

SURVEY OF ADULT SKILLS
FIRST RESULTS

GERMANY

Key issues

- **Adults in Germany show around average proficiency in literacy, numeracy and problem solving in technology-rich environments compared with adults in the other countries participating in the survey.**
- **As in most countries, a significant minority of Germans have very low proficiency in literacy and numeracy, and a large proportion of adults show poor proficiency in accessing, analysing and communicating information using common computer applications.**
- **Foreign-language immigrants in Germany have very low levels of literacy proficiency in the German language, even if their level of skill, relative to native-born, native-language Germans, is around the international average.**
- **The relationship between parents' educational attainment and literacy proficiency is one of the strongest observed among survey participants; however, that relationship weakens significantly once other individual characteristics are taken into account.**

The survey

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 Germany from August 2011 to March 2012.

A total of 5 465 adults aged 16-65 were surveyed.

Adults in Germany show around average proficiency in literacy, numeracy and problem solving in technology-rich environments compared with adults in the other countries participating in the survey.

Some 10.7% of adults in Germany (aged 16-65) attain the two highest levels of proficiency in literacy (Level 4 or 5) compared with the average of 11.8% of adults in all participating countries. At Level 4, 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). **Some 36.4% are proficient at Level 3 in literacy** compared to 38.2% of adults in all participating countries. Adults performing at this level can understand and respond appropriately to dense or lengthy texts, and can identify, interpret, or evaluate one or more pieces of information and make appropriate inferences using knowledge text structures and rhetorical devices.

Some 14.3% of adults in Germany attain Level 4 or 5 in numeracy compared with the average of 12.5% of adults across all participating countries. At Level 4, adults understand a broad range of mathematical information that may be complex, abstract or found in unfamiliar contexts. **Some 34.9% attain Level 3 proficiency in numeracy** compared to 34.4% of adults in all participating countries. 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.

Some 6.8% of adults are proficient at Level 3, the highest proficiency level, in problem solving in technology-rich environments (compared to an average of 5.8% of adults in all participating countries), while 29.2% attain proficiency Level 2 in problem solving (compared with the average of 28.2%). 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.

Young adults (aged 16-24) in Germany have higher proficiency than older adults in all three domains surveyed. Compared with their peers in other countries, Germany's young adults show average proficiency in literacy and slightly above-average proficiency in numeracy and problem solving.

In **literacy**, young adults in Germany show lower proficiency, on average, than young adults in Finland, Japan, Korea and the Netherlands, but greater proficiency than those in England/Northern Ireland (UK), Italy and Spain.

In **numeracy**, young adults in Germany show lower proficiency, on average, than their peers in Finland, Japan and the Netherlands, greater proficiency than their peers in England/Northern Ireland (UK), Ireland, Italy, Spain and the United States, and proficiency similar to that of young adults in the Czech Republic, the Slovak Republic and Sweden.

In **problem solving in technology-rich environments**, 54.2% of Germany's young adults attain Level 2 or 3 (compared with 50.7% of young adults across all participating countries). This proportion is 9.2 percentage points smaller than that in Korea (where young adults attain the highest scores in problem solving) and 16.6 percentage points larger than that in the United States (where young adults attain the lowest scores in problem solving).

As in most participating countries, relatively large proportions of the adult population in Germany have poor literacy, numeracy and problem-solving skills.

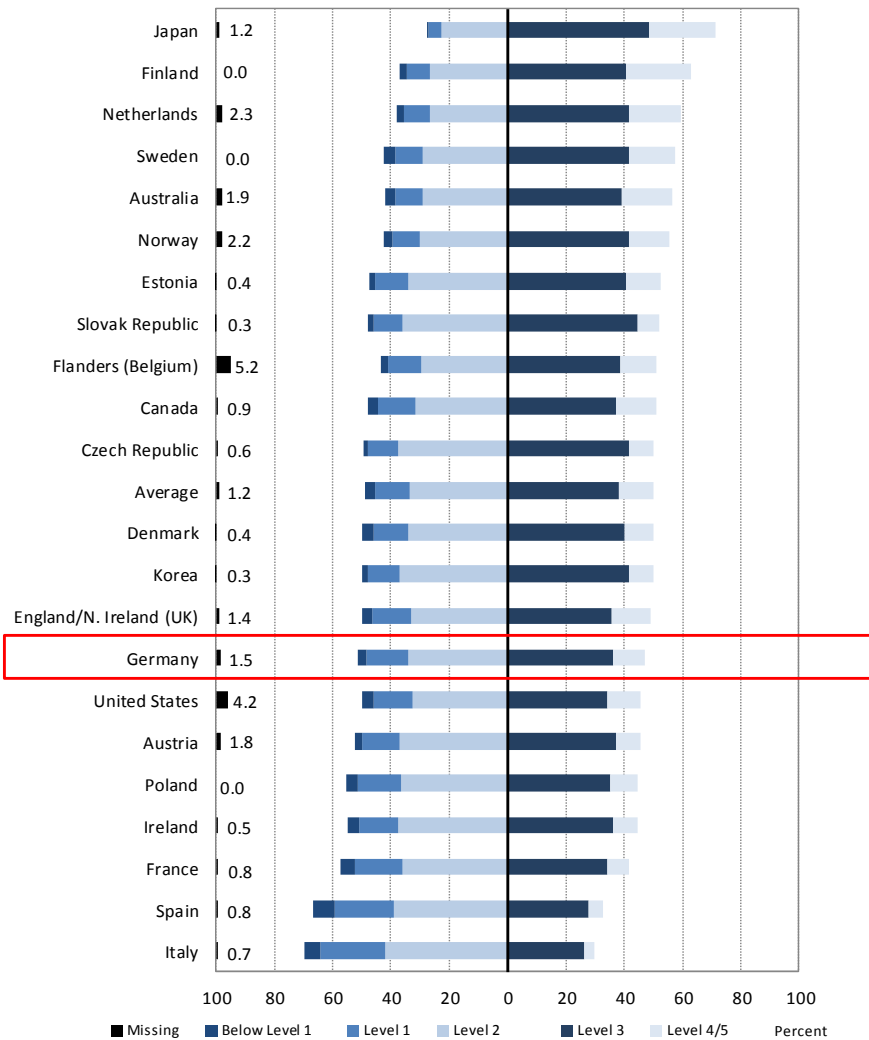
Some 17.5% of adults attain only Level 1 or below in literacy proficiency (compared with the average of 15.5%) and 18.4% attain Level 1 or below in numeracy (compared with the average 19.0%). At Level 1 in

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 11.6% of German adults (compared with 14.2% of adults in all participating countries) **indicated that they had no prior experience with computers or lacked very basic computer skills. The proportion of scoring at Level 1 or below in problem solving in technology-rich environments in Germany is 44.8%.** This is slightly above the average for and similar to the levels found in Denmark, England/Northern Ireland (UK), the Netherlands and the United States. At Level 1, adults can only use 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.

Literacy proficiency among adults

Percentage of adults scoring at each proficiency level in literacy



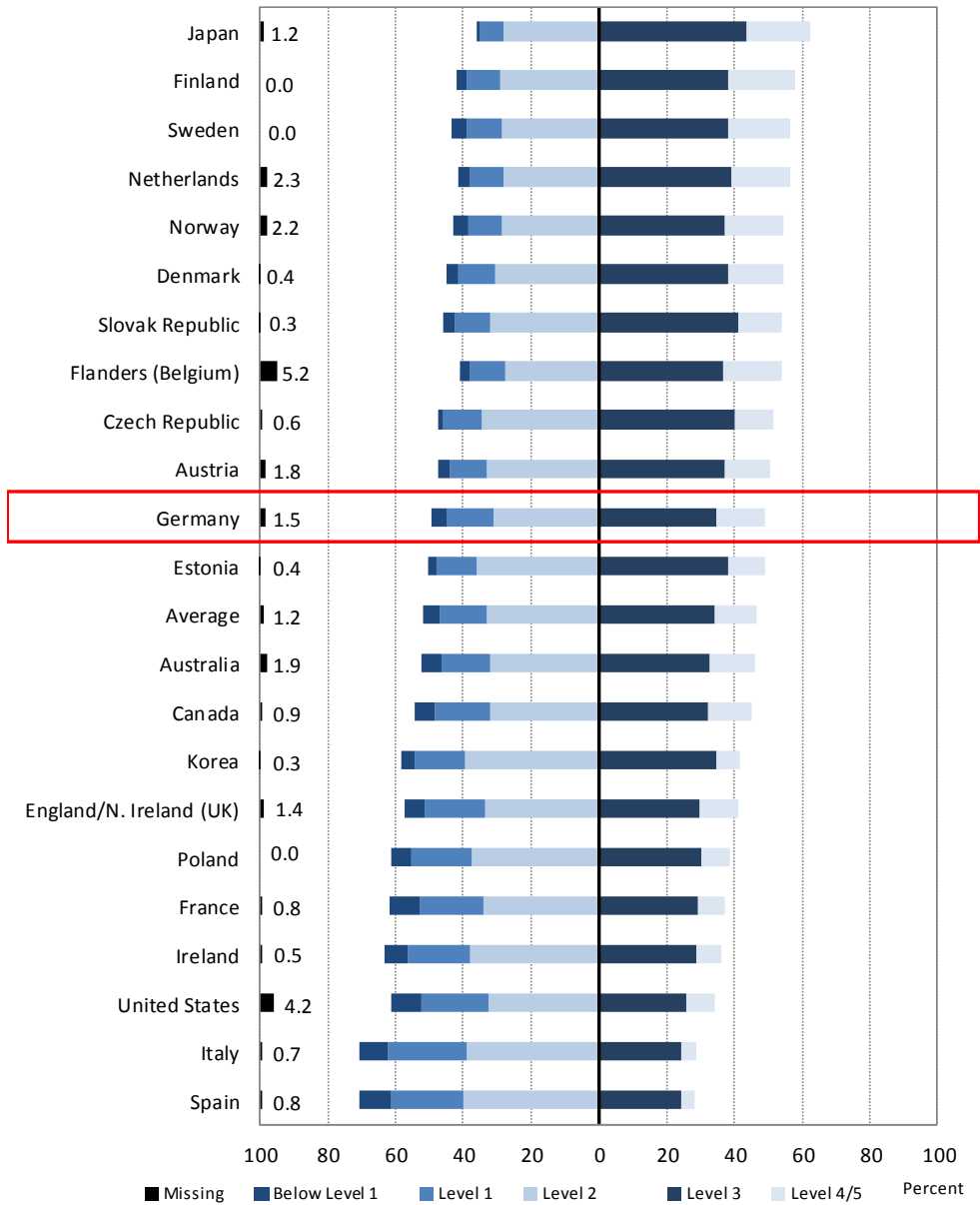
Countries are ranked in descending order of the combined percentage of adults scoring at Level 3 and Level 4/5

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).

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

Numeracy proficiency among adults

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



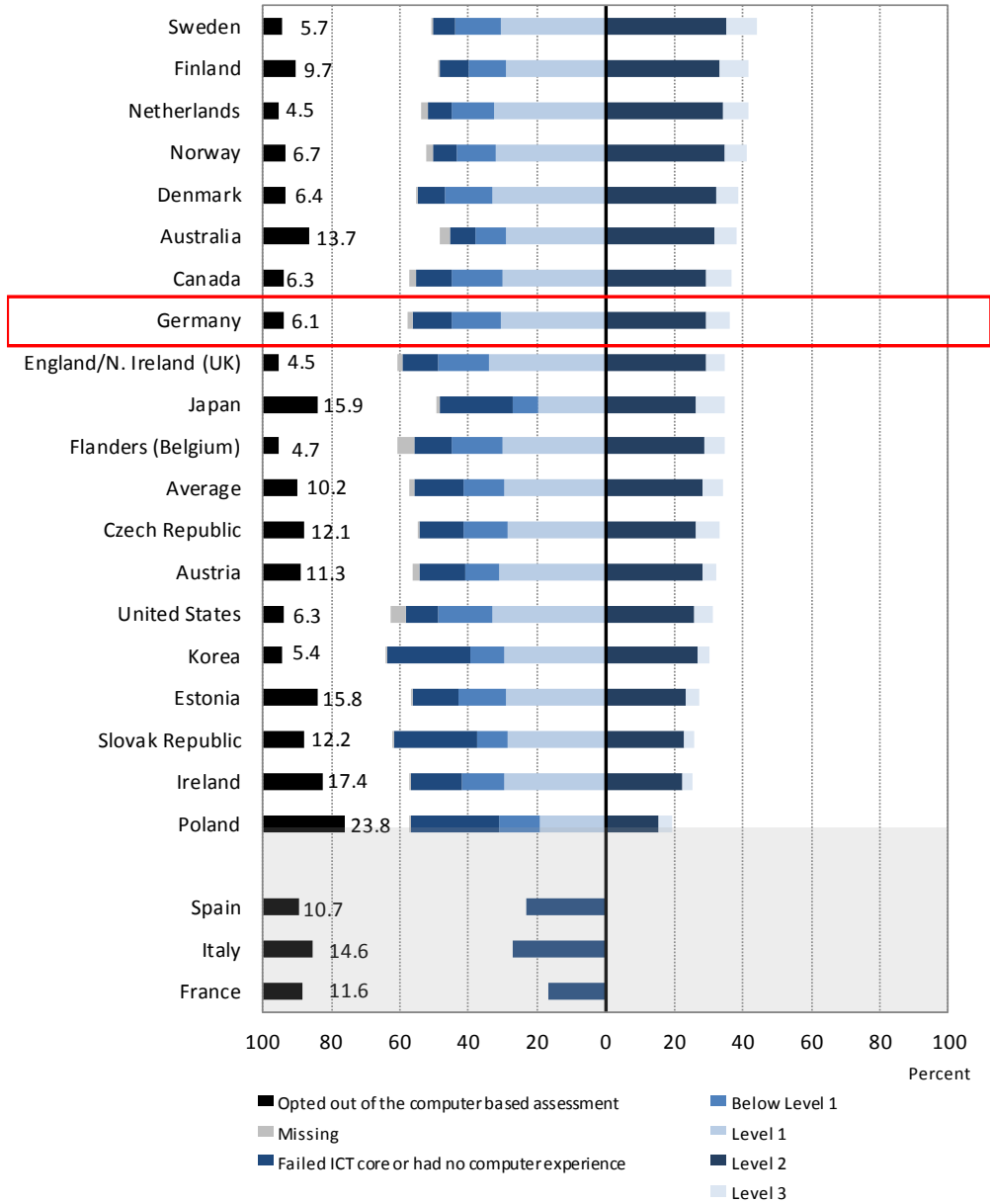
Countries are ranked in descending order of the combined percentage of adults scoring at Level 3 and Level 4/5

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).

Source: Survey of Adult Skills (PIAAC) (2012), Table A2.5

Proficiency in problem solving in technology-rich environments among adults

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



Countries are ranked in descending order of the combined percentage of adults scoring at Levels 2 and 3

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. France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment.

Source: Survey of Adult Skills (PIAAC) (2012), Table A2.10a

Foreign-language immigrants in Germany have very low levels of literacy proficiency in the German language, even if their level of skill, relative to native-born, native-language Germans, is around the international average.

As expected foreign language immigrants tend to have lower literacy skills than the native born who spoke the countries official language from birth in all countries. Both their overall level of proficiency and their proficiency relative to the native born will reflect the changing size and composition of immigrant intakes in the countries concerned over the post-war period as well as the impact of language and integration policies. Foreign-language immigrants in Germany are slightly less proficient in literacy than the average for this group. The difference in literacy proficiency between foreign-language immigrants and native-born Germans is 39 points, which is close to the average for all countries (37 points).

The relationship between most socio-demographic characteristics and proficiency is similar to that observed in other countries. The exceptions are age and gender.

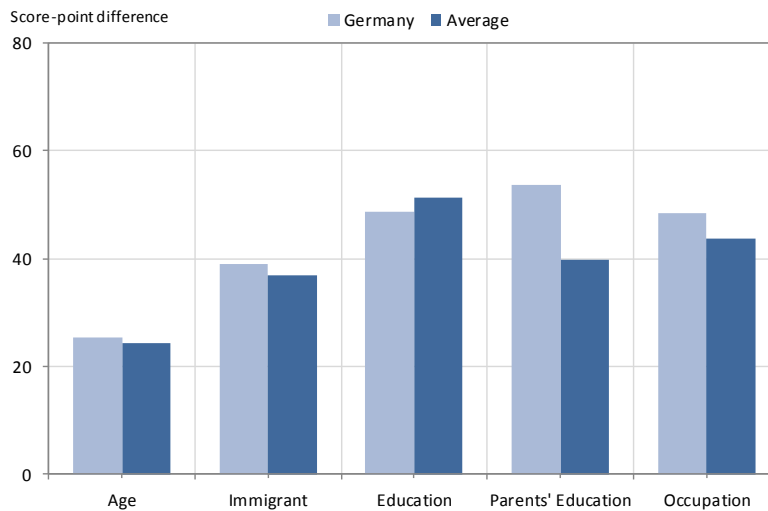
In most countries, including Germany, there are differences in skills proficiency related to socio-demographic characteristics, such as gender, age, level of education and social background. Differences related to age and gender are larger in Germany than in many other countries.

Across the countries in the survey, proficiency peaks among 25-34 year-olds while the proficiency of 55-64 year-olds is generally the lowest of all age groups. This is true in Germany too. While older Germans have only slightly lower proficiency than the average for their peers in other countries, the gap between the proficiency of the youngest and oldest age groups is among the largest observed when other factors such as educational attainment and immigrant status.

On average across countries, men have higher proficiency in numeracy than women. The difference in numeracy scores between men and women in Germany is 17.3 points, 5.6 points above the average of 11.7 points. In literacy, the score gap between men and women is much smaller than that in numeracy. Men score 5.1 points higher than women in Germany – 3.2 points more than the 1.9-point difference between men and women across OECD countries. The advantage in literacy proficiency among adults who have at least one parent who attained a tertiary education compared with adults whose parents did not attain an upper secondary education is one of the largest observed, second only to that observed in the United States. However, when other factors, such as age, the respondent's own educational attainment, and immigration status are taken into account, the impact of parents' educational attainment on literacy proficiency is only slightly above the average for all countries.

Synthesis of socio-demographic differences in literacy proficiency

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



Notes: The estimates show the differences between the two means for each contrast category). The differences are: 16-24 year-olds minus 55-65 year-olds (age), native born and native language minus foreign born and foreign language (immigrant), tertiary minus less than upper secondary (education), at least one parent attained tertiary minus neither parent attained upper secondary (parents' education) and skilled minus elementary occupations (occupation).

Source: Survey of Adult Skills (PIAAC) (2012), Table A3.2(L), Table A3.6(L), Table A3.9(L), Table A3.15(L) and Table A3.19(L).

Germany's 16-29 year-old graduates of upper secondary general programmes have substantially higher proficiency in literacy than young adults of the same age who graduated from vocational programmes.

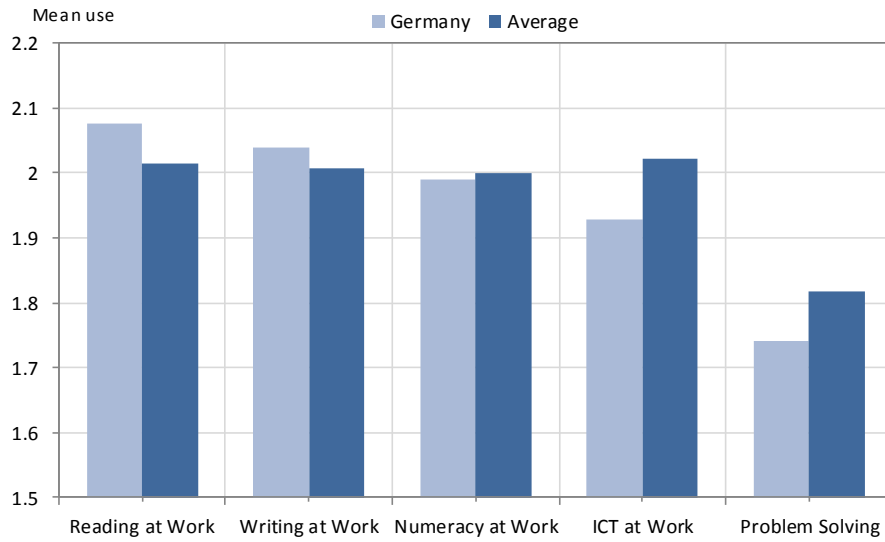
In most countries, young people with a highest level of attainment at upper secondary level who have completed general programmes have higher proficiency in literacy than those who have undertaken vocationally oriented programmes. This may be the result of large curricular differences between vocational and general programmes or the processes of selection into different programmes, including self-selection. In Germany, as in Australia, Austria, the Czech Republic, Denmark, Finland and the Netherlands, there is a particularly large advantage in literacy proficiency among 16-29 year-olds who graduated from general rather than vocational programmes at the upper secondary level. In Germany this reflects the relatively strong performance of graduates of general secondary programmes (which is among the highest observed in the survey) rather than poor performance among graduates of vocationally oriented programmes (which is slightly above the country average).

Information processing skills matter: having higher proficiency in literacy and numeracy has a positive effect on labour force participation and wages.

In all participating countries, there is a positive relationship between proficiency and labour force participation and employment. Individuals with higher levels of proficiency in literacy, numeracy and problem solving in technology-rich environments have greater chances of participating in the labour market and of being employed and less chances of being unemployed than individuals with lower levels of proficiency, on average.

Some 82.4% of German respondents scoring at Level 4/5 in literacy are employed, while only 62.7% of those scoring at or below Level 1 are. This difference is similar to that observed in the United States. Meanwhile, the rate of inactivity (15.8%) among Germany's highly proficient (Level 4/5) adults is slightly lower than the average (17.1%) among participating countries.

Average use of information-processing skills at work

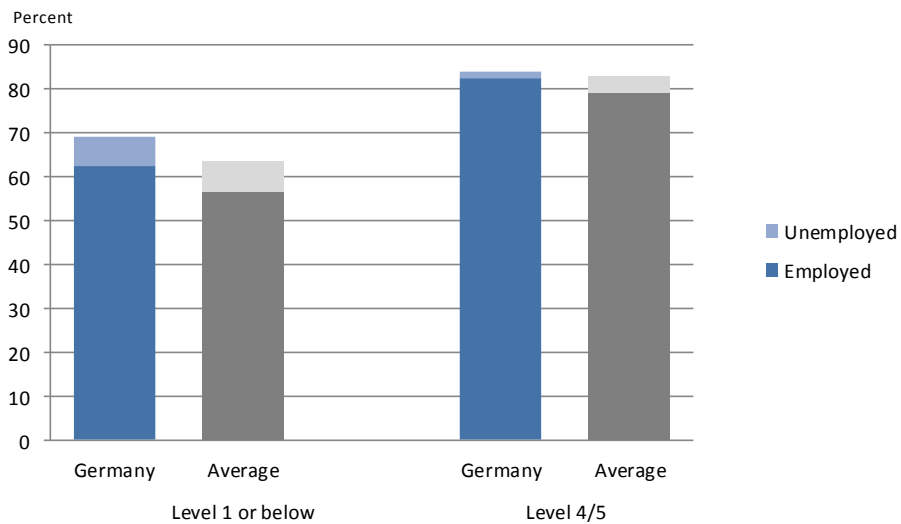


Notes: Skills use indicators are standardised to have a mean of 2 and a standard deviation of 1 across the entire survey sample.

Source: Survey of Adult Skills (PIAAC) (2012), Table A4.1.

Employment status, by literacy proficiency level

Percentage of adults in each labour market status

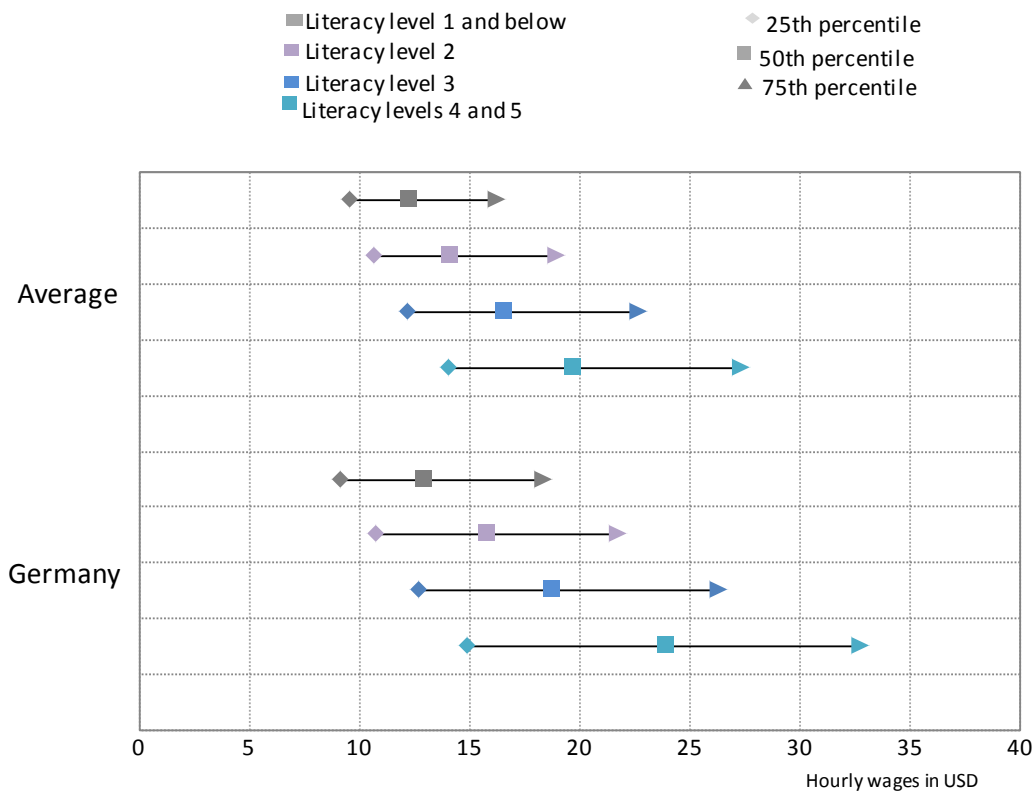


Source: Survey of Adults Skills (PIAAC) (2012), Table A6.3 (L)

Wages are also affected by proficiency in information-processing skills. **In Germany, the best-paid workers who score at Level 4/5 in literacy earn about USD 14.40 more per hour than the best-paid workers who score at or below Level 1.** However, there is slight overlap in the wage distributions at different levels of proficiency. For instance, in Germany, a median earner with Level 2 proficiency in literacy earns about the same as a low-paid worker with Level 4/5 proficiency. This is probably due to the large differences in wages earned by adults who score at Level 4/5, a situation also seen in Ireland and Korea.

Distribution of wages, by literacy proficiency level

25th, 50th and 75th percentiles of the wage distribution



Notes : Employees only. Hourly wages, including bonuses, in purchasing-power-parity-adjusted USD.

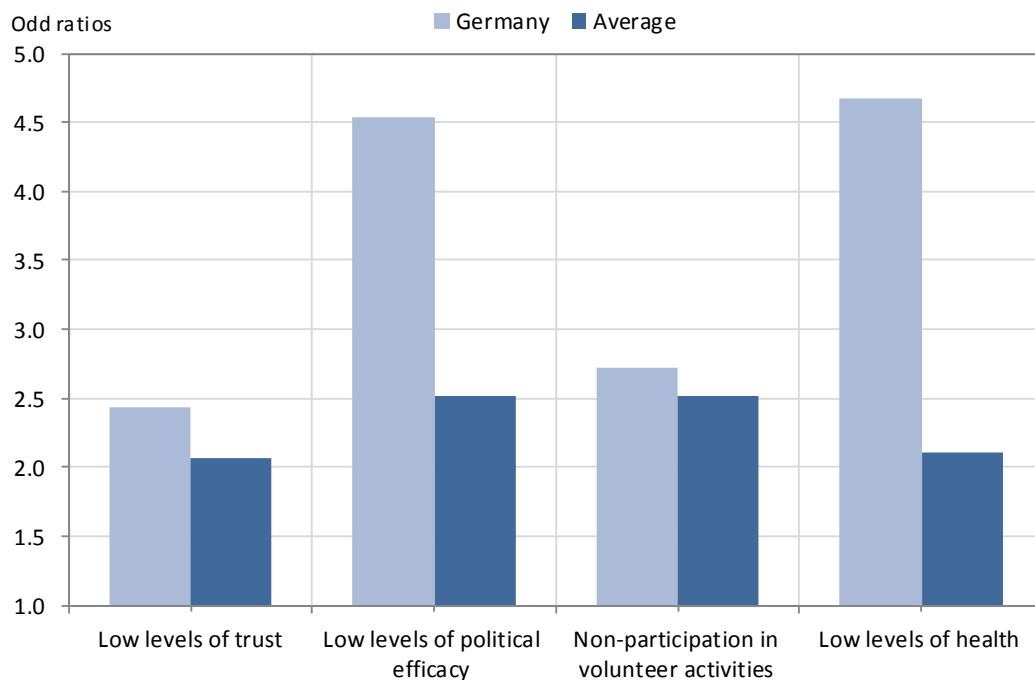
Source: Survey of Adults Skills (PIAAC) (2012), Table A6.4 (L).

The link between higher literacy and social outcomes, such as trust in others, belief that an individual can have an impact on the political process, participation in volunteer and associative activities, and better health is stronger in Germany than in most other countries.

In Germany, individuals proficient in literacy at or below Level 1 have much greater chances, relative to those of adults with Level 4/5 proficiency in literacy, of distrusting others, believing they have little impact on the political process, not participating in volunteer activities and reporting poor health. In the case of political efficacy and health, German adults scoring at or below Level 1 in literacy have nearly five times the chance of those with a high level of literacy of not participating in volunteer activities and reporting poor health.

Low literacy proficiency and negative social outcomes

Odds ratio showing the likelihood of adults scoring at or below Level 1 in literacy reporting low levels of trust and political efficacy, fair or poor health, or of not participating in volunteer activities (adjusted)



Notes: Reference group is adults scoring at level 4/5 in literacy.

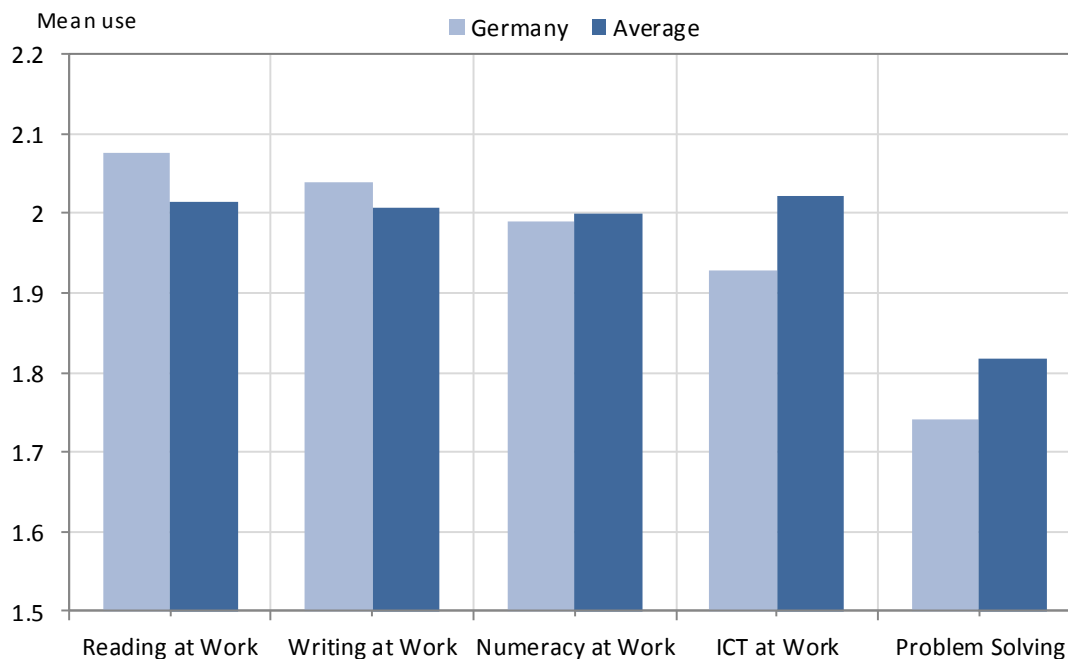
Source: Survey of Adult Skills (PIAAC) (2012), Table A6.9(L).

Germany has above an average incidence of over-skilling in literacy and numeracy, but the impact of this is unclear.

The Survey of Adult Skills collected information about the use of information-processing and other generic skills in the work-place. Linked with data about workers' proficiency in these skills, this information provides a picture of the match – or mismatch – between workers' skills and the tasks they are asked to perform in their jobs.

German workers read, write, work with mathematics, solve problems and use computers in their jobs at around the average level observed across OECD countries participating in the Survey of Adult Skills. The country has, at around 15%, one of the largest proportions of workers whose proficiency in literacy and numeracy is estimated to be above the maximum required by their job (over-skilling) and one of the smallest proportions of workers whose proficiency in literacy and numeracy is below the minimum required by their job (under-skilling) among all participating countries. This should not be interpreted as implying over-supply of these skills as there is no wage penalty associated with being over-skilled in literacy or numeracy compared to being well-matched to the requirements of the job in Germany, despite the large proportion of ostensibly over-skilled workers. There may, however be potential for work to be organised in ways which make more of the literacy and numeracy skills that workers have, for the benefit of the workers themselves and the economy as a whole.

Average use of information-processing skills at work



Notes: Skills use indicators are standardised to have a mean of 2 and a standard deviation of 1 across the entire survey sample.

Source: Survey of Adult Skills (PIAAC) (2012), Table A4.1.

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

- Around 166 000 adults aged 16-65 were surveyed in 24 countries and sub-national regions: 22 OECD member countries – Australia, Austria, Belgium (Flanders), Canada, the Czech Republic, Denmark, Estonia, Finland, France, Norway, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden, the United Kingdom (England and Northern Ireland), and the United States; and two partner countries – Cyprus** and the Russian Federation
- Data collection for the Survey of Adult Skills took place from 1 August 2011 to 31 March 2012 in most participating countries. In Canada, data collection took place from November 2011 to June 2012; and France collected data from September to November 2012.
- 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.

**A. 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”.

B. 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.

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.

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**For more information on the Survey of Adult Skills (PIAAC)
and to access the full *OECD Skills Outlook 2013* report, visit:**

<http://skills.oecd.org/skillsoutlook.html>

www.oecd.org/site/piaac

