

The OECD Survey of Adult Skills

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Introduction

A decade after the publication of results from the first round of PISA, its seminal assessment of the knowledge and skills of 15-year-olds, the OECD has conducted its first Survey of Adult Skills, which extends the assessment of skills to the entire adult population. The survey, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), focuses on skills similar to those assessed in PISA – literacy, numeracy and problem-solving – but the two studies use different assessment tasks, reflecting the different contexts in which 15-year-old students and older adults live. The surveys have complementary goals: PISA seeks to identify ways in which students can learn better, teachers can teach better, and schools can operate more effectively; the Survey of Adult Skills focuses on how adults develop their skills, how they use those skills, and what benefits they gain from using them. To this end, the Survey of Adult Skills collects information on how skills are used at home, in the workplace and in the community; how these skills are developed, maintained and lost over a lifetime; and how these skills are related to labour market participation, income, health, and social and political engagement. With this information, the Survey of Adult Skills can help policy makers to:

- examine the impact of reading, numeracy and problem-solving skills on a range of economic and social outcomes;
- assess the performance of education and training systems, workplace practices and social policies in developing the skills required by the labour market and by society, in general; and
- identify policy levers to reduce deficiencies in key competencies.

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 157 000 adults aged 16 to 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, 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; 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.
- Respondents with very low literacy skills bypassed the full literacy, numeracy and problem solving in technology-rich environment assessments and went directly to a test of basic “read-

ing component” skills instead. This test assessed vocabulary knowledge, the ability to process meaning at the level of the sentence, and to fluently read passages of text. The test had no time limit but the time taken by respondents to complete the tasks was recorded. The reading components assessment was also taken by all respondents taking the paper version of the assessment.

What the results show and what this means for policy

Skills transform lives and drive economies

Skills transform lives, generate prosperity and promote social inclusion. Without the right skills, people are kept at the margins of society, technological progress does not translate into economic growth, and enterprises and countries can’t compete in today’s globally connected and increasingly complex world. Getting the best returns on investment in skills requires good information about the skills that are needed and available in the labour market. It also requires policies that ensure that skills are used effectively to generate better jobs that lead to better lives. To support these goals, the OECD has begun to measure the skills of adult populations.

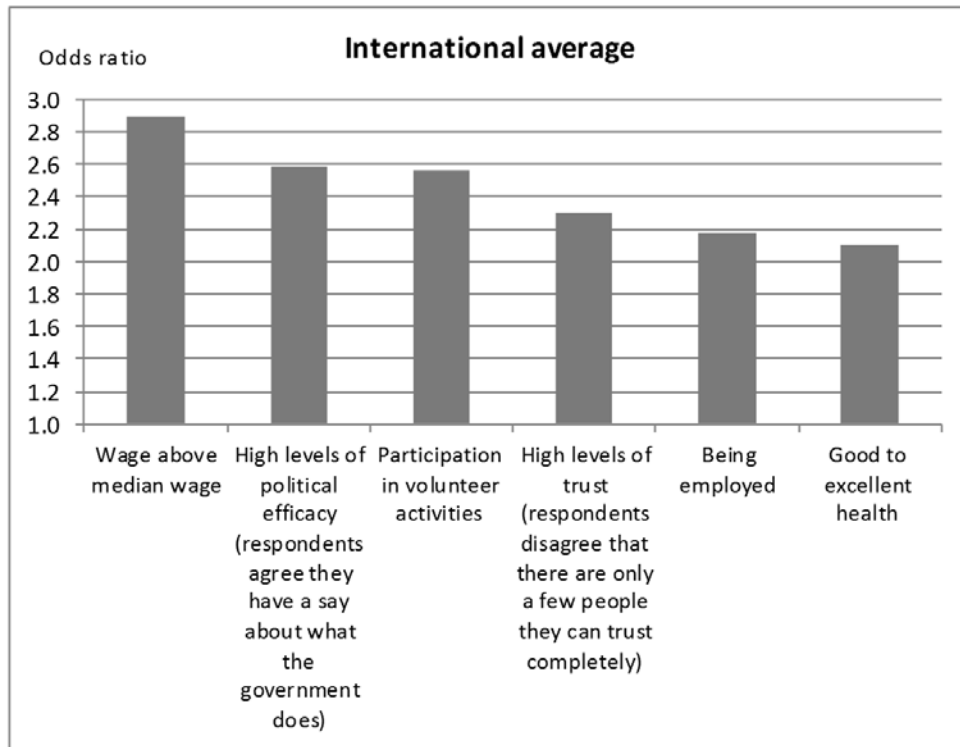
If there is one central message emerging from this new Survey of Adult Skills, it is that what people know and what they can do with what they know has a major impact on their life chances. For example, the median hourly wage of workers scoring at Level 4 or 5 in literacy – those who can make complex inferences and evaluate subtle truth claims or arguments in written texts – is more than 60% higher than for workers scoring at Level 1 or below – those who can, at best, read relatively short texts to locate a single piece of information that is identical to the information given in the question or directive or to understand basic vocabulary. Those with low literacy skills are also more than twice as likely to be unemployed. In Japan, however, the relationships between skills and economic outcomes is far less pronounced than in many other countries (see Figure 1).

As the demand for skills continues to shift towards more sophisticated tasks, as jobs increasingly involve analysing and communicating information, and as technology pervades all aspects of life, those individuals with poor literacy and numeracy skills are more likely to find themselves at risk. Poor proficiency in information-processing skills limits adults’ access to many basic services, to better-paying and more-rewarding jobs, and to the possibility of participating in further education and training, which is crucial for developing and maintaining skills over the working life and beyond.

Figure 1

Likelihood of positive social and economic outcomes among highly literate adults (2012)

Increased likelihood (odds ratio) of adults scoring at Level 4/5 in literacy on the OECD Survey of Adult Skills reporting high earnings, high levels of trust and political efficacy, good health, participating in volunteer activities and being employed, compared with adults scoring at or below Level 1 in literacy (adjusted)



Notes: Odds ratios are adjusted for age, gender, educational attainment and immigrant and language background. High wages are defined as workers' hourly earnings that are above the country's median.

Source: Based on data from the Survey of Adult Skills (PIAAC) 2012

Those relationships hold not just for individuals; they also apply to countries: per capita incomes are higher in countries with larger proportions of adults who reach the highest levels of literacy or numeracy proficiency and with smaller proportions of adults at the lowest levels of proficiency.

How literacy skills are distributed across a population also has significant implications on how economic and social outcomes are distributed within the society. The Skills Survey shows that higher levels of inequality in literacy and numeracy skills are associated with greater inequality in the distribution of income, whatever the causal nature of this relationship. If large proportions of adults have low reading and numeracy skills, introducing and disseminating productivity-improving technologies and work-organisation practices can be hampered; that, in turn, will stall improvements in living standards.

But the impact of skills goes far beyond earnings and employment. In all countries, individuals with lower proficiency in literacy are more likely than those with better literacy skills to report poor health, to

believe that they have little impact on political processes, and not to participate in associative or volunteer activities. In most countries, they are also less likely to trust others. For example, on average across countries, individuals who perform at Level 1 in literacy are twice as likely to report low levels of trust as individuals who score at Level 4 or 5, even after accounting for their education and social background. While the causal nature of these relationships is difficult to discern, these links clearly matter, because trust is the glue of modern societies and the foundation of economic behaviour. Without trust in governments, public institutions and well-regulated markets, public support for ambitious and innovative policies is difficult to mobilise, particularly where short-term sacrifices are involved and where long-term benefits are not evident. Lower trust can also lead to lower rates of compliance with rules and regulations and therefore lead to more stringent and bureaucratic regulations. Citizens and businesses may avoid taking risks, delaying decisions regarding investment, innovation and labour mobility that are essential to jump-start growth and regain competitiveness. Emphasising fairness and integrity in policy development and implementation, ensuring that policy making is more inclusive, and building real engagement with citizens all involve citizens' skills.

Taken together, these results underscore the crucial importance of information-processing skills in adults' participation in the labour market, education and training, and in social and civic life. These skills are also highly transferable and therefore relevant to many social contexts and work situations. Accessing, analysing and communicating information takes now place largely through the use of digital devices and applications, such as personal computers, smart phones and the Internet. The capacity to use these devices intelligently to manage information is thus becoming essential. That is why the Survey results are so important for addressing the policy challenges of developing skills, activating the supply of skills and putting skills to more effective use.

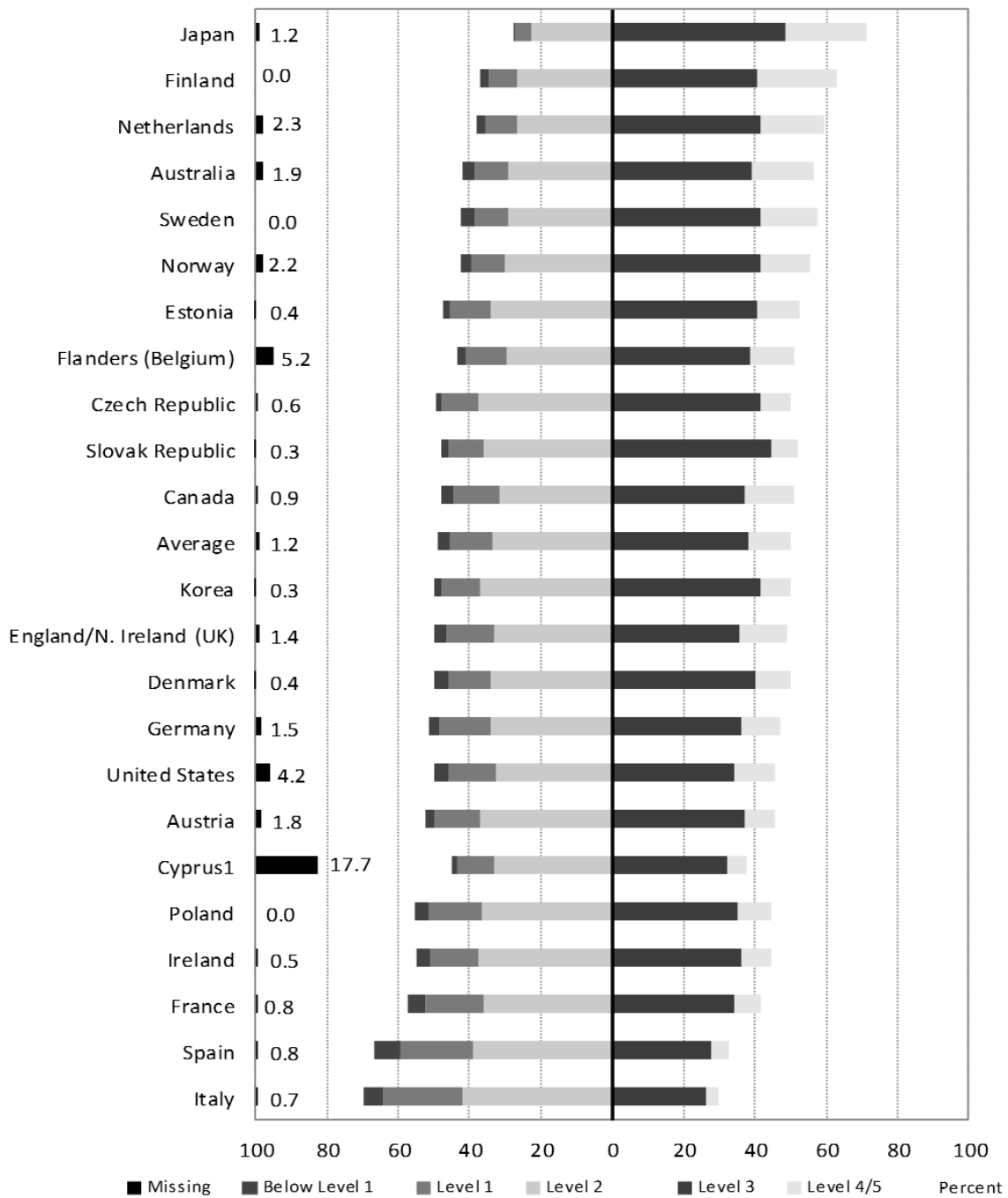
The level and distribution of skills differs markedly across countries

Perhaps most important in the context of public policy, the information-processing skills measured by the Skills Survey are “learnable”. That is, countries can shape the level and distribution of these skills in their populations through the quality and equity of learning opportunities both in formal educational institutions and in the workplace. Against this backdrop, it is striking how widely countries vary in how well their populations are prepared.

Roughly every fifth Japanese reads at high levels (Level 4 or 5 on the Skills Survey) (Figure 2). This means, for example, that they can perform multiple-step operations to integrate, interpret, or synthesise information from complex or lengthy texts that involve conditional and/or competing information; and they can make complex inferences and appropriately apply background knowledge as well as interpret or evaluate subtle truth claims or arguments. They are also good at numbers: they can analyse and engage in complex reasoning about quantities and data, statistics and chance, spatial relationships, change, proportions and formulae; perform tasks involving multiple steps and select appropriate problem-solving strategies and processes; and understand arguments and communicate well-reasoned explanations for answers or choices.

Figure 2
Literacy proficiency among adults

Percentage of adults scoring at each proficiency level in literacy



Countries are ranked in descending order of the mean score 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).

Source: Survey of Adult Skills (PIAAC) (2012), Tables A2.1 and A2.2a.

In contrast, in other countries large proportions of young people leave school with poor skills in literacy, numeracy and problem solving, and significant numbers of adults have low levels of proficiency in the

information-processing skills increasingly needed in the information societies of today. In Italy and Spain, for example, only one in 20 adults is proficient at the highest level of literacy (Level 4 or 5). More than one out of three adults in these countries perform at or below the lowest level of proficiency (Level 1) in both literacy and numeracy. These individuals can, at best, read relatively short texts to locate a single piece of information that is identical to the information given in the question or directive, understand basic vocabulary, determine the meaning of sentences, and read continuous texts with some degree of fluency. They can, at best, perform one-step or simple mathematical processes involving counting, sorting, basic arithmetic operations, understanding simple percentages, and locating and identifying elements of simple or common graphical or spatial representations.

However, even highly literate nations like Japan have significant liabilities in their talent pool. Indeed, a closer look at the results reveals that more than nine-tenths of the overall variation in literacy skills observed by the survey lies within, rather than between, countries. In fact, in all but one participating country, at least one in ten adults is proficient only at or below Level 1 in literacy or numeracy. In other words, significant numbers of adults do not possess the most basic information-processing skills considered necessary to succeed in today's world. Policy makers should be particularly concerned about low proficiency in literacy and numeracy among workers in elementary occupations, as it may hamper the introduction of changes in technologies and organisational structures that can improve productivity. Poor literacy and numeracy skills may also place workers at considerable risk in the event that they lose their jobs or have to assume new or different duties when new technologies, processes and forms of work organisation are introduced.

The Skills Survey also shows that, in most countries, significant shares of adults have trouble using digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks. Across participating countries, from 7% to 27% of adults report having no experience in using computers or lack the most elementary computer skills, such as the ability to use a mouse. In addition, there are also adults who lack confidence in their ability to use computers. Of the adults undertaking the problem-solving assessment, most are only capable of using familiar applications to solve problems that involve few steps and explicit criteria, such as sorting e-mails into pre-existing folders. While Japanese adults do well in both literacy and numeracy, they only perform at the average level when it comes to problem-solving in a digital environment.

Naturally, young adults are more likely than their older counterparts to have computer skills or to have higher proficiency in problem solving in technology-rich environments; yet in some countries, there are surprisingly small proportions of young adults who can solve more complex problems in computer environments. The Nordic countries and the Netherlands have been far more successful than other countries in creating an environment in which most adults have experience with computers and few have only the most basic computer skills.

Some countries have made significant progress in improving skills proficiency

The Skills Survey results show how effective countries have been in developing literacy skills through successive generations. The gains made in some countries illustrate the pace of progress that is achievable. For example, Korea is among the three lowest-performing countries when comparing the skills proficiency of 55-64-year-olds; however, when comparing proficiency among 16-25 year-olds, Korea ranks second only to Japan. Similarly, older Finns perform at around the average among the countries taking part in the Skills Survey while younger Finns are, together with young adults from Japan, Korea and the Netherlands, today's top performers.

However, progress has been highly uneven across countries. In England and the United States, improvements between younger and older generations are barely apparent. Young people in these countries are entering a much more demanding labour market, yet they are not much better prepared than those who are retiring. England is among the three highest-performing countries in literacy when comparing 55-64 year-olds; but England is among the bottom three countries when comparing literacy proficiency among 16-25 year-olds. In numeracy, the United States performs around the average when comparing the proficiency of 55-64 year-olds, but is lowest in numeracy among all participating countries when comparing proficiency among 16-25 year-olds. This is not necessarily because performance has declined in England or the United States, but because it has risen so much faster in so many other countries across successive generations.

Of course, the Survey data are results from a cross-section of populations, not cohorts, so some of the observed differences across generations are attributable to changes in the composition of populations, such as increased social diversity, income inequality or migration, or to different rates with which skills depreciate with age. At the same time, the fact that socio-economic patterns explain part of the observed changes is little consolation to countries whose economic success depends on the quality of their actual labour force, not the hypothetical labour force that they might have had in a different context. The implication for these countries is that the stock of skills available to them is bound to decline over the next decades unless action is taken both to improve skills proficiency among young people, both through better teaching of literacy and numeracy in school, and through providing more opportunities for adults to develop and maintain their skills as they age.

Key points for policy

Provide high-quality initial education and lifelong learning opportunities. The impressive progress that some countries have made in improving the skills of their population over successive generations shows what can be achieved. These countries have established systems that combine high-quality initial education with opportunities and incentives for the entire population to continue to develop proficiency in reading and numeracy skills, whether outside work or at the workplace, after initial education and training are completed.

Make lifelong learning opportunities accessible to all. While countries cannot change the past, policies

designed to provide high-quality lifelong opportunities for learning can help to ensure that the adults of the future maintain their skills. This requires a concerted engagement of all stakeholders. Governments, employers, employees, parents and students need to establish effective and equitable arrangements as to who pays for what, when and how. Since individuals with poor skills are unlikely to engage in education and training on their own initiative and tend to receive less employer-sponsored training, second-chance options can offer them a way out of the low-skills/low-income trap. The survey shows that some countries have been much better than others in establishing systems that combine high-quality initial education with opportunities and incentives for the entire population to continue to develop proficiency in reading and numeracy skills after the completion of initial education and training, whether outside work or at the workplace.

Make sure all children have a strong start in education. As PISA has shown, initial education can do much to ensure that all school-leavers, regardless of their background, have the skills and attitudes necessary to be successful in modern societies. Investing in high-quality early childhood education and initial schooling, particularly for children from socio-economically disadvantaged backgrounds, has proved to be an efficient strategy to ensure that all children start strong and become effective learners. Financial support targeted at disadvantaged students and schools can improve the development of skills.

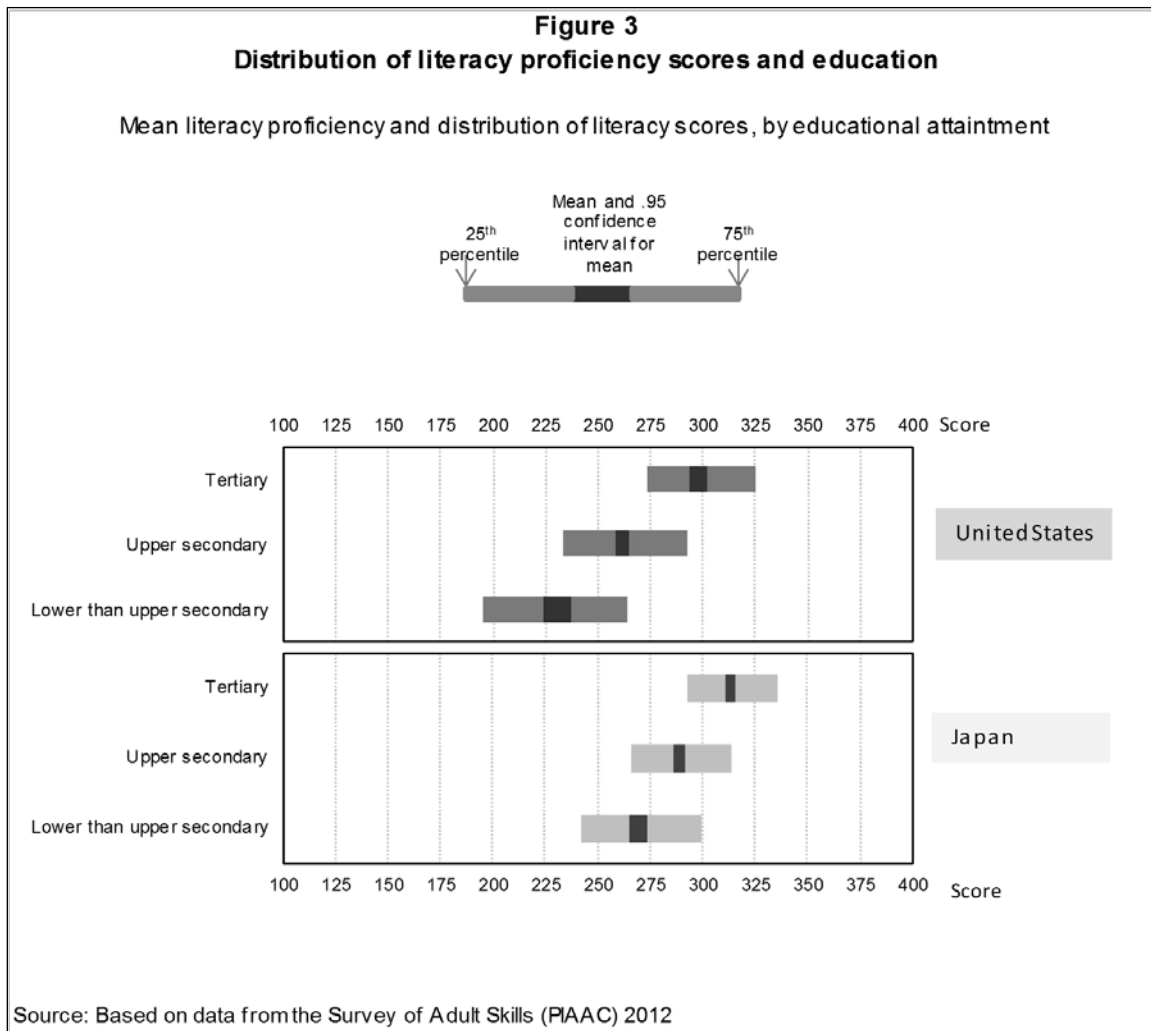
Formal education plays a key role in developing foundation skills

Formal education is one of the main mechanisms through which proficiency in literacy, numeracy and problem solving is developed and maintained. Indeed, reading, writing, literature and mathematics make up close to half of the school curricula across OECD countries. Also, adults who have completed tertiary education will have spent longer in education and received higher levels of instruction than their less-qualified peers. And typically, though not always, adults with higher qualifications generally have greater ability and motivation for study. Completing higher levels of education also often provides access to jobs that involve further learning and more information-processing tasks.

For all these reasons, it is not surprising, then, that the Skills Survey finds that educational attainment is positively related to proficiency. For example, adults with tertiary-level qualifications have an average 36 score-point lead on the literacy scale – the equivalent of about five years of formal schooling – over adults who have not completed secondary education, even after accounting for differences in their social background and age. This is close to the overall 46 score-point difference between the highest- and lowest-performing country in the survey. But the skills gap between adults with tertiary education and those who have not completed secondary education varies considerably: in the United States and Canada, for example, it is over a third wider than it is in Estonia, Italy, Norway, Australia, Japan, the Slovak Republic, Austria and Finland.

What is most surprising is the extent to which information-processing skills vary among individuals with similar qualifications, both within and across countries. While the Survey of Adult Skills only assesses

some components of the knowledge and skills certified by educational qualifications, proficiency in literacy, numeracy and problem solving represents outcomes that are expected to be developed through formal education. Irrespective of any other outcomes, across countries, the extent to which graduates with similar qualifications differ in their proficiency in information-processing skills is striking.



The Skills Survey shows that, in some countries, actual skills levels differ markedly from what data on formal qualifications suggest. For example, Italy, Spain and the United States rank much higher internationally in the proportion of 25-34 year-olds with tertiary attainment than they do in literacy or numeracy proficiency among the same age group. Even more striking is that Japanese and Dutch 25-34 year-olds who have only completed high school easily outperform Italian or Spanish university graduates of the same age. The performance gaps observed across countries cannot be explained by the proportion of the age group attending tertiary education. In Austria and Germany, a comparatively small share of 25-34 year-olds are tertiary graduates, but that age group performs around the average on the literacy scale, while Japan has a large share of tertiary graduates who do very well. The picture is similar, albeit less pronounced, among people with less formal education.

In virtually all countries, there is also significant overlap in the distribution of skills among individuals

with different levels of educational attainment (Figure 3). For example, significant shares of individuals with secondary education as their highest level of attainment outperform adults with a university degree.

People may have acquired new skills since they completed their formal education or lost some skills that they did not use. Indeed, the longer a person is out of formal education, the weaker the direct relationship between his or her formal education and proficiency, and the greater the role of other factors that may affect proficiency, such as the work or social environment. In other words, a 55-year-old's experience in formal education is likely to have less of a direct impact on his or her proficiency than that of a 26-year-old. The quality of education may also have changed considerably over the decades, even within the same country, so that individuals with ostensibly the same qualifications or level of attainment may have had very different experiences in education.

Still, the data from the Skills Survey raise questions about the relevance and quality of formal education in some countries, at least when these are compared internationally. This is important because the level and type of formal learning completed, and the qualifications earned, are indirectly related to individuals' proficiency in information-processing skills: they determine access to the jobs and further education and training that could help individuals maintain and develop their skills.

Success is increasingly about building skills beyond formal education

Beyond formal education, learning occurs in a range of other settings, including within the family, at the workplace and through self-directed individual activity. For skills to retain their value, they must be continuously developed throughout life. Lifelong learning opportunities are relevant for workers in both high-skilled and low-skilled occupations. In high-technology sectors, workers need to update their competences and keep pace with rapidly changing techniques. Workers in low-technology sectors and those performing low-skilled tasks must learn to be adaptable, since they are at higher risk of losing their job as routine tasks are increasingly performed by machines, and since companies may relocate to countries with lower labour costs.

The Skills Survey shows proficiency in literacy, numeracy and problem-solving skills to be closely related to age in all countries, reaching a peak at around age 30. While this survey simply compares different age groups at the same point in time, a longitudinal survey following Canadian students who participated in PISA in 2000 also showed significant gains being made in literacy and numeracy proficiency between the ages of 15 and 24, even for those without post-secondary education. But skills proficiency falls off steadily for those in their 30s and older.

And yet, while older adults generally have lower proficiency than their younger counterparts, the gap between generations varies considerably across countries. To some extent this may reflect differences in the quality of education, but it may also reflect the opportunities available to pursue further training or to engage in practices that help to maintain and develop proficiency over a lifetime.

Participation in adult education and training is now common in many countries, but the Skills Survey indicates major differences across countries. Countries showing higher levels of participation in organised adult learning activities also demonstrate higher literacy and numeracy skills. The large variation among countries at similar levels of economic development suggests major differences in learning cultures, learning opportunities at work, and adult-education structures.

The skills adults already have explain some of the differences in participation patterns. The survey results show a strong positive relationship between participation in adult education and skills proficiency. On average, an adult with Level 4 or Level 5 literacy proficiency is around three times more likely to participate in adult education than someone who is at or below Level 1. Participation in adult learning helps to develop and maintain literacy and numeracy skills, especially when the learning programmes require participants to read and write, and confront and solve new problems.

Yet, in most countries, adults with already-high levels of literacy and numeracy skills tend to participate the most, while those with lower levels of skills participate less – and often much less. In all countries except Norway, participation rates in job-related education and training are at least twice as high among adults who attained at least Level 4 in literacy than they are among those who attained at most Level 1. In Poland, Flanders (Belgium), Spain, Japan and Austria the odds are larger than three to one, and in Italy, the Slovak Republic and Korea, highly literate adults are between four and five times as likely to benefit from such training as people with poor literacy skills.

Higher levels of literacy and numeracy facilitate learning; therefore people with greater proficiency are more likely to have higher levels of education and be in jobs that demand ongoing training. They may also have the motivation and engagement with work that encourage individuals to learn and/or their employers to support them. All this can create a virtuous cycle for adults with high proficiency and a vicious cycle for those with low proficiency.

In contrast, low-skilled adults risk getting trapped in a situation in which they rarely benefit from adult learning, and their skills remain weak or deteriorate over time – which makes it even harder for these individuals to participate in learning activities. This presents a formidable policy challenge for countries such as Spain, the United States, Canada, Italy, Ireland and England/Northern Ireland (UK), where significant shares of adults are at or below Level 1 on the literacy and numeracy scales. Helping low-skilled adults to break this vicious cycle is a formidable challenge. Many countries offer subsidised adult literacy and numeracy programmes, designed to upgrade the skills of low-skilled adults. In addition, policies may aim specifically to increase the participation of low-skilled adults in adult learning, for example through targeted subsidies. Results from the Skills Survey suggest that Denmark, Finland, the Netherlands, Norway and Sweden have been most successful in extending opportunities for adult learning to those adults who score at or below Level 1.

Adults who engage more often in literacy- and numeracy-related activities and use ICTs more both at

and outside of work show higher proficiency in literacy, numeracy and problem solving. Notably, engagement in relevant activities outside of work has an even stronger relationship with the skills assessed than engagement in the corresponding activities at work. While reading often is likely to aid in developing and maintaining reading skills, having better reading skills is also likely to result in greater enjoyment of reading and, thus, in reading more frequently. Beyond instruction, the opportunity to engage in relevant practices is important both for developing proficiency and preventing its loss. Within the workplace, for example, redesigning work tasks to maximise engagement in activities that require the use of literacy, numeracy and ICT skills should be considered in conjunction with providing training.

Key points for policy

Develop links between the world of learning and the world of work. Skills development can be more relevant and effective if the world of learning and the world of work are linked. Learning in the workplace allows young people to develop “hard” skills on modern equipment, and “soft” skills, such as teamwork, communication and negotiation, through real-world experience. Hands-on workplace training can also help to motivate disengaged youth to stay in or re-engage with the education system and makes the transition from education into the labour market smoother.

Provide training for workers. Employers have an important role in training their own staff; but some, particularly small and medium-sized enterprises, might need public assistance to provide such training.

Ensure that the training is relevant. Employers and trade unions can also play an important role in shaping education and training, to make it relevant to the current needs of the labour market but also to ensure that workers’ broader employability is enhanced.

Allow workers to adapt their learning to their lives. Programmes to enhance adult information-processing skills need to be relevant to users and flexible enough, both in content and in how they are delivered (part-time, flexible hours, convenient location) to adapt to adults’ needs. Distance learning and the open educational resources approach have also allowed users to adapt their learning to their lives.

Identify those most at risk of poor skills proficiency. The most disadvantaged adults need to be not only offered, but also encouraged, to improve their proficiency. This means identifying low-skilled adults who require support, particularly foreign-language immigrants, older adults and those from disadvantaged backgrounds, and providing them with learning opportunities tailored to their needs. This is likely to require innovative approaches and significant community engagement.

Show how adults can benefit from better skills. More adults will be tempted to invest in education and training if the benefits of improving their skills are made apparent to them. For example, governments can provide better information about the economic benefits, including wages net of taxes, employment and productivity, and non-economic benefits, including self-esteem and increased social interaction, of adult learning.

Provide easy-to-find information about adult education activities. Less-educated individuals tend to be less aware of education and training opportunities, and may find the available information con-

fusing. A combination of easily searchable, up-to-date online information and personal guidance and counselling services to help individuals define their own training needs and identify the appropriate programmes has often made a real difference

Recognise and certify skills proficiency. Providing recognition and certification of competencies can facilitate and encourage adult learners to undertake continued education and training. Transparent standards, embedded in a framework of national qualifications, and reliable assessment procedures are important instruments to this end. Recognising prior learning can also reduce the time needed to obtain a certain qualification and, thus, the cost in foregone earnings.

Activating the supply of skills

Skills are only of value when they are used – whether in the labour market or in other, non-market settings, such as voluntary work, home production or even in leisure activities. Unused skills represent a waste of skills and of initial investment in those skills. As the demand for skills changes, unused skills can also become obsolete; and skills that are unused during inactivity are bound to atrophy over time. Conversely, the more individuals use their skills and engage in complex and demanding tasks, both at work and elsewhere, the more likely it is that skills decline due to ageing can be prevented. Some inactivity might be voluntary and temporary, such as that among young people who are still engaged in full-time education or skilled women who are caring for family members.

To the extent that workers' productivity is related to the knowledge and skills they possess, and that wages reflect such productivity, individuals with more skills should expect higher returns from labour market participation and would thus be more likely to participate. That is also what the results from the Skills Survey suggest, which show average literacy proficiency to be generally higher among employed adults than among unemployed and inactive individuals. Just over half of adults scoring at or below Level 1 in literacy proficiency are employed in contrast to four out of five adults scoring at Level 4 or 5. Employed adults tend also to have higher mean proficiency scores in literacy and numeracy than unemployed adults, who score higher, in turn, than those outside the labour force. But these overall results hide some striking variations across countries. Unemployed Japanese adults, for example, outperform employed individuals in every other country.

Some countries have been far more effective in activating their more highly skilled adults – those at proficiency Levels 4 and 5. In Norway around 9% of adults at proficiency Level 4 or 5 do not participate in the labour force; in Korea, 32% of adults who score at those levels do. In the Czech Republic, Italy, Japan, Poland and the Slovak Republic more than 20% of the most proficient adults are out of the labour force. This represents a relatively large pool of skills that could be activated. In many cases, the underuse of highly skilled workers is a reflection of the general under-use of labour.

The economic implications of this inactivity can be significant. For example, less than 5% of Italy's workforce attains Level 4 or 5 in literacy proficiency, and yet close to one in four Italian adults with

that level of proficiency does not participate in the labour market at all – and another 5% are unemployed. In contrast, the Netherlands not only has a more highly proficient workforce overall, it also does much better at activating its most highly skilled workers: only 11% of adults with that level of proficiency are outside the workforce.

Similarly, many adults who perform at Level 3 proficiency are also outside the labour force, although the proportions vary significantly across countries. In Japan and Ireland, for example, around one in four adults with Level 3 proficiency is outside the labour force, while in the United States, fewer than one in five adults at this proficiency level does not participate in the labour market.

The survey results show that low-skilled adults are less likely to participate in the labour force, although here, too, there are significant differences across countries. Two out of three Korean adults who score at or below Level 1 are employed, while in the Slovak Republic, only two in five adults with this level of proficiency are employed. These patterns may be affected by the extent of jobs available for those with very low skills; they may also reflect weak financial rewards for working, especially if interactions between the tax and benefit systems mean that low-skilled adults face high marginal effective tax rates.

The large shares of low-skilled adults outside the labour force present additional challenges to policy makers because these adults' lack of skills is likely to be closely linked to their prospects for employment. Indeed, on average 7% of those at or below Level 1 in literacy proficiency are unemployed, compared with less than 4% of those performing at Level 4 or 5. As noted above, employment is both a source of economic independence and an environment where skills can be maintained and developed. Yet lack of skills present a formidable obstacle to employment for these adults; tackling these skills deficits will be important to enhance their longer-term employment prospects and to expand the overall supply of skills.

Key points for policy

Provide high-quality early childhood education and care at reasonable cost. Ensuring the availability of high-quality early childhood education and care and after-school care at reasonable cost makes it easier for parents of young children to bring their skills to the labour market.

Encourage employers to hire those who temporarily withdrew from the labour force. Labour market arrangements and hiring practices that make it easy for those who have withdrawn from the labour force for a period of time to re-enter and put their skills to use will help countries to mobilise their untapped economic potential.

Encourage older workers to remain in the labour market. This may require re-examining the factors that lead these workers to withdraw, including the age of retirement, early-retirement policies, the interaction among financial incentives to remain or withdraw, as well as company practices in human-resource management. Lifelong learning and targeted training, especially in mid-career, can improve employability in later life and discourage early withdrawal from the labour market. A rise in

the pensionable age lengthens the period of time over which employers could recover training costs; hence, it is likely to prompt more employers and older employees to invest in training.

Create flexible working arrangements to accommodate workers with care obligations and disabilities. Inflexible working conditions can make it difficult for people with care obligations and individuals with disabilities to participate in the labour force. For people with disabilities, incentives to withdraw from the labour force largely depend on their access to full disability-benefit schemes.

Tax policies should encourage workers to make their skills available to the labour market. High marginal effective tax rates undermine the economic returns to supplying skills to the labour market. For parents of young children, the financial returns to work may be further undermined by the cost of childcare and after-school care.

Take stock of the skills held by unemployed adults. This can help public employment services to identify the most appropriate course of action for each job-seeker, particularly at the start of a period of unemployment.

Offer economic rewards for greater proficiency. Economic rewards for greater proficiency provide an incentive for investing in developing and maintaining skills. Greater proficiency in information-processing skills appears to be more generously rewarded in some countries than others, where wage-setting and other labour market arrangements may limit those incentives.

Continue to promote educational attainment. The skills measured in this survey only tell part of the story. Employers still rely on qualifications when deciding whom to hire because proficiency in information-processing skills is less transparent or because qualification play a large role in wage negotiations. However, over-reliance on qualifications and years of education may make it harder for those with higher proficiency, but who did not have the same access to education as others, to gain entry into jobs where those skills can be put to full use.

Putting skills to more effective use

All this being said, developing skills and making them available to the labour market will not translate into better social and economic outcomes if those skills are not used effectively on the job. The Skills Survey shows that people who not only have reading skills but also use them see higher output per hour worked, a standard indicator of labour productivity. In fact, differences in the average use of reading skills explain around 30% of the variation in labour productivity across countries. In other words, the way in which people use their skills at work is important in explaining differences in labour productivity. The positive link between labour productivity and reading at work remains strong even after adjusting for average proficiency scores in literacy and numeracy. Put simply, the way in which people use their skills at work is important in explaining differences in labour productivity.

Interestingly, skills-use indicators correlate weakly with measures of skills proficiency: the distributions of skills use among workers at different levels of proficiency overlap substantially. As a result, it is not uncommon that more proficient workers use their skills at work less intensively than less-proficient workers do. This is usually the result of significant mismatch between skills and how they are used at

work, particularly among some socio-demographic groups.

The results also show that under-use of qualifications is particularly common among young and foreign-born workers and those employed in small establishments, in part-time jobs or on fixed-term contracts. This has a significant impact on their wages, even after adjusting for proficiency, and on workers' productivity. The Skills Survey shows that mismatches in skills proficiency have a weaker impact on wages than qualifications mismatch. This can either be because labour market mismatch is more often related to job-specific or generic skills than to the literacy, numeracy and problem-solving skills measured by the Skills Survey, and/or because employers succeed in identifying their employees' real skills, irrespective of their formal qualifications, and adapt job content accordingly.

Requirements regarding skills and qualifications are never fixed. The task content of jobs changes over time in response to technological and organisational change, the demands of customers, and in response to the evolution of the supply of labour. Young people leaving education and people moving from unemployment into employment, for example, may take jobs that do not necessarily fully match their qualifications and skills. Thus, for a number of reasons, some workers are likely to be employed in jobs that do not fully use their qualifications; others may be in jobs, at least temporarily, for which they lack adequate qualifications. Skills mismatch on the job can also be a temporary phenomenon. Sometimes, for example, the demand for skills takes time to adjust to the fact that there is a larger pool of highly skilled workers available. Thus, not all types of skills mismatch are bad for the economy.

Mismatch on the job, where it adversely affects economic and social outcomes, can be tackled in various ways. In the case of under-skilling, public policies can help to identify workers with low levels of information-processing skills and offer incentives to both employees and employers to invest in skills development to meet the requirements of the job. When the skills available aren't adequately used, better management practices can make a difference. For example, employers can grant workers some autonomy to develop their own working methods so that they use their skills effectively. As workers assume more responsibility for identifying and tackling problems, they are also more likely to "learn by doing", which, in turn, can spark innovation. Trade unions can also play an important role in improving the match between skills demand and supply.

Under-skilling, under-use of skills, and unemployment can also arise simply because of a lack of information and transparency in skills systems. The under-use of skills is often related to field-of-study mismatch, whereby individuals work in an area that is unrelated to their field of study and in which their qualifications are not fully valued. Under-skilling could be the result of skills shortages that force employers to hire workers who are not the best fit for the jobs on offer.

Another reason why the skills shortages frequently reported by employers can co-exist with high unemployment is that people with the relevant skills are not in same geographical location as the jobs that require those skills. Reducing costs and other barriers associated with internal mobility helps employees to

find suitable jobs and helps employers to find suitable workers. Importing skills from outside a country without first considering the potential for skills supply through internal mobility can have adverse consequences for overall employment and skills use in the country.

A perfect match between available skills and job tasks is not always a positive situation: people can be matched with their jobs, but at a very low level. Such low-skills equilibria can adversely affect the economic development of a local economy or region, or indeed an entire country. To tackle such a situation, policies can “shape” demand, rather than merely respond to it. Government programmes can influence both employer-competitiveness strategies (how a company organises its work to gain competitive advantage in the markets in which it is operating) and product-market strategies, which determine in what markets the company competes. As companies move into higher value-added product and service markets, the levels of skills that they require, and the extent to which they use these skills, tend to increase. By fostering competition in the market for goods and services, policy makers can promote productive economic activities that contribute to stronger economic growth and the creation of more productive and rewarding jobs. While such policies primarily fall into the realm of economic-development actors, educational institutions focusing on new technologies and innovation can also be involved in developing the skills that will shape the economies of the future.

Key points for policy

Collect timely information about demand for and supply of skills. Better information and greater transparency about skills demand and supply across economies is essential for addressing skills mismatch.

Create flexible labour market arrangements. Labour market arrangements, including employment protection, can facilitate or hinder the effective use of skills and address skill mismatches. These can have a particularly pernicious effect on young people making the transition into the labour market as well as others, such as displaced workers or those seeking to re-enter the workforce. They may also discourage workers from moving from one job to another that would offer them a better skills match but also expose them to greater risk.

Provide quality career guidance. Competent personnel who have the latest labour market information at their fingertips can steer individuals to the learning programmes that would be best for their prospective careers. Public employment services can also play a crucial role in facilitating skill matching especially at local levels working closely with local employers as well as education and training providers. Ensure that qualifications are coherent and easy to interpret. In order to match prospective employees to a job, employers need to be able to identify a candidate’s skills. Qualifications should thus not only be clear, but consistently awarded. Continuous certification that incorporates non-formal and informal learning over the working life is also essential, as is recognition of foreign diplomas. One of the biggest obstacles immigrants face when looking for work is that their qualifications and foreign work experience may not be fully recognised in the host country. As a result, many immigrant workers hold jobs for which they are over-qualified.

Conclusions

Since it is costly to develop a population's skills, countries need to prioritise investment of scarce resources and design skills policies such that investments reap the greatest economic and social benefits. In doing so, they need to weigh short- and long-term considerations. Effective skills policies need to respond to structural and cyclical challenges, such as rising unemployment when economies contract or acute skills shortages when sectors boom, but also support longer-term strategic planning for the skills that are needed to foster a competitive edge and support required structural changes.

In periods of depressed economic conditions and when public budgets are tight, governments tend to cut investments in human capital first. But cutting investment in skills at such times may be short-sighted, as a skilled workforce will play a crucial role in generating future jobs and growth. If cuts to public spending have to be made, they should be based on the long-term cost/benefit ratios of alternative public investments. On these grounds, there is a strong case to be made for maintaining public investment in skills and in using them effectively.

The results from the Skills Survey also underline the need to move from a reliance on initial education towards fostering lifelong, skills-oriented learning. Seeing skills as a tool to be honed over an individual's lifetime will also help countries to better balance the allocation of resources to maximise economic and social outcomes. In turn, if skills are to be developed over a lifetime, then a broad range of policy fields are implicated, including education, science and technology, employment, economic development, migration and public finance. Aligning policies among these diverse fields will be key for policy makers to identify policy trade-offs that may be required and to avoid duplication of efforts and ensure efficiency. Similarly, with major geographical variations in the supply of and the demand for skills within countries, there is a strong rationale for considering skills policies at the local level to align national aspirations with local needs.

All this said, skills are only of value when they are used – whether in the labour market or in other, non-market settings, such as voluntary work, home production or even in leisure activities. Unused skills represent a waste of skills and of initial investment in those skills. Conversely, the more individuals use their skills and engage in complex and demanding tasks, both at work and elsewhere, the more likely it is that skills decline due to ageing can be prevented. While Japanese adults show the highest performance in literacy and numeracy, the effective use of talent is Japan's greatest challenge. The data from the Survey of Adult Skills show that many highly skilled Japanese adults are not in employment, and if they are, their skills are often not well matched against the skills required at their job. Unemployed Japanese women, for example, are more highly skilled than employed women in virtually every other country. Ensuring a better match between the skills acquired in education and on the job and those required in the labour market is essential if countries want to make the most of their talent. A mismatch between the two has potentially significant economic implications. At the individual level, the under-use of skills in specific jobs in the short to medium term may lead to skills loss. Japanese workers whose skills are under-used in their current jobs earn less than similarly-skilled workers who are well-matched to their jobs.

This situation tends to generate more employee turnover, which is likely to affect a firm's productivity. Under-skilling is also likely to affect productivity and, as with skills shortages, slow the rate at which more efficient technologies and approaches to work are adopted. By implication, it increases unemployment and reduces GDP growth at the macro-economic level. The fact that employers in some countries report skills shortages during times of high unemployment indicates that a population's stock of skills – and the investment made to develop those skills – may be partly going to waste.

Effective skills policies are everybody's business, and countries need to address the tough question of who should pay for what, when and how, particularly for learning beyond school. Employers can do a lot more to create a climate that supports learning, and invest in learning; some individuals can shoulder more of the financial burden; and governments can do a lot to design more rigorous standards, provide financial incentives, and create a safety net so that all people have access to high-quality education and training. Designing effective skills policies requires more than co-ordinating different sectors of public administration and aligning different levels of government. A broad range of non-governmental actors, including employers, professional and industry associations and chambers of commerce, trade unions, education and training institutions and, of course, individuals must also be involved.