9 Education policies to make globalization more inclusive

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9.1 Introduction

The process of globalization has furthered economic growth and development in many cases, but concerns have been expressed as to its sustainability from a social point of view. There are indications that in developed countries, globalization has increased inequality of labour-market outcomes. While some developing countries have managed to take advantage of the opportunities created by the globalization process, others have not. This chapter discusses the role of education and skill policies in helping individuals and societies profit from globalization, thereby increasing the social sustainability of the globalization process.

Globalization is the "ongoing process of greater interdependence among countries and their citizens" (Fischer, 2003, p. 2). When it comes to education and skill policies, it is important to take into account the relevance of globalization for the international flow of ideas. Romer (2010, p. 94) emphasizes that "globalization is driven by the gains from reuse of ideas". In this sense, education and skill policies take centre stage because of their impact on individuals' and societies' capacity to adapt to the changes and to take advantage of the opportunities brought about by globalization.

Section 9.2 thus lays the theoretical foundation for an analysis of skill policies in the globalization process by pointing out that globalization opens up the possibility for countries to catch up with technological advances in the world. In order to be able to catch up, countries need a sound skill base. This is the topic of models of technological diffusion in the spirit of Nelson and Phelps (1966), which suggest that education is the key ingredient for absorbing new technologies and adapting to change. These models stress the leading role of the stock of human capital in the adoption of new technologies and in the ability to deal with changing conditions.

Section 9.3 turns to empirical evidence on the role of education and skill policies in economic development. Empirical research shows that the strongest predictor of long-run economic growth is the cognitive skills of the population in such basic knowledge areas as mathematics, science and reading (Hanushek and Woessmann, 2008 and 2011a). Cognitive skills go a long way in helping to understand why some

countries have managed to prosper economically in times of globalization while others have not. Also, there is some indication that the positive effect of cognitive skills is higher in more open economies. Both basic skills and high-level skills have separate growth effects. Evidence also suggests that high-level skills may be particularly relevant in developing countries, presumably because they help in adopting rich countries' technologies.

Section 9.4 discusses implications for education and skill policies to make globalization more inclusive. In rich countries, such policies have to ensure a decent quality education even for the disadvantaged, which raises the question of how a more equitable education system can be devised. This has direct implications for education policies in particular in the areas of early childhood education, school tracking, public versus private financing and operation of schools, policies to attract and retain a high-quality teaching force, and other institutional features of education systems. In poor countries, such policies have to ensure that students receive a high-quality education in general. Among others, this requires a shift from policies focused just on school attainment, as in the Millennium Development Goals, to policies focused directly on learning outcomes. Apart from the institutional reforms just mentioned, this requires a focus of demand-side incentives on outcomes rather than attendance and policies ensuring teacher effort. Implementing education reforms in these directions will ensure a more inclusive process of globalization in developed and developing countries alike in the future.

9.2 Theoretical framework: Skills and technological diffusion in a globalized world

Globalization is the process that makes nations and people increasingly interdependent. This interdependence materializes in increased international flows of goods and services, of financial funds, labour and ideas. The last aspect – increased international flows of ideas – is the most relevant one for catch-up growth (Romer, 2010; see also Jones and Romer, 2010). Rather than static comparative-advantage aspects of globalization, the reuse of ideas that have been generated in other countries is what is most important for the process of development in a dynamic perspective. For example, when discussing health in an age of globalization, Deaton (2004, pp. 83–84) ventures to say that: "The health and life expectancy of the vast majority of mankind, whether they live in rich or poor countries, depends on ideas, techniques, and therapies developed elsewhere, so that it is the spread of knowledge that is the fundamental determinant of population health."

In such a perspective, the most important role of education and skill policies in an era of globalization is its role in facilitating the international flow of ideas. The defining

characteristic of ideas is that they are non-rival: once an idea is invented, it can be used by any number of people at no additional cost.[1] Ideas can be subdivided into technologies and rules: technologies are "ideas about how to rearrange inanimate objects", whereas rules "specify how people interact with other people" (Romer, 2010, p. 96). The level of productivity of an economy can be viewed as depending on both technologies and rules. Human capital may be an important fundamental cause of the rules that a nation adopts (Glaeser et al., 2004). But in this chapter, we will focus on the more straightforward (and better-researched) link between human capital and technology.[2]

Models of technological diffusion have long suggested that human capital is a key ingredient in technological catch-up. Thus, Nelson and Phelps (1966, p. 69) argue that: "education is especially important to those functions requiring adaptation to change. Here it is necessary to learn to follow and to understand new technological developments." Classical technological-follower models therefore describe the role of human capital in creating the ability to adjust to changing conditions, thereby facilitating the adoption of new technologies (see Benhabib and Spiegel (2005) for a recent overview of the corresponding literature). Such a feature is also part of the recent wave of growth models focusing on the distance to the technological frontier (Acemoglu et al., 2006; Aghion and Howitt, 2006; Vandenbussche et al., 2006). The technological-diffusion models predict that the adoption of new technologies is a function of the stock of, rather than the change in, human capital.

In a dynamic setting of changing technology, education plays a particular role by fostering the "ability to deal with disequilibria" (Schultz, 1975) – that is, to perceive a given disequilibrium, to evaluate its attributes properly in determining whether it is worthwhile to act, and to undertake action to appropriately reallocate resources. Education may enhance "allocative ability in the sense of selecting the appropriate input bundles and of efficiently distributing inputs between competing uses" (Welch, 1970, p. 55). According to Schultz (1975, p. 835): "The presumption is that education – even primary schooling – enhances the ability of students to perceive new classes of problems, to clarify such problems, and to learn ways of solving them. … [These] abilities … seem to have general properties that contribute measurably to their performance as economic agents in perceiving and solving the problems that arise as a consequence of economic changes." This type of economic returns to education accrues only in a technically dynamic context, not in a static economy with stationary technology (see Bartel and Lichtenberg, 1987; Foster and Rosenzweig, 1996, 2004 for evidence). The ability to reallocate one's resources in response to changing conditions and the ability to discover and master new tasks is not restricted to entrepreneurs, but is useful and required for basically any economic activity at all stages of management and production (Schultz, 1975).

This theoretical background suggests that globalization opens up the opportunity to catch up to the world technological frontier by reusing ideas generated in other countries. But in order to be able to benefit from this opportunity, countries need a sound skill base.

9.3 Empirical evidence: Skills and economic growth

This section surveys the empirical evidence on the role of education and skill policies in economic development, with a particular focus on aspects that are of special relevance for globalization.

Basic results on cognitive skills and economic growth

The macroeconomic literature focusing on cross-country differences in economic growth has overwhelmingly employed measures related to school attainment, or years of schooling, to estimate the effect of education on economic growth (for example, Barro, 1991; Mankiw et al. 1992; Barro and Lee, 2010). The vast literature of cross-country growth regressions tends to find a significant positive association between quantitative measures of schooling and economic growth (see Topel, 1999; Temple, 2001; Krueger and Lindahl, 2001; Sianesi and Van Reenen, 2003 for extensive reviews of the literature). To give an idea of the robustness of this association, an extensive empirical analysis by Sala-i-Martin et al. (2004) of 67 explanatory variables in growth regressions on a sample of 88 countries found that primary schooling was the most robust influence factor on growth in GDP per capita in 1960–96 (after a dummy variable for being an East Asian country).

However, average years of schooling is a particularly incomplete and potentially misleading measure of education for comparing the impacts of human capital on the economies of different countries. It implicitly assumes that a year of schooling delivers the same increase in knowledge and skills regardless of the education system. For example, a year of schooling in Kyrgyzstan (a country performing at the bottom of the Programme for International Student Assessment (PISA) tests of student achievement) is assumed to create the same increase in productive human capital as a year of schooling in Finland (a top PISA performer). Additionally, this measure assumes that formal schooling is the primary (sole) source of education and that variations in non-school factors have a negligible effect on education outcomes. This neglect of cross-country differences in the quality of education and in the strength of family, health and other influences is probably the major drawback of such a quantitative measure of schooling.

Consequently, research over the past decade has started to use direct measures of the cognitive skills of the population. Cognitive skills encompass basic knowledge

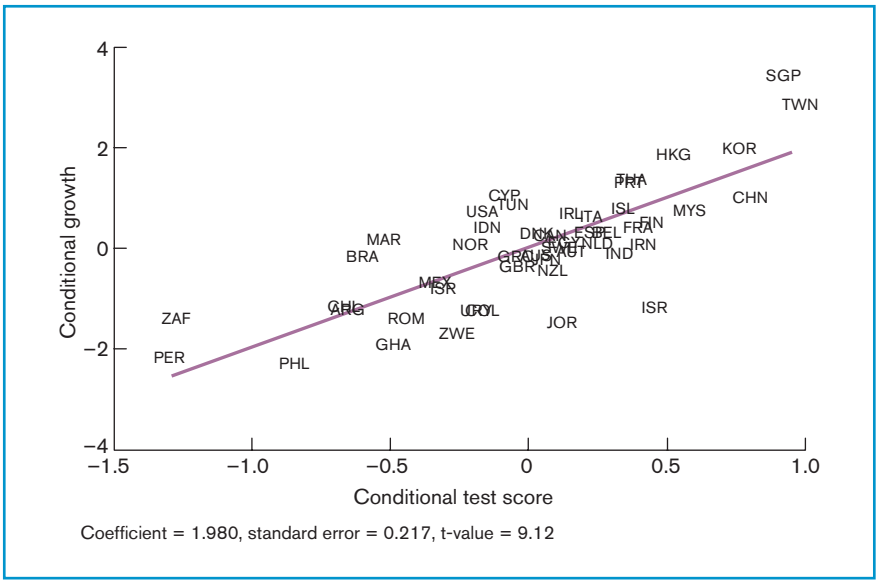
and competencies in such domains as reading and understanding, mathematics and science, and the ability to apply this knowledge in different settings. These skills may be acquired in school, but also at home and in interactions with peers and wider communities. In applied research, cognitive skills are measured by comparable international student achievement tests in such basic knowledge areas as mathematics, science and reading (see Hanushek and Woessmann, 2008, 2011a for reviews).

Based on these measures, cognitive skills have been repeatedly found to be a leading predictor of long-run growth (see Hanushek and Kimko, 2000; Barro, 2001; Hanushek and Woessmann, 2008). Most recently, Hanushek and Woessmann (2009) combine data from international tests given over the past 45 years in order to develop a single comparable measure of skills for each country that can be used to index skills of individuals in the labour force. They apply this measure in cross-country growth regressions that control for initial income, years of schooling and (depending on the model) a set of additional factors to predict the growth rate in real GDP per capita in 1960–2000 across 50 countries with available data.

The basic result is depicted in figure 9.1. After controlling for the initial level of GDP per capita and for years of schooling, cognitive skills have a statistically significant and powerful effect on economic growth. According to this specification, test scores that are larger by one standard deviation (measured at the student level across OECD countries) are associated with an average annual growth rate in GDP per capita that is two percentage points higher over the whole 40-year period. The countries are all relatively close to the line, indicating that the model explains most of the variation in growth rates across countries. In fact, adding cognitive skills to a basic model that just includes initial income and years of schooling increases the share of cross-country variation in economic growth explained by the model from about one-quarter to about three-quarters. The quantity of schooling is statistically significantly related to economic growth in a specification that neglects educational quality, but the association between years of schooling and growth turns insignificant and is reduced to close to zero once cognitive skills are included in the model. In other words, added years of schooling do not affect growth unless they yield greater achievement. Of course, much of the observed cognitive skill is developed in schools, so this does not say that schools are irrelevant. It does say that the quality of schools, as determined by increases in student achievement, is very important.

Adding several other factors as control variables (including the openness of the economy, security of property rights, other political and institutional measures, fertility rates, location in the tropics, latitude, physical capital, and the like) leaves the effects of cognitive skills strongly statistically significant, although it is reduced by about one-third once the institutional measures are controlled for. Figure 9.1

Figure 9.1 Cognitive skills and economic growth



Notes: Added-variable plot of a regression of the average annual rate of growth (in per cent) of real GDP per capita in 1960–2000 on the initial level of real GDP per capita in 1960, average years of schooling in 1960, and average test scores on international student achievement tests.

Source: Hanushek and Woessmann (2008).

highlights that a group of East Asian countries provides a prime example of outstanding test-score performance and outstanding growth records. The results thus suggest that cognitive skills are capable of accounting for a vast part of the extraordinary growth performance of East Asia over the long run. Still, to rule out that the results just capture other East Asian particularities, results are also robust to considering the variation just within each of five world regions, indicating that the association between cognitive skills and growth does not simply reflect economic differences across regions.

Hanushek and Woessmann (2009) perform a set of analyses that provide additional assurance that the estimated effect indeed reflects a causal impact of educational achievement on economic growth. Additional resources in the school system, which might become affordable with increased growth, are not systematically related to improved test scores (see also Hanushek and Woessmann, 2011b). To rule out simple reverse causation, Hanushek and Woessmann (2009) also separate the timing of the analysis by estimating the effect of scores on tests conducted until the early 1980s on economic growth in the period 1980–2000, finding an even larger effect.

Three direct tests of causality devised to rule out certain alternative explanations based on unobserved country-specific cultures and institutions confirm the results. The first one considers the earnings of immigrants to the United States and finds that the international test scores for their home country significantly explain earnings in the United States, but only for those educated in their home country and not for those educated in the United States. A second analysis takes out level considerations and shows that changes in test scores over time are systematically related to changes in growth rates over time. A third causality analysis uses institutional features of school systems as instrumental variables for test performance, thereby employing only that part of the variation in test outcomes that emanates from such country differences as use of central exams, decentralized decision making, and the share of privately operated schools. These results support a causal interpretation of the skill–growth nexus and also suggest that schooling can be a policy instrument contributing to economic outcomes.

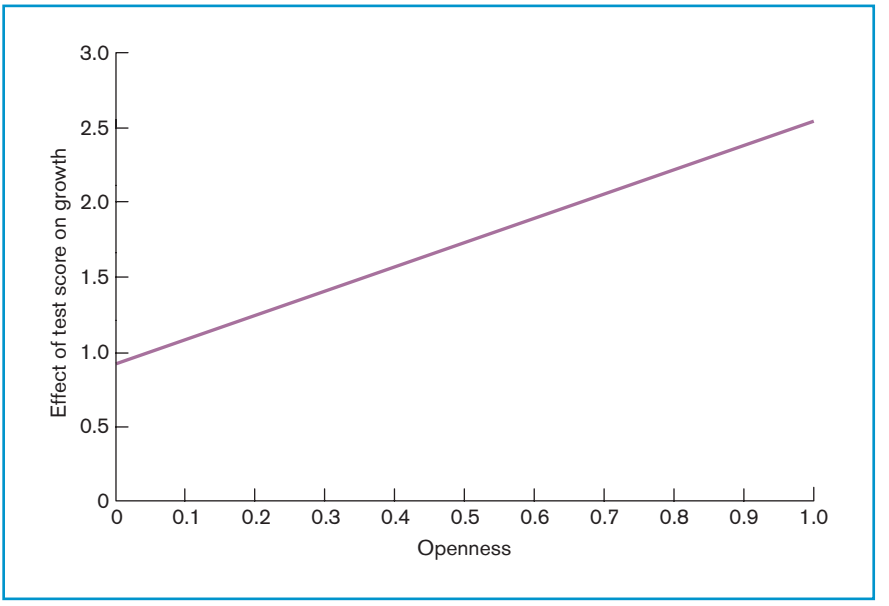
Of course, the results do not mean that individuals learn nothing after high school, the age at which the international tests of educational achievement are performed. They rather show that what individuals have learned in school is a good predictor for the accumulation of further skills in life and the capacity to deploy these skills effectively. The aim of combining data from international tests given over the past 45 years is to develop a measure of skills of people in the labour force.[3] The results suggest that the international achievement measures provide a good measure of the skills of the labour force in different countries and that these skills are closely tied to economic outcomes. A possible interpretation is that strong cognitive skills learned during school facilitate lifelong learning in the sense of a constant adjustment to new technologies. The extent to which the relevant skills can be learned during adulthood remains an open issue, although recent evidence suggests that later remediation tends to be very costly (see Cunha and Heckman, 2007 for an overview and interpretation in terms of a life cycle of skill formation).

Globalization and the role of skills in economic development

The evidence just discussed suggests that cognitive skills can explain a substantial part of the variation in why some countries have succeeded in reaping the opportunities opened up during the period of globalization whereas other countries have not. Two additional aspects can shed further light on the role of skills in catch-up growth during globalization. First, there is evidence that the positive effect of cognitive skills gets larger with the extent to which a country is open to the world economy. Second, there is evidence on the respective roles of basic and top skills in economic growth.

To measure the openness of an economy to international trade, Sachs and Warner (1995) suggested calculating the fraction of years (here, between 1960 and 1998) that a country was classified as having an economy open to international trade, based on five factors including tariffs, quotas, exchange rate controls, export controls and whether or not the country has a socialist economy. Hanushek and Woessmann (2008) report a specification that adds this measure of openness and its interaction with cognitive skills to the basic growth model discussed above. Their results suggest that openness and cognitive skills not only have significant separate effects on economic growth but also a significant positive interaction. As depicted in figure 9.2, the effect of cognitive skills on economic growth is significantly higher in countries that have been fully open to international trade than in countries that have been fully closed. The estimated coefficients imply that the effect of cognitive skills is significantly positive but relatively low in closed economies and increases to a very large effect in open economies. A possible interpretation of this finding is that skills have more scope to facilitate the adoption of new technologies in countries whose institutional environments – the rules – are more readily devised to let ideas from other countries flow into the local economy. Countries that combine high cognitive skills with openness are the most capable of profiting from globalization.

Figure 9.2 The effect of cognitive skills on growth depending on openness



Notes: Estimated effect of average achievement test scores on the average annual rate of growth of real GDP per capita in 1960–2000, depending on the degree of openness to international trade of a country.

Source: Hanushek and Woessmann (2008).

An additional question is which type of skills is required to profit from globalization. Does an economy particularly require a small group of "rocket scientists" capable of high-end technological imitation and innovation, or are approaches such as the Education for All initiative (UNESCO, 2005) more promising in spurring growth? Hanushek and Woessmann (2009) use the micro data of the international achievement tests to devise two separate measures of basic and top performance: the shares of students in a country who reach a basic level of one standard deviation below the OECD mean and an advanced level of one standard deviation above the OECD mean, respectively. When adding both skill dimensions jointly in the growth regression, Hanuschek and Woessmann (2009) find that improving both ends of the distribution is separately beneficial and that increasing basic literacy and advancing the best students are complementary. Furthermore, a cadre of highly skilled individuals is even more important in initially poor countries that have scope for imitating rich countries' technologies than in initially rich countries that are innovating.[4]

9.4 Policy implications: Education policies to make globalization more inclusive

Given the central role of skills in determining a country's capacity to profit from globalization, education and skill policies have a key function in making globalization more inclusive. Research into the production of skills has derived a number of results that indicate promising ways to achieve skill improvements. These will be reviewed in this section. One basic result is that, in general, just adding more resources in existing education systems will not yield noteworthy improvements in the required educational achievement if the existing systems provide little incentive to use the additional resources in order to improve student outcomes (see Hanushek, 2006; Woessmann, 2007a for reviews).[5] By contrast, a set of institutional reforms bears the promise of making educational outcomes more equitable both within and across countries.

Policies for equitable educational outcomes

Countries that on average have high-performing education systems are well set to profit from the opportunities opened up by globalization. However, in some countries educational achievement is distributed quite unequally, with a substantial part of the population not reaching adequate skill levels. Depending on the social systems of the countries, these are the parts of the population that will gain less or even lose out in the process of globalization. A set of policies that make the educational system more equitable can help to distribute the gains from globalization more broadly (see also Woessmann and Peterson, 2007; Schuetz et al., 2008).

A first element of an equitable education system is a system of early childhood education that ensures a decent early education for children from disadvantaged backgrounds (see Heckman, 2006; Blau and Currie, 2006 for reviews). A growing body of evidence suggests that the formation of skills is a life-cycle process that exhibits self productivity and dynamic complementarity (see Cunha and Heckman, 2007). In this perspective, education learned at one stage is an input into the learning process of the next stage, and the productivity with which investments at one stage of education are transformed into valuable skills is positively affected by the level of skills that a person has already obtained in the previous stages. This generates a skill multiplier whereby an investment in education at one stage does not only raise the skills attained at that stage directly, but also the productivity with which educational investments at the next stage will be transformed into even further skills. This multiplier effect makes education a dynamic synergistic process in which early learning begets later learning.

As a consequence, measures at early stages can be particularly crucial, and some deficiencies are hardly amenable at late stages. Importantly, returns to early interventions are particularly high for children from disadvantaged backgrounds whose homes do not provide them with the foundation of skills necessary to prosper at later educational stages. Such interventions do not only build skills, but also lay the foundation that makes later learning more productive due to the complementarity in learning over the life cycle. Early childhood education programmes targeted at disadvantaged children thus have strong potential for raising equity.

A second finding of the education production literature is that the practice of early tracking into different types of schools tends to increase the inequality of educational outcomes (for example, Hanushek and Woessmann, 2006; see Woessmann, 2009a for a review). Early tracking into differing-ability schools is found to increase the dispersion of educational outcomes at the end of secondary school and their dependence on measures of family background. At the same time, there is no evidence that early tracking offers clear gains in terms of the overall level of achievement. In countries that track their students early on, reforms that postpone tracking could thus help to make the skill distribution more equitable, ensuring that the gains from globalization are more widely shared.

A third aspect of the school system that is systematically related to the equity of educational outcomes is the extent of public vs. private financing and operation of schools. A consistent pattern in cross-country evidence is that larger shares of public funding of schools, but at the same time larger shares of privately operated schools, are associated with a reduced dependence of student achievement on socio-economic background (see Woessmann et al., 2009; Hanushek and Woessmann, 2011a). At the same time, larger public funding shares and larger private operation

shares are also associated with higher levels of student outcomes (Woessmann, 2009b), suggesting that a system that combines public funding with non-public operation is good for equity and efficiency alike.

The cross-country evidence is consistent with an interpretation where competition among schools – and, in particular, the competition created by schools not operated by the public administration – raises educational outcomes, and particularly so for students who do not have much choice in less competitive systems. Public funding of schools irrespective of who operates them ensures that also less well-off parents have the opportunity to exert choice. A system that combines public funding with private operation is similar to a voucher system that can be targeted at disadvantaged students, who have regularly been found to profit from such vouchers (see, for example, the evidence on the United States in Rouse, 1998 and Howell and Peterson, 2002).

Fourth, recent evidence suggests that teacher quality – as measured by the learning gains of a teacher's students – is enormously important in determining student achievement. Working with extensive panel data on individual students from different US states, several studies confirm large differences among teachers in terms of outcomes in the classroom (for example, Rockoff, 2004; Rivkin et al., 2005; see Hanushek and Rivkin, 2010 for a recent review). Policies that succeed in attracting and retaining a high-quality teaching force in particular in disadvantaged areas have a large potential to raise the equity of educational outcomes.

At the same time, this research also shows that the observed differences in teacher quality are not closely related to commonly observed characteristics of teachers (such as amount of teacher education). Some attributes of teachers – such as having one or two years of experience – have explained part of the differences in teacher quality, but these factors are a small part of the overall variance in teacher results. There is some indication that teachers' own academic skills measured by scores on achievement tests may be an important factor (see Wayne and Youngs, 2003; Eide et al., 2004 and Hanushek and Rivkin, 2006 for reviews), but more research is required to ascertain the causal character of this finding (see Metzler and Woessmann, 2010 for recent evidence). But the general inability to identify specific teacher qualities makes it difficult to regulate or legislate having high-quality teachers in classrooms, in particular in schools serving disadvantaged students.

Consequently, a final conclusion of the education production literature is that changes in the institutional structure and incentives of schools are fundamental to improving school outcomes (see Woessmann, 2007b and Woessmann et al., 2009 for reviews). Most generally, the performance of a system is affected by the incentives that actors face. That is, if the actors in the education process are

rewarded (extrinsically or intrinsically) for producing better student achievement, and if they are penalized for not producing high achievement, this will improve achievement. The incentives to produce high-quality education, in turn, are created by the institutions of the education system – the rules and regulations that (explicitly or implicitly) set rewards and penalties for the people involved in the education process. The key to improvement thus appears to lie in better incentives – incentives that will lead to management keyed to student achievement and that will promote strong schools with high-quality teachers.

Apart from the topic of choice and competition discussed above, two further institutional features that have a strong bearing on incentives are accountability and school autonomy (see Hanushek and Woessmann, 2011b for more extensive discussion). Accountability introduced by curriculum-based external exit exams or explicit school accountability systems has been found to be systematically related to better student outcomes. There is also a positive interaction between accountability and autonomy: several studies suggest that once accountability is in place, increased autonomy of schools is related to better student outcomes. Autonomy in local decision making is a prerequisite for individual schools and their leaders to take actions to promote student achievement. At the same time, accountability systems that identify good school performance and lead to rewards based on this, as well as competition that allows parental demand to be expressed, create the incentives for individual schools to focus their efforts on student outcomes.

This range of policies can help to ensure that education systems produce a decent quality education also for disadvantaged students. In the future, more equitable educational outcomes mean that the disadvantaged are in a better position to share in the gains from globalization.

Advancing skills in developing countries

The policies discussed so far aim to achieve more equitable educational outcomes within countries, and in particular within technological leader countries where the average level of skills is already high. Additional aspects arise for technological follower countries with generally low-performing education systems. Given the very low levels of educational achievement throughout the population of many developing countries, policies to raise the overall level of skills should probably take precedence in these countries. At the same time, there is no evidence of a noteworthy trade-off between education policies aimed at efficiency and equity (Schuetz et al., 2008), suggesting that policies aimed at the equity and the level of educational outcomes may go hand in hand. When it comes to advancing the overall skill levels in poor

countries, it is in particular the institutional measures of accountability, autonomy and competition discussed above that are clearly part of a reform aimed at higher skills for the population that will allow for a faster adoption of technologies from abroad.

More broadly, for poor countries to produce the skills necessary to participate in the gains from globalization, their education policies will have to shift from a focus on school enrolment and attainment to a focus on learning outcomes (see Hanushek and Woessmann, 2008). Current international policy initiatives such as the Millennium Development Goals and the Education for All initiative stress the importance of expanded school attainment in developing countries and target goals of quantitative schooling. However, the available evidence shows that it is not the quantity of schooling but the knowledge and skills actually learned that matter for economic growth. Policy therefore has to focus much more clearly on how to ensure that students really acquire knowledge and skills while in school. Rather than sticking to goals for school attainment, education policy may be more effective when focusing on the quality of education.

Indeed, by reasonable calculations, many developing countries have less than 10 per cent of their youth currently reaching minimal literacy and numeracy levels, even when school attainment data look considerably better (Hanushek and Woessmann, 2008). This has to change if globalization is to become more inclusive.[6] Apart from the supply-side incentives discussed above, this perspective also has clear implications for the type of demand-side incentive programmes that are increasingly used in developing countries.

Mostly motivated by issues of school access and attainment, a range of demand-side programmes have been implemented that work through changing student and family behaviour in order to encourage school attendance and completion (Hanushek, 2008). These programmes include cash transfers conditional on students' attending school (for example, in Brazil, Columbia, Mexico and Nicaragua), reductions of school fees (for example, Cambodia, Indonesia, Kenya and Chinese Taipei), and food and nutrition supplements that go with school attendance (for example, Bangladesh, India, and Kenya). Many of these programmes have been carefully evaluated.

The results suggest that incentives work and have an impact on behaviour: each of the well-studied programmes surveyed in Hanushek (2008) has a positive and significant impact on attendance and attainment. But, with one exception, there is little or no apparent impact on achievement – the outcome that matters for growth. The one exception is the Kenyan merit scholarship programme which paid school fees and grants for girls who scored well in academic exams (Kremer et al., 2009). As such, this is the only programme surveyed that linked incentives to achievement

rather than attainment. The results suggest that you get what you pay for: if incentives are focused on school attainment, it is likely that higher attainment is generated, but not necessarily higher knowledge and skills. To achieve better educational outcomes, demand-side incentive programmes clearly have a promising role to play, but they will need to be focused on learning outcomes rather than attendance. Unless care is exercised in structuring the incentives, they may even have perverse effects if there is a trade-off between school access and quality.

Given the importance of teacher quality, a final topic of high relevance in developing countries is teacher effort. In many developing countries, the incidence of teacher absence from the classroom is widespread (see Chaudhury et al., 2006; Banerjee and Duflo, 2006). Evidence from India suggests that a simple incentive programme that monitored teacher attendance and provided financial incentives for attendance resulted in a substantial decline in teacher absence and increase in student achievement (Duflo and Hanna, 2005). Furthermore, programmes that linked teachers' salaries to their students' measured performance have been found to lead to substantial increases in student achievement in India and Israel (Lavy, 2009; Muralidharan and Sundararaman, 2011). Policies aimed at ensuring teacher effort can thus help to advance skill levels in the future.

9.5 Conclusions

Education and skill policies take centre stage in increasing the social sustainability of globalization. They determine whether people acquire the capabilities required to share in the gains from globalization. Currently, many low-educated people in rich countries tend to be excluded from this. Despite the large possible gains from the reuse of ideas that globalization opens up, many poor countries are excluded because they lack the skills required to adopt new technologies from abroad and to deal with the rapidly changing conditions that globalization brings about.

There is no silver bullet that could change this situation overnight, but a clear general direction for needed reforms is that education policies have to create incentives for better educational outcomes, and that they have to focus on the knowledge and skills actually learned rather than on the mere attendance of schools. Based on the available evidence, promising components of a successful strategy for education and skill policy include supply-side incentives created by a combination of public funding and non-public provision of schools, accountability and autonomy of schools, demand-side incentives focused on learning outcomes, incentives aimed at teacher effort and teacher quality more generally, and – to achieve more equitable outcomes – high-quality programmes of early childhood education for disadvantaged children and the postponement of tracking in schools.

Recent research shows that basic cognitive skills, measured by tests in mathematics and science in primary and secondary school, are a leading predictor of economic growth. Obviously, this does not mean that other skills are irrelevant. It suggests that these basic skills learned in school are a good predictor of the ability to address the constant need to adapt to new technologies and changing conditions in a globalizing world. At any given point in time, an economy clearly needs additional skills more specifically linked to certain occupations and sectors.

This raises the question to what extent education systems should provide general vs. specific skills. While evidence on this topic is limited, there is an obvious rationale to expect that a general type of education provides a better foundation for sustained growth than specialized vocational education in times of globalization when new technologies emerge at a rapid pace (see Krueger and Kumar, 2004). Globalization and the accelerated pace of technological change require a more adaptable labour force than in a static economy, forcing all countries to rethink the role of education and training. There is a clear need to develop specialized programmes of vocational and technical education, where they exist, in ways that provide generalizable skills – ones that will not become obsolete immediately with the changes in technology and industrial structure that globalization processes bring about (Mertaugh and Hanushek, 2005). A sound basis of general skills creates the ability of lifelong learning which allows people to develop job-specific skills, to keep their skills up to date, and to retool their skills when career changes are required.

When the focus is on socially sustainable globalization, education policies in rich countries should aim to ensure that children from disadvantaged backgrounds receive a high-quality education. Education policies in poor countries should aim to lift the skill level of their populations in a way that allows them to profit from the international flow of ideas, which requires improvements in educational outcomes throughout.

Endnotes

1. Ideas may have different degrees of excludability, an aspect which raises topics such as intellectual property rights that will not be covered in this chapter.

2. Below, however, we will also discuss evidence suggesting that the effect of human capital on growth may depend on local rules, which is consistent with an indirect effect of local rules on productivity through the incentives they create to introduce new technologies (Romer, 2010).

3. With few exceptions direct measures of achievement of people in the labour force are unavailable, and analysis instead must rely upon skills measured during the schooling period. The one exception with measures of the cognitive skills of people in the labour force is the 1994–98 International Adult Literacy Survey (IALS), which tested representative samples of people aged

16–65 years. Coulombe et al. (2004) use these data to construct synthetic cohorts in order to estimate a growth model across 14 countries. Their results confirm the ones reported here.

4. Sector-specific evidence that would allow an analysis of the possible role of skills in ensuring that the gains in sectors that adopt rich countries' technologies spill over into the rest of the economy is not available so far.

5. Similarly, there is little clear-cut evidence of specific teaching methods that would help to lift levels of educational outcomes substantially in general (see, for example, Schwerdt and Wuppermann, 2011).

6. In light of the evidence presented above, developing countries should not focus exclusively on just providing minimal skills for all or exclusively on fostering a group of students with high-end skills, but rather pursue both goals at the same time. This would require a strategy that combines initiatives aimed at the lower end of the cognitive distribution throughout the school system with initiatives aimed more at the top end, such as the focused technological colleges of India. However, little concrete evidence is known so far about which specific policies would focus on basic vs. top skill levels in practical terms.

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