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Human capital availability across the EU — skills perspective

Social Europe

This supplement to the Quarterly Review provides in-depth analysis of recent labour market and social developments. It is prepared by the Employment Analysis and Social Analysis Units in DG EMPL.

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Human capital availability across the EU — skills perspective

Developing relevant skills, activating the existing skills supply and using skills effectively are crucial for making economies more productive and internationally competitive and for stimulating sustainable, inclusive economic growth.[1] International competitiveness country rankings show that the most competitive countries tend to have a better educated and more skilled population/workforce than less competitive ones.[2] This supplement will focus [i] on the impact of skills beyond those acquired through initial education on individual's outcomes in the labour market and [ii] on the impact of work history on person's level of skill. The latter will be extensively analysed in the forthcoming (2014) Employment and Social Developments in Europe 2014.

Direct ways of measuring skills, like the OECD's Programme for the International Assessment of Adult Competencies (PIAAC), also known as the Survey of Adult Skills,[3] complement the indirect ways of doing so based on educational attainment.[4] PIAAC provides comparable and valuable information on skills which was not previously available. This information sheds some light on the differences in human capital availability across the EU and its main partners. Although an important one, education is not the only way of acquiring skills. They are also acquired by working and doing other activities throughout the course of one's life.[5]

This article gives an overview of the availability of human capital[6] in the EU from the skills perspective by providing information about skills proficiency across various socio-demographic groups. Skills proficiency, beyond the skills acquired through initial education, is shown to be positively and independently associated with the individual's probability of participating in the labour market, being employed and having higher wages and better social outcomes.[7] An individual who had 46 more score points than another in literacy proficiency, was on average 20% more likely to be active and 10% more likely to be employed and could expect on average a 7% increase in his hourly wage.[8] Improving the skills proficiency of poorly skilled groups should allow them obtain some of those benefits.

[1] See OECD (2012).
[2] See for example *The Global Competitiveness Report* by the World Economic Forum: http://www.weforum.org/issues/global-competitiveness or the IMD *World Competitiveness Yearbook* http://www.imd.org/wcc/news-wcy-ranking/. Skills can improve competitiveness and contribute to economic growth and productivity per capita, but countries with higher per capita income have more resources to invest in developing them.
[3] See box for a short explanation of the survey.
[4] OECD (2013a).
[5] The 2014 edition of the Commission's Employment and Social Developments (Chapter 2, ESDE 2014 forthcoming) in Europe Report contains a regression analysis of PIAAC microdata showing how work intensity, exposure to ICT work and the regular exercise of relevant skills tend to improve proficiency in key cognitive skills. Simple correlations confirm the importance of exposure to several relevant tasks. For example, the numeracy and literacy scores tend to correlate positively in all countries with 'Skill use at work' variables like the frequency of ' ICT use for mail', '… for spreadsheets', '… for Word', to 'solve complex problems at work', or to 'use or calculate fractions or percentages'. The results for the use of skills in everyday life are similar. For example, the frequency of 'reading newspapers or magazines' or 'reading books' correlates positively with the literacy and numeracy score.
[6] Human capital can be defined in overall terms as 'the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being.' (OECD 2001). See also short summary on the concept of human capital in the forthcoming Chapter 2 of 2014 ESDE report.
[7] OECD (2013b), Hanushek et al (2013), Quintini (2014), Dinis da Costa et al (2014).
[8] 46 score points represent an increase of one standard deviation in an individual's literacy proficiency. Results for labour activity were adjusted for gender, age, marital status and foreign-born status and refered to adults not in formal education. The link between proficiency in literacy and labour market participation was not statistically significant in the Czech Republic, the Netherlands, Italy, Spain, Cyprus, Korea and Japan. In estimating wage impacts, the wage distribution was trimmed to eliminate the 1st and 99th percentiles and the data sample included only employees. Results were adjusted for gender, age, marital status, foreign-born status and tenure. Years of education/level of qualification are still important, independent and more stronger determinant of wages than skills proficiency. For more details see OECD (2013b).

PIAAC — Measuring key cognitive and various generic skills and competencies

The Survey of Adult Skills measures the key cognitive and various generic skills and competencies needed for individuals to participate in society and contribute to economic growth. It directly tests proficiency in broadly transferable (generic) literacy, numeracy and problem-solving skills in technology-rich environments.[a] Literacy refers to the reading of written texts[b] and the ability to understand, evaluate and use them in various life situations. Numeracy is the ability to access, use, interpret and communicate mathematical information and ideas. Problem solving in technology-rich environments is defined as the ability to use digital technology, communication tools and networks for completing practical tasks, getting information or communicating with others.

The results are measured on a scale from 0 to 500 points, divided into different proficiency levels. The more proficient they are, the more easily respondents deal with complex textual and mathematical information and master a broader range of technologies; the more successfully they complete tasks in different contexts (e.g. work-related, personal) and apply various strategies (e.g. not only accessing and identifying but also interpreting, evaluating, analysing or communicating). Six proficiency levels are defined for literacy and numeracy (levels 1 (lowest performance) to 5 (highest performance), plus levels below level 1). The results for problem solving in technology-rich environments are divided in four levels for respondents participating in computer-based (levels 1 to 3, plus levels below level 1). There are two extra groups for those with no previous computer experience and for those who failed the core ICT test.

The survey also collects information on the use of information and communication technologies at work and in everyday life, and on the exercise of several generic skills individuals need in their work. Respondents were also asked if their skills and qualifications match their work requirements.

The first part of the survey assessed the skills of about 166 000 adults aged 16-65 in 24 countries. Of these, 17 are EU Member States (EU-17 in this supplement), representing about 83 % of the EU-28 population.[c]

[a] The survey did not directly assess inter- and intra-personal skills, personal attitudes or subject-specific skills (e.g. specific vocational or professional skills, company-specific skills and knowledge) or competencies. For more information about the survey methodology and definitions, see OECD (2013a) and OECD (2013b).
[b] The survey did not test speaking, listening or writing.
[c] The first round of data collection covered 22 OECD countries: Australia, Austria, Belgium (Flanders), Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden, the United Kingdom (England and Northern Ireland) and the United States, plus two partner countries, Cyprus and the Russian Federation. The data collection took place between August 2011 and March 2012. The second round covered nine additional countries: Greece, Slovenia, Lithuania, New Zealand, Chile, Indonesia, Israel, Singapore and Turkey. Data are being collected in 2014 and the results are expected in May 2016.

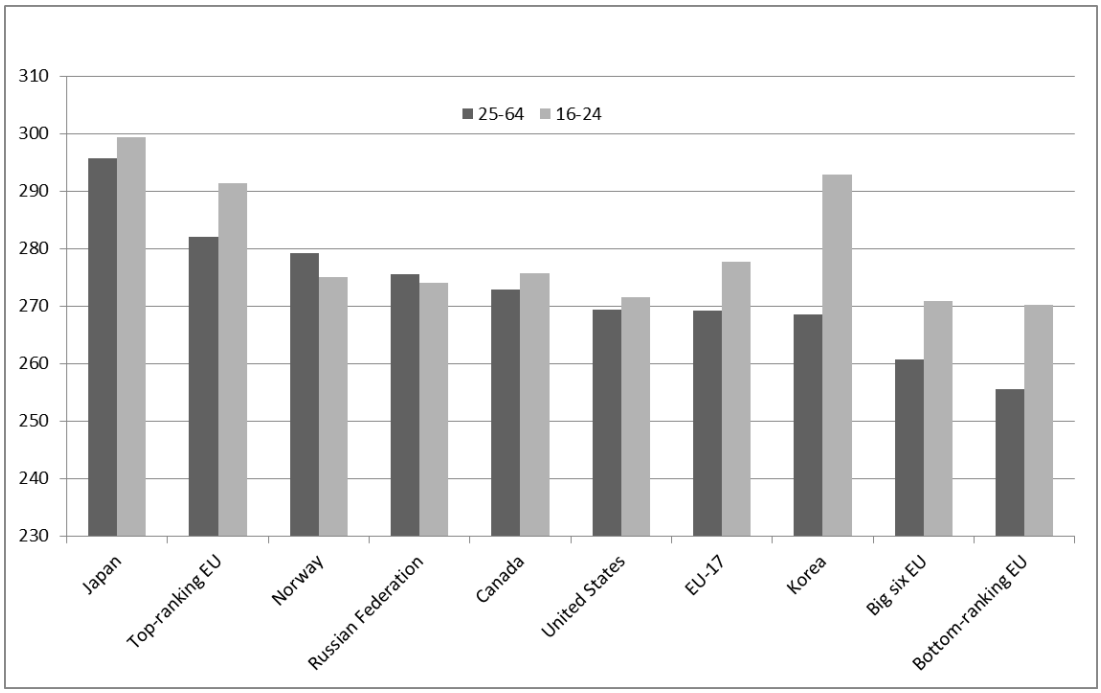
Many Member States have a poorly skilled population

The EU is falling behind its competitors with regard to the skills proficiency of its adult population. Mean average scores for six large EU countries (Germany, the UK (England/Northern Ireland), Poland, France, Italy and Spain), representing more than two thirds of the total EU population (70 %), show that EU skills and competencies levels in the 25-64 age group fall far short of those of its large competitors (Chart 1).[9] The population of the three EU countries with the highest average literacy scores (Finland, the Netherlands, Sweden) represented only 6 % of the total EU population in 2013, while the population of the countries with the lowest average scores (Poland, France, Italy, Spain) represented around one third of the total population.

[9] See Table A1 in the annex for a detailed overview of each country and age group.

Chart 1: The top-ranking EU countries are too few and too small to improve overall EU results compared to those of other world economies

Mean literacy proficiency scores, for age groups and groups of countries



Notes: [a]Top- and bottom-ranking EU countries based on the mean score of 25-64 year olds being statistically significantly different from the EU average. [b]Top-ranking EU: FI, NL, SE (only three countries with around 10 points above the EU average). [c]EU-17 average. [d]Big six EU: DE, UK (England/Northern Ireland), PL, FR, IT, ES. [e]Bottom-ranking EU: PL, FR, IT, ES — all countries scored statistically significantly below the EU average. [f]Countries are ranked according to the descending mean score of the 25-64 age group. [g]Data for the Russian Federation (RF) do not cover the Moscow municipal area.

Source: Survey of Adult Skills 2012 (PIAAC).

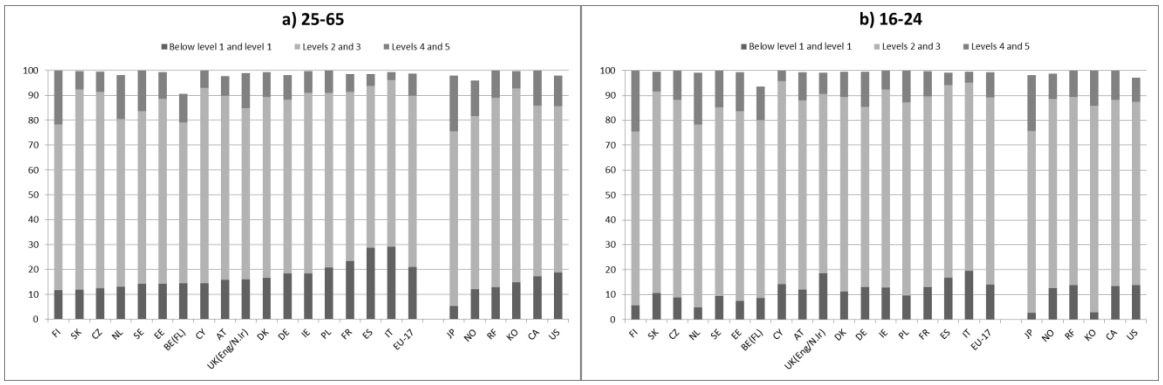
The skills proficiency of the younger generation (16-24) is in general higher, with some exceptions like the UK (England/Northern Ireland) and Cyprus within the EU and Norway outside it. In contrast, the skills proficiency of young people in Korea was improved a lot by increasing the educational attainment rate over a relatively short period of time. This has resulted in age-related differences in skills proficiency. The skills proficiency of young people in the bottom-ranking EU countries is higher, but there are still major differences between countries in the EU. The results for numeracy and problem-solving skills, given in the annex (Chart A1 and Chart A2), are relatively similar.

On average, top-ranking EU countries have a lower proportion of poorly skilled, and a higher proportion of highly skilled, adults. The opposite is the case in the bottom-ranking EU countries (Chart 2). For example, in Italy and Spain almost 30 % of adults (25-65 years old) perform at or below the lowest level of proficiency in literacy and numeracy. Less than 5 % of Italian and Spanish adults are at the top literacy and numeracy levels (levels 4 and 5). Many of the countries in the bottom-ranking EU group had high proportion of early school leavers in previous decades. In 1996 the proportion of early school leavers was around 31 % in Spain and Italy and 19 % in Ireland, while it was below 8 % in Sweden and around 11 % in Finland, two of the top-ranking EU countries. Outside the EU, the US also scored poorly. Nevertheless, even top-ranking EU countries have significant skills weaknesses, with around 10 % of adults proficient only at or below level 1 in literacy or numeracy.[10] The proportion of poorly skilled young people is lower in comparison to adults, with the exception of Norway, the Russian Federation and the UK (England/Northern Ireland). This shows that there has been an improvement in equipping young people with basic skills, but there are similar differences in proficiency between countries to those in the case of adults.

[10] See Chart A3 in the annex for numeracy results.

Chart 2: Better performing countries have on average a lower proportion of poorly skilled, and a higher proportion of highly skilled, adults

Percentage of population by proficiency levels in literacy, for each age group and country



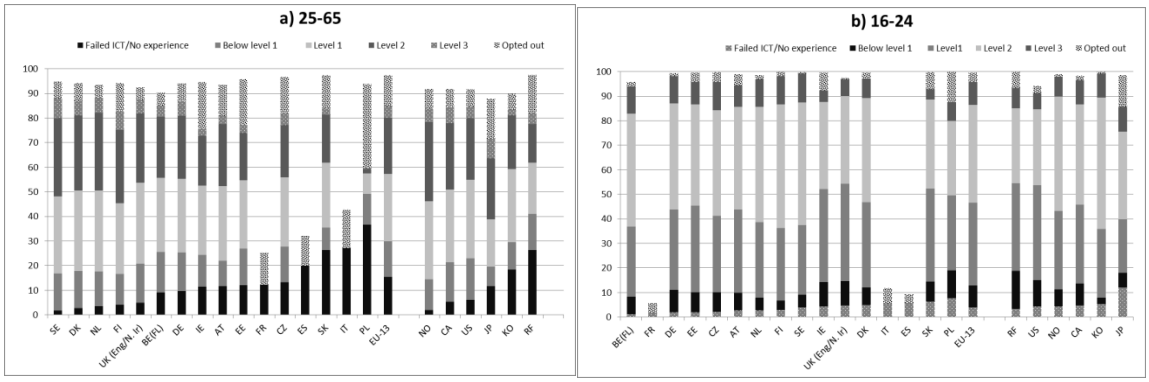
Note: [a]Data presented according to the ascending proportion of 25-65 year olds at level 1 and below it. [b]The EU-17 average is weighted according to population. [c]Data for the Russian Federation (RF) do not cover the Moscow municipal area. [d]The difference to 100 % is literacy-related non-response.

Source: Survey of Adult Skills 2012 (PIAAC).

Computer and ICT skills in general are more important than ever for labour market activity and social inclusion. Results show that in the great majority of all countries at least 10 % of adults lack the most elementary computer skills (proportion of adults in the failed ICT/no computer experience group on Chart 3). Around 20 % or more of the adult population in Italy, Poland, Slovakia and Spain have no ICT experience, or lack the basic skills needed to use such technology for many everyday tasks. These countries also have the highest proportion of young people lacking basic computer and ICT skills (more than 5 %). This is also the case in Japan and Korea. The Nordic countries, Netherlands and the UK (England/Northern Ireland) have been more successful than other countries in creating an environment in which most adults have computer experience. As a result, only a small proportion of adults in these countries score poorly in this area (less than 5 %).

Chart 3: Need to strengthen computer and ICT skills across the EU

Percentage of population by proficiency levels in problem solving in technology-rich environments, for each age group and country



Note: [a]Data presented according to the ascending proportion of 25-65 year olds in the 'failed/no experience' category. The 'no computer experience' group includes adults who reported having no previous computer experience, while 'failed core ICT' includes those who had previous computer experience but failed the core ICT test. Both groups did the paper-based version of the test, which did not include problem solving in a technology-rich environment. [b]'Opted out' of doing the computer-based test includes adults who chose to do the paper-based test — which did not include problem solving in a technology-rich environment — despite having some previous computer experience. [c]Differences to 100 % are missing because test was not taken. This module was not used in Spain, France, Cyprus and Italy. [d]The EU-13 average is weighted according to population. It includes EU countries participating in the survey, except for Spain, France, Cyprus and Italy where module was not used. [e]Data for the Russian Federation (RF) do not cover the Moscow municipal area.

Source: Survey of Adult Skills 2012 (PIAAC).

Many of those with poor computer or general ICT skills are inactive. Of those who have no computer experience or failed the core ICT test, 42 % are inactive (8 % unemployed), compared to 17 % of the most skilled individuals (4 % unemployed). In Finland, Belgium (Flanders) and the Czech Republic every second person with no core computer skills is inactive. Adults with no computer experience also have lower mean literacy and numeracy scores than those with computer experience. They are also more often among groups at a disadvantage on the labour market (older people, immigrants, poorly educated people) or they do less skilled work.[11] This increases their inactivity. At the same time, their inactivity diminishes their opportunities for developing skills in all areas, including ICT.[12]

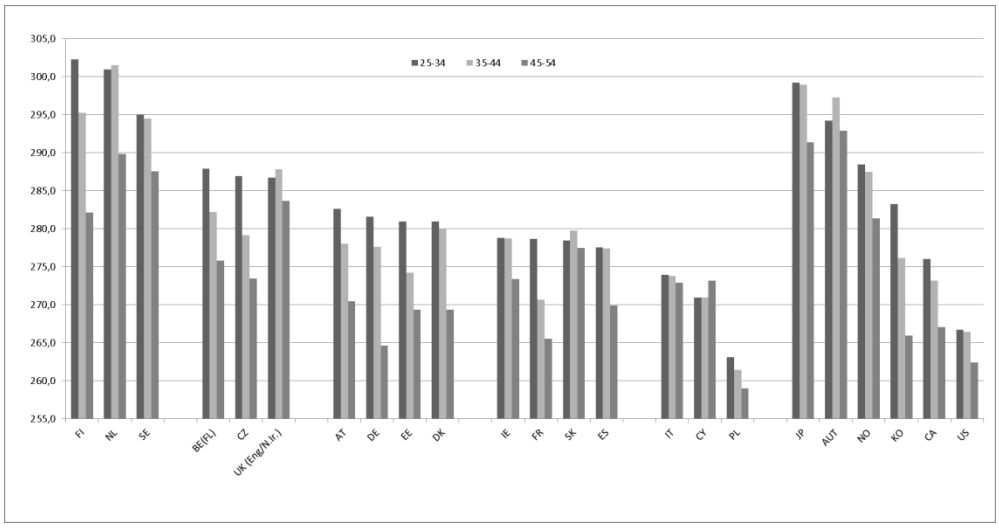
Groups with poor skills: who are they and how do they differ across the Member States?

Skills proficiency is on average lower among groups usually at a disadvantage on the labour market, like older people, immigrants, poorly educated people or people from disadvantaged social backgrounds. Skills proficiency varies greatly among them across countries however. This suggests that the national situation has a major impact on the skills proficiency of disadvantaged groups. This is because it determines the quantity and quality of initial education and the possibilities of maintaining and using the skills acquired throughout one's life by investing in training, lifelong learning and the use of skills at work.

Proficiency in literacy, numeracy and problem solving in technology-rich environments is closely related to **age**. Younger age groups tend to have higher levels of proficiency than older ones, with considerable variety in the results across the EU Member States (see Chart 4).

Chart 4: Literacy proficiency decreases with age but is affected by more than just biological ageing

Literacy proficiency by age, adjusted according to socio-demographic characteristics



Notes: Data are based on a multiple linear regression model that takes account of differences associated with the following variables: age, gender, education, immigration and language background, socio-economic background and type of occupation.

Source of data: Table B3.17 in OECD (2013b).

[11] Differences in computer experience between different categories are striking. For example, almost two thirds of adults without upper secondary education have no computer experience. Only around one third of those with upper secondary education have no computer experience and only 4 % of those with tertiary education have no computer experience. The proportion of adults with no computer experience is the highest among those with semi-skilled blue-collar jobs and those born in the country in question, whose language of origin is the same as that of the survey assessment. Similar patterns can be observed across a large majority of countries (OECD 2013b).

[12] The survey shows that prime-age and older workers spend more time using ICT at work than outside work. The opposite is the case for younger workers.

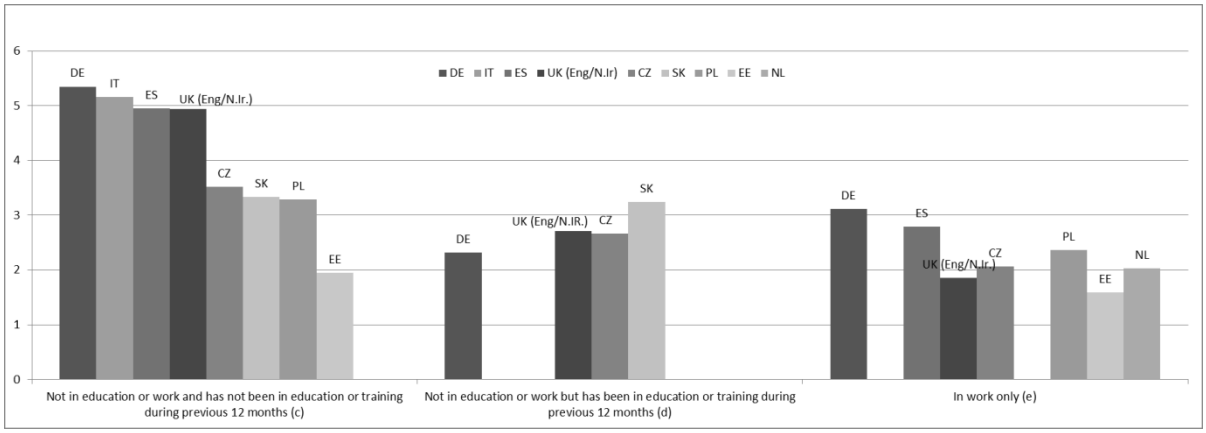
A proficiency gap between younger and older groups, in favour of younger groups, can indicate an increase in the quantity and quality of education over time. Biological ageing and training and working opportunities to maintain and use skills acquired throughout one's life also play a part. Some countries have wider skills proficiency gaps than others. The literacy proficiency gap can be wide in countries with a high average mean score (e.g. Finland) and in countries with a low average mean score (e.g. Germany and France). A narrow proficiency gap in countries with a mean score below the EU average is probably related more to the lack of improvement in the quantity and quality of education than to the availability of good lifelong learning opportunities and training (e.g. Italy).

The gap between the old and the young is especially marked in problem solving in technology-rich environments. On average, 51 % of people aged 16-24 scored at level 2 or higher on problem solving in technology-rich environments. Very few adults aged 55-65 in any country scored at level 2 or 3 in this area.

Young people aged 16-24 who are not in education, employment or training (NEET) are at risk of poor skills development. On average, this group's odds of scoring at level 2 or below on the literacy scale are nearly three times those of young people who remain in education. Their probability of scoring at low levels ranges from five times higher than in Germany and Italy, to three times higher in Poland and two times higher in Estonia (Chart 5). Young people who participated in education and training in the recent past and those who work are at less risk of poor skills development, but are still more likely to score at low levels than those who are in education.

Chart 5: High risk of poor skills development for young people not in education, employment or training

Adjusted odds ratios of 16-24 year olds scoring at or below proficiency level 2 on the literacy scale, according to education and work status, with the reference group in education only



Note: [a]The chart shows only estimates based on a sample of more than 30 or one statistically different from the reference group. There are no significant odds ratios for Austria, Denmark, Ireland, Belgium (Flanders), Finland, Sweden and Cyprus. [b]Odds ratios are adjusted depending on age, gender, type of occupation and immigrant status. [c]Sample smaller than 30 for the Netherlands. [d]Sample smaller than 30 for Italy and the Netherlands, results not statistically significantly different from those for the reference group for Estonia, Spain and Poland. [e]Results not statistically significantly different from those for the reference group for Italy and Slovakia.

Source of data: Table A3.11 (L) in OECD (2013b).

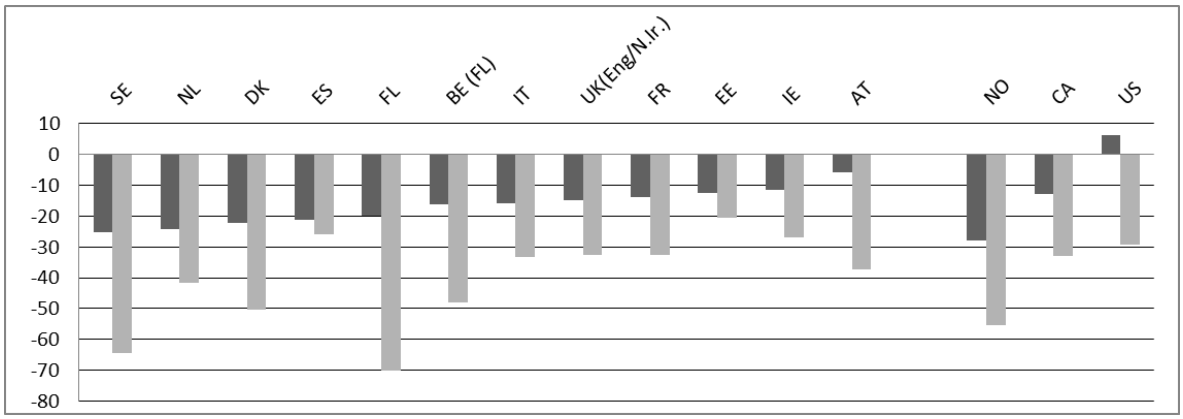
On average, **immigrants** are less proficient in literacy, numeracy and problem solving in technology-rich environments than adults born in the country in question. The mean literacy proficiency of immigrant adults is lowest in Belgium (Flanders), France and Denmark, and highest in Slovakia, the Czech Republic and the Netherlands, and immigrant women are more likely to be less proficient than men.[13]

[13] The results for numeracy are quite similar to those for literacy. This could be because good language skills are required to understand and answer the questions in the survey. Scores are based on a multiple linear regression model that takes account of differences associated with the following variables: age, gender, education, immigration and language background, socio-economic background and type of occupation (OECD 2013b).

An OECD study on migrants, supported by the Commission,[14] compared the skills proficiency of immigrants from EU and non-EU countries. The results show that on average, the literacy and numeracy scores of EU immigrants are closer to those of people born in the country in question, in particular in Austria, Ireland and the UK (England/Northern Ireland) (Chart 6). Differences between natives and EU immigrants are bigger in the Netherlands and Sweden. This can be due to the composition of the EU migrant groups, the complexity of the host country's language and the small proportion of migrants who speak it when migrating.[15]

Chart 6: Immigrants are a heterogeneous group - so are their skills

Differences in literacy proficiency between immigrants and natives aged 16-65, depending on whether they are of EU or non-EU origin, score point difference



Note: [a] Data presented according to the descending difference between EU-immigrants and natives. [b]The sample includes people aged 16-65. The coefficients presented are from separate regressions including controls for age, gender, level of education and level of parental education. [c]Difference between EU immigrants and natives in the US and AT is not statistically significant (at 10 % level).

Source: Bonfanti and Xenogiani (2014).

Adults' familiarity with, and ease in using, the language most widely used in the society in question explains a lot about differences in proficiency. PIAAC results can be low for immigrants because they are not tested in their own language. The mean proficiency scores of adults born outside the country in question, who have a good knowledge of the assessment language,[16] are on average higher than those of foreign-language immigrants.

In the case of most countries the length of time spent living in the host country makes a significant difference, because it takes time to integrate. In general, adults who have lived over five years in the host country score significantly higher than those who have lived in the same country for less time. Differences in skills (literacy) proficiency between immigrants and natives are smaller in the case of immigrants who have a host-country qualification. These have a lot to do with differences in the quality of education across countries. The PIAAC survey showed that educational attainment is an imperfect measure of skills, especially for immigrants.

While proficiency in the language of the host country is important for labour market integration, this may not always be the case. For example, an ICT engineer who speaks English can work in a highly skilled job in Sweden, the Netherlands or Germany without having a good knowledge of the host country language.

The results show the difference between skills and qualifications and that more **education** alone is no guarantee of a better skilled workforce. Skills proficiency on average increases with higher educational attainment, but the level of skills varies considerably among individuals within and across education levels. In and across countries, many people with secondary education as their highest level of educational attainment outperform adults with a university degree. The literacy proficiency gap between those with tertiary education and those whose

[14] Bonfanti and Xenogiani (2014).
[15] Bonfanti and Xenogiani (2014).
[16] Called the 'foreign-born and native language' group.

education level is lower than upper secondary is high in Belgian (Flanders), France and Ireland (more than 40 points). It is low in Cyprus, Estonia and Italy (less than 30 points).[17]

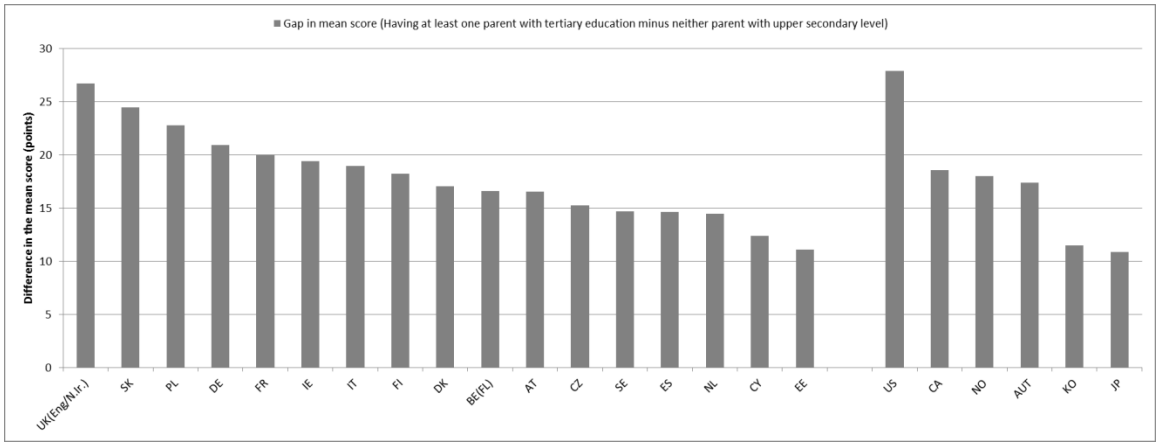
The extent to which the skills proficiency of graduates with similar educational qualifications varies between countries is striking. For example, adults with upper secondary education in Japan and the Netherlands scored 40 more points than those in Poland. There are similar differences at tertiary level.

Adults who have completed high school in Finland, the Netherlands, Sweden, Japan and Australia scored higher in literacy proficiency on average than university graduates in Estonia, France, Italy, Poland, Slovakia, Spain, Cyprus, Korea, the USA and Canada. Adults whose education level is lower than upper secondary in Finland, the Netherlands, Sweden, Australia and Japan scored better than those with upper secondary education in Estonia, France, Italy, Poland, Cyprus, Spain, Germany, Korea, Canada and the US.[18] There are also such differences among subgroups, such as young people (16-29 year olds). The reasons for this include differences in the quality of education and the possibilities for adults to continue developing their skills after completing formal (initial) education.

The literacy gap between adults from **socio-economically disadvantaged backgrounds**[19] and adults with more educated parents (Chart 7) is very wide in the UK (England/Northern Ireland), Slovakia and Poland. It is narrower in Estonia and Cyprus.

Chart 7: The education level of parents can have a major effect on the skills proficiency of children…

Literacy proficiency of 16-65 year olds by socio-economic background and by country, adjusted according to socio-demographic characteristics



Notes: [a]Data are based on a multiple linear regression model that takes account of differences associated with the following variables: age, gender, education, immigration and language background, socio-economic background and type of occupation. [b]All differences are statistically significant.

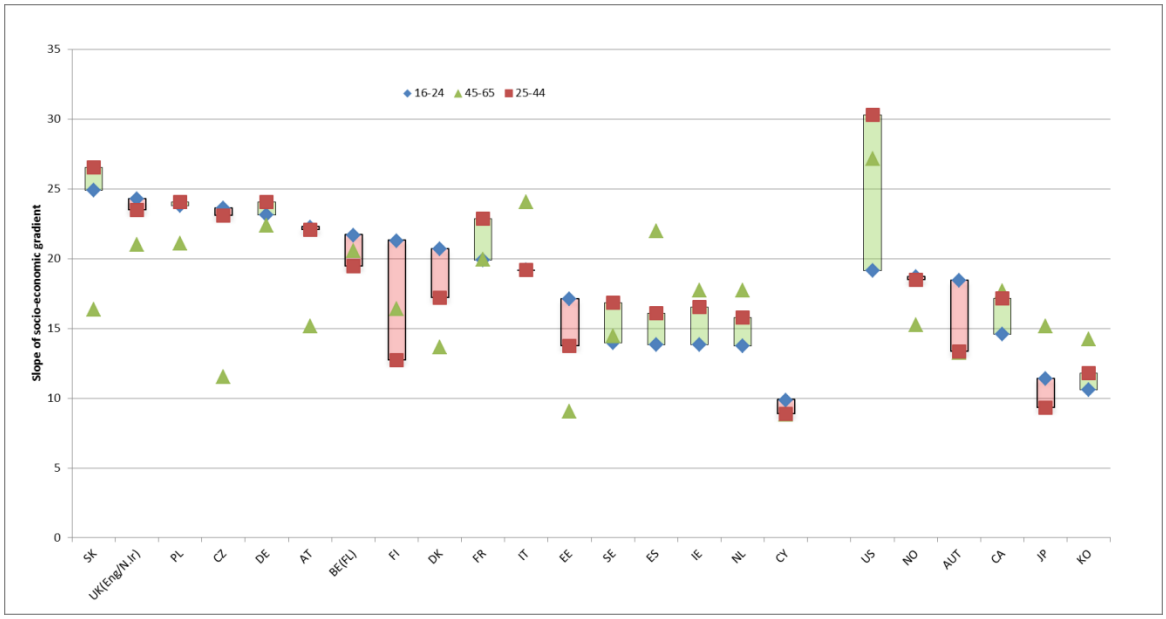
Source of data: Table B3.17 in OECD (2013b).

[17] Results adjusted according to socio-demographic characteristics. Table B3.17(L) in OECD (2013b).
[18] Data adjusted to take into account socio-demographic characteristics: age, gender, immigration and language background, socio-economic background and type of occupation.
[19] In the survey, socio-economic background is determined in terms of parents' educational attainment. If both parents have low levels of educational attainment, adults are regarded as coming from socio-economically disadvantaged backgrounds.

Comparing the 16-24 and 25-44 age groups, the link between socio-economic background and literacy proficiency is weaker for the younger group in Slovakia, Poland, Germany, France, Sweden, Spain, Ireland, the Netherlands, the USA, Canada and Korea. It is stronger in Finland, Denmark, Estonia, Belgium (Flanders) and Australia (Chart 8). One reason for this could be that the proficiency levels of adults from a disadvantaged background can improve over time. Another reason could be that in countries with a higher socio-economic gradient for younger adults than for prime-age adults, opportunities for young people from disadvantaged families to get a good education and acquire useful skills have diminished over time.[20] Cyprus, the Netherlands, Ireland, Spain, Sweden, Japan and Korea have the weakest link between socio-economic background and literacy proficiency among young people (16-24). The link is strongest in Slovakia, the UK (England/Northern Ireland), Poland, the Czech Republic and Germany.

Chart 8: …and the impact varies across age groups

The slope of the socio-economic gradient for literacy proficiency, by age groups and by country



Note: The slope of the socio-economic gradient is based on the trend line connecting mean scores for each level of parents' educational attainment. High values show that there is a strong link between socio-economic background – measured in terms of parents' educational attainment – and literacy proficiency.

Source of data: Table A3.8L in OECD (2013b).

Cumulative disadvantages

The combination of poor initial education and the lack of opportunities to further improve skills can become a vicious circle in which poor proficiency leads to fewer opportunities to further develop proficiency.[21]

Foreign-language immigrants from disadvantaged backgrounds are nearly seven times more likely than non-immigrants from advantaged backgrounds to score at level 2 or below on the literacy scale. Non-immigrants from disadvantaged backgrounds are about 1.5 times more likely than non-immigrants from advantaged backgrounds to score at level 2. On average about 40 % of foreign-language immigrants come from a socio-economically disadvantaged background, but the proportion varies from low proportions in some countries with few immigrants to as much as 60 % in Spain.

Adults who have low levels of education, whose **parents also have low levels of education** (below upper secondary education), are on average nearly five times as likely to get low literacy

[20] This is worth exploring in more detail, but it is beyond the scope of this article to do so.
[21] The data sources are Table A3.12 (L) and Table A3.17 in OECD (2013b).

scores as adults with parents who have higher levels of education. This is most likely in the US and the UK (England/Northern Ireland) and least likely in Estonia and Finland. These adults are the least likely to participate in any form of adult education and training.

Adults from socio-economically disadvantaged backgrounds with at least upper secondary education are still about twice as likely to get low literacy scores as adults from advantaged backgrounds with at least upper secondary education.

Another important transmission channel of cumulative disadvantages is explained by the impact of work intensity and the use of skills on skills proficiency. A more elaborated analysis performed in the ESDE Report 2014 (Chapter 2) shows that work history has a particularly strong impact on the level of skills. Those who have been in paid work for most of their working life perform better than those who have been unemployed for considerable periods of time. The longer individuals have been in paid work, the higher their relative performance in numeracy, literacy and, to a lesser extent, problem solving.

One more year of paid work per year of age produces a PIAAC score between one and two points higher, in all dimensions of skills proficiency. This holds true after controlling for age, sex, country of origin, and educational attainment level. Moreover, this is also controlled for variables which describe the relevant individual work environment (having specific ICT-experience, being exposed to tasks which involve complex problem solving).[22]

This analysis confirms the strong link between people's work history and their skills proficiency. At any level of educational attainment, the possibility of using skills at work is associated with a higher performance. This, in turn, has strong implications for future labour market prospects of individuals, generating cumulative (dis)advantages.

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Annex

Table A1: Summary for each country of proficiency scores in key information-processing skills, 2012

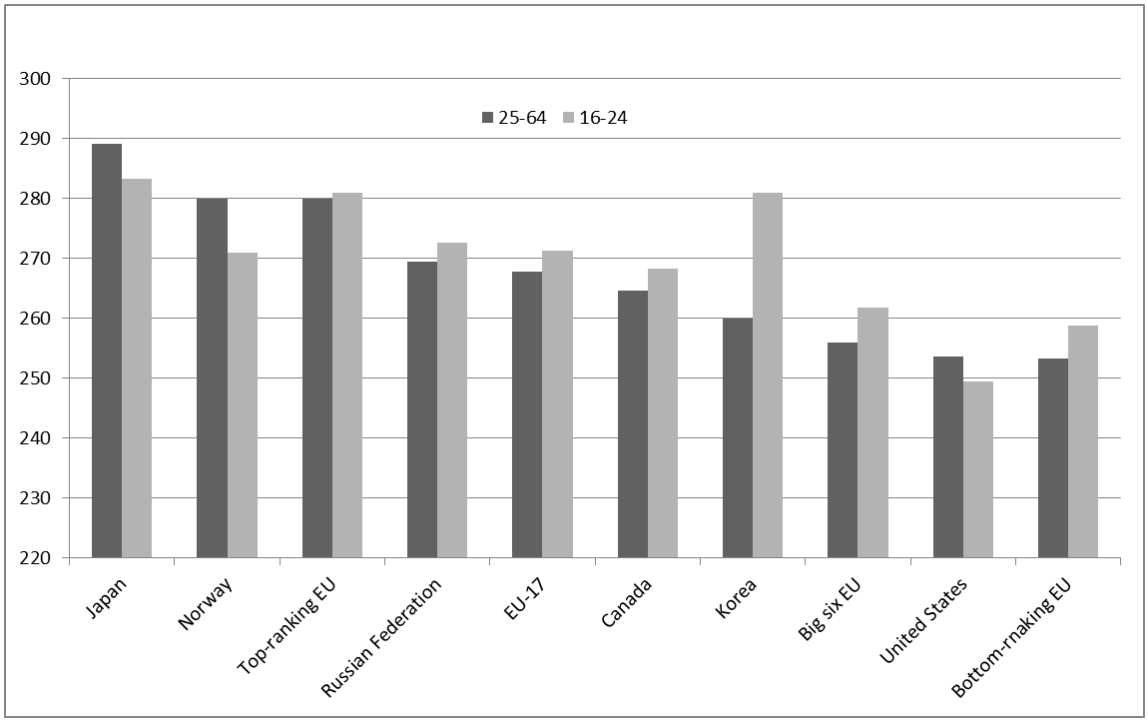
Mean proficiency scores of 16-24 and 25-65 year olds in literacy, numeracy and problem solving in technology-rich environments

	Literacy		Numeracy		Problem solving[b]	
	16-24	**25-65**	**16-24**	**25-65**	**16-24**	**25-65**
EU-17 (Literacy and numeracy)/ EU-13 (problem solving)	**277.6**	**269.2**	**271.2**	**267.72**	**294.1**	**278.97**
AT	277.7	267.9	279.3	274.23	294.2	281.41
BE(FL)	285.0	273.7	282.8	279.94	298.9	276.78
CY	267.1	269.3	264.2	264.75		
CZ	280.5	272.7	278.0	275.29	296.7	279.46
DK	276.1	269.7	273.1	279.36	293.5	280.69
EE	287.1	273.5	278.5	271.94	293.3	272.71
FI	296.7	285.7	284.8	281.71	302.9	286.02
FR	275.0	259.4	263.4	252.27		
DE	278.9	268.1	275.1	271.08	294.8	279.75
IE	270.6	265.7	257.9	255.11	285.7	274.18
IT	260.8	248.7	251.3	246.42		
NL	294.6	281.8	285.4	279.31	300.1	283.33
PL	281.5	263.8	268.6	257.87	286.8	270.27
SK	276.0	273.4	278.0	275.34	286.8	279.24
ES	263.9	250.2	255.2	244.56		
SE	282.8	278.4	278.2	279.24	301.9	284.21
UK(England/Northern Ireland)	265.7	273.9	256.5	262.85	287.8	278.51
CA	275.7	272.8	268.3	264.61	293.8	279.52
JP	299.4	295.7	283.2	288.99	299.9	292.82
KO	292.9	268.5	280.9	259.91	303.5	277.10
NO	275.0	279.2	270.9	279.96	295.7	284.18
RF[c]	274.0	275.5	272.5	269.38	282.8	274.21
US	271.5	269.4	249.4	253.60	285.2	275.48

Notes: [a]Mean score statistically significantly different from EU-17 average (EU-13 for problem solving (above average in green, below average in red)). [b]Problem solving was not tested in Spain, France, Cyprus and Italy. [c]Data for the Russian Federation (RF) do not cover the Moscow municipal area.

Source: Survey of Adult Skills 2012 (PIAAC).

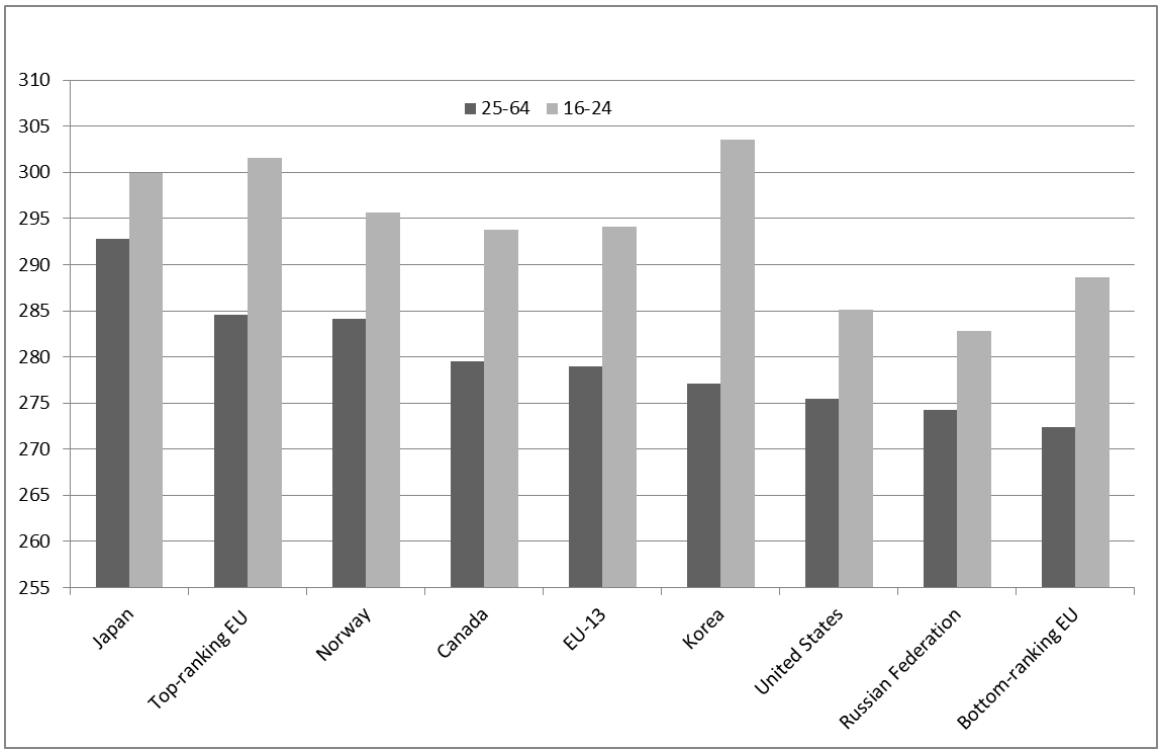
Chart A1: Mean numeracy proficiency scores, by age group and group of countries



Notes: [a]Top- and bottom-ranking EU countries based on the mean score of 25-64 year olds being statistically significantly different from the EU average. [b]Top-ranking EU: FI, NL, SE, BE (Flanders), DK (only five countries with around 10 points more than the EU average). [c]Big six EU: DE, UK (England/Northern Ireland), PL, FR, IT, ES. [d]Bottom-ranking EU: IE, PL, FR, IT, ES, UK (England/Northern Ireland) — all countries scored statistically significantly below the EU average. [e]Countries are ranked according to the descending mean score of the 25-64 age group. [f]Data for the Russian Federation (RF) do not cover the Moscow municipal area.

Source: Survey of Adult Skills 2012 (PIAAC).

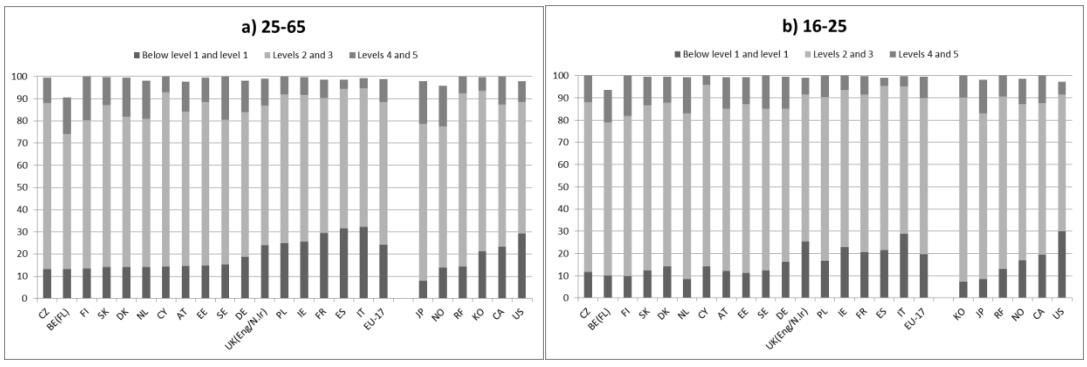
Chart A2: Mean problem-solving proficiency scores, by age group and group of countries



Notes: [a]Top- and bottom-ranking EU countries based on the mean score of 25-64 year olds being statistically significantly different from the EU average. [b]Top-ranking EU: FI, NL, SE. [c]EU average without FR, IT, ES, CY. [d]No average for big six EU countries because three (FR, ES, IT) are missing. [e]Bottom-ranking EU: IE, PL, EE. [f]Countries are ranked according to the descending mean score of the 25-64 age group. [f]Data for the Russian Federation (RF) do not cover the Moscow municipal area. [g]The EU-13 EU countries participating in the survey, except for Spain, France, Cyprus and Italy where module was not used.

Source: Survey of Adult Skills 2012 (PIAAC).

Chart A3: Percentage of population by proficiency levels in numeracy, for each age group and each country



Note: [a]Data presented according to the ascending proportion of 25-65 year olds at level 1 and below it. [b]The EU-17 average is weighted according to population. [c]Data for the Russian Federation (RF) do not cover the Moscow municipal area. [d]The difference to 100 % is literacy-related non-response.

Source: Survey of Adult Skills 2012 (PIAAC).

European Commission

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