunk of online media consumption are particularly vulnerable to the spread of online misinformation and fake news (Pennycook and Rand, 2019). Social media algorithms are designed to channel the flow of like-minded people towards each other. This creates "echo chambers" reinforcing our thoughts and opinions rather than challenging them, fuelling people's confirmation bias. Moreover, fake news reaches more people than the truth (Vosoughi, Roy and Aral, 2018).On the other hand, a recent study in the United States shows that TV news dominates online in a ratio of 5:1 and estimates fake news to be about 1% of overall news consumption (Allen et al., 2020). Another study in the United Kingdom shows that people interested in politics and those with diverse media diets tend to avoid echo chambers (Dubois and Blank, 2018). This study claims that a small segment of the population is likely to find themselves in an echo chamber. In fact, these studies argue that it is more likely to find people choosing not to be informed than people being deceived.
2. 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.
3. Students' responses about the usefulness of different reading strategies were rated by reading experts to create the index of knowledge of reading strategies for assessing the credibility of sources (see Chapter 16, PISA 2018 Technical Report).
4. This value is calculated as 1 minus the result of dividing the ESCS coefficient after accounting for the indirect effect of knowledge of reading strategies by the ESCS coefficient for the total effect and then multiplying by 100 (see Figure 5.12, 21st-Century Readers: Developing literacy skills in a digital world).
5. Reading proficiency Level 5 is one of the highest and corresponds to students who scored from 625.61 to less than 698.32 score points. For further details on the reading proficiency levels, please see PISA 2018 Report: Volume I.
6. Reading proficiency Level 3 corresponds to students who scored from 480.18 to less than 552.89 score point. For further details on the reading proficiency levels, please see PISA 2018 Report: Volume I.
7. 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, PISA 2018 Results: Volume I).
8. The partial correlation after accounting for per capita GDP was 0.66 among OECD countries.The partial correlation after accounting for reading performance was 0.60 among OECD countries. The partial correlation is calculated using the percentage of students who reported learning in school how to detect whether information is subjective or biased (Table B.2.6, 21st-Century Readers: Developing literacy skills in a digital world) and the percentage correct in the reading assessment items to assess the capacity to distinguish facts from opinions (Table B.2.6, 21st-Century Readers: Developing literacy skills in a digital world), after accounting for per capita GDP (see Table B3.1.4, PISA 2018 Results: Volume I) and average reading performance (Table B.2.1a).
9. Countries that 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.

For more information

Contact: Javier Suarez-Alvarez (Javier.SUAREZ-ALVAREZ@oecd.org)