

## SKILLS MATTER: ADDITIONAL RESULTS FROM THE SURVEY OF ADULT SKILLS

# Ecuador

### Highlights

- Adults in Ecuador perform well below the OECD average in literacy and numeracy. Their performance is similar to other Latin American countries participating in the survey. The proportion of adults performing at the highest levels in the domain of problem solving in technology-rich environments is also below the OECD average.
- The proportion of low performing adults in Ecuador is above the OECD average in the case of literacy, numeracy as well as problem solving in technology-rich environments.
- In Ecuador, the gap in literacy and numeracy between the top- and bottom-performing adults is larger than that observed across OECD countries.
- The difference in the proficiency of high and low educated adults in both literacy and numeracy is smaller than the OECD average in Ecuador.
- In Ecuador, as in Mexico and Peru, the youngest age cohorts have the highest proficiency and proficiency declines steadily with the increasing age. This differs from the pattern observed in many other countries where proficiency is highest among adults aged 30-34 years. This is possibly related to the fact that rates of completion of upper-secondary and tertiary education in Ecuador have increased only very recently.
- Differences in literacy and numeracy proficiency between men and women in Ecuador are similar to the OECD average.
- The relationship between proficiency and the parental education in Ecuador is similar to that observed in OECD countries on average.
- Adults in Ecuador have lower levels of engagement in numeracy practices at work and in everyday life than the average OECD country.
- Proficiency in numeracy has a relatively weak association with labour market outcomes in the country. Years of schooling is positively associated with wages in Ecuador, but has no relationship with the probability of employment.
- The incidence of skills and field-of-study mismatch is higher than the OECD average in Ecuador but that of qualification mismatch is in line with that of OECD countries on average.

### Box 1. The Survey of Adult Skills

The Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), provides a picture of adults' proficiency in three key information-processing skills:

- literacy – the ability to understand and respond appropriately to written texts
- numeracy – the ability to use numerical and mathematical concepts
- problem solving in technology-rich environments – the capacity to access, interpret and analyse information found, transformed and communicated in digital environments.

Proficiency is described on a scale of 500 points divided into levels. Each level summarises what a person with a particular score can do. Six proficiency levels are defined for literacy and numeracy (Levels 1 through 5 plus below Level 1) and four are defined for problem solving in technology-rich environments (Levels 1 through 3 plus below Level 1).

The survey also provides a wide range of information about respondents' use of skills at work and in everyday life, their education, their linguistic and social backgrounds, their participation in adult education and training programmes and in the labour market, and other aspects of their well-being.

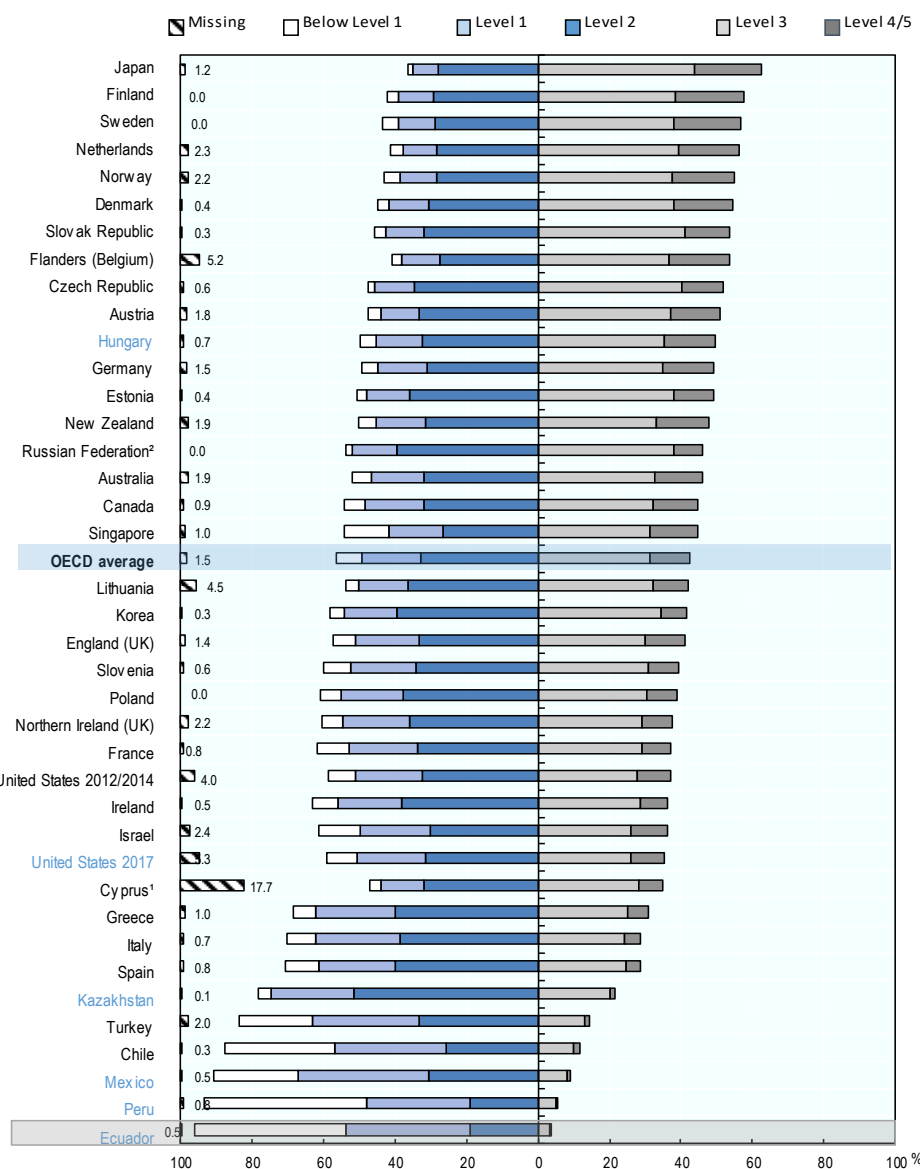
**The Survey of Adult Skills was conducted in Ecuador from August 2017 to April 2018.  
Some 5 700 adults aged 16-65 were surveyed.**

Adults in Ecuador perform well below the OECD average in literacy and numeracy. Their performance is similar to other Latin American countries participating in the survey.

Less than 1 in 10 adults are proficient at Level 3 or higher in literacy (5.2%) in Ecuador. This is far lower than in OECD countries where almost 5 in 10 adults (44.6%) are proficient at Level 3 or above but similar to the proportions observed in other middle-income countries such as Peru (6.1%), Mexico (11.7%) and Turkey (12.1%). At Level 3, adults demonstrate the ability to understand and respond appropriately to dense and lengthy texts and to identify, interpret or evaluate one or more pieces of information and make appropriate inferences. At Level 4 and above, adults can integrate, interpret and synthesise information from complex or lengthy texts that contain conditional and/or competing information (for more details on what adults can do at each proficiency level, see the table at the end of this note).

Figure 1. Literacy proficiency among adults

Percentage of adults scoring at each proficiency level in literacy



Notes: Adults in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties, or learning or mental disabilities (referred to as literacy-related non-response).

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."

2. The sample for the Russian Federation does not include the population of the Moscow municipal area. More detailed information can be found in the *Technical Report of the Survey of Adult Skills, Third Edition* (OECD, 2019).

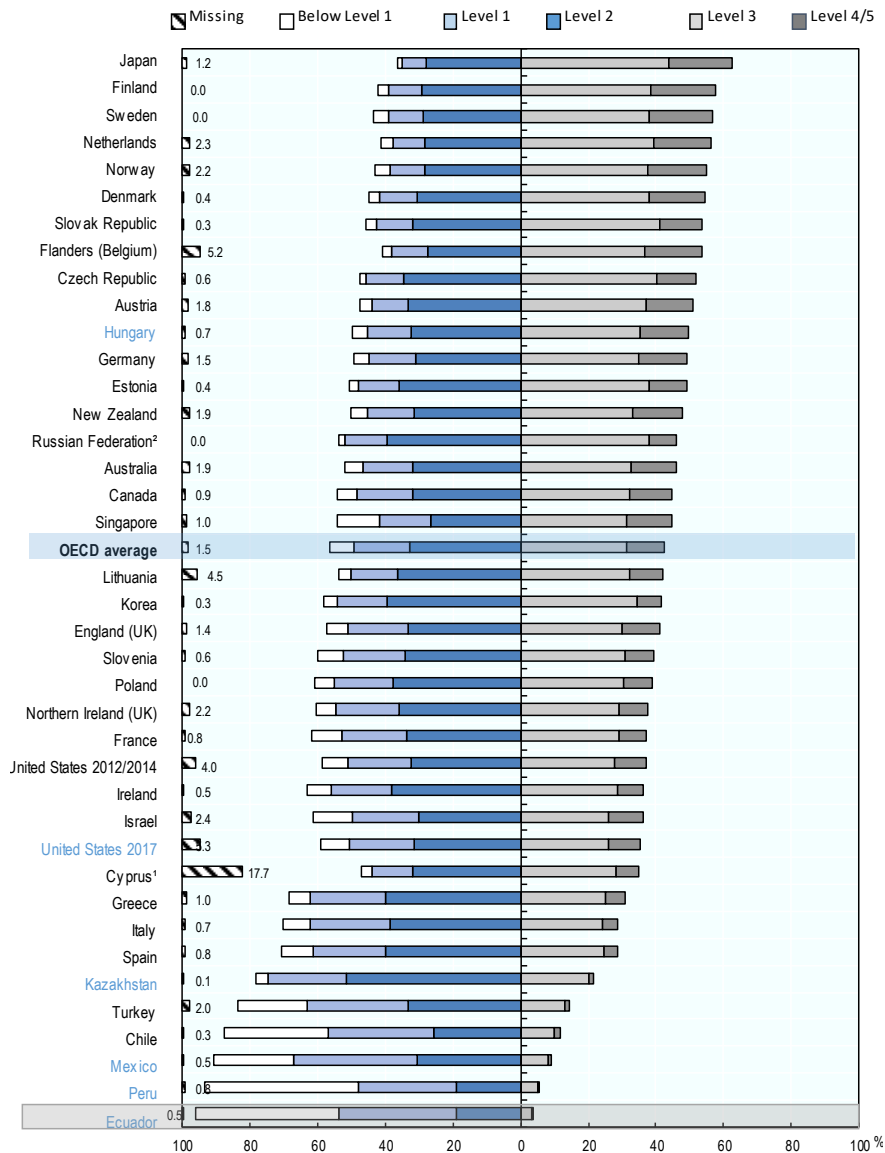
Countries and economies are ranked in descending order of the combined percentages of adults scoring at Level 3 and at Level 4/5.

Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A2.1.

The results for numeracy are similar. On average across participating OECD countries/economies, two in five adults scored at Level 3 and above in numeracy. In contrast, a very small percentage of the population performed at this level in Ecuador (3.6%). This is similar to the situation in other Latin-American countries in the study. The proportion of adults proficient at Level 3 and high is 8.9% in Mexico, 5.6% in Peru and 11.9% in Chile. Adults performing at Level 3 have a good sense of number and space; can recognise and work with mathematical relationships, patterns, and proportions expressed in verbal or numerical form; and can interpret and perform basic analyses of data and statistics in texts, tables and graphs. At Levels 4 and above, adults understand a broad range of mathematical information that may be complex, abstract or found in unfamiliar contexts.

**Figure 2. Numeracy proficiency among adults**

Percentage of adults scoring at each proficiency level in numeracy



Notes: Adults in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties, or learning or mental disabilities (referred to as literacy-related non-response).

1. See note 1 under Figure 1.

2. See note 2 under Figure 1.

Countries and economies are ranked in descending order of the combined percentages of adults scoring at Level 3 and at Level 4/5.

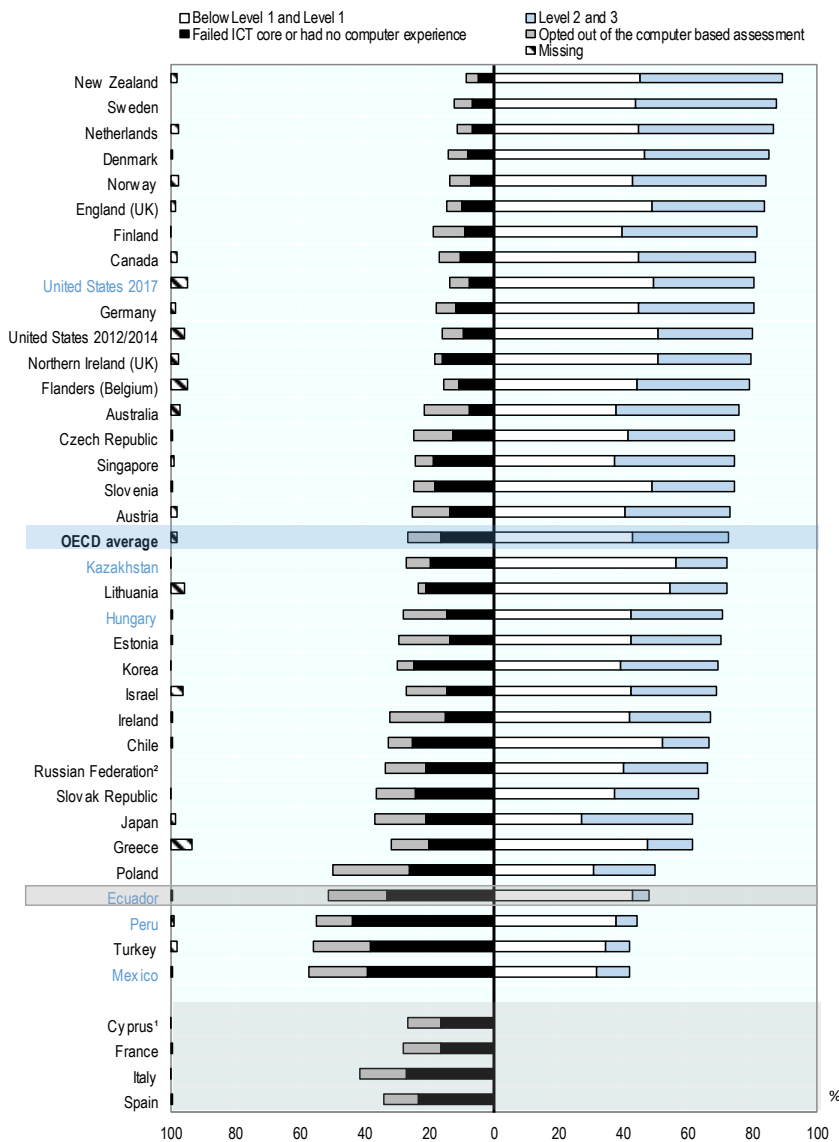
Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A2.3.

The proportion of adults scoring at the highest levels in the domain of problem solving in technology-rich environments is also below the OECD average in Ecuador.

Less than one in ten adults in Ecuador (5.2%) is proficient at the two highest levels (level 2 or 3) in the domain of problem solving in technology-rich environments as compared to the OECD countries on average where around one in three adults (29.7%) scores at these levels. Adults at Level 3 can complete tasks involving multiple computer applications, a large number of steps, and the discovery and use of ad hoc commands in a novel environment. At Level 2, adults can complete problems that involve a small number of computer applications, and require completing several steps and operations to reach a solution. These proportions render Ecuador comparable to similar populations in other middle income economies such as Peru (6.6%), and Mexico (10.2%) and Turkey (7.8%).

Figure 3. Proficiency in problem solving in technology-rich environments among adults

Percentage of 16-65 year-olds scoring at each proficiency level



Notes: Adults included in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties, or learning or mental disabilities (referred to as literacy-related non-response). The missing category also includes adults who could not complete the assessment of problem solving in technology-rich environments because of technical problems with the computer used for the survey. Cyprus<sup>1</sup>, France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment.

1. See note 1 under Figure 1.

2. See note 2 under Figure 1.

Countries and economies are ranked in descending order of the combined percentages of adults scoring at Levels 2 and at Level 3.

Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A2.7.

## The proportion of low performing adults in Ecuador is above the OECD average in the case of literacy, numeracy as well as problem solving in technology-rich environments.

Ecuador is among the countries/economies with one of the largest proportions of adults (71.2%) who scored at Level 1 or below in literacy. At this level, adults have basic reading skills, for example, reading brief texts on familiar topics and locating a single piece of specific information identical in form to information in the question or directive. The proportion of adults performing at these levels is similar to that observed in the other countries in the region, Chile (53.4%), Mexico (50.6%) and Peru (70.2%).

In numeracy, close to three quarters of the adult population in Ecuador (76.8%) is proficient only at Level 1 and below, demonstrating the ability to perform basic mathematical processes in common, concrete contexts, for example, one-step or simple processes involving counting, sorting, basic arithmetic operations and understanding simple percentages. Again, this is far higher than around one in four adults (23.5%) who scored at the two lowest levels of numeracy proficiency across OECD participating countries. In this respect, Ecuador is similar to Peru where 74.8% are proficient at Level 1 or below in numeracy. Chile and Mexico are not far behind with 61.9% and 60.1% of adults performing at these levels respectively.

While, in Ecuador, many adults have poor literacy, there are very few adults who could be regarded as illiterate. Adults with low proficiency performed well on the reading components module that assesses mastery of the basic building blocks of reading comprehension – vocabulary knowledge, understanding of the logic of sentences and reading fluency. In Ecuador, where there are otherwise very high proportions of adults performing at Level 1 or below on the literacy scale, only around 16.9% of adults failed the literacy and numeracy core designed to identify respondents who had the capacity to undertake the full assessment. Additionally, those failing the core test in Ecuador answered 77.7% of the items in sentence processing (and 78.6% and 93.7% of items respectively in passage comprehension and print vocabulary respectively) on the reading components assessment correctly.

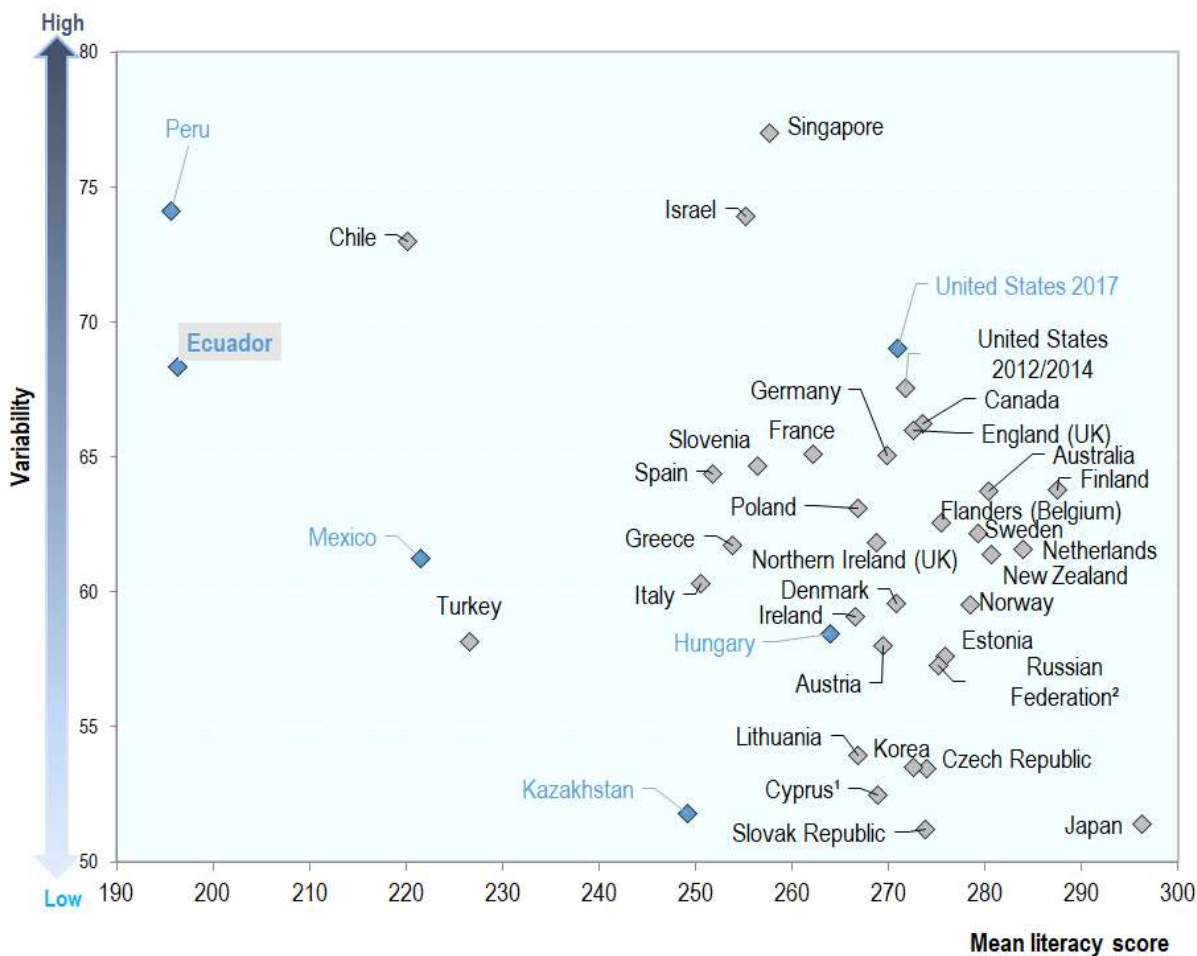
Ecuador, together with Turkey, Mexico and Peru, also stands out as having very large proportions of its adult populations that have no prior computer experience or very poor ICT skills (32.9%, 38.0%, 39.3% and 43.6% respectively). The relatively large proportions of adults in Ecuador without basic ICT skills or computer experience is not surprising. In 2017, only about a third of the households in Ecuador (38.1%) had a fixed line phone subscription and - around 40% of households had access to a computer and functional internet connection (ITU, 2019<sup>[11]</sup>). This is in stark contrast to many of the high-income OECD countries where more than two-thirds of the households have access to a computer, internet and a telephone line.

## In Ecuador, the gap in literacy and numeracy between the top- and bottom-performing adults is larger than that observed across OECD countries.

In addition to examining differences in average literacy proficiency between countries, it is also useful to explore differences in the distribution of scores within each country or economy. Comparing score-point differences among adults at different points in the distribution of proficiency measures the extent of variation in that distribution in each participating country or economy. In all countries and economies participating in PIAAC, the variability of adults' scores in literacy – defined as the difference between the score of an adult who performs better than 75% of survey participant and the score of an adult who performs better than only 25% of respondents – tends to be large (more than one standard deviation) and increasing with the average literacy proficiency. The gaps in literacy and numeracy scores between the top- and bottom-performing 25% of adults in Ecuador (68 and 74 points respectively compared to the OECD average of 61 and 68 score-points) are among the largest observed among participating countries.

Figure 4. Average and distribution of literacy scores

Relationship between mean literacy proficiency score and variability



Notes:

1. See note 1 under Figure 1.

2. See note 2 under Figure 1.

The measure of variability used is the interquartile range (difference between the third quartile and the first quartile).

Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A2.2.

**The difference in the proficiency of high and low educated adults in both literacy and numeracy is smaller than the OECD average in Ecuador.**

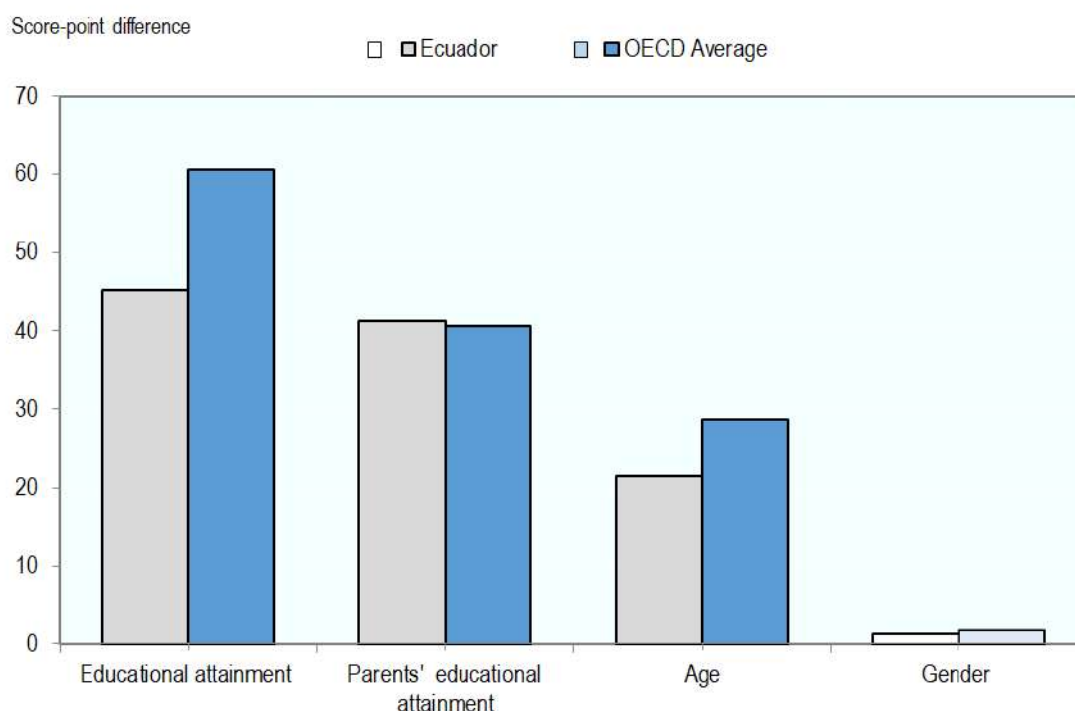
In all countries, level of education has a positive association with performance in the PIAAC assessment. The results show that more highly educated adults perform better in the PIAAC assessment and Ecuador is no different. However, it is worth noting that in Ecuador, the proficiency differences between high and low educated adults are not large. In OECD countries that participated in PIAAC, the average difference between tertiary-educated adults and adults with lower than upper secondary education is 61 score points in literacy and 70 score points in numeracy. Differences in both literacy and numeracy proficiency between high and low educated adults, aged 25-65 years, were smaller than the OECD average in Ecuador at 45 and 56 score points respectively. This could be due to tertiary-educated adults in Ecuador scoring lower than the average adult with the same level of education across OECD countries, by about 72 points in literacy and about 75 points in numeracy. Additionally, Ecuador also comes second after Peru in terms of the share of adults without an upper-secondary qualification scoring below Level 1 in literacy or numeracy (50% and 61% respectively compared to 67% and 78% in Peru).

As in other countries, accounting for differences in other socio-demographic characteristics such as age, gender, and parents' educational attainment reduces the strength of the associations between proficiency and level of educational attainment, although not by a large amount.

In comparison with 25-65 year olds, the differences in proficiency by level of education are even smaller in Ecuador among young adults. The difference in proficiency between young adults aged 20-24 years who are enrolled in or have completed tertiary level studies and other young people is 36 score points in Ecuador, compared to an OECD average of 35 score points. The score point gap between early school leavers (young adults aged 16-24 years who have left education without attaining an upper secondary qualification) in Ecuador and other young people still in education is also marginally lower than the OECD average (40 score points compared to an OECD average of 41 score points).

**Figure 5. Synthesis of socio-demographic differences in literacy proficiency**

Difference in literacy scores between contrast categories within various socio-demographic groups



*Notes:* Statistically significant differences are marked in a darker tone. The estimates show the differences between the two means for each contrast category). The differences are: tertiary minus less than upper secondary (educational attainment), at least one parent attained tertiary minus neither parent attained upper secondary (parents' educational attainment) 25-34 year-olds minus 55-65 year-olds (age) and men minus women (gender).

*Source:* Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Tables A3.1(L), A3.2(L), A3.5(L), A3.8(L), and A3.11(L).

**In Ecuador, as in Mexico and Peru, the youngest age cohorts have the highest proficiency and proficiency declines steadily with the increasing age. This differs from the pattern observed in many other countries where proficiency is highest among adults aged 25-34 years. This is possibly related to the fact that rates of completion of upper-secondary and tertiary education in Ecuador have increased only very recently.**

In most countries, adults aged 25-34 years have the highest average proficiency in literacy and adults aged 55-65, the lowest. In contrast, in Ecuador, as in Mexico and Peru, proficiency is highest among the youngest cohorts and declines more or less steadily with age. This is likely to be related to the fact that the rate of completion of upper-secondary education in Ecuador has increased only very recently. As expected, in Ecuador, the difference in the rates of completion of upper secondary education between adults aged 25-34 years and those younger than 25 years is 12% as compared to the average difference across OECD countries at 36%.

There is much less variation across countries in the magnitude of proficiency differences between adults aged 55-65 years and those aged 25-34 years. The gap in literacy proficiency between the two groups in most countries is only around 30 score points. Ecuador records an even lower gap in literacy proficiency between the two groups at 21.5 score points. Across

countries, about half of the gap can be accounted for by differences in observable characteristics, notably in educational attainment, as younger cohorts are normally more educated than older cohorts.

Proficiency in problem solving in technology-rich environments was lower than the OECD average for older adults in Ecuador. In Ecuador, (as well as in Mexico and Peru), the vast majority of older adults aged 55-65 years did not undertake the assessment of problem solving because they lacked the necessary ICT experience or failed a very basic test of ICT skills. Virtually no adults aged 55-65 demonstrated problem solving proficiency at Level 2 or 3 in Ecuador as a result. In the case of adults aged 25-34 years, the share at Level 2 or 3 is 7.4%, significantly lower than the OECD average of 43.1%, but in line with proficiency levels of similarly qualified adults in Turkey and Peru. The share of prime-aged adults that failed the ICT core or lacked ICT experience is also above average, at 22.5%.

### **Differences in literacy and numeracy proficiency between men and women in Ecuador are similar to the OECD average.**

Gender differences in literacy and numeracy skills are typically small across all countries. In Ecuador, the average literacy scores for men and women (197 and 196 score-points respectively) were both lower than the corresponding OECD averages (267 and 265 score-points for men and women). Numeracy scores were also substantially lower than the OECD average, for women (180 score-points vs the OECD average of 256 score-points) and for men (190 score-points vs the OECD average of 268 score-points). However, Gender gaps in Ecuador were essentially identical (and extremely small) to the OECD average, in both literacy and numeracy. When observing the results of men and women across different ages, the gender gap in numeracy is higher in Ecuador than the OECD average for older adults (above 45), but are much smaller for adults aged 25-35 years and those who are younger.

Gender differences are also small in the domain of problem solving in Ecuador. As is true across OECD countries, men in Ecuador have a slight advantage over women. In Ecuador, some 6% of men performed at Level 2 or 3, compared to 4% of women, a difference of around 2% (close to the OECD average of 4%). Differences are instead more pronounced at the bottom end of the distribution, with a higher share of women having no computer experience or failing the ICT core. The proportion of men in Ecuador who had no computer experience or failed the ICT core test was around 35% compared to around 31% for women. The gap of almost 4 percentage points in favour of men is larger than the OECD average of 0.7 percentage points in favour of men.

### **The relationship between proficiency and the parental education in Ecuador is similar to that observed in OECD countries on average.**

In Ecuador, adults with at least one tertiary-educated parent scored on average 41 points higher in literacy than adults from families in which neither of the parents attained upper secondary level education, in line with an OECD average of 41 score points. The association of parental education to proficiency in Ecuador is similar in strength to that observed in Mexico but weaker than that observed in Peru.

Much of these raw differences are accounted for by differences in other personal characteristics, as the effect of socio-economic background mainly works through the intergenerational transmission of educational attainment: adults with highly educated parents are more likely to attain themselves higher levels of education. In most countries, adjusted differences are about half the size of unadjusted differences. Ecuador is a partial exception, as adjusted differences remain relatively high, at 24 score points.

### **Ecuador displays lower intensity in engagement in numeracy practices at work and in everyday life than the average OECD country.**

Countries ranking low in skills use in everyday life (Italy, Kazakhstan, Peru, Turkey) also rank low in use at work, and the same holds true for countries ranking at the top of the distribution (Finland, New Zealand, United States, the Czech Republic). It suggests that the use of skills in everyday life and at work are highly, albeit imperfectly, correlated at the country level.

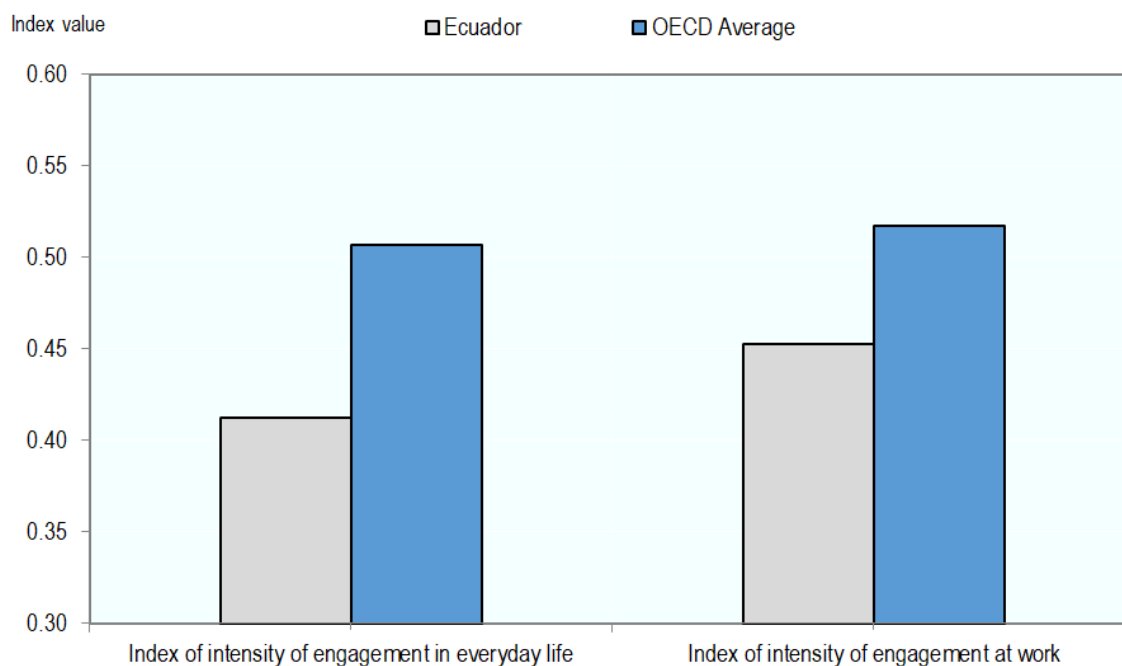


Ecuador displays lower-than-OECD-average intensity in engagement in numeracy practices at work everyday life. Ranking in the lower part of the distribution of engagement in numeracy practices for both indicators of interest, Ecuador is similar to countries such as Chile, Mexico and Peru.

As in OECD (2016<sup>[2]</sup>), engagement in numeracy practices in both work and everyday life is positively associated with level of educational attainment. The gaps in the intensity of practice across educational groups are greater in all Round 3 countries than in other countries, but especially in Ecuador. As such, Ecuador is similar to Mexico and Peru. In Ecuador, the gaps in numeracy use between lower secondary and upper-secondary educated are three times larger than in the OECD average country.

**Figure 6. Engagement in numeracy practices in everyday life and at work**

Index of intensity of engagement in numeracy practices in everyday life and at work



Note: Differences in proficiency related to age are Note: The index of intensity of engagement is an average across individuals in the country, and ranges between 0 and 1.

Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A4.2.

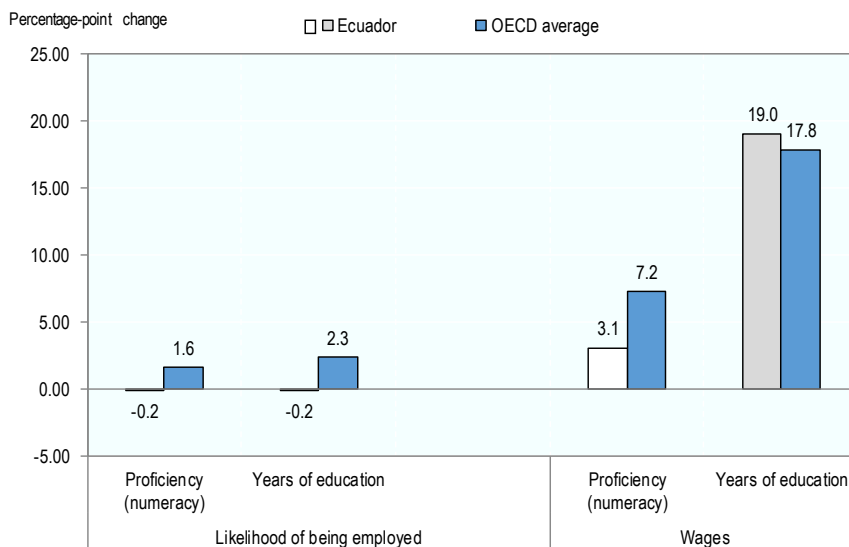
**Proficiency in numeracy has a relatively weak association with labour market outcomes in the country. Years of schooling is positively associated with wages in Ecuador, but has no relationship with the probability of employment.**

In Ecuador, neither numeracy proficiency nor years of education were associated with the probability of being employed. These results contrast with those observed for the generality of countries participating in the Survey of Adult Skills where a statistically significant and positive relationship between association between numeracy proficiency and educational attainment and the likelihood of employment was observed. In this regard, Ecuador is similar to the other Latin-American countries- Mexico and Peru.

Proficiency and schooling have significant and independent effects on hourly wages across the OECD. In Ecuador, however, returns to proficiency in terms of wages are lower than the OECD average and in line with that of Mexico and Peru. The contribution of information-processing skills to the variance of hourly wages is lower in Ecuador (1.5%) as compared to the OECD average of 4.5%. Overall, years of schooling are more important in understanding the returns to human capital than proficiency. In Ecuador, years of education account for around 13.7% of the variance of wages as compared to the OECD average of 11.7%. In this respect, Ecuador is similar to Chile and Peru.

**Figure 7. Effect of education and numeracy proficiency on the likelihood of being employed and on wages**

Marginal effects (as percentage point change) of a one standard deviation increase in years education and numeracy on the likelihood of being employed among adults not in formal education and on wages



*Notes:* The reference category is "unemployed" for the modelisation of the likelihood of being employed and results are adjusted for gender, age, marital and foreign-born status. Hourly wages, including bonuses, in PPP-adjusted USD (2012). Coefficients from the OLS regression of log hourly wages on years of education and proficiency, directly interpreted as percentage effects on wages. Coefficients adjusted for age, gender, foreign-born status, numeracy skills at work and tenure. The wage distribution was trimmed to eliminate the 1st and 99th percentiles. One standard deviation in proficiency in numeracy is 56 points. One standard deviation in years of education is 3.3 years. All values are statistically significant (at the 5% level).

*Source:* Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A4.2.

**The incidence of skills and field-of-study mismatch is higher than the OECD average in Ecuador but that of qualification mismatch is in line with that of OECD countries on average.**

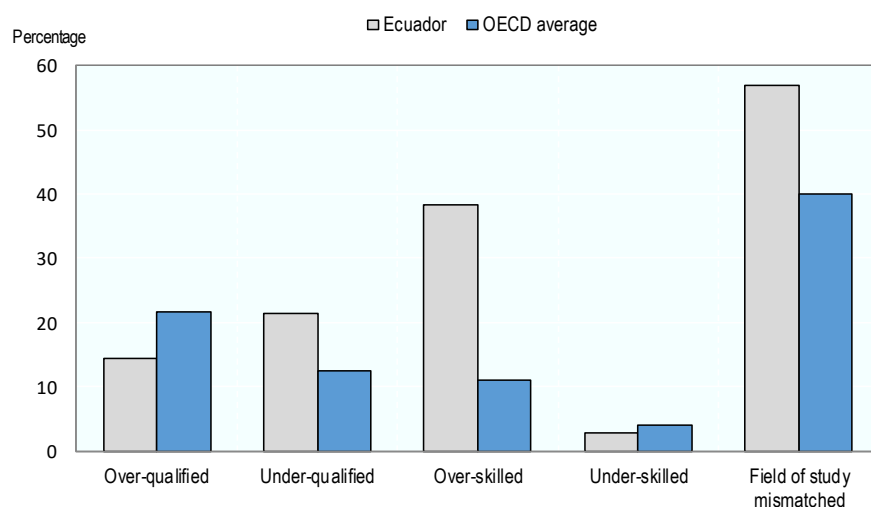
The incidence of qualification mismatch varies significantly across countries. Ecuador has an overall qualification mismatch rate very similar to the OECD average (35.7% vs the OECD average of 34.2%). However, in Ecuador, contrary to the majority of PIAAC countries, under-qualification is more prominent than over-qualification. 21.3% of adults in the country are under-qualified as compared to the OECD average of 12.4%. This could reflect the rapid growth in the demand for higher qualifications not matched by an equivalent increase in graduate numbers.

When it comes to skills mismatch, Ecuador, along with other Latin American countries, stands out with an incidence well above average (37% in literacy and 40.9% in numeracy vs the OECD average of 15% for both domains). This is mostly due to an above average incidence of over-skilling. One possibility is that skill requirements are weighted down by the low skill levels of workers on average. This would make high-skilled individuals stand out even in occupations that would normally require higher-level qualifications and competences. Although measured differently, this finding is in line with relatively low use of literacy and numeracy in the workplace in Ecuador.

Ecuador, like Chile and Mexico also has a relatively high incidence of field-of-study mismatch, whereby workers are in jobs that are not related to their field of study. In Ecuador, the incidence of field-of-study mismatch is 17 percentage points higher than the OECD average of 40%. This result could be due to a poorer alignment of education choices with labour market need. Findings by the Inter-American Development Bank (Rucci, 2017<sup>[3]</sup>) suggest that, in Latin American countries, the alignment between the content of education and training and labour market requirements may be particularly poor.

**Figure 8. Mismatches in qualifications, numeracy and fields-of-study**

Percentage of mismatched workers, by type of mismatch



Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A5.6.

## References

- ILO (ed.) (2017), *Skills mismatches in Latin America and the Caribbean Skills for Employment*, [https://www.skillsforemployment.org/KSP/en/Details/?dn=WCMSTEST4\\_189325](https://www.skillsforemployment.org/KSP/en/Details/?dn=WCMSTEST4_189325) (accessed on 11 May 2019). [3]
- ITU (2019), *ICT Statistics*, <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>. [1]
- OECD (2016), *Skills Matter: Further Results from the Survey of Adult Skills*, OECD Skills Studies, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264258051-en>. [2]

## Key facts about the Survey of Adult Skills (PIAAC)

### What is assessed

- The Survey of Adult Skills (PIAAC) assesses the proficiency of adults from age 16 onwards in literacy, numeracy and problem solving in technology-rich environments. These skills are “key information-processing competencies” that are relevant to adults in many social contexts and work situations, and necessary for fully integrating and participating in the labour market, education and training, and social and civic life.
- In addition, the survey collects a range of information on the reading- and numeracy-related activities of respondents, the use of information and communication technologies at work and in everyday life, and on a range of generic skills, such as collaborating with others and organising one’s time, required of individuals in their work. Respondents are also asked whether their skills and qualifications match their work requirements and whether they have autonomy over key aspects of their work.

### Methods

- The first cycle of the Survey of Adults Skills has been conducted over three rounds of data collection. The first round surveyed around 166 000 adults aged 16-65 years in 24 countries (or regions within these countries) in 2011-12. In Australia, Austria, Canada, Cyprus<sup>1</sup>, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden and the United States – the sample was drawn from the entire national population. In Belgium, the data were collected in Flanders; in the United Kingdom, the data were collected in England and Northern Ireland (data are reported separately for England and Northern Ireland in the report).
- Nine countries (or regions within these countries) took part in a second round of data collection in 2014-15: Chile, Greece, Jakarta (Indonesia), Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey. A total of 50 250 adults were surveyed. In all countries except Indonesia, the entire national population was covered. In Indonesia, the data were collected in the Jakarta municipal area only.
- The third round was conducted in 2017-18 in six countries: Ecuador, Hungary, Kazakhstan, Mexico, Peru and the United States. A total of 34 792 adults were surveyed. Note that the United States had already participated in Round 1. This brought the number of participating countries and economies to a total of 39.
- The language of assessment was the official language or languages of each participating country. In some countries, the assessment was also conducted in widely spoken minority or regional languages.
- Two components of the assessment were optional: the assessment of problem solving in technology-rich environments and the assessment of reading components. Twenty of the 24 participating countries administered the problem-solving assessment and 21 administered the reading components assessment.
- The target population for the survey was the non-institutionalised population, aged 16 to 65 years, residing in the country at the time of data collection, irrespective of nationality, citizenship or language status.
- Sample sizes depended primarily on the number of cognitive domains assessed and the number of languages in which the assessment was administered. Some countries boosted sample sizes in order to have reliable estimates of proficiency for the residents of particular geographical regions and/or for certain sub-groups of the population such as indigenous inhabitants or immigrants. The achieved samples ranged from a minimum of approximately 4 500 to a maximum of nearly 27 300.
- The survey was administered under the supervision of trained interviewers either in the respondent’s home or in a location agreed between the respondent and the interviewer. The background questionnaire was administered in Computer-Aided Personal Interview format by the interviewer. Depending on the situation of the respondent, the time taken to complete the questionnaire ranged between 30 and 45 minutes.
- After having answered the background questionnaire, the respondent completed the assessment either on a laptop computer or by completing a paper version using printed test booklets, depending on their computer skills. Respondents could take as much or as little time as needed to complete the assessment. On average, the respondents took 50 minutes to complete the cognitive assessment.

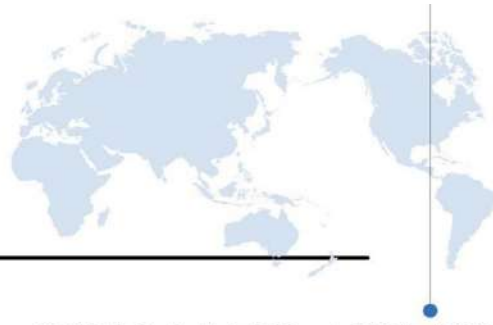
<sup>1</sup> See note 1 under Figure 1.

## Proficiency levels: Literacy and numeracy

Level	Score range	Literacy	Numeracy
Below Level 1	Below 176 points	Tasks at this level require the respondent to read brief texts on familiar topics and locate a single piece of specific information. There is seldom any competing information in the text. Only basic vocabulary knowledge is required, and the reader is not required to understand the structure of sentences or paragraphs or make use of other text features.	Tasks at this level require the respondent to carry out simple processes such as counting, sorting, performing basic arithmetic operations with whole numbers or money, or recognising common spatial representations.
1	176 to less than 226 points	Tasks at this level require the respondent to read relatively short digital or print texts to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. Knowledge and skill in recognising basic vocabulary, determining the meaning of sentences, and reading paragraphs of text is expected.	Tasks at this level require the respondent to carry out basic mathematical processes in common, concrete contexts where the mathematical content is explicit. Tasks usually require one-step or simple processes involving counting; sorting; performing basic arithmetic operations; and identifying elements of simple or common graphical or spatial representations.
2	226 to less than 276 points	Tasks at this level require the respondent to make matches between the text, either digital or printed, and information, and may require paraphrasing or low-level inferences.	Tasks at this level require the application of two or more steps or processes involving calculation with whole numbers and common decimals, percents and fractions; simple measurement and spatial representation; estimation; and interpretation of relatively simple data and statistics in texts, tables and graphs.
3	276 to less than 326 points	Texts at this level are often dense or lengthy. Understanding text and rhetorical structures is often required, as is navigating complex digital texts.	Tasks at this level require the application of number sense and spatial sense; recognising and working with mathematical relationships, patterns, and proportions expressed in verbal or numerical form; and interpreting data and statistics in texts, tables and graphs.
4	326 to less than 376 points	Tasks at this level often require the respondent to perform multiple-step operations to integrate, interpret, or synthesise information from complex or lengthy texts. Many tasks require identifying and understanding one or more specific, non-central idea(s) in the text in order to interpret or evaluate subtle evidence-claim or persuasive discourse relationships.	Tasks at this level require analysis and more complex reasoning about quantities and data; statistics and chance; spatial relationships; and change, proportions and formulas. They may also require understanding arguments or communicating well-reasoned explanations for answers or choices.
5	Equal to or higher than 376 points	Tasks at this level may require the respondent to search for and integrate information across multiple, dense texts; construct syntheses of similar and contrasting ideas or points of view; or evaluate evidence based arguments. They often require respondents to be aware of subtle, rhetorical cues and to make high-level inferences or use specialised background knowledge.	Tasks at this level may require the respondent to integrate multiple types of mathematical information where considerable translation or interpretation is required; draw inferences; develop or work with mathematical arguments or models; and critically reflect on solutions or choices.

Description of proficiency levels in problem solving in technology-rich environments

Level	Score range	The types of tasks completed successfully at each level of proficiency
No computer experience	Not applicable	Adults in this category reported having no prior computer experience; therefore, they did not take part in the computer-based assessment but took the paper-based version of the assessment, which does not include the problem solving in technology-rich environment domain.
Failed ICT core	Not applicable	Adults in this category had prior computer experience but failed the ICT core test, which assesses basic ICT skills, such as the capacity to use a mouse or scroll through a web page, needed to take the computer-based assessment. Therefore, they did not take part in the computer-based assessment, but took the paper-based version of the assessment, which does not include the problem solving in technology-rich environment domain.
“Opted out” of taking computer-based assessment	Not applicable	Adults in this category opted to take the paper-based assessment without first taking the ICT core assessment, even if they reported some prior experience with computers. They also did not take part in the computer-based assessment, but took the paper-based version of the assessment, which does not include the problem solving in technology-rich environment domain.
Below Level 1	Below 241 points	Tasks are based on well-defined problems involving the use of only one function within a generic interface to meet one explicit criterion without any categorical or inferential reasoning, or transforming of information. Few steps are required and no sub-goal has to be generated.
1	241 to less than 291 points	At this level, tasks typically require the use of widely available and familiar technology applications, such as e-mail software or a web browser. There is little or no navigation required to access the information or commands required to solve the problem. The tasks involve few steps and a minimal number of operators. Only simple forms of reasoning, such as assigning items to categories, are required; there is no need to contrast or integrate information.
2	291 to less than 341 points	At this level, tasks typically require the use of both generic and more specific technology applications. For instance, the respondent may have to make use of a novel online form. Some navigation across pages and applications is required to solve the problem. The task may involve multiple steps and operators. The goal of the problem may have to be defined by the respondent, though the criteria to be met are explicit.
3	Equal to or higher than 341 points	At this level, tasks typically require the use of both generic and more specific technology applications. Some navigation across pages and applications is required to solve the problem. The task may involve multiple steps and operators. The goal of the problem may have to be defined by the respondent, and the criteria to be met may or may not be explicit. Integration and inferential reasoning may be needed to a large extent.



## SKILLS MATTER: ADDITIONAL RESULTS FROM THE SURVEY OF ADULT SKILLS

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