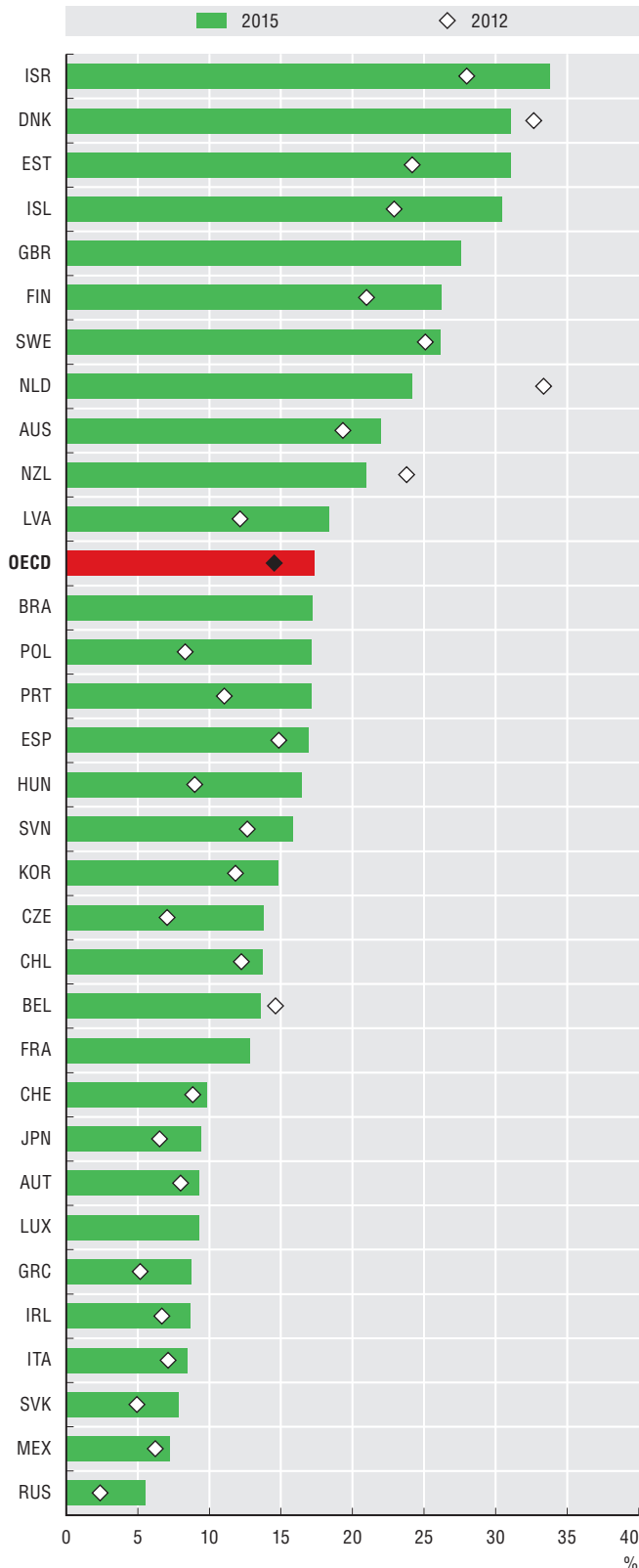


## 2. Digital natives

### Students who first accessed the Internet at the age of 6 or before, 2012 and 2015

As a percentage of 15 year-old students



Source: OECD calculations based on OECD PISA 2015 Database, July 2017. StatLink contains more data.

StatLink <http://dx.doi.org/10.1787/888933619980>

### Did you know?

On average, 56% of 15-year-old boys in OECD play online games daily or almost daily against only 13% of girls, who themselves have a higher propensity to chat online.

The Internet permeates every aspect of the economy and society, and is also becoming an essential element of young people's lives. Increasingly, policy makers require evidence of the impact of ICTs on students' school performance. However, current research presents a rather mixed picture and underlines the need for additional metrics.

According to the results of the 2015 OECD Programme for International Student Assessment (PISA), 17% of students in the OECD area first accessed the Internet at the age of 6 or before. For countries where data are available, less than 0.3% of 15-year-olds reported never having accessed the Internet.

The age of first access to the Internet varies across countries. Over 30% of students started using the Internet at the age of 6 or before in Denmark, Estonia, Iceland and Israel. The most common age of first access to the Internet is between 7 and 9 years in about two-thirds of the countries surveyed by PISA, and 10 years and over in the remaining third.

In 2015, 43% of 15-year-olds in the OECD area spent between 2 and 6 hours a day online outside school – a sizeable increase from less than 30% in 2012. Brazil and Chile were the countries with the largest proportion of students (over 30%) spending more than 6 hours a day on the Internet outside school.

Today, 62% of 15-year-olds in the OECD area chat online and 73% participate in a social network daily or almost daily. Gender differences are particularly notable in activities such as playing online games (most popular among boys) and uploading personally created content for sharing online (most popular among girls).

### Definitions

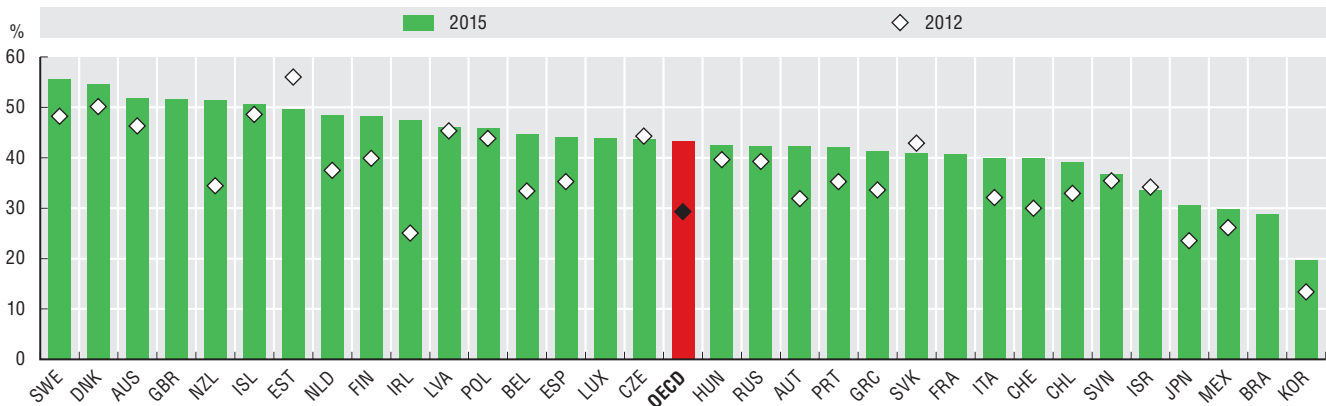
Students assessed by PISA are between the ages of 15 years, 3 months and 16 years, 2 months. They must be enrolled in school and have completed at least six years of formal schooling, regardless of the type of institution, programme followed or whether the education is full-time or part-time.

Online games include one-player or collaborative online games.

All PISA shares are reported as a percentage of respondents. Results are based on students' self-reports.

### Time spent on the Internet by students outside school, 2012 and 2015

Percentage of 15 year-old students spending 2 to 6 hours on the Internet during a typical weekday

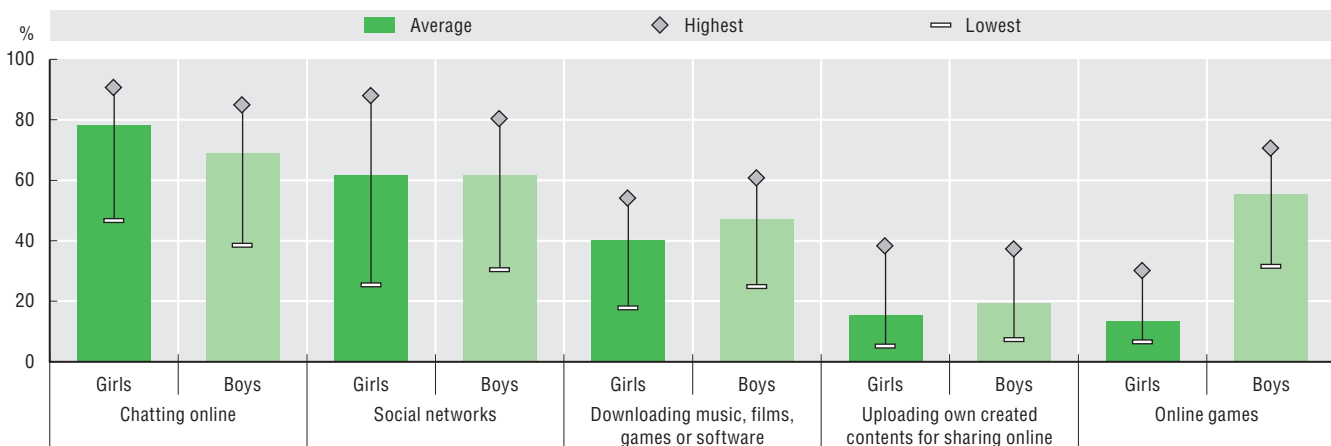


Source: OECD calculations based on OECD PISA 2015 Database, July 2017. StatLink contains more data.

StatLink <http://dx.doi.org/10.1787/888933619999>

### Diffusion of selected online activities among students in OECD countries, by gender, 2015

Percentage of 15 year-old students performing each activity daily or almost daily



Source: OECD calculations based on OECD PISA 2015 Database, July 2017. StatLink contains more data.

StatLink <http://dx.doi.org/10.1787/888933620018>

### Measurability

PISA 2015 assessed the skills of 15-year-olds in 72 economies. Over half a million students between the ages of 15 years, 3 months and 16 years, 2 months, representing 28 million 15-year-olds globally, took the internationally agreed 2-hour test.

The ICT familiarity questionnaire is an optional module and consists of questions on the availability of ICTs at home and school, the frequency of use of different devices and technologies, students' ability to carry out computer tasks and their attitudes towards computer use. In 2015, 47 out of 72 economies participating in PISA ran this specific module. Despite the valuable information gained as a result of implementation, the ICT questionnaire was not administered in 2015 in several OECD countries (Canada, Norway, Turkey and the United States) due largely to the high costs generated by the inclusion of these additional questions in the survey.

Increasing availability of data from multiple PISA waves allows the assessment of student use of ICTs both at school and outside school over time, as well as investigation of the impact on school performance, which is a key concern for education policy makers.

#### Cyprus

The following note is included at the request of 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 recognizes 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.’”

The following note is included at the request of all of the European Union Member States of the OECD and the European Union:

“The Republic of Cyprus is recognized 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.”

#### Israel

“The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

“It should be noted that statistical data on Israeli patents and trademarks are supplied by the patent and trademark offices of the relevant countries.”

### 6.1. Connectivity

#### Mobile broadband penetration, by technology, December 2016

For Brazil, China, India, Indonesia, the Russian Federation, Saudi Arabia and South Africa, the data source is ITU World Telecommunication/ICT Indicators Database, July 2017.

For Israel, the data source is GSMA Intelligence.

For Switzerland and the United States, data for December 2016 are estimates.

#### Households with broadband connections, urban and rural, 2010 and 2016

For Brazil and the United States, data refer to 2015 instead of 2016.

For Chile, data refer to 2012 and 2015.

For Iceland, data refer to 2010 and 2014.

For Switzerland, data refer to 2012 and 2014.

For the United Kingdom, data refer to 2009 instead of 2010.

For Brazil, areas are defined as urban or rural according to local legislation, as compiled by the NSO. Reported data refer to urban (densely populated) and rural (thinly populated).

For Chile, for the year 2012, large urban areas refer to a contiguous set of local areas, each of which has a density superior to 500 inhabitants per square kilometre, where the total population for the set is at least 50 000 inhabitants. Rural areas refer to a contiguous set of local areas belonging neither to a densely populated nor to an intermediate area. An intermediate area refers to a contiguous set of local areas, not belonging to a densely populated area, each of which has a density superior to 100 inhabitants per square kilometre, and either with a total population for the set of at least 50 000 inhabitants or adjacent to a densely populated area.

For France, Latvia, the Netherlands and Sweden, there is a break in series with previous years in 2016 for rural and urban data.

For the United States, population density categories are approximated based on a household’s location in a principal city, the balance of a metropolitan statistical area (MSA), or neither. To protect respondent confidentiality, the information has been redacted from some observations in the public use datasets.

#### Small and medium enterprises with broadband access, fixed or mobile, 2016

Only enterprises with ten or more employees are considered. Unless otherwise stated, size classes are defined as: small (10-49 employees) and medium (50-249 employees).

For Australia, data refer to the fiscal year 2014/15 ending on 30 June.

For Brazil, broadband is defined by type of connection rather than download speed, and includes DSL, cable modem, fibre, radio, satellite and 3G/4G. Data refer to 2015.

For Canada, data include all connection groups except dial-up connection. Responses of 'don't know' were removed from the numerator and the denominator. Data refer to 2013 and medium-sized enterprises have 50-299 employees.

For Japan, data refer to 2015 and to businesses with 100 or more employees instead of ten or more; medium-sized enterprises have 100-299 employees. Data include leased lines and mobile broadband.

For Korea, data refer to 2015.

For Mexico, data refer to 2012.

For New Zealand, data refer to the fiscal year 2015/16 ending on 30 June.

For Switzerland, data refer to 2015. Small firms have 5-49 employees instead of 10-49.

### 6.3. Internet users

#### Total, daily and mobile Internet users, 2016

Unless otherwise stated, Internet users are defined for a recall period of 3 months. For Australia, Canada and Japan, the recall period is 12 months. For the United States, the recall period is 6 months for 2015, and no time period is specified in 2006. For Korea and New Zealand, the recall period is 12 months in 2006. For Chile in 2009, China, India, Indonesia, the Russian Federation and South Africa, no time period is specified.

For Australia, data refer to the fiscal years 2006/07 ending on 30 June and 2014/15.

For Brazil, data refer to 2008 and 2015.

For Canada, data refer to 2007 and 2012. In 2007, data refer to individuals aged 16 and over instead of 16-74.

For Iceland and Switzerland, data refer to 2014 instead of 2016.

For Israel, data refer to 2015 instead of 2016 and to individuals aged 20 and more instead of 16-74.

For Japan, data refer to 2015 instead of 2016 and to individuals aged 15-69.

For Korea, data refer to 2015 instead of 2016.

Notes for all users:

For Chile, data refer to 2009 and 2015.

For China, India, Indonesia, the Russian Federation and South Africa, data originate from ITU, ITU World Telecommunication/ICT Indicators Database, and refer to 2015 instead of 2016.

For Indonesia, data relates to individuals aged 5 or more.

For New Zealand, data refer to 2012 instead of 2016.

For Turkey, data refer to 2007 instead of 2006.

For the United States, data refer to 2007 and 2015.

Notes for daily users:

For the Russian Federation, data originate from ITU, ITU World Telecommunication/ICT Indicators (WTI) Database, and refer to 2014 instead of 2016.

Notes for mobile users:

For Israel, data refer to individuals who use the Internet through a mobile phone, from any location.

For New Zealand, data originate from Statistics New Zealand. Data refer to 2012 and to individuals aged 15-74. Data include individuals using cellular and wireless or both.

For Switzerland, data refer to Internet users who have personal use of a mobile device to access the Internet outside home or work.

For the United States, data originate from the NTIA and relate to 2015. Data refer to the proportion of individuals aged 15 or more who use the Internet while travelling between places, as a proportion of individuals aged 15 or more who use the Internet at any location.

#### Gap in Internet use by educational attainment, 2016

Unless otherwise stated, Internet users are defined for a recall period of 3 months. For Australia, the recall period is 12 months. For the Russian Federation, no time period is specified. For the United States, the recall period is 6 months for 2015.

For Australia, data refer to the fiscal year 2014/15 ending on 30 June.

For Brazil, Chile, Israel, Korea and the United States, data refer to 2015.

For Iceland and Switzerland, data refer to 2014.

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### Notes and references

For Israel, data refer to individuals aged 20 and more instead of 16-74.

For New Zealand, data refer to 2012.

For the Russian Federation, data originate from ITU, ITU World Telecommunication/ICT Indicators Database. Data refer to 2015 for all Internet users and to 2014 by educational attainment.

#### **Women Internet users, by age, 2016**

Unless otherwise stated, Internet users are defined for a recall period of 3 months. For Canada and Japan, the recall period is 12 months. For the United States, the recall period is 6 months.

For Australia, data refer to the fiscal year 2014/15 ending on 30 June.

For Brazil, Chile, Israel, Japan, Korea and the United States, data refer to 2015.

For Canada and New Zealand, data refer to 2012.

For Iceland and Switzerland, data refer to 2014.

For Israel, data refer to women aged 20 and over instead of 16-74, and to 20-24 instead of 16-24.

For Japan, data refer to women aged 15-69 instead of 16-74, and to 15-29 instead of 16-24.

### 6.4 User sophistication

#### **Diffusion of selected online activities among Internet users in OECD countries, by age and educational attainment, 2016**

For a given activity:

(i) Data are computed on the basis of the same group of OECD countries for both age categories.

(ii) For both age categories, data relate to the average of all individuals ("Average"), the average of all individuals with low or no formal education, and the average of all individuals with tertiary educational attainment.

For all activities, the average for all individuals relates to a number of OECD countries ranging from 20 to 24, according to data availability for both age categories. Therefore, the OECD average for a given activity in this figure may differ from values provided in other figures.

Tertiary education refers to ISCED levels 5 or 6 and above. Low or no formal education refers to ISCED levels 0 to 2.

#### **Individuals who purchased online in the last 12 months, by age, 2016**

Unless otherwise stated, Internet users are defined for a recall period of 3 months. For Australia, Canada and Japan, the recall period is 12 months. For Chile and the Russian Federation, no time period is specified. For the United States, the recall period is 6 months.

For Australia, data refer to the fiscal year 2014/15 ending on 30 June. The information provided is from a question wording that differs slightly from other countries: "In the last 3 months, did you personally access the Internet for any of the following reasons: Purchasing goods or services?".

For Brazil, data refer to 2015.

For Canada, data refer to 2012.

For Chile, data refer to 2015.

For Iceland, data refer to 2014.

For Israel, data refer to 2015 and to individuals aged 20 and over instead of 16-74, and 20-24 instead of 16-24. Data relate to individuals who used the Internet for purchasing goods or services in the last 3 months, and include all types of goods and services.

For Japan, data refer to 2015 and to individuals aged 15-69.

For Korea, data refer to 2015.

For New Zealand, data refer to 2012.

For the Russian Federation, data originate from ITU, ITU World Telecommunication/B17ICT Indicators Database, refer to 2014 and to individuals aged 15-72.

For Switzerland, data refer to 2014.

For the United States, data refer to 2015. The age gap in lighter blue is reversed. Individuals aged 55-74 have a slightly higher propensity to purchase online than individuals aged 16-24.



**Individuals aged 16-24 who attended an online course, 2009 and 2016**

For Austria, data refer to 2011 instead of 2009.

For Brazil and Denmark, data refer to 2015 instead of 2016.

For Canada, data refer to 2010 and 2012.

For Chile, data refer to 2012 and 2015.

For Iceland, data refer to 2013 instead of 2016.

For Korea, data refer to 2015.

For Mexico, data refer to 2014 instead of 2016. 2009 data include the category “to support efforts related to education and learning” and 2014 data are integrated into the category “to support education/training”.

For the United States, data refer to 2015 with a reference period of 6 months.

**6.5 E-consumers across borders****Enterprises having undertaken cross-border e-commerce sales, 2014**

E-commerce sales refer to web sales (orders received via websites).

For Iceland, data refer to 2012.

**Individuals purchasing online from domestic and foreign markets, 2016**

Partner countries refer to other EU countries for countries in the European Statistical System and to the United States for Canada.

For Canada, data refer to 2012.

**Business to consumer transactions (B2C), 2009 and 2015**

For Iceland, data refer to 2011 instead of 2015.

For Latvia, data refer to 2013 instead of 2015.

For Portugal, data refer to 2014 instead of 2015.

For the United States, data originate from the US Bureau of the Census, Quarterly Retail E-commerce sales, 1st Quarter 2017 ([https://www.census.gov/retail/mrts/www/data/pdf/ec\\_current.pdf](https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf)). The ratios have been calculated using the quarterly values of the respective years of the adjusted values, as provided in Table 1.

**6.6. E-government****Individuals using the Internet to interact with public authorities, by age, 2016**

Unless otherwise stated, data refer to the respective online activities in the last 12 months.

For Australia, data refer to the fiscal years 2010/11 ending on 30 June and 2012/13. Data refer to “Individuals who have used the Internet for downloading official forms from government organisations’ websites, in the last 12 months” and “Individuals who have used the Internet for completing/lodging filled in forms from government organisations’ websites, in the last 12 months”.

For Brazil and Chile, data refer to 2015.

For Canada, data refer to 2012.

For Iceland and Switzerland, data refer to 2014.

For Israel, data refer to 2015 and to individuals aged 20 and more instead of 16-74. Data relate to the Internet use for obtaining services online from government offices, including downloading or filling in official forms in the last 3 months.

For New Zealand, data refer to 2012 and to individuals using the Internet for obtaining information from public authorities in the last 12 months.

For Japan, data refer to 2015 and to individuals aged 15-69 instead of 16-74 using the Internet for sending filled forms via public authority websites in the last 12 months.

For Mexico, using e-government services includes the following categories: “communicating with the government”, “consulting government information”, “downloading government forms”, “filling out or submitting government forms”, “carrying out government procedures” and “participating in government consultations”. For “sending forms”, data correspond to the use of the Internet in the last 3 months.

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### Notes and references

For Switzerland, e-government refers only to public administrations at local, regional or country level referred as “public administration or authorities”. Data exclude health or education institutions.

#### **Individuals not submitting official forms online due to privacy and security concerns, 2016**

For Iceland, data refer to 2014.

For the United Kingdom, data refer to 2014 instead of 2013.

### 6.7. Trust

#### **Enterprises having a formally defined security policy, by size, 2015**

Data for SMEs contracting out digital security services refer to the share of SMEs who have a formal ICT security policy where the security and data protection are mainly performed by external suppliers.

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