Chapter 6

Sharing the benefits of universal basic skills

This chapter discusses how the benefits of universal basic skills can be distributed across societies and can narrow gaps in earnings that feed into income disparities. It also considers the question of whether to support the lowest achievers and/or cultivate the highest achievers.

Inclusive growth has two components. Most broadly, it requires that all the countries of the world be in a position to reap the economic rewards from growth. This issue has been the focus of this report. But it also requires that the benefits of growth are shared among all citizens of each country. This latter distributional issue is also directly addressed by the development goal of universal basic skills because, as framed, the goal involves preparing all youth for participation in the global economy. Key distributional issues raised by this component – about how changing the skills distribution affects the income distribution, and about whether to focus on the basic-skills or the high-skills part of the skill distribution – are discussed below.

Variations in skills and in income

In any country, the observed income distribution is a function of many factors. The character of the labour market, the taxes levied by the government, the nature of any welfare and social security programmes, and the returns to investments all enter into the distribution of income. But in a modern competitive economy, a fundamental factor in determining incomes is the productivity of individuals that is rewarded in the labour market. Analysing the full distribution of income in the various economies of the world is clearly beyond the scope and intent of this report; but a look at how the distribution of productivity and individual earnings might change with achievement of universal basic skills is relevant, and can be undertaken using available data on skills distribution.

Simply put, the distribution of skills is an important ingredient in the distribution of productivity in modern economies, and in competitive economies the distribution of productivity directly affects the earnings of workers. The distribution of labour earnings, in turn, enters significantly into the distribution of income in society. Clearly the earnings distribution would change if all members of society had basic skills; but estimating this change is not possible for countries where the skills of significant shares of the population are not measured because their productivity and earnings are not known. Therefore, the estimation here is restricted to countries with a secondary school enrolment rate of 98% or more. For these countries, changes in the skills distribution brought about by universal basic skills are considered.

The most direct way to see these changes comes from information about the rewards to skills in the labour market. Information on labour market earnings is directly available for a number of OECD economies. Under the Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), the OECD sampled a random selection of adults in 24 countries in 2011-12 and gave them a series of tests covering cognitive skills in three domains: literacy, numeracy and problem solving in technology-rich environments. The tasks to be solved were often framed as real-world problems, such as maintaining a driver's logbook (numeracy domain) or reserving a meeting room on a particular date using a reservation system (problem-solving domain). The domains, described more completely in *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, refer to key information-processing competencies that are demanded in modern economies.

Using the Survey of Adult Skills, it is possible to estimate how different skills affect individual earnings in different countries. It turns out that the return to skills varies considerably across countries.[1] The largest return to skills is found in the United States, and the analysis relies on estimates of the U.S. returns to indicate the impact of the improvements in skills discussed. This choice reflects the fact that the United States – with what is regarded generally as the least-distorted product and labour markets – is useful in identifying most clearly how individual skills affect productivity and potential earnings in the labour market.

The U.S. labour market data indicate that one standard deviation of mathematics achievement yields 28% higher earnings each year of a career, on average.[2] In other words, somebody at the 84th percentile of the mathematics distribution would earn 28% more than an average person (i.e. somebody at the 50th percentile) over their working lives. Similarly – and importantly for this analysis – somebody at the 16th percentile of the mathematics distribution would earn 28% less than an average person.

To see the changes that arise from attaining universal basic skills in terms of earnings, one can estimate the achievement-induced changes in the earnings distribution. The increase in average earnings from attaining a baseline level of skills amounts to some 4.2% across the 28 countries with universal enrolment in secondary schools.[3] This increase is accompanied by a 5.2% average reduction in the achievement-induced part of the standard deviation of earnings.[4] There is, however, considerable variation across countries: change is smallest in Estonia and Korea, and largest in Qatar and Tunisia.

This analysis points to a significant fact for inclusive development: achieving the development goal of universal basic skills has a complementary impact on reducing gaps in earnings that filter into income differences. But it has this impact while also expanding the size of the economy, and thus differs from simple tax and redistribution schemes that might change income distribution but would not add to societal output. Thus, policies to improve knowledge capital will also promote inclusion and a more equitable income distribution.

Basic skills for all and/or cultivating top achievers

One aspect of the previous calculations is artificial. It considers policies that affect only those youth who would otherwise not attain basic skills. The policies are analysed as if all others were unaffected, and this surely is an improbable outcome. Any school policy that improves the performance of the lowest achievers will likely improve the performance of some higher achievers as well. In this regard, then, the policy scenarios would represent lower bounds on the achievement and economic impacts of policies designed to ensure that all youth acquire at least basic skills (that is, at least 420 points on the Programme for International Student Assessment [PISA] proficiency scale).

A second aspect of the wider performance distribution also deserves attention. Many countries are torn between providing basic skills and cultivating the very highest achievers. Looking at the distribution of achievement within countries suggests that different countries make different choices about where to focus the attention of their education systems.[5]

Earlier research (Hanushek and Woessmann, 2015) compares economic growth under two scenarios: greater proportions of superior achievers and universal basic skills. Instead of relying on just mean skills, that analysis incorporates the share of top achievers (those who score above 600 points) and the share of bottom achievers (those who score less than 400 points) into the growth modeling. It turns out that at both ends of the distribution, a nation's cognitive skills are significantly related to economic growth, and this is true whether the two extremes are treated individually or jointly.[6] Both the basic-skill and the top-performing dimensions of education performance appear important for growth.

The impact of the basic-skills share does not vary significantly with the initial level of development, but the impact of the top-performing share is significantly larger in countries that have more scope to catch up to the most productive countries.[7] This difference appears to reflect the importance of high-skilled human capital in imitation strategies: the process of economic convergence is accelerated in countries with larger shares of high-performing students. Obvious cases are East Asian countries, such as Chinese Taipei, Singapore and Korea, all of which have particularly large shares of high performers, started from relatively low levels, and have shown outstanding growth. The interaction of the top-performing and basic-literacy shares in growth models appears to produce a complementarity between basic skills and top-level skills. In order to be able to implement the imitation and innovation strategies developed by the most-skilled workers, countries need a workforce with at least basic skills.

Many countries have focused on either promoting basic skills or producing engineers, scientists and other highly skilled workers. In terms of growth, the estimates described above suggest that these two efforts reinforce each other. Moreover, achieving basic literacy for all may well be a precondition for identifying those who can achieve at the highest levels. In other words, tournaments among a large pool of students with basic skills may be an efficient way to produce a large share of high performers.

Improving in PISA: Turkey

When it first participated in PISA, in 2003, Turkey was among the lowest-performing OECD countries in mathematics, reading and science. Yet Turkey's performance in all three domains has improved markedly since then, at an average yearly rate of 3.2, 4.1 and 6.4 points per year, respectively. In 2003, for example, the average 15-year-old student in Turkey scored 423 points in mathematics. With an average annual increase of 3.2 points, the average score in mathematics in 2012 was 448 points – an improvement over 2003 scores that is the equivalent of more than half a year of schooling. Much of this improvement was concentrated among students with the greatest educational needs. The mathematics scores of Turkey's lowest-achieving students (the 10th percentile) improved from 300 to 338 points between 2003 and 2012, with no significant change among the highest-achieving students during the period. Consistent with this trend, the share of students who perform below proficiency Level 2 in mathematics shrank from 52% in 2003 to 42% in 2012. Between-school differences in average mathematics performance did not change between 2003 and 2012, but differences in performance among students within schools narrowed during that time, meaning that much of the improvement in mathematics performance observed between 2003 and 2012 is the result of low-performing students across all schools improving their performance (Table II.2.1b).

The observed improvement in mathematics was concentrated among socio-economically disadvantaged and low-achieving students. Between 2003 and 2012, both the average difference in performance between advantaged and disadvantaged students and the degree to which students' socio-economic status predicts their performance shrank. In 2003, advantaged students outperformed disadvantaged students by almost 100 score points; in 2012, the difference was around 60 score points. In 2003, 28% of the variation in students' scores (around the OECD average) was explained by students' socio-economic status; by 2012, 15% of the variation (below the OECD average) was explained by students' socio-economic status. While all students, on average, improved their scores no matter where their schools were located, students attending schools in towns (population of 3 000 to 100 000) improved their mathematics scores by 59 points between 2003 and 2012 – more than the increase observed among students in cities or large cities (population greater than 100 000; no change in performance detected).

Turkey has a highly centralised school system: education policy is set centrally at the Ministry of National Education and schools have comparatively little autonomy. Education policy is guided by a two-year Strategic Plan and a four-year Development Plan. The Basic Education Programme (BEP), launched in 1998, sought to expand primary education, improve the quality of education and overall student outcomes, narrow the gender gap in performance, align performance indicators with those of the European Union, develop school libraries, ensure that qualified teachers were employed, integrate information and communication technologies into the education system, and create local learning centres, based in schools, that are open to everyone (OECD, 2007). The Master Implementation Plan (2001-05), designed in collaboration with UNICEF, and the Secondary Project (2006-11), in collaboration with the World Bank, included multiple projects to improve both equity and quality in the education system. The Standards for Primary Education, piloted in 2010 and recently expanded to all primary institutions, defines quality standards for primary education, guides schools in achieving these standards, develops a system of school self assessments, and guides local and central authorities in addressing inequalities among schools.

Compulsory education law

One of the major changes introduced with the BEP programme involved the compulsory education law. This change was first implemented in the 1997/98 school year, and in 2003 the first students graduated from the eight-year compulsory education system. Since the launch of this programme, the attendance rate among primary students increased from around 85% to nearly 100%, while the attendance rate in pre-primary programmes increased from 10% to 25%. In addition, the system was expanded to include 3.5 million more pupils, average class size was reduced to roughly 30 students, all students learn at least one foreign language, computer laboratories were established in every primary school, and overall physical conditions were improved in all 35 000 rural schools. Resources devoted to the programme exceeded USD 11 billion. This programme did not directly affect school participation for most of the 15-year-olds assessed by PISA, who are mainly in secondary schools where enrolment rates are close to 60%. In 2012, compulsory education was increased from 8 to 12 years of schooling, and the school system was redefined into three levels (primary, lower secondary and upper secondary) of four years each.

Fifteen-year-old students in Turkey are the least likely among students in all OECD countries to have attended pre-primary education. Several initiatives are in place to change this, but none has yet had a direct impact on the students who participated in PISA 2012. Early childhood education and care is featured in the current Development Plan (2014-18) and other on-going programmes include the Mobile Classroom (for children aged 36-66 months from low-income families), the Summer Preschool (for children aged 60-66 months), the Turkey Country Programme, and the Pre-School Education Project.

Improving in PISA: Turkey (continued)

Curricular reform

New curricula were introduced in the 2006/07 school year, starting from the 6th grade. The secondary school mathematics and language curricula were also revised and a new science curriculum was applied in the 9th grade for the 2008/09 school year. In PISA 2012 students had already been taught the new curriculum for four years, although their primary school education was part of the former system. The standards of the new curricula were intended to meet PISA goals: "Increased importance has been placed on students' doing mathematics which means exploring mathematical ideas, solving problems, making connections among mathematical ideas, and applying them in real life situations" (Talim ve Terbiye Kurulu [TTKB] [Board of Education], 2008).

The curricular reform was designed not only to change the content of school education and encourage the introduction of innovative teaching methods, but above all to change the teaching philosophy and culture within schools. The new curricula and teaching materials emphasise "student-centred learning", giving students a more active role than before, when memorising information had been the predominant approach. They also reflect the assumption, on which PISA is based, that schools should equip students with the skills needed to ensure success at school and in life, in general.

In 2003, more than one in four students reported having arrived late for school at least once in the two weeks prior to the PISA test; by 2012, more than four in ten students reported having arrived late. By contrast, students' sense of belonging at school seems to have improved during the same period. Students in 2012 also spent half an hour less per week in mathematics instruction than students in 2003 did, and almost an hour-and-a-half less per week in after-school study.

Changes in the schools

Students in 2012 attended schools with better physical infrastructure and better educational resources than their counterparts in 2003 did. Throughout 2004 and 2005, private-sector investments funded 14 000 additional classrooms in the country. Taxes were reduced for private businesses that invested in education. This was particularly helpful in provinces where there was large internal migration (OECD, 2006).

Several policies had sought to change the culture and management of schools. Schools were obliged to propose a plan of work, including development targets and strategic plans for reaching them. More democratic governance, parental involvement and teamwork were suggested. In 2004, a project aimed at teaching students democratic skills was started in all primary and secondary schools, with many responsibilities assigned to student assemblies. In addition, more transparent and performance-oriented inspection tools were introduced.

Teachers were also the target of policy changes. New arrangements were implemented in 2008 to train teachers for upper secondary education through five-year graduate programmes. The arrangements also stipulated that graduates in other fields, such as science or literature, who wanted to teach would also have to attend a year-and-a-half of graduate training in education. The Teacher Formation Programmes of Education Faculties (2008) links pre-service training courses to the Ministry's curriculum and teacher-practice standards while giving more autonomy to faculties on the courses that should be taught. The New Teacher Programme, introduced in 2011, established stricter requirements for certain subjects.

Several projects implemented over the past decade have addressed equity issues. The Girls to Schools Now campaign, in collaboration with UNICEF, that started in 2003 aimed to ensure that all girls aged 6 to 14 attend primary school. Efforts to increase enrolment in school continue through programmes like the Address-Based Population Registry System, which creates a registry to identify non-schooled children, the Education with Transport programme, which benefits students who have no access to school, and the Complementary Transitional Training Programme, which tries to ensure that 10-14 year-olds acquire a basic education even if they have never been enrolled in a school or if they had dropped out of school. The Project for Increasing Enrolment Rates Especially for Girls, in a pilot phase in the 16 provinces with the lowest enrolment rates among girls, addresses families' awareness about the links between education and the labour market. Since 2003, textbooks for all primary students have been supplied free of charge by the Ministry of National Education. The International Inspiration Project, begun in 2011, and the Strengthening Special Education Project, begun in 2010, are designed to promote disadvantaged students' performance.

Sources:

OECD (2013), *Education Policy Outlook: Turkey*, OECD Publishing, Paris, http://www.oecd.org/edu/EDUCATION%20POLICY%20OUTLOOK%20TURKEY_EN.pdf

OECD (2007), *Reviews of National Policies for Education: Basic Education in Turkey*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264030206-en

OECD (2006), *Economic Survey of Turkey: 2006*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-tur-2006-en

Talim ve Terbiye Kurulu (TTKB) (2008), *slkögretim Matematik Dersi 6–8 Sınıflar Öğretim Programı ve Kılavuzu (Teaching Syllabus and Curriculum Guidebook for Elementary School Mathematics Course: Grades 6 to 8)*, Milli Eğitim Bakanlığı, Ankara.

NOTES

1. See the analysis in Hanushek et al. (2015). This analysis also shows that earnings within each country are related to the individual's years of schooling. This differs from the international growth analysis, where school attainment has no impact on growth after consideration is given to cognitive skills. Hanushek and Woessmann (2012) explain this apparent anomaly by showing that human capital investments by individuals may signal skill differences when compared to other workers in an economy, but there is no relationship between the level of school quality and the steepness of the returns to school investments within a country.

2. The analysis of the PIAAC data indicates a wide range of returns to mathematics skills – from 28% in the United States to 12% in Sweden.

3. The list of countries, along with changes in the mean and standard deviation of achievement based on reaching basic skills, is found in Table D.1 in Annex D. The earnings gains come from relating the change in skills to earnings through the estimated U.S. earnings parameter of 28% per standard deviation.

4. In calculating the standard deviation of the post-reform distribution, a score of 420 points is assigned to everybody previously below this level. In reality, instead of all of the people being stacked at 420 points, there would almost certainly be a distribution of scores, with a portion of the affected distribution scoring above 420 points. This would produce an even larger reduction in the standard deviation than calculated here.

5. See the depictions of distributions of cognitive skills across countries in Hanushek and Woessmann (2015), section 3.3.

6. In the joint model, the two measures are separately significant even though they are highly correlated across countries, with a simple correlation of 0.73.

7. The larger growth effect of high-level skills in countries farther from the technological frontier is most consistent with technological diffusion models (e.g. Nelson and Phelps, 1966).

REFERENCES

Hanushek, E.A., G. Schwerdt, S. Wiederhold and L. Woessmann (2015), "Returns to skills around the world: Evidence from PIAAC", *European Economic Review*, Vol. 73, pp. 103-130.

Hanushek, E.A. and L. Woessmann (2015), *The Knowledge Capital of Nations: Education and the Economics of Growth*, The MIT Press, Cambridge, MA.

Nelson, R.R. and E. Phelps (1966), "Investment in humans, technology diffusion and economic growth", *American Economic Review*, Vol. 56/2, pp. 69-75.

OECD (2013), *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264204256-en.


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