Students, Computers and Learning: Making the Connection

- Computers have a greater presence in Australian schools than in most other OECD countries. In 2012, schools in Australia had about one computer available for every 15-year-old student, and 93.7% of Australian students reported using computers at school. The share of students who reported browsing the Internet for schoolwork, at school, at least once a week increased by more than 15 percentage points between 2009 and 2012, to 80.8%.

- Students in Australia perform significantly above the OECD average in digital reading (521 points on the PISA digital reading scale). In particular, they have strong web-browsing skills, and are better able to plan and execute a search, evaluate the usefulness of information, and assess the credibility of sources on line than students in other OECD countries, on average.

- In contrast to the OECD average pattern, students in Australia who use computers at school frequently to browse the Internet for schoolwork (once a week or more often) score highest in the PISA assessment of digital reading. This suggests that through targeted practice, schools can help students to develop the skills they need to handle electronic sources of information.

- Mean performance in Australia is above the OECD average in the computer-based assessment of mathematics (508 points on the PISA mathematics scale). Furthermore, fifteen-year-old students perform slightly better in this assessment when tasks require them to actually use the computer to solve a mathematics problem, such as sorting data or creating a chart, than when the computer only serves as a means to enter an answer.

- Regardless of socio-economic status, students in Australia spend about 2 hours and 30 minutes on line every weekend day, on average – more than the OECD average. In their leisure time on line, advantaged students (those among the top 25% in socio-economic status) are more likely than disadvantaged students to search the Internet for information, read online news, or read e-mails, while disadvantaged students are more likely to play games.

Key international findings

Over the past 10 years, there has been no appreciable improvement in student achievement in reading, mathematics or science, on average, in countries that have invested heavily in information and communication technologies for education. In 2012, in the vast majority of countries, students who used computers moderately at school had somewhat better learning outcomes than students who used computers rarely; but students who used computers very frequently at school did a lot worse, even after accounting for the students' socio-economic status.

The top-performing country in the PISA 2012 assessment of digital reading was Singapore, followed by Korea, Hong Kong-China, Japan, Canada and Shanghai-China. Students in Australia, Canada, Ireland, Korea, Singapore and the United States showed the most advanced web-browsing skills. More often than students elsewhere, they carefully selected links to follow before clicking on them, and followed relevant links for as long as was needed to answer the question. To use and understand online sources of information, students need such web-browsing skills in addition to the reading skills required for printed texts.

In most countries, differences between advantaged and disadvantaged students in access to computers and the Internet at home shrank between 2009 and 2012. In all but five OECD countries with available data, in 2012 disadvantaged students – those from the bottom 25% in socio-economic status – typically spent at least as much time on line, outside of school, as advantaged students did. But traditional socio-economic differences persist when looking

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at how students use their time on line, and they continue to have a strong impact on performance in reading. Indeed in all countries, advantaged students are significantly more likely to use their time on line to read news or obtain practical information. To benefit from online information about education, health or financial services and improve one's personal situation, having sufficient basic skills in reading is perhaps more important than easy access to the Internet.

Students' exposure to computers at school varies significantly across countries and schools. While the availability of devices and of an Internet connection at school explains much of this variation, teachers' readiness to integrate technology into instruction also depends on other factors, such as whether the devices can be accessed in the classroom or only in separate rooms, whether the school has a digital skills curriculum, and whether teachers in the school have learned how to use these devices to enhance student learning. Among all teachers, those who are more inclined to use and better prepared for practices such as group work, individualised learning and project work are more likely to use digital resources.

To learn more…

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