

Organisation for Economic Cooperation and Development (OECD)

OECD OCDE Education

Are students ready for a technology-rich world?

What PISA studies tell us

Results from Programme for International Student Assessment (PISA) 2003

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Under embargo until

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Are students ready for a technology-rich world?

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□ First internationally comparative data on:

- The opportunities 15-year-old students have for using computers at home and at school
- How they use computers and their attitudes to them;
- The relationship between computer use and performance in key school subjects.

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Key features of PISA 2003

Information collected

Volume of the tests

- 3½ hours of mathematics assessment
- 1 hour for each of reading, science and problem solving

Each student

- 2 hours on paper-and-pencil tasks (subset of all questions)
- ½ hour for questionnaire on background, learning habits, learning environment, engagement and motivation, computer use

School principals

- questionnaire (school demography, learning environment quality)

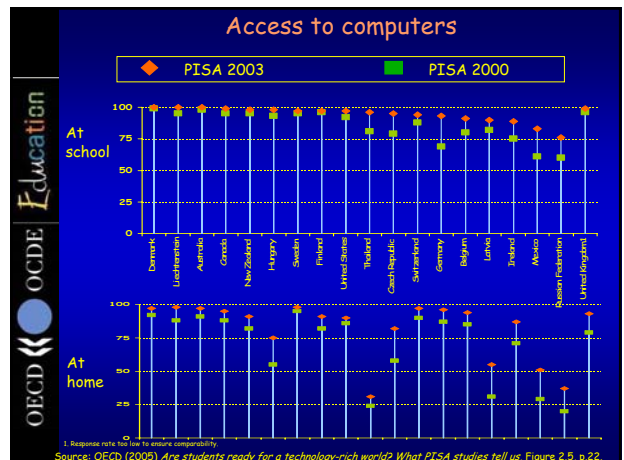
Coverage

- PISA covers roughly nine tenths of the world economy
- Representative samples of between 3,500 and 50,000 students

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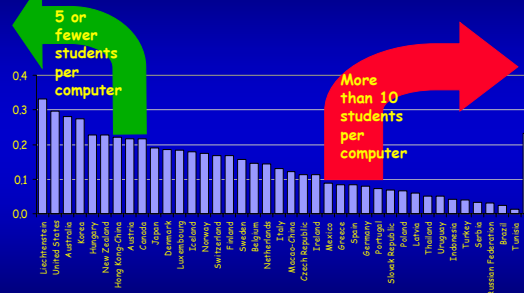
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Access to computers at school has increased rapidly between PISA 2000 and PISA 2003...



...but in some countries students still have only limited opportunity to use computers at school.

Number of computers per student (PISA 2003)

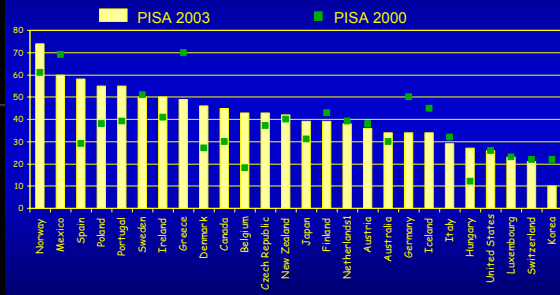


1. Response rate too low to ensure comparability.

Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Figure 2.8, p.27.

School principals' reports on shortage of computers for instruction

Percentage of students in schools whose principals report that instruction is hindered by a shortage of computers for instruction



1. Response rate too low to ensure comparability for PISA 2000.
2. Response rate too low to ensure comparability for PISA 2003.

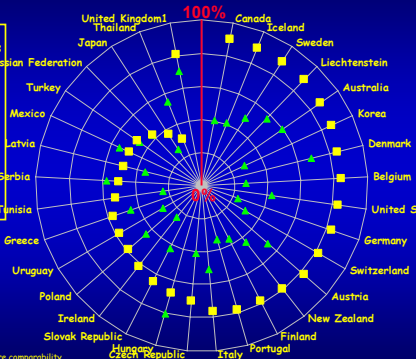
Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Figure 2.9, p.29.

Access to computers at school is more universal than access to computers at home, but students report using computers much more frequently at home.

Percentage of students using a computer at least a few times each week

Percentage of students reporting they use computers "Almost every day" or "A few times each week":

■ At home
▲ At school



1. Response rate too low to ensure comparability.

Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Figure 3.2, p.37.

What do students use computers to do?

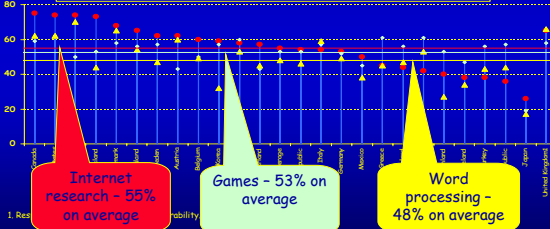
- PISA asked students how often they used:
 - The Internet to look up information about people things or ideas
 - Games on a computer
 - Word processing (e.g. Microsoft Word® or WordPerfect®)
 - The Internet to collaborate with a group or team
 - Spreadsheets (e.g. Lotus 1 2 3® or Microsoft Excel®)
 - The Internet to download software (including games)
 - Drawing, painting or graphics programs on a computer
 - Educational software such as mathematics programs
 - The computer to help learn school material
 - The Internet to download music
 - The computer for programming
 - A computer for electronic communication (e.g. e-mail or "chat rooms")
- Students could choose from the following answers:
 - Almost every day, A few times each week, Between once a week and once a month, Less than once a month, Never

Students use computers for a wide range of purposes and not just to play games...

Students' use of computers (1)

Percentage of students reporting they use the following "Almost every day" or "A few times each week":

- The Internet to look up information about people, things or ideas.
- Games on a computer.
- Word processing (e.g. Word® or WordPerfect®)



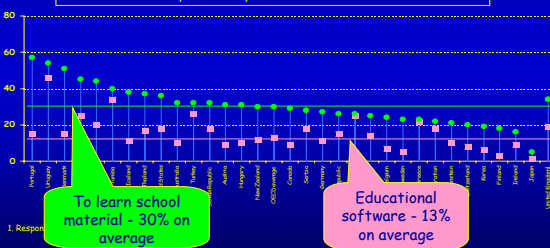
Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Figures 3.3 and 3.4, pp.39 and 41.

... a minority of students frequently use educational software on computers...

Students' use of computers (2)

Percentage of students reporting they use the following "Almost every day" or "A few times each week":

- Educational software such as mathematics programs
- ◆ The computer to help learn school material



Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Figure 3.4, p.41.

In general, students are confident in performing routine and Internet tasks on computers.

Routine tasks on a computer - percentage of students who are confident (OECD average)

	I can do this...	
	By myself	With help
Open a file	90	7
Play computer games	90	7
Start a computer game	86	10
Save a computer document or file	88	8
Delete a computer document or file	88	8
Draw pictures using a mouse	85	10
Print a computer document or file	86	9
Scroll a document up and down a screen	87	8
Create/edit a document	80	13
Move files from one place to another on a computer	76	17
Copy a file from a floppy disk	75	16

Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Table 3.9, p.110.

Internet tasks on a computer - percentage of students who are confident (OECD average)

	I can do this...	
	By myself	With help
Get onto the Internet	88	7
Write and send e-mails	79	12
Copy or download files from the Internet	70	19
Download music from the Internet	66	21
Attach a file to an e-mail message	58	24

At least 90% of students report confidence in these tasks in Australia, Canada, Iceland, Korea, New Zealand, Sweden and the United States.

Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Table 3.11, p.112.

In general, 15-year-old boys report higher confidence than girls do in performing computing tasks and these differences are particularly apparent for the more demanding computing tasks...

High-level tasks on a computer - percentage of students who are confident to perform these tasks by themselves or with help (OECD average)

	Boys	Girls
Use software to find and get rid of computer viruses	79	54
Create a multi-media presentation (with sound, pictures, video)	77	62
Create a computer program (e.g. in Logo, Pascal, Basic)	63	48
Construct a Web page	71	61
Create a presentation (e.g. using <Microsoft® PowerPoint®>	79	70
Use a spreadsheet to plot a graph	79	70
Use a database to produce a list of addresses	85	79

Source: OECD (2005) *Are students ready for a technology-rich world? What PISA studies tell us*, Table 3.14, p.115.

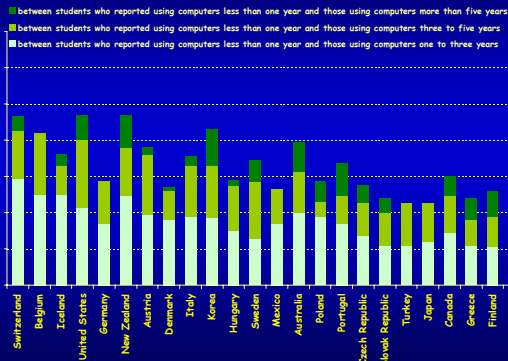
Students who are established computer users perform better than students with limited computing experience.

On average across OECD countries

- The 37% of students having more than 5 years of computer experience scored at 532 points
- The 27% of students having between 3 and 5 years of computer experience scored at 513 points
- The 26% of students having between 1 and 2 years of computer experience scored at 479 points
- The 10% of students having less than 1 year of computer experience scored at 433 points

... but the performance advantage varies across countries

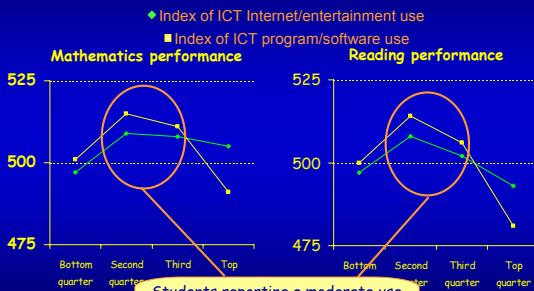
... and diminishes somewhat when socio-economic background factors are taken into account



If more experience counts, more frequent use does not necessarily

Looking at a wide range of students' use of computers, moderate users perform better than students who are either not using computers/using them rarely or are using computers very often...

Frequency of use of computer to perform a wide range of tasks and student performance



Students reporting a moderate use of computers to perform a range of tasks

Source: OECD (2009) *Are students ready for a technology-rich world? What PISA studies tell us*, Figure 4.6, p.65.

Further information

- www.pisa.oecd.org
 - All national and international publications
 - The complete database
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- andreas.schleicher@oecd.org