Chapter 3

The goal: Every young person acquires basic skills

This chapter defines the concept of "basic" skills and identifies the people to whom this goal applies: all young people, not just those who are enrolled in school.

The conclusion suggested by the analysis described in Chapter 2 – that improved knowledge capital increases economic growth – has great relevance for any development goal. It suggests that in order to engender inclusive and sustainable growth, any goal must relate directly to populations' skills. Relevant goals should be phrased in terms of student achievement levels that are consistent with the skills required by the workforce in the future. This chapter defines these skills and what they entail.

The definition uses the OECD categories of performance, in part because these categories relate to the effective levels of skills in high-income economies. The definition refers to the skills of 15-year-old students who are enrolled in roughly the ninth year of schooling. Not only is this benchmark consistent with the Programme for International Student Assessment (PISA) testing that now covers a wide spectrum of countries, it also incorporates a school-enrolment component that builds on the original Millennium Development Goals and the Education for All aspirations for 2015.

Level 1 skills (fully attained) are assumed to represent the basic skills necessary for participating productively in modern economies.[1] The border line between Levels 1 and 2 is 420 points on the PISA mathematics scale.[2] With the mean of 500 and standard deviation of 100 for OECD countries, this score implies performance at the 23rd percentile of the OECD distribution. The OECD considers reaching Level 2 as "baseline skills", since these skills both open up further learning opportunities and prepare individuals for participation in modern market economies.

The different levels of performance correspond to distinct skills of individuals (OECD, 2013). The descriptions of the performance levels for mathematics are as follows:

LEVEL 1

At Level 1, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.

LEVEL 2

At Level 2, students can interpret and recognise situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures, or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of the results.

In order to make these abstract explanations somewhat more concrete, Annex E gives a number of examples of questions that exemplify the skills required to successfully complete Level 1. The standard is that somebody with basic skills can reliably answer these questions and others like it, while somebody without basic skills cannot.

These skills clearly are not overly advanced – e.g. being able to convert from one currency to another with a known exchange rate, or to interpret a simple table of values for different products – but instead represent the kinds of problems routinely faced in a modern economy. As shown in subsequent chapters, significant proportions of young people in both high- and lower-income countries are unable to demonstrate this level of skill. Thus, reaching this skill level universally presents a tangible goal for all parts of the world.

The goal of ensuring basic skills for all should not be taken as defining a rigid cutoff of what modern technology requires. For an individual, being above this level is not "success" and below "failure." It is clear that there is a continuum of skills, and more is better than less for both individuals and society. Economies where the entire population exceeds the Level 1 standard will be better off in terms of growth than those that just get to this level. At the same time, these basic skills are heavily demanded throughout modern societies, and inclusive growth is difficult if there are substantial proportions of the population that lack the skills to participate fully in the economy.

This goal applies to all youth, not just those in school. Thus the routine testing of students in school, such as conducted by both PISA and the Trends in International Mathematics and Science Study (TIMSS), will provide a mistaken view of a country's actual achievement, since some young people will have already left the education system (and, on average, will presumably have lower skill levels than those still in school). This is not a serious issue in countries where school participation at age 15 is nearly universal; but it is a concern for the countries where a very large share of young people may leave school early.

Improving in PISA: Brazil

With an economy that traditionally relied on the extraction of natural resources and suffered stagnating growth and spells of hyperinflation until the early 1990s, Brazil is today rapidly expanding its industrial and service sector. Its population of more than 190 million, which is spread across 27 states in geographic areas as vast and diverse as Rio de Janeiro and the Amazon River basin, recognises the critical role education plays in the country's economic development.

As in only a handful of other countries, Brazil's performance in mathematics, reading and science has improved notably over the past decade. Its mean score in the PISA mathematics assessment has improved by an average of 4.1 point per year – from 356 points in 2003 to 391 points in 2012. Since 2000, reading scores have improved by an average of 1.2 score points per year; and, since 2006, science scores have risen by an average of 2.3 score points per year. Lowest-achieving students (defined as the 10% of students who score the lowest) have improved their performance by 65 score points – the equivalent of more than a year and a half of schooling. Despite these considerable improvements, around two out of three Brazilian students still perform below Level 2 in mathematics (in 2003, three in four students did).

Not only have most Brazilian students remarkably improved their performance, Brazil has expanded enrolment in primary and secondary schools. While in 1995, 90% of students were enrolled in primary schools at age seven, only half of them continued to finish eighth grade. In 2003, 35% of 15-year-olds were not enrolled in school in grade 7 or above; by 2012 this percentage had shrunk to 22%. Enrolment rates for 15-year-olds thus increased, from 65% in 2003 to 78% in 2012. Many of the students who are now included in the school system come from rural communities or socio-economically disadvantaged families, so the population of students who participated in the PISA 2012 assessment is very different from that of 2003.

PISA compares the performance of 15-year-old students who are enrolled in schools; but for those countries where this population has changed dramatically in a short period of time, trend data for students with similar background characteristics provide another way of examining how students' performance is changing beyond changes in enrolment. The table below compares the performance of students with similar socio-economic status across all years. The score attained by a socio-economically advantaged/average/disadvantaged student increased by 21/25/27 points, respectively, between 2003 and 2012.

OBSERVED AND EXPECTED TRENDS IN MATHEMATICS PERFORMANCE FOR BRAZIL (2003-12)

	2003		2012		Change between 2003 and 2012 (2012 – 2003)	
Total number of 15-year-olds		3 618 332		3 574 928		-43 404
Total 15-year-olds enrolled in grades 7 or higher		2 359 854		2 786 064		+426 210
Enrolment rates for 15-year-old students		65%		78%		+19%
	Mean	**S.E.**	**Mean**	**S.E.**	**Mean**	**S.E.**
Mathematics performance	**356**	**(4,8)**	**391**	**(2,1)**	**+35.4**	**(5,6)**
Comparing the performance of students with similar socio-economic backgrounds:						
Advantaged student in 2003	383	(5,2)	404	(2,3)	+20.5	(6,0)
Average student in 2003	357	(4,0)	382	(1,6)	+24.9	(4,7)
Disadvantaged student in 2003	342	(3,9)	369	(1,7)	+27.3	(4,7)
Average performance excluding newly enrolled students assuming that newly enrolled students are at:						
Bottom half of performance	356	(4,8)	406	(2,2)	+49.7	(5,6)
Bottom quarter of performance	356	(4,8)	412	(2,0)	+56.4	(5,6)
Bottom of the distribution	356	(4,8)	415	(1,8)	+58.6	(5,5)
Average performance excluding newly enrolled students assuming that newly enrolled students come from:						
Bottom half of ESCS	356	(4,8)	397	(2,2)	+40.5	(5,7)
Bottom quarter of ESCS	356	(4,8)	399	(2,3)	+43.5	(5,7)
Bottom of ESCS	356	(4,8)	400	(2,3)	+44.1	(5,7)

Notes: Enrolment rates are those reported as the coverage index 3 in Annex A3 in the 2003 PISA Report (OECD, 2004) and in Annex A2 of this volume. An advantaged/disadvantaged student is one who has a *PISA index of economic, social and cultural status* (ESCS) that places him/her at the top/lower end of the fourth/first quartile of ESCS in 2003. Average students are those with an ESCS equal to the average in 2003. Average performance in 2012 that excludes newly enrolled students assuming that they come from the bottom half/quarter of performance and ESCS is calculated by randomly deleting 19% of the sample only among students scoring bottom half/quarter in the performance and ESCS distribution, respectively. Average performance in 2012 that excludes the bottom of the performance or ESCS distribution excludes the bottom 19% of the sample in the performance and ESCS distribution, respectively.

Improving in PISA: Brazil (continued)

The figure also simulates alternate scenarios, assuming that the students who are now enrolled in schools – but probably weren't in 2003 – score in the bottom half of the performance distribution, the bottom quarter of the performance distribution, or the bottom of the distribution and also come from the bottom half, bottom quarter, and bottom of the socio-economic distribution. Given that they assume that the newly enrolled students have lower scores than students who would have been enrolled in 2003, these simulations indicate the upper bounds of Brazil's improvement in performance.

For example, under the assumption that the newly enrolled students perform in the bottom quarter of mathematics performance, Brazil's improvement in mathematics, had enrolment rates retained their 2003 levels, would have been 56 score points. Similarly, if the assumption is that newly enrolled students come from the bottom quarter of the socio-economic distribution, Brazil's improvement in mathematics between 2003 and 2012 would have been 44 score points had enrolment rates not increased since 2003. Still, it is the observed enrolment rates and the observed performance in 2003 and 2012 that truly reflect the student population, its performance and the education challenges facing Brazil.

Brazil's increases in coverage are remarkable. However, although practically all students aged 7-14 start school at the beginning of the year, few continue until the end. They leave because the curriculum isn't engaging, or because they want or need to work, or because of the prevalence of grade repetition. The pervasiveness of grade repetition in Brazil has been linked to high dropout rates, high levels of student disengagement, and the more than 12 years it takes students, on average, to complete eight grades of primary school. (PISA results suggest that repetition rates remain high in Brazil: in 2003, 33% of students reported having repeated at least one grade in primary or secondary education; in 2012, 36% of students reported so).

Reform at the national level

Despite the fact that primary and secondary education is managed and largely funded at the municipal and state levels, the central government has been a key actor in driving and shaping education reform. Over the past 15 years it has actively promoted reforms to increase funding, improve teacher quality, set national curriculum standards, improve high school completion rates, develop and put in place accountability measures, and set student achievement and learning targets for schools, municipalities and states.

After Brazil's economy stabilised, in the mid-1990s, the Cardoso administration increased federal spending on primary education through FUNDEF *(Fundo de Manutenção e Desenvolvimento do Ensino Fundamental)* and simultaneously distributed the funding more equitably, replacing a population-density formula that allocated the majority of funds to large cities and linking part of the funding to school enrolments. This was only possible after developing a student and school census to gather and consolidate information about schools and students. FUNDEF also raised teachers' salaries, increased the number of teachers, increased the length of teacher-preparation programmes, and contributed to higher enrolments in rural areas. A conditional cash-transfer programme for families who send their 7-14 year-old children to school (Bolsa Escola) lifted many families out of subsistence-level poverty encouraging their interest that their children receive an education.

In 2006, the Lula administration expanded FUNDEF to cover early childhood and after-school learning and increased overall funding for education, renaming the programme FUNDEB, as it now covered basic education more broadly. The administration also expanded the conditional cash transfers to cover students aged 15-17, thereby encouraging enrolment in upper secondary education, where enrolment is lowest. This expansion means that 6.1% of Brazil's GDP is now spent on education and the country aims to devote 10% of its GDP to education by 2020. Funding for this important increase in education expenditure will come from the recently approved allocation of 75% of public revenues from oil to education.

Improving the quality of teachers

A core element of FUNDEF was increasing teacher salaries, which rose 13% on average after FUNDEF, and more than 60% in the poorer, northeast region of the country. At the same time, the 1996 Law of Directive and Bases of National Education (LDB) mandated that, by 2006, all new teachers have a university qualification, and that initial and in-service teacher training programmes be free of charge. These regulations came at a time when coverage was expanding significantly, leading to an increase in the number of teachers in the system. In 2000, for example, there were 430 467 secondary school teachers, and 88% of whom had a tertiary degree; in 2012 there were 497 797 teachers, 95% of whom had tertiary qualifications (INEP, 2000 and 2012). Subsequent reforms in the late 2000s sought to create standards for teachers' career paths based on qualifications, not solely on tenure. The planned implementation of a new examination system for teacher certification, covering both content and pedagogy, has been delayed. Although universities are free to determine their curriculum for teacher-training programmes, the establishment of an examination system to certify teachers sends a strong signal of what content and pedagogical orientation should be developed.

Improving in PISA: Brazil (continued)

To encourage more students to enrol – and stay – in school, upper secondary education has become mandatory (this policy is being phased in so that enrolment will be obligatory for students aged 4 to 17 by 2016), and a new grade level has been added at the start of primary school. Giving students more opportunities to learn in school has also meant shifting to a full school day, as underscored in the 2011-2020 National Plan for Education. Most school days are just four hours long; and even though FUNDEB provided incentives for full-day schools, they were not sufficient to prompt the investments in infrastructure required for schools that accommodate two or three shifts in a day to become full-day schools. Although enrolment in full-day schools increased 24% between 2010 and 2012, overall coverage in full-day schools remains low: only 2 million out of a total of almost 30 million students attended such schools in 2012 (INEP, 2013).

The reforms of the mid-1990s included provisions to improve the education information system and increase school accountability. It transformed the National Institute for Educational Studies and Research into an independent organisation responsible for the national assessment and evaluation of education. It turned a national assessment system into the Evaluation System for Basic Education (SAEB/Prova Brazil) for grades 4, 8 and 11 and the National Secondary Education Examination in Grade 11, which provides qualifications for further studies or entry into the labour market. SAEB changed over time to become a national census-based assessment for students in grades 4 and 8 and its results were combined with repetition and dropout rates in 2005 to create an index of schools quality, the Basic Education Development Index (IDEB). This gave schools, municipalities and states an incentive to reduce retention and dropout rates and a benchmark against which to monitor their progress. The IDEB is set individually for each school and is scaled so that its levels are aligned with those of PISA. Results are widely published, and schools that show significant progress are granted more autonomy while schools that remain low performers are given additional assistance. Support for schools is also offered through the Fundescola programme. IDEB provides targets for each school; it is up to the schools, municipalities and states to develop strategic improvement plans. In line with Brazil's progress in PISA, national performance as measured by the SAEB has also improved between 1999 and 2009 (Bruns, Evans and Luque, 2011).

Perhaps as a result of these reforms, not only are more Brazilian students attending school and performing at higher levels, they are also attending better-staffed schools (the index of teacher shortage dropped from 0.47 in 2003 to 0.19 in 2012, and the number of students per teacher in a school fell from 34 to 28 in the same period), and schools with better material resources (the index of quality of educational resources increased from -1.17 to -0.54). They are also attending schools with better learning environments, as shown by improved disciplinary climates and student-teacher relations. Students in 2012 also reported spending one-and-a-half hours less per week on homework than their counterparts in 2003 did.

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NOTES

1. Filmer, Hasan and Pritchett (2006) arrive at the same standard when they develop their Millennium Learning Goals.

2. Note that the border between Levels 1 and 2 in science is slightly lower at 407 points (OECD, 2013). Nonetheless, 420 PISA points are used for both mathematics and science.

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