COUNTRY NOTE

SKILLS MATTER: ADDITIONAL RESULTS FROM THE SURVEY OF ADULT SKILLS

Kazakhstan

Key findings

- On average, adults in Kazakhstan perform below the OECD average in literacy and numeracy. 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 Kazakhstan, differences between adults at the top and the bottom of the distribution of literacy and numeracy scores are smaller than the OECD average, indicating smaller inequalities in the acquisition of skills.
- Despite higher rates of completion of tertiary education, 25-34 year-olds perform at the same level as 55-65 year-olds, and far below the average score of 25-34 year-olds on average across OECD countries.
- The small differences in performance between tertiary-educated adults and adults with below upper secondary education can be attributed to the low proficiency of tertiary-educated adults, who score well below the OECD average.
- Adults in Kazakhstan display the lowest level of engagement in numeracy practices, both at work and in everyday life. This might have negative consequences for the development of skills through their lifetime.
- The economic benefits of skills, as measured by the wage increase associated with higher numeracy skills, are positive in Kazakhstan, although smaller than on average across OECD countries. The wage increase associated with additional years of education is higher than the OECD average.
- Unlike in most other countries, more proficient adults in Kazakhstan do not report being in better health, nor having higher levels of trust or political efficacy.

Box 1. The Survey of Adult Skills

The Survey of Adult Skills (PIAAC) provides a picture of adults' proficiency in three key information-processing skills:

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

Proficiency is described in terms of 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 for problem solving in technology-rich environments (Levels 1 through 3 plus below Level 1).

The survey also provides a rich array of information regarding respondents' use of skills at work and in everyday life, their education, their linguistic and social backgrounds, their participation in the labour market and other aspects of their well-being.

The Survey of Adult Skills was conducted in Kazakhstan from August 2017 to April 2018.
Some 6 050 adults aged 16-65 were surveyed.

Adults in Kazakhstan perform below the OECD average in both literacy and numeracy.

Fewer than one in four adults attain Level 3 in literacy, **compared to about one in three across OECD countries**, on average. At that level, 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. **About one in two 16-65 year-olds in Kazakhstan attain Level 2**, meaning that they are only able to perform low-level inferences and make matches between texts that are not too dense or lengthy. **Only one in 50 adults attain the highest levels of proficiency (Level 4 or 5)**, which require the ability to 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).

One in five adults in Kazakhstan attains Level 3 in numeracy. At this level, adults 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. **About one in two adults in Kazakhstan attains Level 2**, meaning that they are only able to perform tasks requiring simple measurement and spatial representation and interpretation of relatively simple data and statistics in texts, tables and graphs. **Only 1% of adults in Kazakhstan (compared to 11%on average across OECD countries) attain Level 4 or 5** and are able to understand a broad range of mathematical information that may be complex, abstract or found in unfamiliar contexts.

The proportion of adults who score at the highest levels in the assessment of problem solving in technology-rich environments is smaller than the OECD average.

Less than 1% of adults in Kazakhstan attain the highest proficiency level in problem solving in technology-rich environments. These adults 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. Some **15% of adults score at Level 2 (compared to 25% on average across OECD countries)**, demonstrating the ability to solve problems that involve a small number of computer applications, but that require completing several steps and operations to reach a solution.

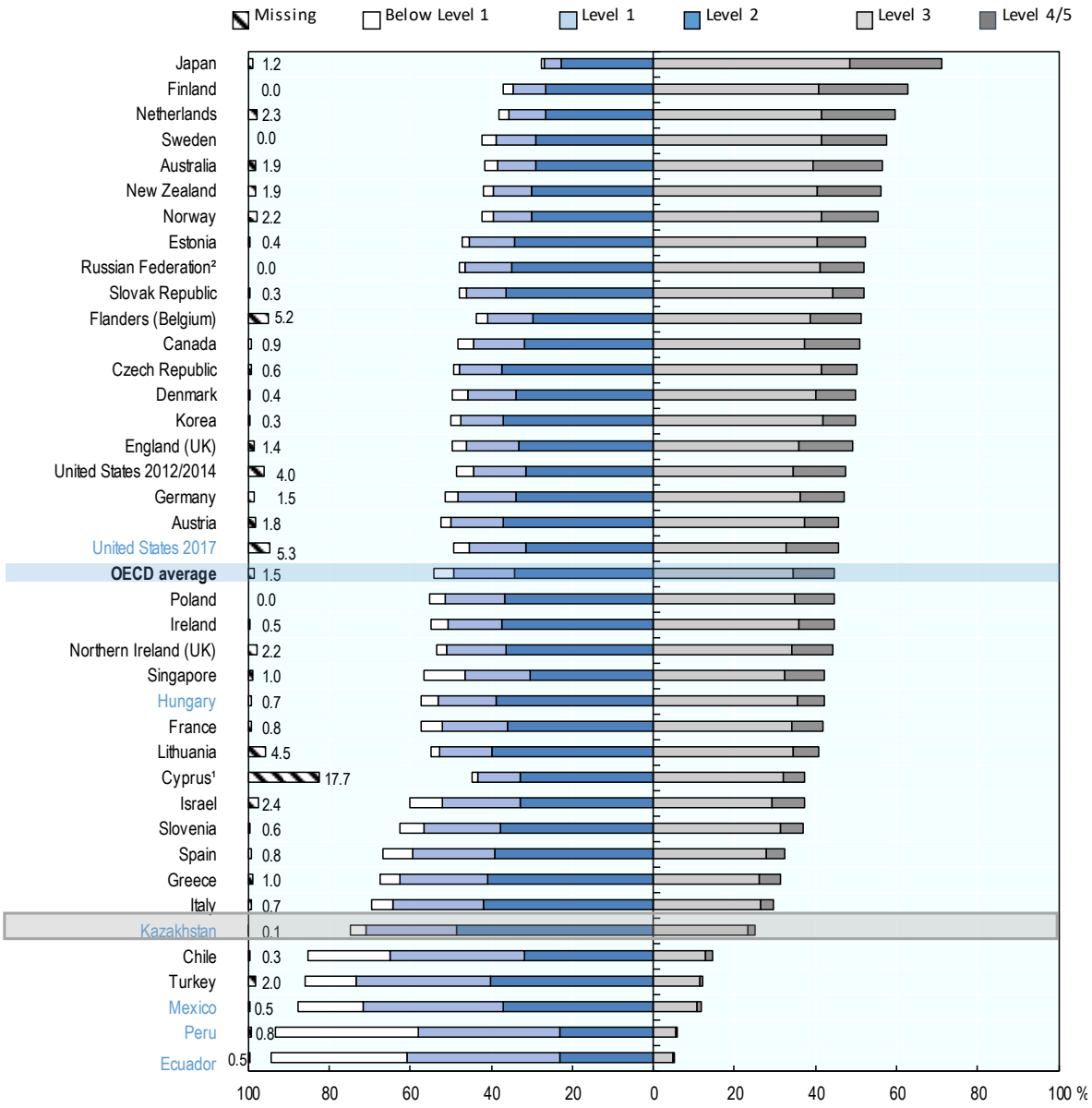
The proportion of low-performing adults in Kazakhstan is larger than the OECD average.

The proportion of adults in Kazakhstan who attain only Level 1 or below in both literacy and numeracy is larger than the OECD average, but only by a small margin (19%, as opposed to 16%). At Level 1 in literacy, adults can read brief texts on familiar topics and locate a single piece of specific information identical in form to information in the question or directive. In numeracy, adults at Level 1 can 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.

Some 15% of adults in Kazakhstan (compared with 12% on average across OECD countries) **indicated that they had no prior experience with computers or lacked basic computer skills; and 4% failed a simple ICT assessment** (compared with 5% on average across OECD countries). These adults did not participate in the problem solving in technology-rich environment assessment. **More than one in two adults in Kazakhstan** (56%, compared to 43% on average across OECD countries) **score at or below Level 1 in problem solving in technology-rich environments**. At Level 1, adults can use only widely available and familiar technology applications, such as e-mail software or a web browser, to solve problems involving few steps, simple reasoning and little or no navigation across applications.

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."

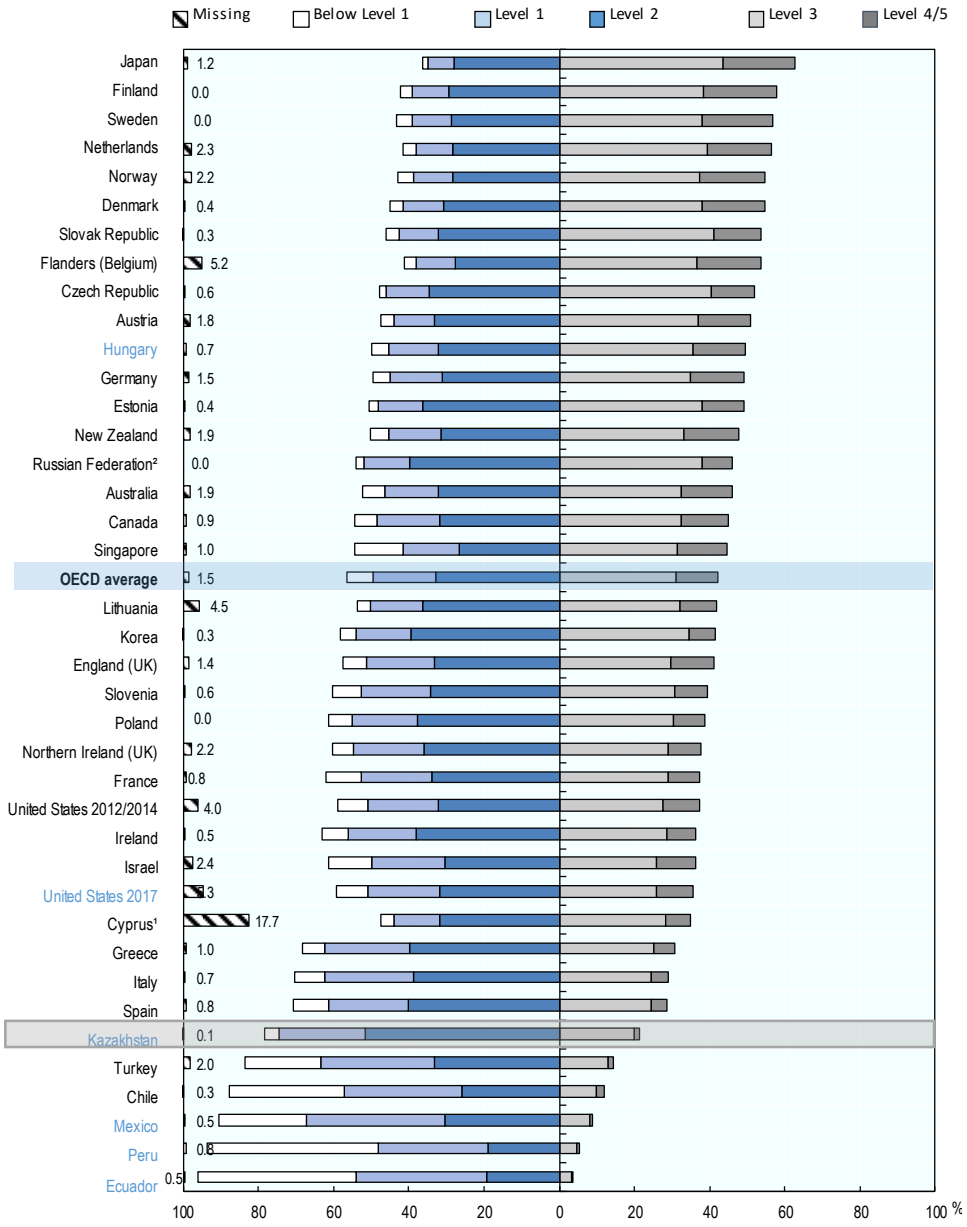
2. The sample for the Russian Federation does not include the population of the Moscow municipal area. More detailed information can be found in the Technical Report of the Survey of Adult Skills, Third Edition (OECD, 2019).

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.

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).

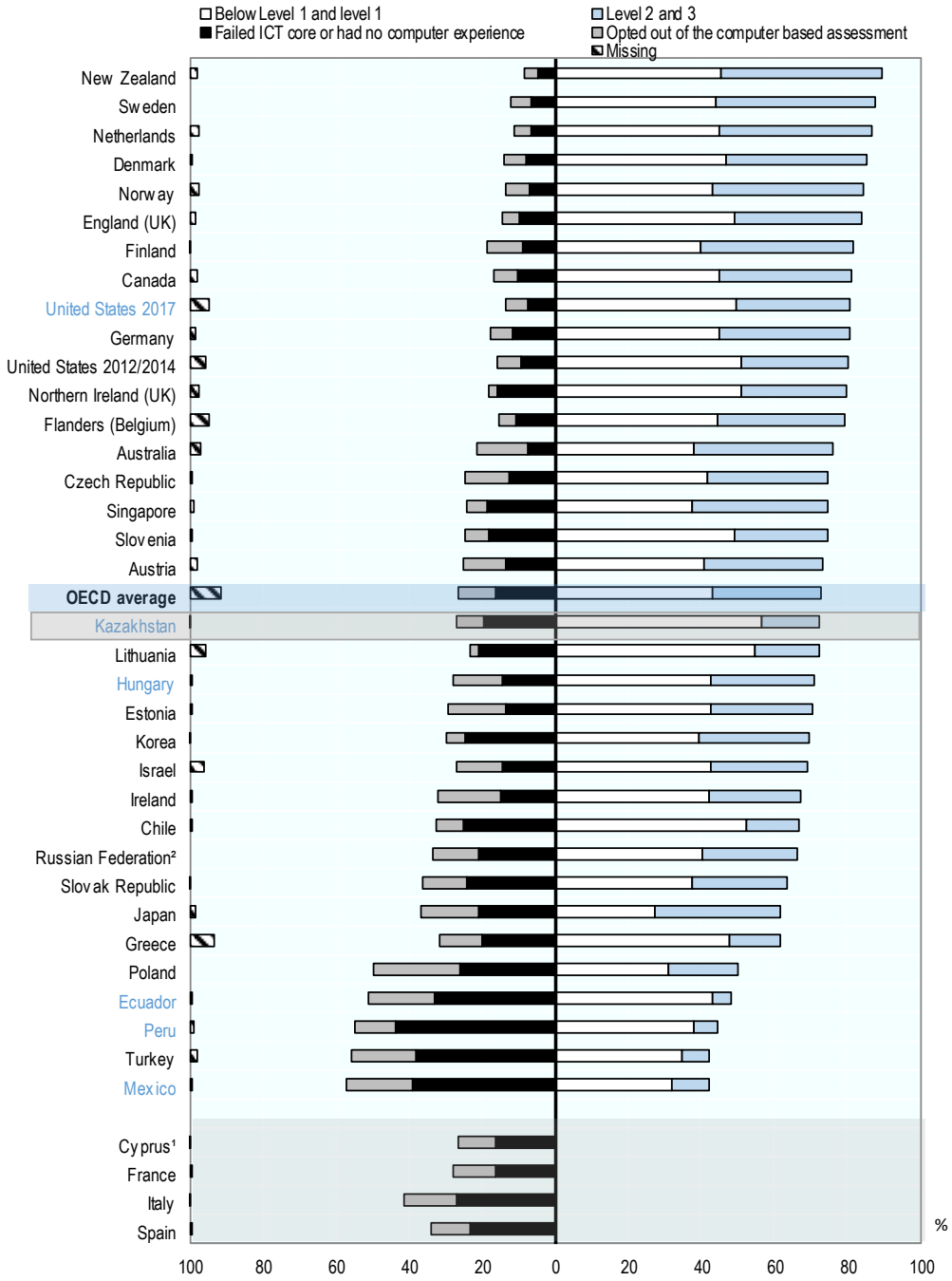
1. See note 1 under Figure 1.
2. See note 2 under Figure 1.

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.

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[1], France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment. Countries and economies are ranked in descending order of the combined percentages of adults scoring at Levels 2 and at Level 3.

1. See note 1 under Figure 1.
2. See note 2 under Figure 1.

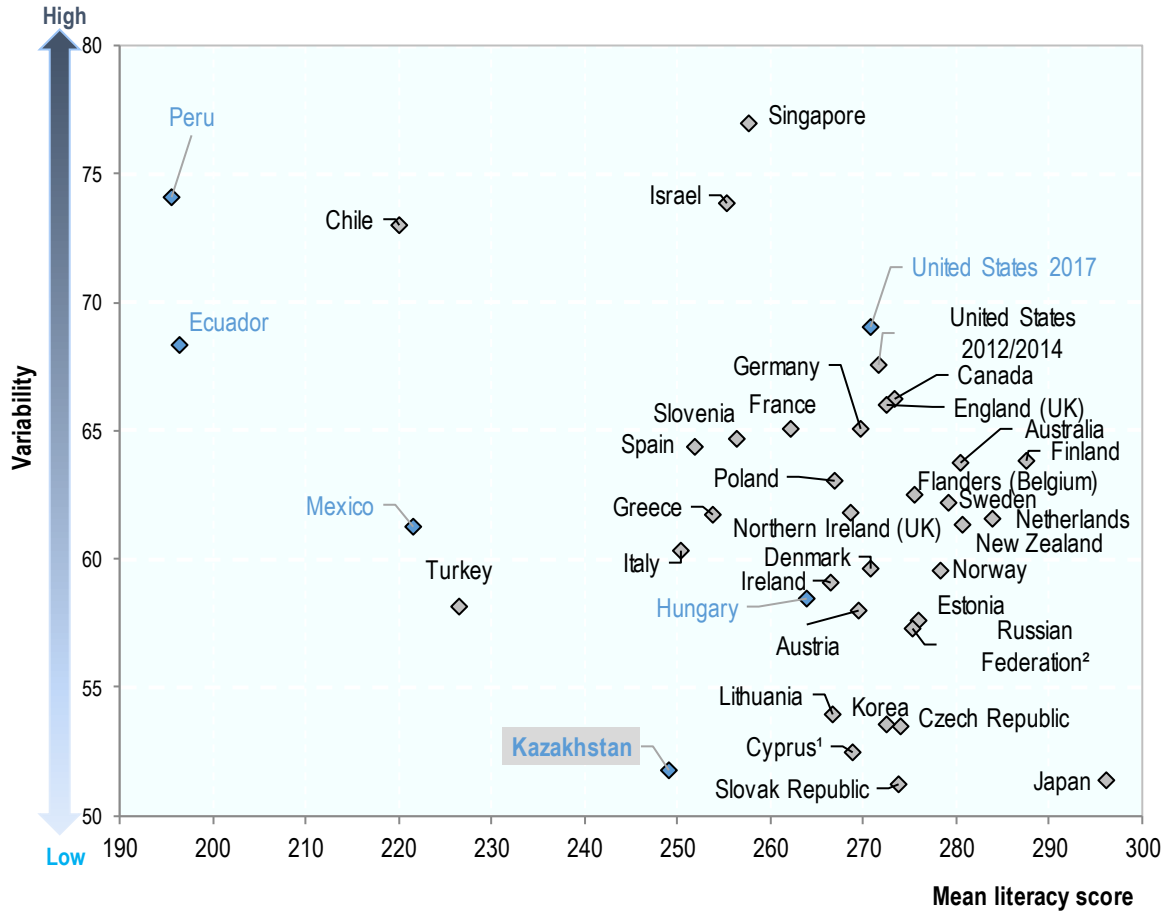
Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A2.7.

In Kazakhstan the gap between the most and least proficient adults is small.

In all countries and economies that participated in the Survey of Adult Skills (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 participants and the score of an adult who performs better than only 25% of respondents – tends to be large (more than one standard deviation) and increases with average literacy proficiency. **Kazakhstan stands out as one of the countries where variability in literacy is lower, at 52 score points** (compared to an average of 61 score points). In numeracy the variability is the lowest (48 score points) among all countries/economies that participated in PIAAC.

Figure 4. Average and distribution of literacy scores

Relationship between mean literacy proficiency score and variability



Note: The measure of variability used is the interquartile range (difference between the third quartile and the first quartile).
1. See note 1 under Figure 1.
2. See note 2 under Figure 1.
Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A2.2.

Performance of highly educated adults in Kazakhstan is below the OECD average.

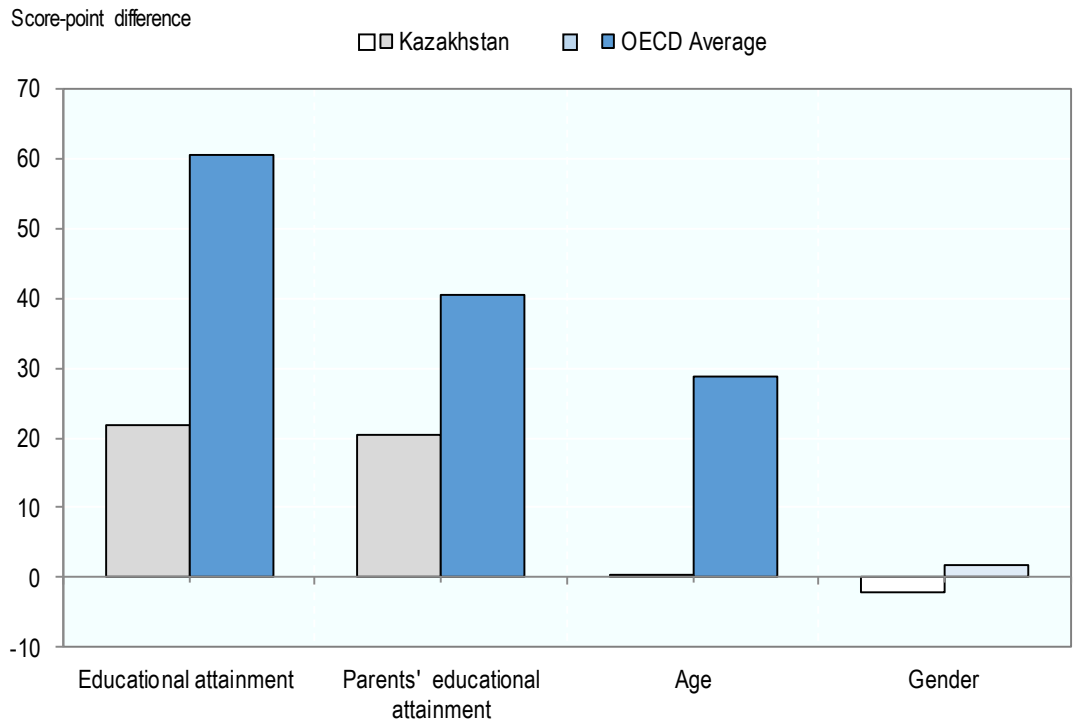
In all countries, adults that are more educated perform better in the PIAAC assessment. In the OECD countries that participated in PIAAC, the average difference between tertiary-educated adults and adults with less than upper secondary education is 61 score points in literacy and 70 score points in numeracy. **In Kazakhstan these differences are much smaller: 22 and 19 score points, respectively.**

This small gap between tertiary-educated adults and adults with below upper secondary education observed in Kazakhstan (in both literacy and numeracy) reflects two other findings. First, **tertiary-educated adults score more than 30 points below the OECD average**, in both domains. Second, adults without an upper secondary qualification scored above the average, by 6 points in literacy and by 16 points in numeracy.

Accounting for differences in other socio-demographic characteristics, like age, gender and socio-economic background (using parents' educational attainment as a proxy) further reduces education-related differences in proficiency, although not greatly.

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).

There are no differences in proficiency between older and younger adults in Kazakhstan.

Unlike what is observed in most other PIAAC-participating countries and economies, in Kazakhstan, **adults aged 25-34 do not show higher proficiency in literacy and numeracy than adults aged 55-65 –** even though nearly twice as many younger adults (50%) as older adults (27%) completed tertiary education. This means that the observed upgrade in educational attainment has not translated into a corresponding increase in the skills of the adult population, possibly because of a decline in the quality of education. This hypothesis is plausible in light of the fact that **25-34 year-olds performed significantly below the OECD average for the same age group, while older adults aged 55-65 scored slightly above the OECD average**.

On the other hand, **younger adults have higher ICT and problem-solving skills**. Only 10% of 25-34 year olds reported no experience with ICT or failed the ICT core assessment, compared to 42% of older adults. **However,**

performance in the problem-solving assessment is well below the OECD average: only 18% of adults aged 25-34 attain Level 2 or 3 in the assessment, compared to 43% in the average OECD country.

The association between proficiency and parental education is weaker in Kazakhstan than in most other PIAAC-participating countries.

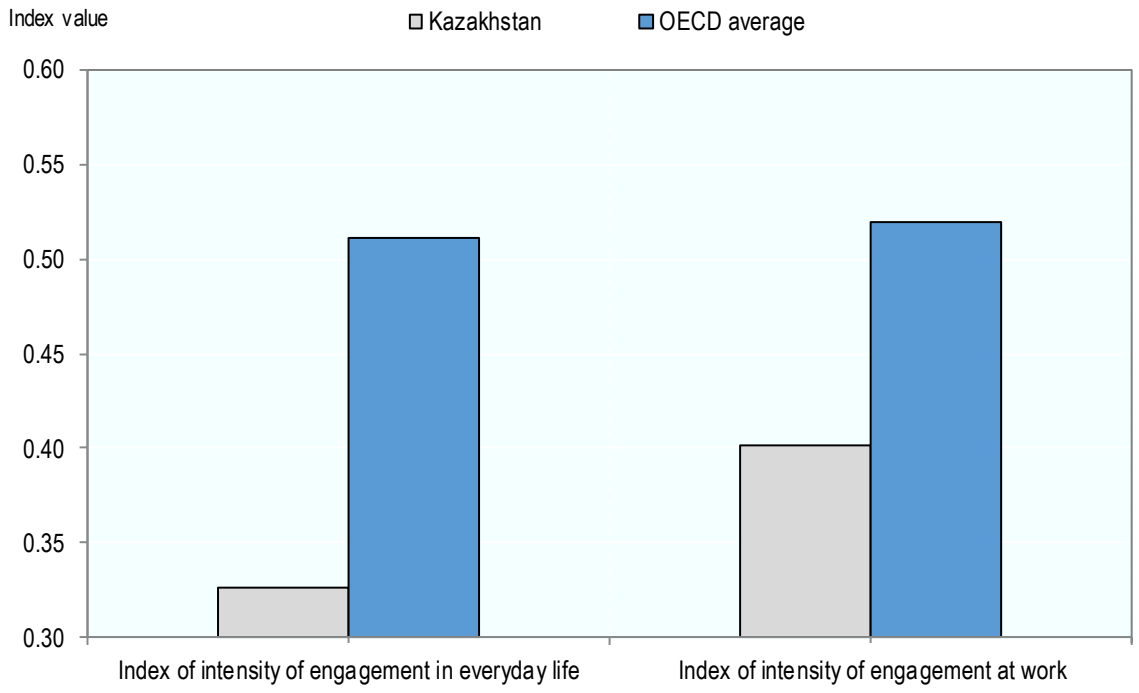
In Kazakhstan, adults with at least one tertiary-educated parent score 20 points higher in literacy than adults from families in which neither parent attained upper secondary education. This gap is one of the smallest among all countries and economies that have participated in PIAAC, and is about half of the gap observed on average in OECD countries.

Adults in Kazakhstan engage little in numeracy practices.

Regular practice of numeracy at home and at work is important for maintaining and further developing skills. In Kazakhstan, this practice is rare. Adults in Kazakhstan have the **lowest index of numeracy practice**, both at work and in everyday life. **Tertiary-educated adults engage more frequently in numeracy practices**, and the difference compared to upper secondary-educated adults is larger than the OECD average.

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



Notes: 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.

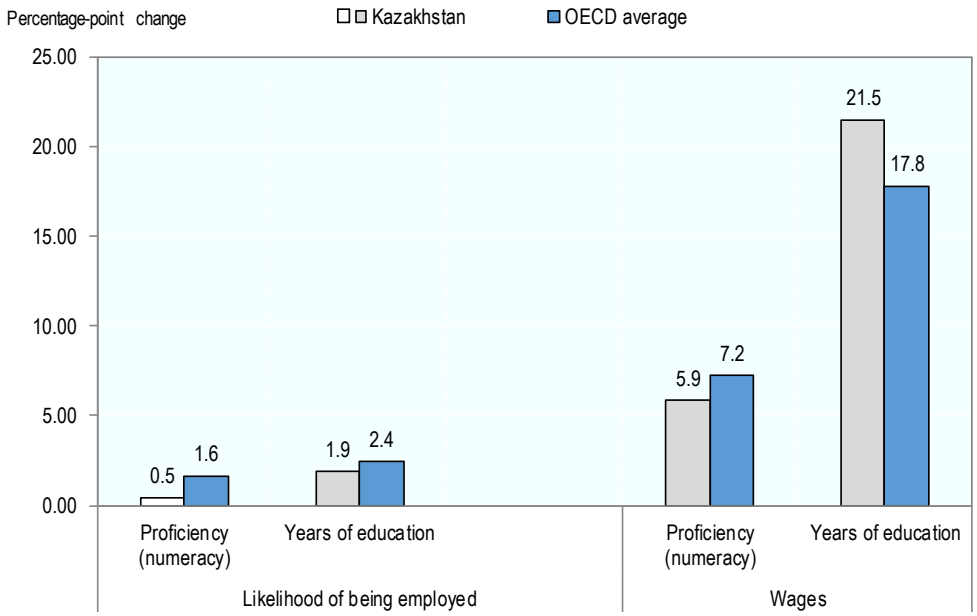
The wage returns to numeracy are lower than average in Kazakhstan, while returns to years of education are higher.

Skills and education are rewarded in the labour markets through higher wages, and Kazakhstan is no exception. **An increase of one standard deviation in numeracy proficiency is associated with a 5.9% increase in hourly wages** (OECD average: 7.2% increase). Similarly, **an increase of one standard deviation in years of**

education (3.3 years) **is associated with a 21.5% increase in hourly wages** (OECD average: 17.8% increase). More years of education are also associated with a higher probability of being employed. This is not the case for numeracy proficiency, possibly because workers' skills (contrary to their educational attainment) are not apparent to employers at the time of making hiring decisions.

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



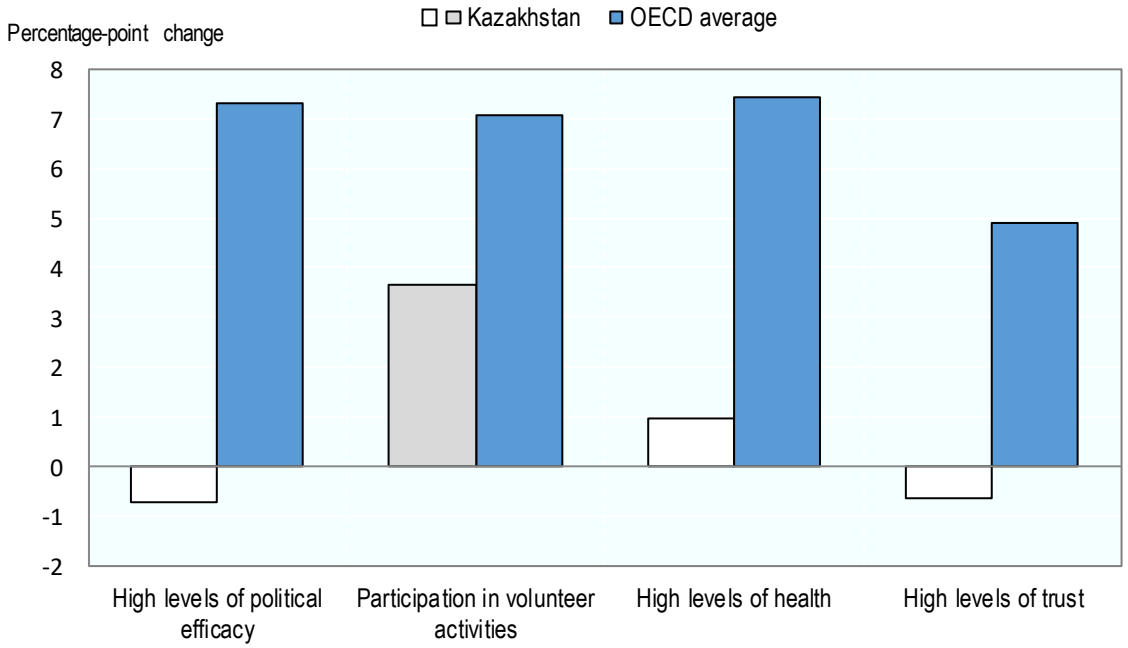
Notes: The reference category is "unemployed" for the modelisation of the likelihood of being employed and results are adjusted for gender, age, marital and foreign-born status. Hourly wages, including bonuses, in PPP-adjusted USD (2012). Coefficients from the OLS regression of log hourly wages on years 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), Tables A5.1(N), A5.2(N).

Unlike other OECD countries, in Kazakhstan, more proficient adults are no more likely to report higher levels of trust, health or political efficacy.

On average across OECD countries, proficiency in information-processing skills is positively associated with trust, volunteering, political efficacy and self-assessed health. This is not the case in Kazakhstan, where only participation in volunteering activities tends to be more likely amongst adults who perform better in the literacy assessment.

Figure 8. Effect of literacy proficiency on positive social outcomes

Marginal effects (as percentage point change) of one standard deviation increase in literacy proficiency score on the probability to report high- and low- levels of trust and political efficacy, good to excellent health, or participating in volunteer activities



Notes: All differences are statistically significant.
Source: Survey of Adult Skills (PIAAC) (2012, 2015, 2018), Table A5.8(L).

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*, 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.

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.

COUNTRY NOTE

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For more information on the Survey of Adult Skills (PIAAC) and to access the full *International* report, visit:

www.oecd.org/site/piaac

BETTER POLICIES FOR BETTER LIVES