



OVERVIEW

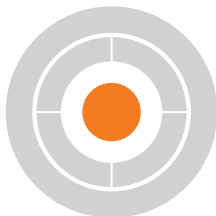
Learning to realize  
education's promise



**LEARNING** to realize education's promise



**Assess learning**



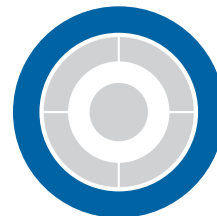
to make it a serious goal

**Act on evidence**



to make schools  
work for learners

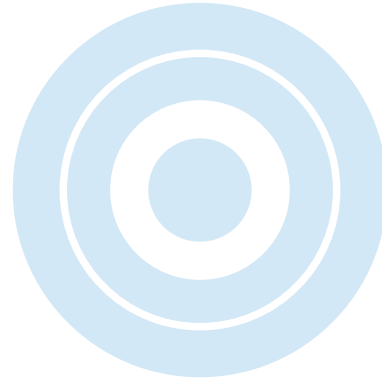
**Align actors**



to make the whole  
system work for learning

## OVERVIEW

# Learning to realize education's promise



**“Education is the most powerful weapon we can use to change the world.”**

NELSON MANDELA (2003)

**“If your plan is for one year, plant rice. If your plan is for ten years, plant trees. If your plan is for one hundred years, educate children.”**

KUAN CHUNG (7TH CENTURY BC)

Schooling is not the same as learning. In Kenya, Tanzania, and Uganda, when grade 3 students were asked recently to read a sentence such as “The name of the dog is Puppy,” three-quarters did not understand what it said.<sup>1</sup> In rural India, just under three-quarters of students in grade 3 could not solve a two-digit subtraction such as  $46 - 17$ , and by grade 5 half could still not do so.<sup>2</sup> Although the skills of Brazilian 15-year-olds have improved, at their current rate of improvement they won't reach the rich-country average score in math for 75 years. In reading, it will take 263 years.<sup>3</sup> Within countries, learning outcomes are almost always much worse for the disadvantaged. In Uruguay, poor children in grade 6 are assessed as “not competent” in math at five times the rate of wealthy children.<sup>4</sup> Moreover, such data are for children and youth lucky enough to be in school. Some 260 million aren't even enrolled in primary or secondary school.<sup>5</sup>

These countries are not unique in the challenges they face. (In fact, they deserve credit for measuring student learning and making the data public.) Worldwide, hundreds of millions of children reach young adulthood without even the most basic life skills. Even if they attend school, many leave without the skills for calculating the correct change from a transaction,

reading a doctor's instructions, or interpreting a campaign promise—let alone building a fulfilling career or educating their children.

This learning crisis is a moral crisis. When delivered well, education cures a host of societal ills. For individuals, it promotes employment, earnings, health, and poverty reduction. For societies, it spurs innovation, strengthens institutions, and fosters social cohesion. But these benefits depend largely on learning. Schooling without learning is a wasted opportunity. More than that, it is a great injustice: the children whom society is failing most are the ones who most need a good education to succeed in life.

Any country can do better if it acts as though learning really matters. That may sound obvious—after all, what else is education for? Yet even as learning goals are receiving greater rhetorical support, in practice many features of education systems conspire against learning. This Report argues that countries can improve by advancing on three fronts:

- *Assess learning—to make it a serious goal.* This means using well-designed student assessments to gauge the health of education systems (not primarily as tools for administering rewards and punishments). It also means using the resulting

learning measures to spotlight hidden exclusions, make choices, and evaluate progress.

- *Act on evidence—to make schools work for learners.* Evidence on how people learn has exploded in recent decades, along with an increase in educational innovation. Countries can make much better use of this evidence to set priorities for their own practice and innovations.
- *Align actors—to make the whole system work for learning.* Countries must recognize that all the classroom innovation in the world is unlikely to have much of an impact if, because of technical and political barriers, the system as a whole does not support learning. By taking into account these real-world barriers to learning, countries can support innovative educators on the front lines.

When improving learning becomes a priority, great progress is possible. In the early 1950s, the Republic of Korea was a war-torn society held back by very low literacy levels. By 1995 it had achieved universal enrollment in high-quality education through secondary school. Today, its young people perform at the highest levels on international learning assessments. Vietnam surprised the world when the 2012 results of the Programme for International Student Assessment (PISA) showed that its 15-year-olds were performing at the same level as those in Germany—even though Vietnam was a lower-middle-income country. Between 2009 and 2015, Peru achieved some of the fastest growth in overall learning outcomes—an improvement attributable to concerted policy action. In Liberia, Papua New Guinea, and Tonga, early grade reading improved substantially within a very short time thanks to focused efforts based on evidence. And recently, Malaysia and Tanzania launched promising societywide collaborative approaches to systematically improving learning.

Progress like this requires a clear-eyed diagnosis, followed by concerted action. Before showing what can be done to fulfill education's promise, this overview first shines a light on the learning crisis: how and why many countries are not yet achieving "learning for all." This makes for bracing reading, but it should not be interpreted as saying that all is lost—only that too many young people are not getting the education they need. The rest of the overview shows how change is possible if systems commit to "all for learning," drawing on examples of families, educators, communities, and systems that have made real progress.

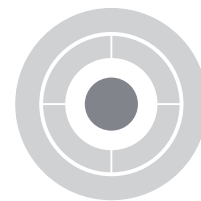
## The three dimensions of the learning crisis

Education should equip students with the skills they need to lead healthy, productive, meaningful lives. Different countries define skills differently, but all share some core aspirations, embodied in their curriculums. Students everywhere must learn how to interpret many types of written passages—from medication labels to job offers, from bank statements to great literature. They have to understand how numbers work so that they can buy and sell in markets, set family budgets, interpret loan agreements, or write engineering software. They require the higher-order reasoning and creativity that builds on these foundational skills. And they need the socio-emotional skills—such as perseverance and the ability to work on teams—that help them acquire and apply the foundational and other skills.

Many countries are not yet achieving these goals. First, the learning that one would expect to happen in schools—whether expectations are based on formal curriculums, the needs of employers, or just common sense—is often not occurring. Of even greater concern, many countries are failing to provide learning for all. Individuals already disadvantaged in society—whether because of poverty, location, ethnicity, gender, or disability—learn the least. Thus education systems are widening social gaps instead of narrowing them. What drives the learning shortfalls is becoming clearer thanks to new analyses spotlighting both the immediate cause—poor service delivery that amplifies the effects of poverty—and the deeper system-level problems, both technical and political, that allow poor-quality schooling to persist.

### Learning outcomes are poor: Low levels, high inequality, slow progress

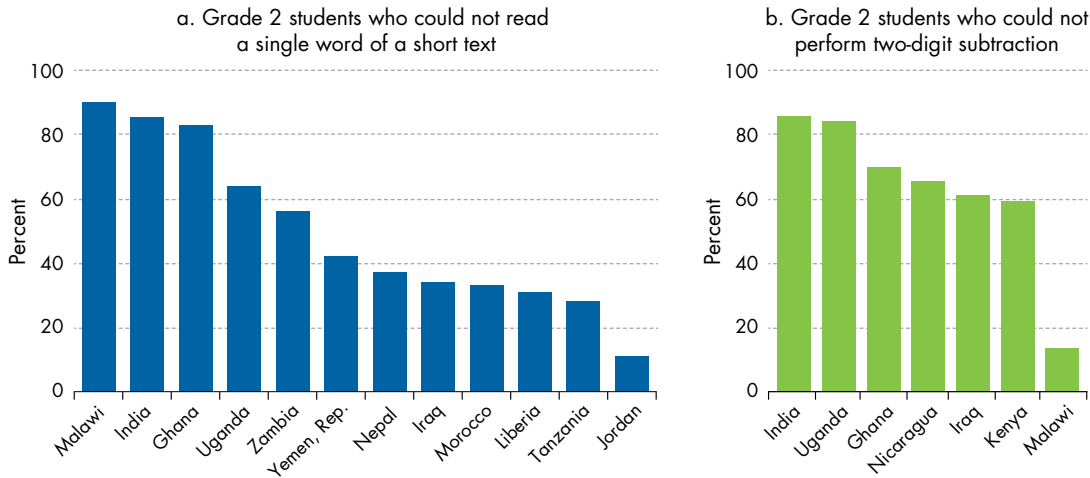
The recent expansion in education is impressive by historical standards. In many developing countries over the last few decades, net enrollment in education has greatly outpaced the historic performance of today's industrial countries. For example, it took the United States 40 years—from 1870 to 1910—to increase girls' enrollments from 57 percent to 88 percent. By contrast, Morocco achieved a similar increase in just 10 years.<sup>6</sup> The number of years of schooling completed by the average adult in the developing world more than tripled from 1950 to



Problem dimension 1: Outcomes

## Figure O.1 Shortfalls in learning start early

Percentage of grade 2 students who could not perform simple reading or math tasks, selected countries



Sources: WDR 2018 team, using reading and mathematics data for Kenya and Uganda from Uwezo, Annual Assessment Reports, 2015 (<http://www.uwezo.net/>); reading and mathematics data for rural India from ASER Centre (2017); reading data for all other countries from U.S. Agency for International Development (USAID), Early Grade Reading Barometer, 2017, accessed May 30, 2017 (<http://www.earlygradereadingbarometer.org/>); and mathematics data for all other countries from USAID/RTI Early Grade Mathematics Assessment intervention reports, 2012–15 (<https://shared.rti.org/sub-topic/early-grade-math-assessment-egma>).

Note: These data typically pertain to selected regions in the countries and are not necessarily nationally representative. Data for India pertain to rural areas.

2010, from 2.0 to 7.2 years.<sup>7</sup> By 2010 the average worker in Bangladesh had completed more years of schooling than the typical worker in France in 1975.<sup>8</sup> This progress means that most enrollment gaps in basic education are closing between high- and low-income countries. By 2008 the average low-income country was enrolling students in primary school at nearly the same rate as the average high-income country.

But schooling is not the same as learning.<sup>9</sup> Children learn very little in many education systems around the world: even after several years in school, millions of students lack basic literacy and numeracy skills. In recent assessments in Ghana and Malawi, more than four-fifths of students at the end of grade 2 were unable to read a single familiar word such as *the* or *cat* (figure O.1).<sup>10</sup> Even in Peru, a middle-income country, that share was half before the recent reforms.<sup>11</sup> When grade 3 students in Nicaragua were tested in 2011, only half could correctly solve  $5 + 6$ .<sup>12</sup> In urban Pakistan in 2015, only three-fifths of grade 3 students could correctly perform a subtraction such as  $54 - 25$ , and in rural areas only just over two-fifths could.<sup>13</sup>

This slow start to learning means that even students who make it to the end of primary school do not master basic competencies. In 2007, the most recent year for which data are available, less than 50 percent

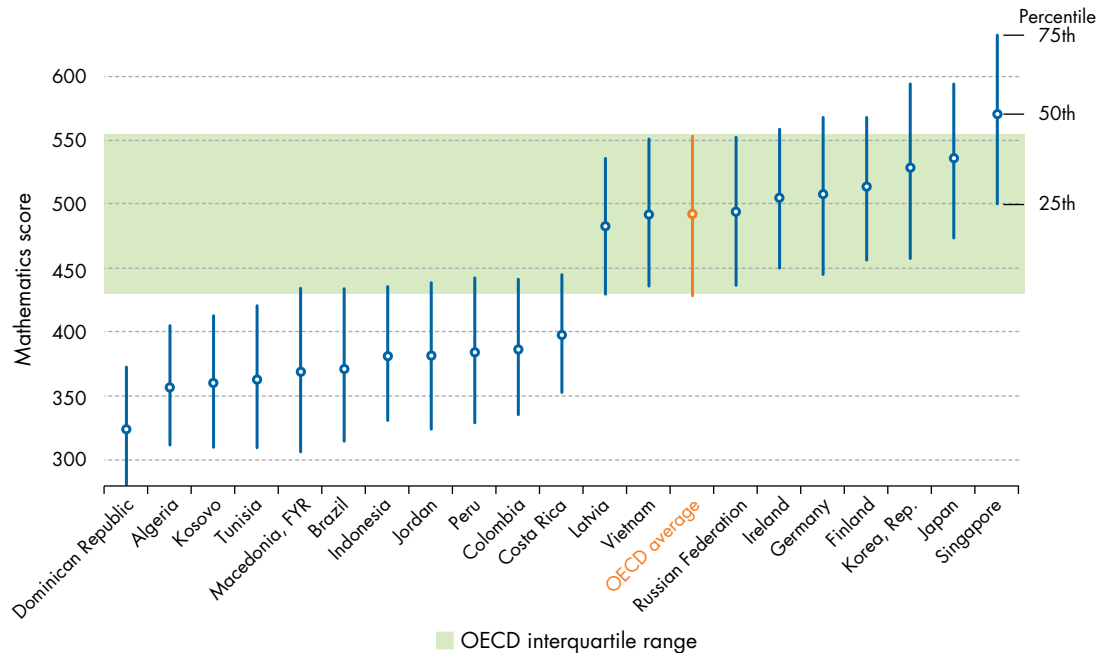
of grade 6 students in southern and East Africa were able to go beyond the level of “reading for meaning,” and less than 40 percent got beyond “basic numeracy.”<sup>14</sup> Among grade 6 students in West and Central Africa in 2014, less than 45 percent reached the “sufficient” competency level for continuing studies in reading or mathematics—for example, the rest could not answer a math problem that required them to divide 130 by 26.<sup>15</sup> In rural India in 2016, only half of grade 5 students could fluently read text at the level of the grade 2 curriculum, which included sentences (in the local language) such as “It was the month of rains” and “There were black clouds in the sky.”<sup>16</sup> These severe shortfalls constitute a learning crisis.

Although not all developing countries suffer from such extreme shortfalls, many are far short of levels they aspire to. According to leading international assessments of literacy and numeracy—Progress in International Reading Literacy Study (PIRLS) and Trends in International Mathematics and Science Study (TIMSS)—the average student in low-income countries performs worse than 95 percent of the students in high-income countries, meaning that student would be singled out for remedial attention in a class in high-income countries.<sup>17</sup> Many high-performing students in middle-income countries—young men and women who have risen to the top quarter of

<AU: In figure O.2 title, would "the 75th percentile on PISA performs..." be better worded as "the 75th percentile of PISA test takers perform..."?>

**Figure O.2** In several countries, the 75th percentile on PISA performs below the 25th percentile of the OECD average

Performance of 25th, 50th, and 75th percentiles in 2015 PISA mathematics assessment, selected countries



Source: WDR 2018 team, using data from Programme for International Student Assessment (PISA) 2015 (OECD 2016).

their cohorts—would rank in the bottom quarter in a wealthier country. In Algeria, the Dominican Republic, and Kosovo, the test scores of students at the cutoff for the top quarter of students (the 75th percentile of the distribution of PISA test takers) are well below the cutoff for the bottom quarter of students (25th percentile) of Organisation for Economic Co-operation and Development (OECD) countries (figure O.2). Even in Costa Rica, a relatively strong performer in education, performance at the cutoff for the top quarter of students is equal to performance at the cutoff for the bottom quarter in Germany.

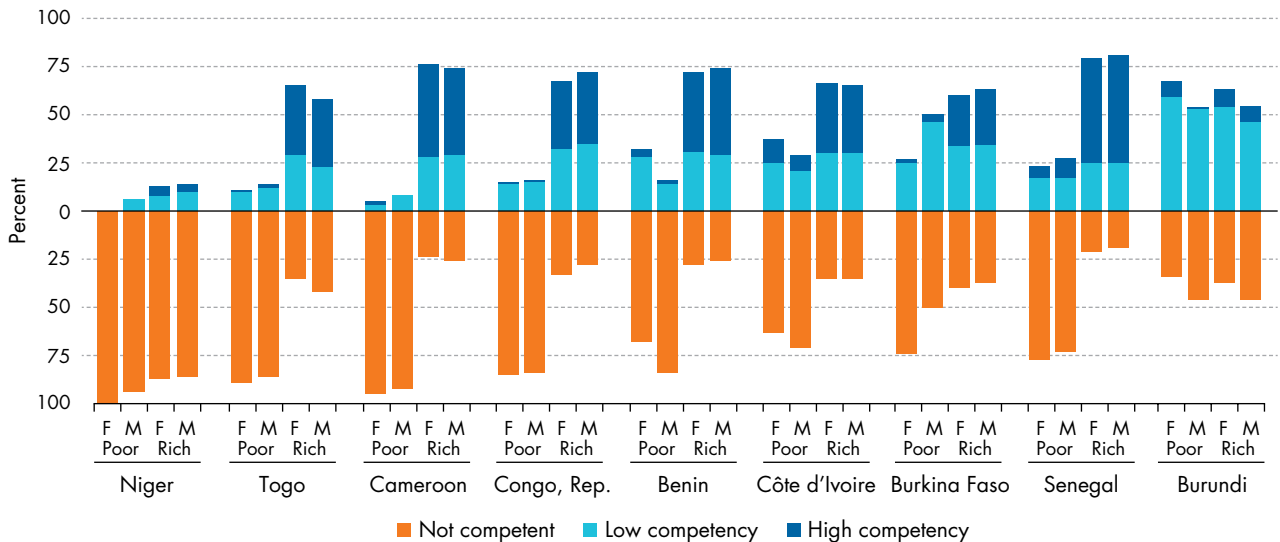
The learning crisis amplifies inequality: it severely hobbles the disadvantaged youth who most need the boost that a good education can offer. For students in many African countries, the differences by income level are stark (figure O.3). In a recent assessment (Programme d'Analyse des Systèmes Éducatifs de la Confemén, PASEC, 2014) administered at the end of the primary cycle, only 5 percent of girls in Cameroon from the poorest quintile of households had learned enough to continue school, compared with 76 percent of girls from the richest quintile.<sup>18</sup> Learning gaps in several other countries—Benin, the Republic of Congo, and Senegal—were nearly as wide. Large gaps among learners afflict many high- and middle-

income countries as well, with disadvantaged students greatly overrepresented among the low scorers. Costa Rica and Qatar have the same average score on one internationally benchmarked assessment (TIMSS 2015)—but the gap between the top and bottom quarters of students is 138 points in Qatar, compared with 92 points in Costa Rica. The gap between the top and bottom quarters in the United States is larger than the gap in the median scores between Algeria and the United States.

Students often learn little from year to year, but early learning deficits are magnified over time. Students who stay in school should be rewarded with steady progress in learning, whatever disadvantages they have in the beginning. And yet in Andhra Pradesh, India, in 2010, low-performing students in grade 5 were no more likely to answer a grade 1 question correctly than those in grade 2. Even the average student in grade 5 had about a 50 percent chance of answering a grade 1 question correctly—compared with about 40 percent in grade 2.<sup>19</sup> In South Africa in the late 2000s, the vast majority of students in grade 4 had mastered only the mathematics curriculum from grade 1; most of those in grade 9 had mastered only the mathematics items from grade 5.<sup>20</sup> In New Delhi, India, in 2015, the average grade 6 student performed at a grade 3

### Figure O.3 Children from poor households in Africa typically learn much less

Percentage of grade 6 PASEC test takers in 2014 who scored above (blue) and below (orange) the sufficiency level on reading achievement: poorest and richest quintiles by gender, selected countries



Source: WDR 2018 team, using data from World Bank (2016b).

Note: Socioeconomic quintiles are defined nationally. "Not competent" refers to levels 0–2 in the original coding and is considered below the sufficiency level for school continuation; "low competency" refers to level 3; and "high competency" refers to level 4. F = female; M = male; PASEC = Programme d'Analyse des Systèmes Éducatifs de la Confemen.

<AU: PISA = Programme for International Student Assessment" so "PISA assessment" is redundant. Is edit below OK, plus the edits on pp.10 & 24?>

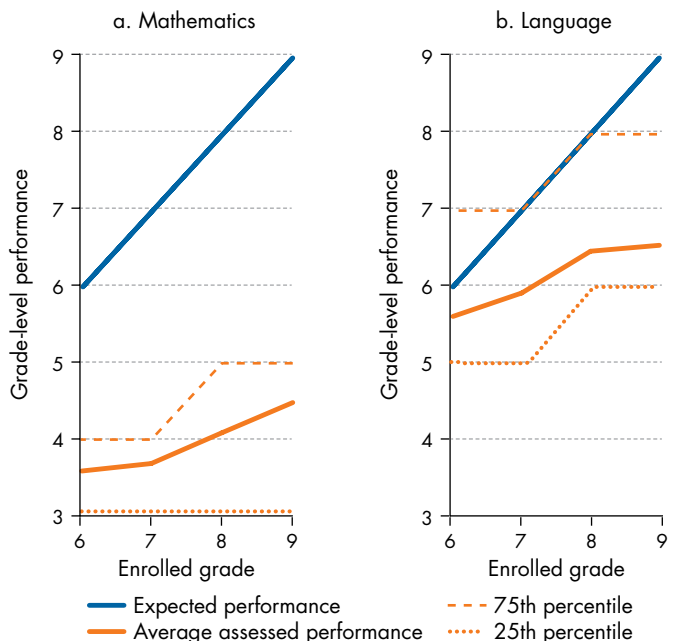


level in math. Even by grade 9, the average student had reached less than a grade 5 level, and the gap between the better and worse performers grew over time (figure O.4). In Peru and Vietnam—one of the lowest and one of the highest performers, respectively, on the PISA assessment of 15-year-old students—5-year-olds start out with similar math skills, but students in Vietnam learn much more for each year of schooling at the primary and lower secondary levels.<sup>21</sup>

Although some countries are making progress on learning, their progress is typically slow. Even the middle-income countries that are catching up to the top performers are doing so very slowly. Indonesia has registered significant gains on PISA over the last 10–15 years. And yet, even assuming it can sustain its 2003–15 rate of improvement, Indonesia won't reach the OECD average score in mathematics for another 48 years; in reading, for 73. For other countries, the wait could be even longer: based on current trends, it would take Tunisia over 180 years to reach the OECD average for math and Brazil over 220 years to reach the OECD average for reading. Moreover, these calculations are for countries where learning has improved. Across all countries participating in multiple rounds of PISA since 2003, the median gain in the national average score from one round to the next was zero.

### Figure O.4 Students often learn little from year to year, and early learning deficits are magnified over time

Assessed grade-level performance of students relative to enrolled grade, New Delhi (2015)

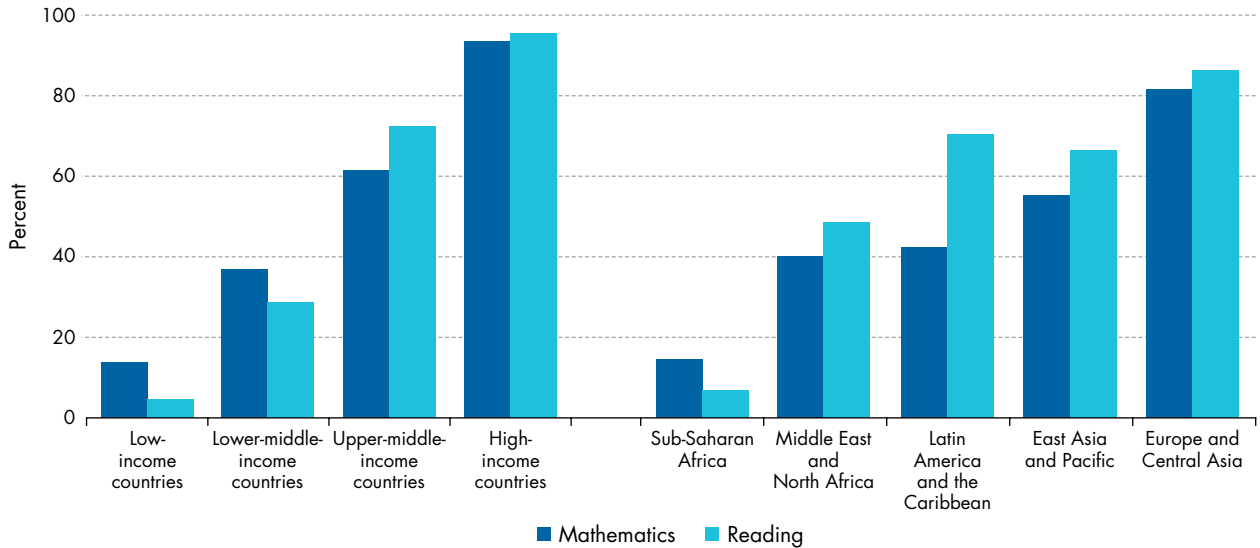


Source: WDR 2018 team, using data from Muralidharan, Singh, and Ganimian (2016).



**Figure O.5** The percentage of primary school students who pass a minimum proficiency threshold is often low

Median percentage of students in late primary school who score above a minimum proficiency level on a learning assessment, by income group and region



Source: WDR 2018 team, using “A Global Data Set on Education Quality” made available to the team by Nadir Altinok, Noam Angrist, and Harry Athony Patrinos, 2017.

Note: Bars show the unweighted cross-country median within country grouping. Regional averages exclude high-income countries. India and China are among the countries excluded for lack of data. Minimum proficiency in mathematics is benchmarked to the Trends in International Mathematics and Science Study (TIMSS) assessment and in reading to the Progress in International Reading Literacy Study (PIRLS) assessment. Minimum proficiency in mathematics means that students have some basic mathematical knowledge such as adding or subtracting whole numbers, recognizing familiar geometric shapes, and reading simple graphs and tables (Mullis and others 2016). Minimum proficiency in reading means that students can locate and retrieve explicitly stated detail when reading literary texts and can locate and reproduce explicitly stated information from the beginning of informational texts (Mullis and others 2012).

Because of this slow progress, more than 60 percent of primary school children in developing countries still fail to achieve minimum proficiency in learning, according to one benchmark. No single learning assessment has been administered in all countries, but combining data from learning assessments in 95 countries makes it possible to establish a globally comparable “minimum proficiency” threshold in math.<sup>22</sup> Below this threshold, students have not mastered even basic mathematical skills, whether making simple computations with whole numbers, using fractions or measurements, or interpreting simple bar graphs. In high-income countries, nearly all students—99 percent in Japan, 98 percent in Norway, 91 percent in Australia—achieve this level in primary school.<sup>23</sup> But in other parts of the world the share is much lower: just 7 percent in Mali, 30 percent in Nicaragua, 34 percent in the Philippines, and 76 percent in Mexico. In low-income countries, 14 percent of students reach this level near the end of primary school, and in lower-middle-income countries 37 percent do (figure O.5). Even in upper-middle-income countries only 61 percent reach this minimum proficiency.

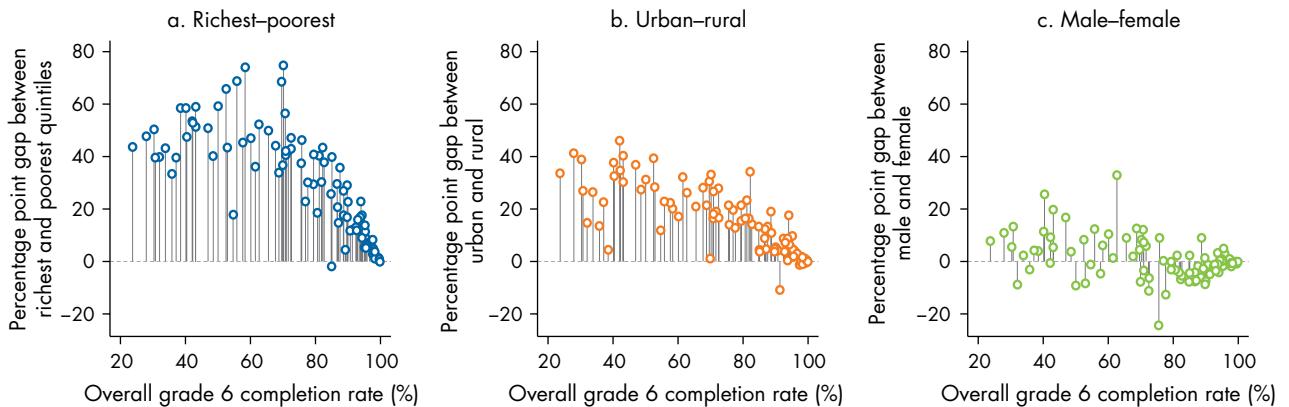
The ultimate barrier to learning is no schooling at all—yet hundreds of millions of youth remain out of

school. In 2016 61 million children of primary school age—10 percent of all children in low- and lower-middle-income countries—were not in school, along with 202 million children of secondary school age.<sup>24</sup> Children in fragile and conflict-affected countries accounted for just over a third of these, a disproportionate share. In the Syrian Arab Republic, which achieved universal primary enrollment in 2000, the civil war had driven 1.8 million children out of school by 2013.<sup>25</sup> Almost all developing countries still have pockets of children from excluded social groups who do not attend school. Poverty most consistently predicts failing to complete schooling, but other characteristics such as gender, disability, caste, and ethnicity also frequently contribute to school participation shortfalls (figure O.6).

But it’s not just poverty and conflict that keep children out of school; the learning crisis does, too. When poor parents perceive education to be of low quality, they are less willing to sacrifice to keep their children in school—a rational response, given the constraints they face.<sup>26</sup> Although parental perceptions of school quality depend on various factors, from the physical condition of schools to teacher punctuality, parents consistently cite student learning outcomes

## Figure O.6 School completion is higher for children from wealthier families and urban settings, whereas gender gaps are more mixed

Gaps in grade 6 completion rates (percent) for 15–19-year-olds, by wealth, location, and gender



Source: WDR 2018 team, using data from Filmer (2016).

Note: The data presented are the latest available by country, 2005–14. Each vertical line indicates the size and direction of the gap for a country.

as a critical component.<sup>27</sup> These outcomes can affect behavior: holding student ability constant, students in the Arab Republic of Egypt who attended poorer-performing schools were more likely to drop out.<sup>28</sup>

Learning shortfalls during the school years eventually show up as weak skills in the workforce. Thus the job skills debate reflects the learning crisis. Work skill shortages are often discussed in a way that is disconnected from the debate on learning, but the two are parts of the same problem. Because education systems have not prepared workers adequately, many enter the labor force with inadequate skills. Measuring adult skills in the workplace is hard, but recent initiatives have assessed a range of skills in the adult populations of numerous countries. They found that even foundational skills such as literacy and numeracy are often low, let alone the more advanced skills. The problem isn't just a lack of trained workers; it is a lack of readily trainable workers. Accordingly, many workers end up in jobs that require minimal amounts of reading or math.<sup>29</sup> Lack of skills reduces job quality, earnings, and labor mobility.

The skills needed in labor markets are multi-dimensional, so systems need to equip students with far more than just reading, writing, and math—but students cannot leapfrog these foundational skills. Whether as workers or members of society, people also need higher-order cognitive skills such as problem-solving. In addition, they need socioemotional skills—sometimes called soft or noncognitive skills—such as conscientiousness. Finally, they need technical skills to perform a specific job. That said,

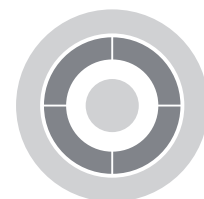
the foundational cognitive skills are essential, and systems cannot bypass the challenges of developing them as they target higher-order skills.

Tackling the learning crisis and skills gaps requires diagnosing their causes—both their immediate causes at the school level and their deeper systemic drivers. Given all the investments countries have made in education, shortfalls in learning are discouraging. But one reason for them is that learning has not always received the attention it should have. As a result, stakeholders lack actionable information about what is going wrong in their schools and in the broader society, and so they cannot craft context-appropriate responses to improve learning. Acting effectively requires first understanding how schools are failing learners and how systems are failing schools.

### Schools are failing learners

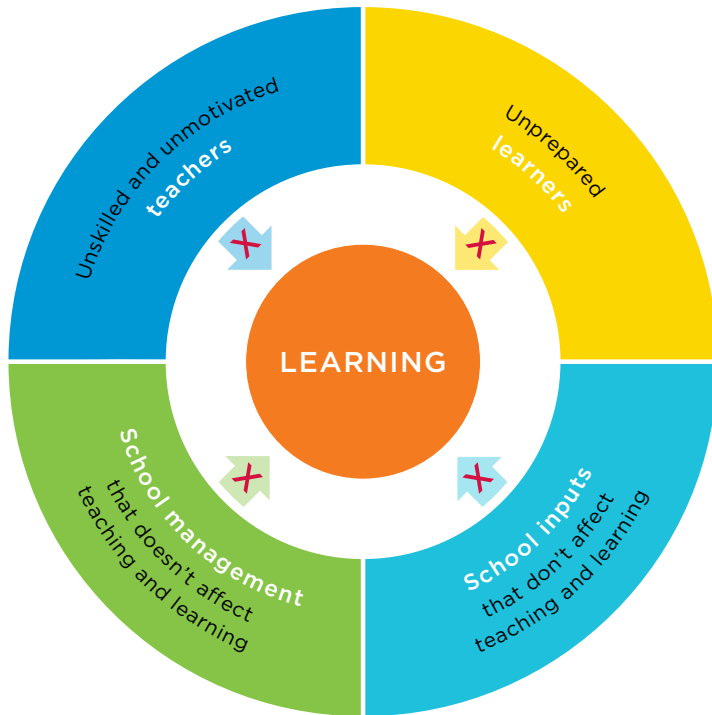
Struggling education systems lack one or more of four key school-level ingredients for learning: prepared learners, effective teaching, learning-focused inputs, and the skilled management and governance that pulls them all together (figure O.7). The next section looks at why these links break down; here the focus is on *how* they break down.

First, children often arrive in school unprepared to learn—if they arrive at all. Malnutrition, illness, low parental investments, and the harsh environments associated



Problem dimension 2:  
**Immediate causes**

**Figure O.7 Why learning doesn't happen:  
Four immediate factors that break down**



Source: WDR 2018 team.

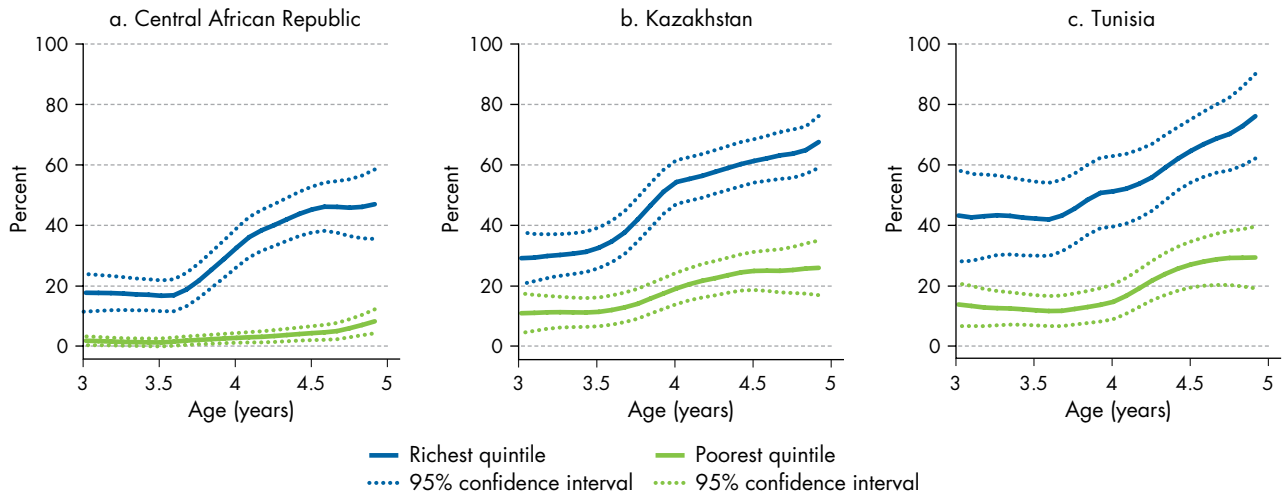
with poverty undermine early childhood learning.<sup>30</sup> Severe deprivations—whether in terms of nutrition, unhealthy environments, or lack of nurture by caregivers—have long-lasting effects because they impair infants’ brain development.<sup>31</sup> Thirty percent of children under 5 in developing countries are physically stunted, meaning they have low height for their age, typically due to chronic malnutrition.<sup>32</sup> The poor developmental foundations and lower levels of preschool skills resulting from deprivation mean many children arrive at school unprepared to benefit fully from it (figure O.8).<sup>33</sup> So even in a good school, deprived children learn less. Moreover, breaking out of lower learning trajectories becomes harder as these children age because the brain becomes less malleable. Thus education systems tend to amplify initial differences. Moreover, many disadvantaged youth are not in school. Fees and opportunity costs are still major financial barriers to schooling, and social dimensions of exclusion—for example, those associated with gender or disability—exacerbate the problem. These inequalities in school participation further widen gaps in learning outcomes.

Second, teachers often lack the skills or motivation to be effective. Teachers are the most important factor affecting learning in schools. In the United States, students with great teachers advance 1.5 grade levels or more over a single school year, compared with just 0.5 grade levels for those with a poor teacher.<sup>34</sup> In developing countries, teacher quality can matter even more than in wealthier countries.<sup>35</sup> But most education systems do not attract applicants with strong backgrounds. For example, 15-year-old students who aspire to be teachers score below the national average on the PISA assessment in nearly all countries.<sup>36</sup> Beyond that, weak teacher education results in teachers lacking subject knowledge and pedagogical skills. In 14 Sub-Saharan countries, the average grade 6 teacher performs no better on reading tests than do the highest-performing students from that grade.<sup>37</sup> In Indonesia, 60 percent of the time in a typical mathematics class is spent on exposition, with limited time remaining for practical work or problem-solving.<sup>38</sup> Meanwhile, in many developing countries substantial amounts of learning time are lost because classroom time is spent on other activities or because teachers are absent. Only a third of total instructional time was used in Ethiopia, Ghana, and Guatemala.<sup>39</sup> Across seven African countries, one in five teachers was absent from school on the day of an unannounced visit by survey teams, with another fifth absent from the classroom even though they were at school (figure O.9).<sup>40</sup> The problems are even more severe in remote communities, amplifying the disadvantages already facing rural students. Such diagnostics are not intended to blame teachers. Rather, they call attention to how systems undermine learning by failing to support them.

Third, inputs often fail to reach classrooms or to affect learning when they do. Public discourse often equates problems of education quality with input gaps. Devoting enough resources to education is crucial, and in some countries resources have not kept pace with the rapid jumps in enrollment. For several reasons, however, input shortages explain only a small part of the learning crisis. First, looking across systems and schools, similar levels of resources are often associated with vast differences in learning outcomes.<sup>41</sup> Second, increasing inputs in a given setting often has small effects on learning outcomes.<sup>42</sup> Part of the reason is that inputs often fail to make it to the front lines. In Sierra Leone, for example, textbooks were distributed to schools, but follow-up inspections found most of them locked away in cupboards, unused.<sup>43</sup> Similarly, many technological interventions

## Figure O.8 Socioeconomic gaps in cognitive achievement grow with age—even in preschool years

Percentage of children ages 3–5 who can recognize 10 letters of the alphabet, by wealth quintile, selected countries



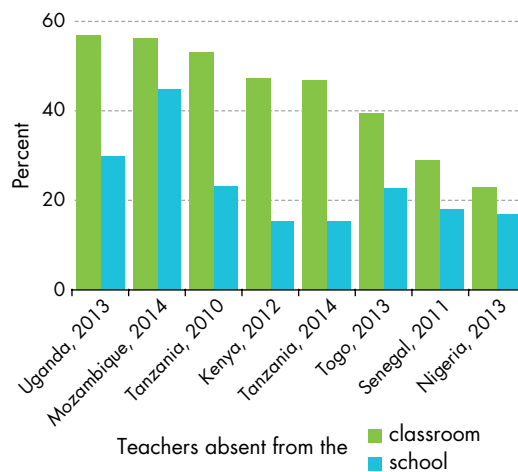
Source: WDR 2018 team, using data from Multiple Indicator Cluster Surveys (<http://mics.unicef.org/>). Data are for 2010 for the Central African Republic, 2010–11 for Kazakhstan, and 2012 for Tunisia.

fail before they reach classrooms, and even when they do make it to classrooms, they often do not enhance teaching or learning. In Brazil, a One Laptop Per Child initiative in several states faced years of delays. Then, even a year after the laptops finally made it to classrooms, more than 40 percent of teachers reported never or rarely using them in classroom activities.<sup>44</sup>

Fourth, poor management and governance often undermine schooling quality. Although effective school leadership does not raise student learning directly, it does so indirectly by improving teaching quality and ensuring effective use of resources.<sup>45</sup> Across eight countries that have been studied, a 1.00 standard deviation increase in an index of management capacity—based on the adoption of 20 management practices—is associated with a 0.23–0.43 standard deviation increase in student outcomes. But school management capacity tends to be lowest in those countries with the lowest income levels, and management capacity is substantially lower in schools than in manufacturing (figure O.10).<sup>46</sup> Ineffective school leadership means school principals are not actively involved in helping teachers solve problems, do not provide instructional advice, and do not set goals that prioritize learning. School governance—particularly the decision-making autonomy of schools, along with the oversight provided by parents and communities—serves as the framework for seeking local solutions and being accountable for them. In many settings, schools lack any meaningful

## Figure O.9 In Africa, teachers are often absent from school or from classrooms while at school

Percentage of teachers absent from school and from class on the day of an unannounced visit, participating countries



Source: Bold and others 2017.

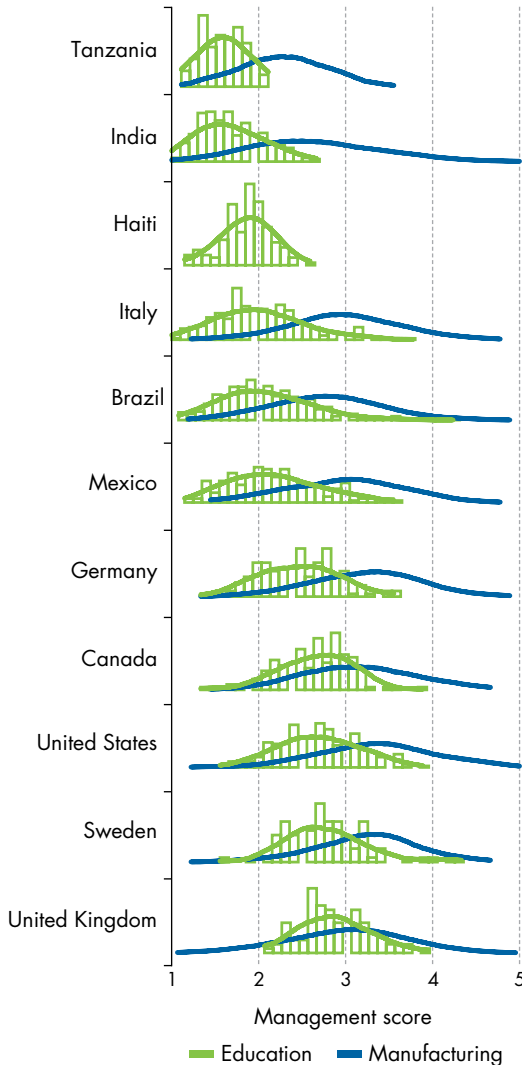
Note: “Absent from the classroom” combines absences from school with absences from class among teachers who are at school. Data are from the World Bank’s Service Delivery Indicators (SDI) surveys (<http://www.worldbank.org/sdi>).

autonomy, and community engagement fails to affect what happens in classrooms.<sup>47</sup>

Because these quality problems are concentrated among disadvantaged children, they amplify social

**Figure O.10 Management capacity is low in schools in low- and middle-income countries**

Distribution of management scores by sector, participating countries



Sources: Bloom and others (2014, 2015); Lemos and Scur (2016), with updates.

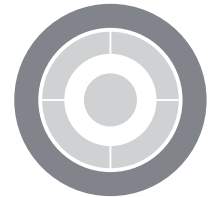
Note: The underlying distributions for the education data are shown as bars; for both sectors, the smoothed distributions are shown as curves. The indexes are constructed from the nine items that are comparable across sectors. Data on manufacturing are not available for Haiti.

inequalities. In low-income countries, on average, stunting rates among children under 5 are almost three times higher in the poorest quintile than in the richest.<sup>48</sup> In schools, problems with teacher absenteeism, lack of inputs, and weak management are typically severest in communities that serve the poorest students. It's not just that spending patterns

typically disadvantage marginalized communities, but also that resources are used less effectively there, exacerbating the problem. Public policy thus has the effect of widening social gaps rather than offering all children an opportunity to learn.

**Systems are failing schools**

Viewed from a systems perspective, the low level of learning and skills should come as no surprise. Technical complexities and political forces constantly pull education systems out of alignment with learning (figure O.11).



Problem dimension 3: Deeper causes

**Technical challenges:**

**Reorienting toward learning is hard**

Complex systems and limited management capacity are obstacles to orienting all parts of an education system toward learning. First, the various parts of the system need to be aligned toward learning. But actors in the system have other goals—some stated, some not. Promoting learning is only one of these, and not necessarily the most important one. At times, these other goals can be harmful, such as when construction firms and bureaucrats collude to provide substandard school buildings for their financial gain. At other times, these goals may be laudable, such as nurturing shared national values. But if system elements are aligned toward these other goals, they will sometimes be at cross-purposes with learning.

Even when countries want to prioritize learning, they often lack the metrics to do so. Every system assesses student learning in some way, but many systems lack the reliable, timely assessments needed to provide feedback on innovations. For example, is a new teacher training program actually making teachers more effective? If the system lacks reliable information on the quality of teaching and the learning of primary students—comparable across time or classrooms—there is no way to answer that question.

To be truly aligned, parts of the education system also have to be coherent with one another. Imagine that a country has set student learning as a top priority and that it has in place reasonable learning metrics. It still needs to leap a major technical hurdle, however: ensuring that system elements mesh. If a country adopts a new curriculum that increases emphasis on active learning and creative thinking, that alone will not change much. Teachers need to be trained so that they can use more active learning

methods, and they need to care enough to make the change because teaching the new curriculum may be much more demanding than the old rote learning methods. Even if teachers are on board with curriculum reform, students could weaken its effects if an unreformed examination system creates misaligned incentives. In Korea, the high-stakes exam system for university entrance has weakened efforts to reorient secondary school learning. The curriculum has changed to build students' creativity and socioemotional skills, but many parents still send their children to private "cram schools" for test preparation.<sup>49</sup>

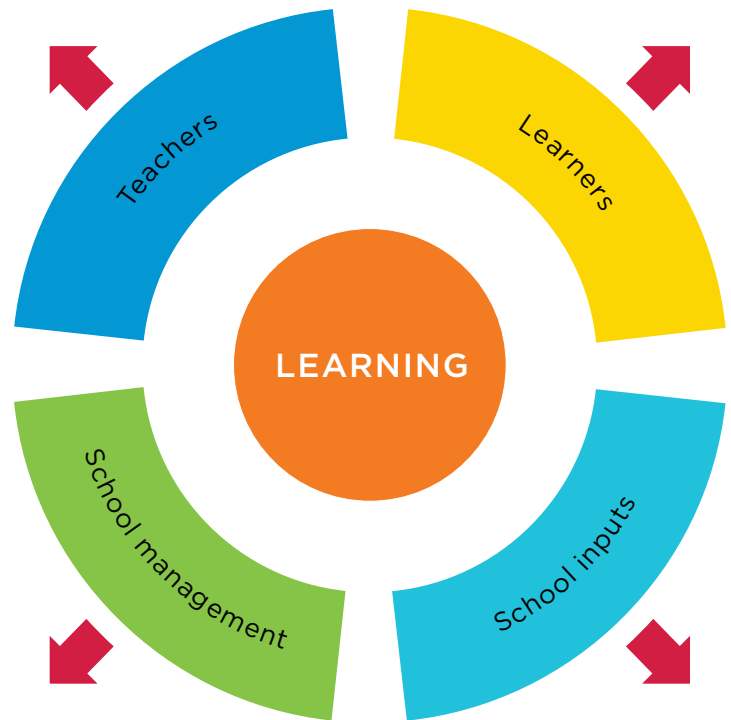
The need for coherence makes it risky to borrow system elements from other countries. Education policy makers and other experts often scrutinize systems that have better learning outcomes to identify what they could borrow. Indeed, in the 2000s the search for the secret behind Finland's admirable record of learning with equity led to a swarm of visiting delegations in what the Finns dubbed "PISA tourism." Finland's system gives considerable autonomy to its well-educated teachers, who can tailor their teaching to the needs of their students. But lower-performing systems that import Finland's teacher autonomy into their own contexts are likely to be disappointed: if teachers are poorly educated, unmotivated, and loosely managed, giving them even more autonomy will likely make matters worse. South Africa discovered this in the 1990s and 2000s when it adopted a curriculum approach that set goals but left implementation up to teachers.<sup>50</sup> The approach failed because it proved to be a poor fit for the capacity of teachers and the resources at their disposal.<sup>51</sup> Home-grown, context-specific solutions are important.

Successful systems combine both alignment and coherence. Alignment means that learning is the goal of the various components of the system. Coherence means that the components reinforce each other in achieving whatever goals the system has set for them. When systems achieve both, they are much more likely to promote student learning. Too much misalignment or incoherence leads to failure to achieve learning, though the system might achieve other goals (table O.1).

**Political challenges: Key players don't always want to prioritize student learning**

Political challenges compound technical ones. Many education actors have different interests, again beyond learning. Politicians act to preserve their positions in power, which may lead them to target particular groups (geographic, ethnic, or economic) for benefits. Bureaucrats may focus more on keeping

**Figure O.11** Technical and political factors divert schools, teachers, and families from a focus on learning



Source: WDR 2018 team.

politicians and teachers happy than on promoting student learning, or they may simply try to protect their own positions. Some private suppliers of education services—whether textbooks, construction, or schooling—may, in the pursuit of profit, advocate policy choices not in the interest of students. Teachers and other education professionals, even when motivated by a sense of mission, also may fight to maintain secure employment and to protect their incomes. None of this is to say that education actors don't care about learning. Rather, especially in poorly managed systems, competing interests may loom larger than the learning-aligned interests (table O.2).

Misalignments aren't random. Because of these competing interests, the choice of a particular policy is rarely determined by whether it improves learning. More often, the choice is made by the more powerful actors in the policy arena. Agents are accountable to one another for different reasons, not just learning. Given these interests, it should come as no surprise that little learning often results.

One problem is that activities to promote learning are difficult to manage. Teaching and learning in the

**Table O.1** Alignment and coherence both matter

| Are system elements . . . |     | Coherent?  |   |
|---------------------------|-----|--|---|
|                           |     | Yes  | No  |
| Aligned toward learning?  | Yes | <i>High performance:</i> Systems well organized to promote learning<br><i>Examples:</i> High performers at each level (Shanghai [China], Finland, Vietnam)   | <i>Incoherent strivers:</i> Systems incoherently oriented toward learning<br><i>Examples:</i> Countries that borrow learning-oriented “best practice” elements but do not ensure that the various elements are coherent with each other |
|                           | No  | <i>Coherent nonlearners:</i> Systems well organized to promote a different goal<br><i>Examples:</i> Totalitarian or authoritarian systems focused on promoting loyalty to the state or nation building (Stalin-era USSR, Suharto-era Indonesia); systems that focus on school attainment rather than learning (many systems) | <i>Failed systems:</i> Systems that are not trying to achieve learning or anything else in a coherent way<br><i>Examples:</i> Systems in failed states  |

Source: WDR 2018 team.

**Table O.2** Multiple interests govern the actions of education stakeholders

| Stakeholders   | Examples of . . .                         |  |
|--|---|--|
|  | Learning-aligned interests                | Competing interests  |
| Teachers   | Student learning, professional ethic      | Employment, job security, salary, private tuitions         |
| Principals   | Student learning, teacher performance     | Employment, salary, good relations with staff, favoritism  |
| Bureaucrats  | Well-functioning schools                  | Employment, salary, rent-seeking                           |
| Politicians  | Well-functioning schools                  | Electoral gains, rent-seeking, patronage                   |
| Parents and students   | Student learning, employment of graduates | Family employment, family income, outdoing others          |
| Judiciary  | Meaningful right to education             | Favoritism, rent-seeking                                   |
| Employers  | Skilled graduates                         | Low taxes, narrowly defined self-interests                 |
| Nongovernment schools (religious, nongovernmental, for-profit)                       | Innovative, responsive schooling          | Profit, religious mission, funding                         |
| Suppliers of educational inputs (e.g., textbooks, information technology, buildings) | High-quality, relevant inputs             | Profit, influence  |
| International donors   | Student learning                          | Domestic strategic interests, taxpayer support, employment |

Source: WDR 2018 team.

classroom involve significant discretion by teachers, as well as regular and repeated interactions between students and teachers.<sup>52</sup> These characteristics, coupled with a dearth of reliable information on learning, make managing learning more difficult than pursuing other goals.<sup>53</sup> For example, improvements in access to education can be monitored by looking

at simple, easily collected enrollment data. Similarly, school construction, cash transfer programs, teacher hiring, and school grant programs intended to expand access are all highly visible, easily monitored investments.

The potential beneficiaries of better foundational learning—such as students, parents, and employers—



often lack the organization, information, or short-term incentive to press for change. Parents are usually not organized to participate in debates at the system level, and they may lack knowledge of the potential gains from different policies to improve learning.<sup>54</sup> They also may worry about the potential ramifications for their children or themselves of opposing interests such as teachers, bureaucrats, or politicians. Students have even less power—except sometimes in higher education, where they can threaten demonstrations—and, like parents, they may be unaware of how little they are learning until they start looking for work. Finally, the business community, even if it suffers from a shortage of skilled graduates to hire, often fails to advocate for quality education, instead lobbying for lower taxes and spending. By contrast to these potential beneficiaries of reform, the potential losers tend to be more aware of what is at stake for them and, in many cases, better organized to act collectively.

As a result, many systems are stuck in low-learning traps, characterized by low accountability and high inequality. These traps bind together key stakeholders through informal contracts that prioritize other goals such as civil service employment, corporate profits, or reelection, perpetuating the low-accountability equilibrium. In better-run systems, actors such as bureaucrats and teachers can devote much of their energy to improving outcomes for students. But in low-learning traps those same actors lack either the incentives or the support needed to focus on learning. Instead, they are constantly pressured to deliver other services for more powerful players. As actors juggle multiple objectives, relying on each other in an environment of uncertainty, low social trust, and risk aversion, it is often in the interest of each to maintain the status quo—even if society, and many of these actors, would be better off if they could shift to a higher-quality equilibrium.

This diagnosis has concentrated on the shortfalls in foundational learning, as will the priorities for action discussed in the next section. However, this focus should not be interpreted as a statement that other areas are unimportant. Education systems and their enabling environment are broader and more complex than this Report can cover, so our priority here is to highlight what can be done most immediately to strengthen the foundations of learning on which all successful systems are built. But both the diagnosis and the priorities for action are relevant for

other parts of the system, such as higher education or lifelong learning. In these areas, too, many countries suffer from a lack of attention to outcomes, wide gaps in opportunity, and systemic barriers to resolving these problems.

### Still, there are reasons for hope

Even in countries that seem stuck in low-learning traps, some teachers and schools manage to strengthen learning. These examples may not be sustainable—and they are not likely to spread systemwide without efforts to reorient the system toward learning—but systems willing to learn from these outliers can benefit. On a larger scale, some regions within countries are more successful in promoting learning, as are some countries at each income level.

These examples reveal that higher-level system equilibriums exist. But is it possible for a whole system to escape the low-learning trap, moving to a better one? There are at least two reasons for optimism. First, as countries innovate to improve learning, they can draw on more systematic knowledge than ever available before about what can work at the micro level—the level of learners, classrooms, and schools. A number of interventions, innovations, and approaches have resulted in substantial gains in learning. These promising approaches come in many flavors—new pedagogical methods, ways to ensure that students and teachers are motivated, approaches to school management, technologies to enhance teaching learning—and they may not pay off in all contexts, but the fact that it is possible to improve learning outcomes should give hope. These interventions can provide substantial improvements in learning: almost one or two grade-equivalents for some students.<sup>55</sup> Even though successful interventions cannot be imported wholesale into new contexts, countries can use them as starting points for their own innovations.

Second, some countries have implemented reforms that have led to sustained systemwide improvements in learning. Finland's major education reform in the 1970s famously improved the equity of outcomes while also increasing quality, so that by the time of the first PISA in 2000, Finland topped the assessment. More recently, Chile, Peru, Poland, and the United Kingdom have made serious, sustained commitments to reforming the quality of their education systems. In all these countries, learning has improved over time—not always steadily, but enough to show that system-level reforms can pay off.



The education systems in Shanghai (China) and Vietnam today—and Korea decades ago—show that it is possible to perform far better than income levels would predict, thanks to a sustained focus on learning with equity. Brazil and Indonesia have made considerable progress, despite the challenges of reforming large, decentralized systems.

## How to realize education's promise: Three policy responses

Learning outcomes won't change unless education systems take learning seriously and use learning as a guide and metric. This idea can be summarized as "all for learning."<sup>56</sup> As this section explains, a commitment to all for learning—and thus to learning for all—implies three complementary strategies:

- *Assess learning—to make it a serious goal.* Measure and track learning better; use the results to guide action.
- *Act on evidence—to make schools work for learners.* Use evidence to guide innovation and practice.
- *Align actors—to make the whole system work for learning.* Tackle the technical and political barriers to learning at scale.

These three strategies depend on one another. Adopting a learning metric without any credible way to achieve learning goals will simply lead to frustration. School-level innovations without a learning metric could take schools off course, and without the system-level support they could prove ephemeral. And system-level commitment to learning without school-level innovation, and without learning measures to guide the reforms, is unlikely to amount to more than aspirational rhetoric. But together, the three strategies can create change for the better.

The potential payoff is huge. When children have a growth mindset, meaning they understand their own great learning potential, they learn much more than when they believe they are constrained by a fixed intelligence.<sup>57</sup> Societies have the same opportunity. By adopting a social growth mindset—recognizing the barriers to learning, but also the very real opportunities to break them down—they can make progress on learning. One overarching priority should be to end the hidden exclusion of low learning. This is not just the right thing to do; it is also the surest way to improve average learning levels and reap education's full rewards for society as a whole.

### Assess learning—to make it a serious goal

"What gets measured gets managed." "Just weighing the pig doesn't make it fatter." There is some truth to both of these sayings. Lack of measurement makes it hard to know where things are, where they are going, and what actions are making any difference. Knowing these things can provide focus and stimulate action. But measurement that is too removed from action can lead nowhere. The challenge is striking a balance—finding the right measures for the right purposes and implementing them within an appropriate accountability framework.



Policy response 1:  
**Assess learning**

### Use measurement to shine a light on learning

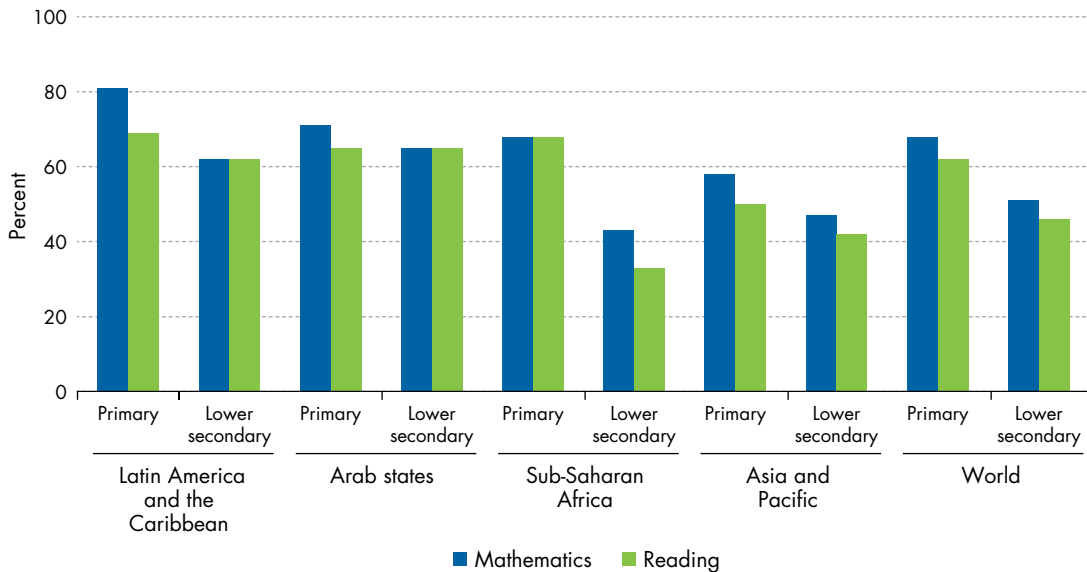
The first step to improving systemwide learning is to put in place good metrics for monitoring whether programs and policies are delivering learning. Credible, reliable information can shape the incentives facing politicians. Most notably, information on student learning and school performance—if presented in a way that makes it salient and acceptable—fosters healthier political engagement and better service delivery. Information also helps policy makers manage a complex system.

Measuring learning can improve equity by revealing hidden exclusions. As emphasized at the outset of this overview, the learning crisis is not just a problem for the society and economy overall; it is also a fundamental source of inequities and widening gaps in opportunity. But because reliable information on learning is so spotty in many education systems, especially in primary and lower secondary schools, the way the system is failing disadvantaged children is a hidden exclusion.<sup>58</sup> Unlike exclusion from school, lack of learning is often invisible, making it impossible for families and communities to exercise their right to quality education.

These measures of learning will never be the only guide for educational progress, nor should they be. Education systems should have ways of tracking progress toward any goal they set for themselves and their students—not just learning. Systems should also track the critical factors that drive learning—such as learner preparation, teacher skills, quality of school management, and the level and equity of financing. But learning metrics are an essential starting point for improving lagging systems.

## Figure O.12 Many countries lack information on learning outcomes

Percentage of countries with data to monitor progress toward the Sustainable Development Goals for learning by the end of primary or lower secondary school



Source: UIS 2016.

Note: Regional groupings follow UNESCO definitions.

### ***There is too little measurement of learning, not too much***

A recommendation to start tackling the learning crisis with more and better measurement of learning may seem jarring. Many education debates highlight the risks of overtesting or an overemphasis on tests. In the United States, two decades of high-stakes testing have led to patterns of behavior consistent with these concerns.<sup>59</sup> Some teachers have been found to concentrate on test-specific skills instead of untested subjects, and some schools have engaged in strategic behavior to ensure that only the better-performing students are tested, such as assigning students to special education that excuses them from testing.<sup>60</sup> In the extreme, problems have expanded to convictions for systemic cheating at the school district level.<sup>61</sup> At the same time, media coverage of education in many low- and middle-income countries (and some high-income ones) often focuses on high-stakes national examinations that screen candidates for tertiary education—raising concerns about an overemphasis on testing.

But in many systems the problem is too little focus on learning—not too much. Many countries lack information on even basic reading and math competencies. An assessment of capacity to monitor

progress toward the United Nations' Sustainable Development Goals found that of the 121 countries studied, a third lack the data required to report on the levels of reading and mathematics proficiency of children at the end of primary school.<sup>62</sup> Even more lack data for the end of lower secondary school (figure O.12). Even when countries have these data, they are often from one-off assessments that do not allow systematic tracking over time. A lack of good measurement means that education systems are often flying blind—and without even agreement on the destination.

### ***Use a range of metrics with one ultimate goal***

Different learning metrics have different purposes, but each contributes to learning for all. Teachers assess students in classrooms every day—formally or informally—even in poorly resourced, poorly managed school systems. But using metrics properly to improve learning systemwide requires a spectrum of types of assessment that, together, allow educators and policy makers to use the right combination of teaching approaches, programs, and policies.

Formative assessment by teachers helps guide instruction and tailor teaching to the needs of

students. Well-prepared, motivated teachers do not need to operate in the dark: they know how to assess the learning of students regularly, formally and informally. As the next section discusses, this type of regular check-in is important because many students lag so far behind that they effectively stop learning. Knowing where students are allows teachers to adjust their teaching accordingly and to give students learning opportunities they can handle. Singapore has successfully used this approach—identifying lagging students in grade 1 using screening tests and then giving them intensive support to bring them up to grade level.<sup>63</sup>

National and subnational learning assessments provide system-level insights that classroom assessments by teachers cannot. To guide an education system, policy makers need to understand whether students are mastering the national curriculum, in which areas students are stronger or weaker, whether certain population groups are lagging behind and by how much, and which factors are associated with better student achievement. There is no effective way to aggregate the results of classroom-level formative assessment by teachers into this type of reliable system-level information. This is why systems need assessments of representative samples of students across wider jurisdictions, such as countries or provinces. Such assessments can be an especially important part of tracking systemwide progress because they are anchored in a system's own expectations for itself. And national assessments can provide a check on the quality of subnational assessments by flagging cases in which trends or levels of student achievement diverge across the two. In the United States, the National Assessment of Educational Progress has played this role.<sup>64</sup>

International assessments also provide information that helps improve systems. Globally benchmarked student assessments such as PISA, TIMSS, and PIRLS, as well as regionally benchmarked ones such as PASEC in West and Central Africa and the Latin American Laboratory for Assessment of the Quality of Education (LLECE), provide an additional perspective on how well students are learning. They allow assessment of country performance in a way that is comparable across countries, and they provide a check on the information that emerges from national assessments. And international assessments can be powerful tools politically: because country leaders are concerned with national productivity and competitiveness, international benchmarking can

raise awareness of how a country is falling short of its peers in building human capital.

Two other types of learning metrics measured in nonschool settings can be used to strengthen the quality and equity focus of assessment systems. Grassroots accountability movements—led by civil society organizations such as the ASER Centre in India and Uwezo in East Africa—have deployed citizen-led assessments that recruit volunteers to measure the foundational learning of young children in their communities. These organizations then use their learning data to advocate for education reform. Some multipurpose household surveys also collect learning data, enabling researchers to analyze how learning outcomes correlate with income and community variables. Both types of assessments are administered in people's homes, not schools. As a result, they don't suffer from a key weakness of school-based assessments: when marginal students drop out, their absence can improve the average scores on school assessments, thereby creating a perverse incentive for school leaders. But household-based assessments yield learning metrics that reward systems for improving both access and quality. This is crucial to ensuring that no child is written off. Even for students who are in school, household-based assessments provide an alternative source of learning data, which can be important in settings where official assessments are of questionable quality.

### ***Measurement can be hard***

Why isn't there more and better measurement of learning? As with system barriers to learning, barriers to better measurement are both technical and political. From a technical perspective, conducting good assessments is not easy. At the classroom level, teachers lack the training to assess learning effectively, especially when assessments try to capture higher-order skills—say, through project-based assessment—rather than rote learning. And at the system level, education ministries lack the capacity to design valid assessments and implement them in a sample of schools. Political factors intrude as well. To paraphrase an old saying, policy makers may decide it is better to avoid testing and be assumed ineffective than to test students and remove all doubt. And even when they do participate in assessments, governments sometimes decline to release the learning results to the public, as happened with the 1995 TIMSS in Mexico.<sup>65</sup> Finally, if assessments are poorly designed or inappropriately made into high-stakes

tests, administrators or educators may have an incentive to cheat on them, rendering the assessment results worthless as a guide to policy.

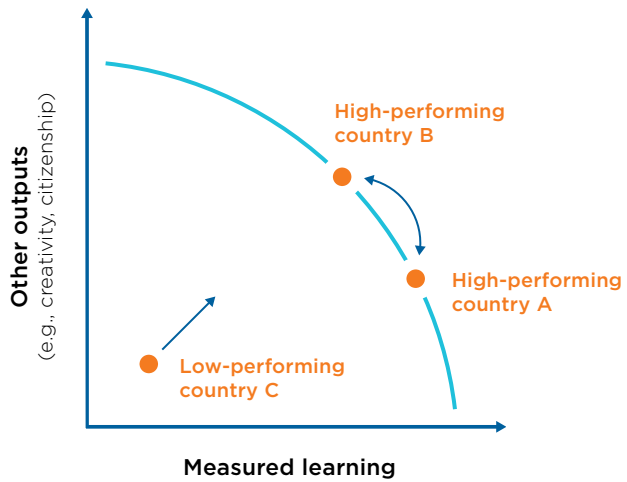
**Measurement doesn't need to detract from broader education objectives—it can even support them**

A stronger emphasis on measurable learning doesn't mean that other education outcomes don't matter. Formal education and other opportunities for learning have many goals, only some of which are captured by the usual assessments of literacy, numeracy, and reasoning. Educators also aspire to help learners develop higher-order cognitive skills, including some (like creativity) that are hard to capture through assessments. Success in life also depends on socioemotional and noncognitive skills—such as persistence, resilience, and teamwork—that a good education helps individuals develop. Education systems often have other goals as well: they want to endow students with citizenship skills, encourage civic-minded values, and promote social cohesion. These are widely shared goals of education, and it is understandable that people will ask whether, especially in education systems that are already overburdened, increasing the emphasis on measurable learning will crowd out these other goals.

In fact, a focus on learning—and on the educational quality that drives it—is more likely to “crowd in” these other desirable outcomes. Conditions that allow children to spend two or three years in school without learning to read a single word, or to reach the end of primary school without learning to do two-digit subtraction, are not conducive to reaching the higher goals of education. Schools that cannot equip youth with relevant job skills usually will not prepare them to launch new companies or analyze great works of literature either. If students cannot focus because of deprivation, if teachers lack the pedagogical skills and motivation to engage students, if materials meant for the classroom never reach it because of poor management, and if the system as a whole is unmoored from the needs of society—well, is it really plausible to believe that students are developing higher-order thinking skills like problem-solving and creativity? It is more likely that these conditions undermine the quest for higher goals—and that, conversely, improving the learning focus would accelerate progress toward those goals as well.

Paradoxically, lower-performing countries probably do not face the same sharp trade-offs encountered

**Figure O.13** Low-performing countries don't face sharp trade-offs between learning and other education outputs



Source: WDR 2018 team.

by high-performing countries on the education frontier. Economists use the concept of the production possibilities frontier to understand how producers—or in this case countries—make trade-offs between the production of different goods. This idea encapsulates the debates on education policy in OECD countries on the learning frontier (figure O.13). For example, in recent years many stakeholders in Korea have argued that their high-performing education system places too much emphasis on test scores (called “measured learning” in figure O.13) and not enough on creativity and certain socioemotional skills such as teamwork (“other outputs”). Implicitly, this Korean debate is about whether to try to move up and to the left on the frontier—that is, from A toward B. But in the low-learning trap, represented by “low-performing country C” in the figure, there is so much slack and such a weak focus on outcomes that this OECD-driven debate is not relevant. Country C has an opportunity to improve on both measured learning and other education outputs at the same time. An experiment in Andhra Pradesh, India, that rewarded teachers for gains in measured learning in math and language led to more learning not just in those subjects, but also in science and social studies—even though there were no rewards for the latter.<sup>66</sup> This outcome makes sense—after all, literacy and numeracy are gateways to education more generally.

## Act on evidence—to make schools work for learners



### Policy response 2: Act on evidence

Measurement of learning shortfalls doesn't provide clear guidance on how to remedy them. Fortunately, there is now a lot of experience on ways to improve learning outcomes at the student, classroom, and school levels. Cognitive neuroscience has evolved dramatically in the last two decades, providing insights on how children learn.<sup>67</sup>

This work has revealed how important the first several years of life are to a child's brain development.<sup>68</sup> At the same time, schools and systems around the world have innovated in many ways: by deploying novel approaches to pedagogy, using new technologies to enhance teaching and learning in classrooms, or increasing the accountability, and sometimes autonomy, of various actors in the system. The number of systematic evaluations of whether these interventions have improved learning has increased 10-fold, from just 32 in 2000 to 352 in 2016.<sup>69</sup>

Many interventions have succeeded in improving learning outcomes. The learning gains from effective interventions translate into additional years of schooling, higher earnings, and lower poverty. For a group of stunted Jamaican children 9–24 months old, a program to improve cognitive and socioemotional development led to much better outcomes 20 years later—lower crime rates, better mental health, and earnings that were 25 percent higher than those of nonparticipants.<sup>70</sup> Programs to improve pedagogy have had an impact greater than the equivalent of an extra half a year of business-as-usual schooling and an 8 percent increase in the present discounted value of lifetime earnings.<sup>71</sup> So while tackling the learning crisis is hard, the fact that there are interventions that improve learning suggests ways forward.

This evidence base does not allow us to identify what works in all contexts because there are no global solutions in education. Improving learning in a particular setting will never be as simple as taking a successful program from one country or region and implementing it elsewhere. Randomized controlled trials and other approaches to evaluate impact place a premium on carefully isolating the causal impact of an intervention. But such approaches may ignore important interactions with underlying factors that affect whether an intervention makes a difference—factors that may not be at play when replicating the intervention in a new context. For example, increasing class size by 10 students reduced test scores by

four times as much in Israel as it did in Kenya—and it has had no impact in some contexts.<sup>72</sup> In the words of two commentators on this literature: “Knowing ‘what works’ in the sense of the treatment effect on the trial population is of limited value without understanding the political and institutional environment in which it is set.”<sup>73</sup>

The next section tackles the question of that broader environment, but in the meantime we first address how to use this evidence most effectively. There are four main considerations.

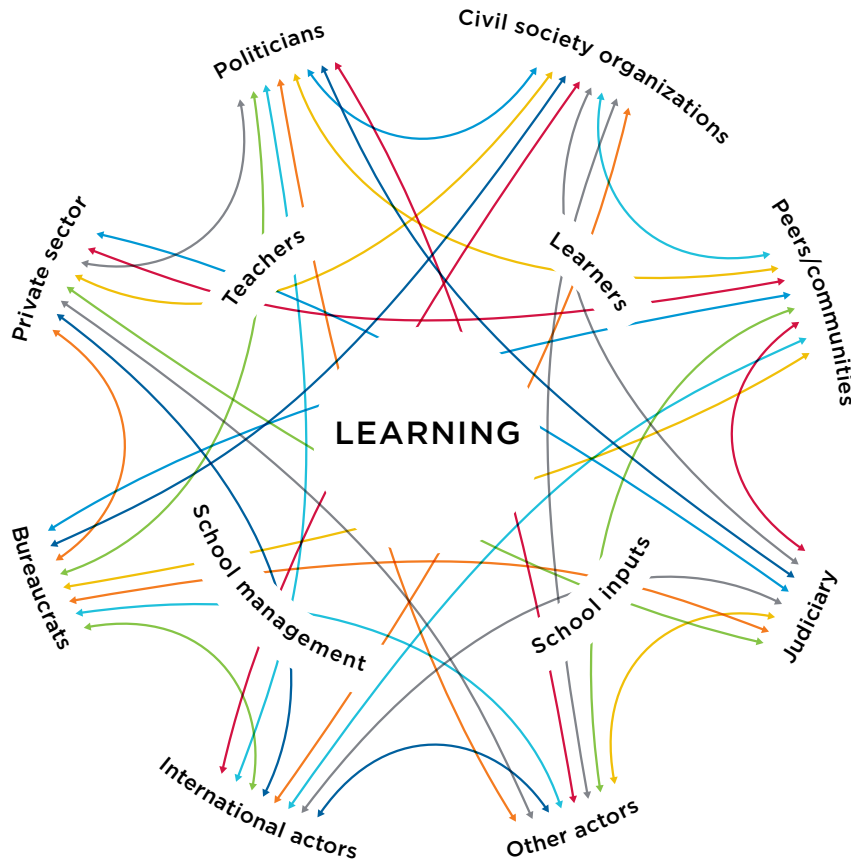
First, more important than the individual results from individual studies are the principles of how and why programs work. In economic terms, “principles” correspond to models of behavior that can then help guide broader sets of approaches to addressing problems. Three types of models can prove especially insightful: straightforward models in which actors maximize their welfare subject to the constraints they face; principal-agent models that incorporate multiple actors with different goals and perhaps different information; and behavioral models that factor in mental models and social norms.

Second, a gap between what the evidence suggests may be effective and what is done in practice points to a potential entry point for action. Understanding why gaps open up helps guide how to address them. For example, when different actors face different information, or some actors lack information, this suggests drawing from approaches that show how information can be disseminated and used better. Gaps point to which types of principles should drive context-specific innovation.

Third, evidence tends to accumulate where it is easiest to generate, not necessarily where action would make the most difference, so policies focused only on that evidence might be misguided.<sup>74</sup> Though the scope of the accumulated evidence in education is broad, just because an approach hasn't been evaluated doesn't mean it lacks potential. Context-specific innovation may mean trying things that have not been tried elsewhere.

Fourth, a focus on underlying principles highlights that the problem can't be solved by one decision maker simply prescribing an increase in the quantity, or even the quality, of one or more inputs. Many of the inputs in learning are the result of choices made by the various actors—choices made in reaction to the actual and anticipated choices of other actors. For example, teachers respond to incentives to attend school and to improve student outcomes, even though the nature of the response varies across contexts.<sup>75</sup> Likewise, students and parents make choices

**Figure O.14** It's more complicated than it looks: People act in reaction to the choices of others throughout the system



Source: WDR 2018 team.

responding to other decisions. In India and Zambia, government grants to schools led parents to reduce their own investments in their children's schooling.<sup>76</sup> All things considered, a more complete characterization of the learning framework might be closer to the one illustrated in figure O.14: learning how to improve outcomes by intervening at the student, classroom, and school levels involves illuminating the various arrows.

Putting all this together sheds light on three sets of promising entry points: prepared learners, effective teaching, and school-level interventions that actually affect the teaching and learning process. Each of these priority areas is founded on evidence from multiple contexts showing that it can make a real difference for learning.

### **Prepare children and youth for learning**

Getting learners to school ready and motivated to learn is a first step to better learning. Without it, other policies and programs will have a minimal effect.

There are three key entry points to addressing learner preparation:

- *Set children on high-development trajectories through early childhood nutrition, stimulation, and care.* Three approaches stand out from successful experiences. First, target mothers and their babies with health and nutrition interventions during the first 1,000 days to reduce malnutrition and foster physiological development. Second, increase the frequency and quality of stimulation and opportunities for learning at home (starting from birth) to improve language and motor development, as well as to cultivate early cognitive and socioemotional skills. Third, promote day-care centers for very young children and preschool programs for children 3–6 years old—along with caregiver programs that enhance the nurturing and protection of children—to improve cognitive and socioemotional skills in the short run, as well as education and labor market outcomes later in life.<sup>77</sup> Program quality matters

a lot: center-based programs with poor process quality (even with relatively good infrastructure, caregiver training, and caregiver-children ratios) can actually worsen developmental outcomes.<sup>78</sup>

- *Lower the cost of schooling to get children into school, but then use other tools to boost motivation and effort because cost-reducing interventions don't usually lead to learning on their own.*<sup>79</sup> To improve learning, demand-side programs need to increase a student's effort or capacity to learn. School-provided meals, for example, have had positive effects on access—and also on learning in places where children have limited access to food at home.<sup>80</sup> Targeted cash transfers have led to more learning when they have incentivized performance itself<sup>81</sup> or were marketed in a way that induces more effort, such as in Cambodia.<sup>82</sup> Some information interventions have motivated efforts as well.<sup>83</sup>
- *To make up for the fact that so many youth lack skills when leaving basic education, provide remediation before further education and training.*<sup>84</sup> Remediation in school is a first best approach. After school, the more successful programs share two main features. First, they provide bridging courses in real-life settings, which allows learners with very low foundational skills to build these in the workplace.<sup>85</sup> Second, accelerated, flexible pathways—not sequential courses over multiple semesters—are associated with greater student retention and ultimate certification.<sup>86</sup>

### ***Make teaching more effective***

Effective teaching depends on teachers' skills and motivation, and yet many systems do not take them seriously. Teacher salaries are the largest single budget item in education systems, consuming three-quarters of the budget at the primary level in developing countries. Yet many systems struggle to attract strong candidates into teaching and to provide a solid foundation of subject or pedagogical knowledge before they start teaching. As a result, new teachers often find themselves in classrooms with little mastery of the content they are to teach.<sup>87</sup> Once teachers are in place, the professional development they receive is often inconsistent and overly theoretical. In some countries, the cost of this training is enormous, reaching \$2.5 billion a year in the United States.<sup>88</sup> Moreover, education systems often have few effective mechanisms in place to mentor, support, and motivate teachers—even though teachers' skills do nothing for learning unless teachers choose to apply them in the classroom.<sup>89</sup> Fortunately, teachers' skills and motivation can be strengthened, leading to greater effort and more learning, with three main promising principles emerging:

- *For effective teacher training, design it to be individually targeted and repeated, with follow-up coaching—often around a specific pedagogical technique.* This approach contrasts starkly with much of today's professional development for teachers across a range of countries. In the United States, a team of teacher training experts characterized professional development there as “episodic, myopic, and often meaningless.”<sup>90</sup> In Sub-Saharan Africa, teacher training is often too short to be effective and too low in quality to make a difference.<sup>91</sup> By contrast, programs in Africa and South Asia that provided long-term coaching led to sizable learning gains.<sup>92</sup>
- *To keep learners from falling behind to the point where they cannot catch up, target teaching to the level of the student.* Over the course of several grades, often only a fraction of learners progress at grade level, with most falling behind and some learning almost nothing. This is partly because teachers teach to the most advanced students in the class, as documented from Australia to Sweden to the United States,<sup>93</sup> or because the curriculum is too ambitious but teachers are required to teach it.<sup>94</sup> Effective strategies to target teaching to the level of the student include using community teachers to provide remedial lessons to the lowest performers, reorganizing classes by ability, or using technology to adapt lessons to individual student needs.<sup>95</sup>
- *Use pecuniary and nonpecuniary incentives to improve the motivation of teachers, ensuring that the incentivized actions are within teachers' capacity.* Education systems typically neither reward teachers for performing well nor penalize them for performing poorly. Incentives are most likely to be effective at improving outcomes when there are straightforward actions that teachers can take to improve learning—such as increasing attendance when absenteeism is the constraint. But incentives do not need to be high-powered (or financial) to affect behavior. In Mexico and Punjab, Pakistan, simply providing diagnostic information to parents and schools about the schools' relative performance improved learning outcomes.<sup>96</sup>

### ***Focus everything else on teaching and learning***

School inputs, management, and governance must benefit the learner-teacher relationship if they are to improve learning—but many do not. Debates on improving education outcomes frequently revolve around increasing inputs, such as textbooks, technology, or school infrastructure. But too often the question of why these inputs might actually improve learning is



overlooked. The evidence on successful use of inputs and management suggests three main principles:

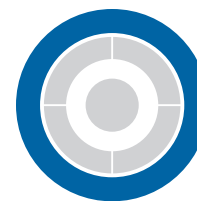
- *Provide additional inputs, including new technologies, in ways that complement rather than substitute for teachers.*<sup>97</sup> A computer-assisted learning program in Gujarat, India, improved learning when it added to teaching and learning time, especially for the poorest-performing students.<sup>98</sup> A Kenyan program that provided public school teachers with tablets to support instruction increased the reading performance of their students.<sup>99</sup> But simply providing desktop computers to classrooms in Colombia—where they were not well integrated with the curriculum—had no impact on learning.<sup>100</sup> Even more traditional inputs—such as books—often fail to affect teaching and learning when they aren't actually deployed in classrooms, or if the content is too advanced for the students.<sup>101</sup>
- *Ensure that new information and communication technology is really implementable in the current systems.* Interventions that incorporate information and communication technology have some of the biggest impacts on learning.<sup>102</sup> But for every highly effective program—such as a dynamic computer-assisted learning program for secondary school students in Delhi that increased math and language scores more than the vast majority of other learning interventions tested in India or elsewhere<sup>103</sup>—there are completely ineffective programs such as the One Laptop Per Child programs in Peru and Uruguay, which had no impact on student reading or math ability.<sup>104</sup> Technologies ill-adapted to their settings often fail to reach the classroom or to be used if they reach it.<sup>105</sup>
- *Focus school management and governance reforms on improving teacher-learner interaction.* Training principals in how to improve that interaction—by providing feedback to teachers on lesson plans, action plans to improve student performance, and classroom behavior—has led to a large impact on student learning.<sup>106</sup> In countries ranging from Brazil and India to Sweden, the United Kingdom, and the United States, the management capacity of school principals significantly and robustly relates to student performance—even after controlling for a variety of student and school characteristics.<sup>107</sup> Involving communities, parents, and school actors in ways that promote local oversight and accountability for service delivery can improve outcomes.<sup>108</sup> But community monitoring tends to have more impact when it covers things that parents can easily observe (such as teacher absenteeism when

it is high), and when a range of stakeholders (not just parents) are brought together in ways that lead to action. In Indonesia, school grants improved learning when links between the school and the village council—a center of local authority—were strengthened.<sup>109</sup>

The most effective systems—in terms of learning—are those that have narrowed gaps between evidence and practice. On learner preparation, for example, East Asian countries such as Korea and Singapore have achieved high levels of children ready to learn. Stunting rates among preschool-age children are low, and children are motivated and supported by their families. To promote effective teaching, Finland and Singapore attract some of the most highly skilled graduates from tertiary education into teaching and provide them with effective professional development opportunities and sustained support.

### Align actors—to make the whole system work for learning

Working at scale is not just “scaling up.” The concept of scaling up in education implies taking interventions that have been shown to be effective on a pilot or experimental scale and replicating them across hundreds or thousands of schools. However, this approach often fails because the key actors are human beings, operating with human aspirations and limitations in a politically charged arena. Real-world complications can undermine well-designed programs, especially when new, systemwide forces come into play. When the Cambodian government tried to scale up early child development centers and preschools—programs that had worked in some parts of the country when implemented by nongovernmental organizations (NGOs)—low demand from parents and low-quality services led to no impacts on child development, and even slowed it for some.<sup>110</sup> When the Kenyan government tried to lower student-teacher ratios by hiring contract teachers—an intervention that had improved student outcomes when implemented by an NGO—the results were negligible because of both implementation constraints and political economy factors.<sup>111</sup> And when the Indonesian government tried to increase teacher capacity by nearly doubling the salaries of certified teachers, political pressures watered down the certification process and left only the pay increase in place. The result was much larger



Policy response 3:  
Align actors



budget outlays on salaries, but no increase in teachers' skills or student learning.<sup>112</sup>

The lesson, then, is that better interventions at the school and student levels will sustainably improve learning only if countries tackle the stubborn system-level technical and political barriers to change. Technical barriers include the complexity of the system, the large number of actors, the interdependence of reforms, and the slow pace of change in education systems. Political barriers include the competing interests of different players and the difficulty of moving out of a low-quality equilibrium, especially in low-trust environments where risks predominate. All of these barriers pull actors away from learning, as discussed earlier. Systems that surmount these barriers and align actors toward learning can achieve remarkable learning outcomes. Shanghai provided proof when it topped the 2012 PISA rankings, in part thanks to policies that ensured that every classroom had a prepared, supported, and motivated teacher.<sup>113</sup>

To shift the system toward learning, technically and politically, reformers can use three sets of tools:

- *Information and metrics.* Better information and metrics can promote learning in two ways: by catalyzing reforms and by serving as indicators of whether reforms are working to improve learning with equity. Thus they can improve both the political and technical alignment of the system.
- *Coalitions and incentives.* Good information will have a payoff only if there is enough support for prioritizing learning. Politics is often the problem, and politics must be part of the solution. This requires forming coalitions to advocate for broad-based learning and skills and to rebalance the political incentives.
- *Innovation and agility.* Schools and societies have achieved high levels of equitable learning in a variety of ways. Figuring out what approaches will work in a given context requires innovation and adaptation. This means using evidence to identify where to start and then using metrics to iterate with feedback loops.

All of these tools will be most effective when supported by strong implementation capacity within government.

### **Information and metrics**

Better information and measurement—starting with learning metrics—are critical to creating political space for innovation and then using that space to achieve continuous improvement. As emphasized,

the absence of good information on learning prevents stakeholders from judging system performance, designing the appropriate policies, and holding politicians and bureaucrats to account. Thus improving learning metrics is crucial for drawing attention to problems and building the will for action. In Germany, the “PISA shock” created by mediocre scores and large achievement gaps on the first PISA assessment in 2000 led to reforms, resulting in a turnaround over the ensuing decade that improved both equity and average learning levels.

Efforts in this area need to go beyond just measuring learning; they should track its determinants as well. Understanding these determinants can enable reforms to grapple with the deeper causes, if there is a systemwide commitment to improving learning. Take the issue of learner preparedness. When indicators reveal that poorer children already lag far behind by the time they start primary school, this finding can build political will not only to expand preschool education in low-income areas, but also to combat stunting and educate parents about early stimulation of children. When indicators show that many teachers lack a strong command of what their students are meant to learn, this finding can spark efforts to improve the quality of teacher education—especially when continual monitoring reveals that just ramping up current training doesn't improve teaching.<sup>114</sup>

Of course, information and metrics can also be misleading, irrelevant, or politically unsustainable, so they need to be designed and used wisely. Metrics may fail to capture important dimensions of the outcomes the education system is trying to promote. For example, the Millennium Development Goal of universal primary education by 2015 embodied a crucial goal—equitable access—but it did not represent what many assumed it did: universal acquisition of foundational literacy and numeracy, let alone other life skills. Another risk is of distorting good metrics by putting high stakes on them, if potential beneficiaries can game the indicators. Thus systems will need different measures for different purposes.<sup>115</sup> Even if they are technically sound, metrics may prove politically unsustainable if they highlight too many problems and do not provide any reason for hope. One way to address this problem is to focus not on levels of learning, which may be very low, but on progress over time.

### **Coalitions and incentives**

Mobilizing everyone who has a stake in learning has been an important strategy in efforts to improve learning. Many countries have used wide-ranging

consultations that have tried to bring in all interest groups to build support for proposed changes in education policy. Malaysia used a “lab” model to bring together coalitions of stakeholders and involve them in all stages of reform, from design to implementation.<sup>116</sup> Mobilizing citizens through regular information and communication campaigns can also be an important strategy. In Peru, reformers in the government used information on poor learning outcomes and performance of the education system to mobilize public support for reforms to strengthen teacher accountability. That information also catalyzed action by the business community, which funded a campaign highlighting the importance of quality education for economic growth. In parts of Peru, parents used this entry point to protest teacher strikes that had disrupted schooling.<sup>117</sup> Another tool for building coalitions is to bundle reforms, so that each actor achieves one of its top priorities. For example, a commitment to modernize vocational training—a reform that could help employers immediately—could buy their support for broader education reforms.

Where feasible, a negotiated and gradual approach to reform can provide a more promising alternative to direct confrontation. When system actors agree to collaborate and build trust around shared goals, the chances of successful reform are likely to be higher. In Chile, successive negotiations between the government and the teachers’ union built broad support for a series of reforms that adjusted the working conditions of teachers to improve their overall welfare, while linking pay and career development more closely to performance.<sup>118</sup> One approach used by several countries has been to compensate actors who might lose out from reforms. In other cases, dual-track reforms have been introduced to phase in changes in a way that protects incumbent actors from their effects—for example, in Peru and the District of Columbia in the United States, pay-for-performance schemes were initially voluntary.<sup>119</sup>

Building strong partnerships between schools and their communities is also important for sustaining reforms. Where political and bureaucratic incentives for reform are weak, action at the local level can act as a substitute. In South Africa, the political and economic context constrains efforts to improve education performance. Yet progress was made in improving outcomes at the local level through strong partnerships between parents and schools.<sup>120</sup> Even where broader incentives exist to improve learning, community engagement at the local level is important and can complement national or subnational change efforts.<sup>121</sup>

### ***Innovation and agility***

To develop effective learning approaches that fit their contexts, education systems need to encourage innovation and adaptation. In many education systems, schools and other education institutions regularly adapt to changing circumstances. Through these adaptations, innovative solutions to education challenges often emerge. Exploring the well-performing parts of any education system can reveal technically and politically feasible approaches to the problems systems face in improving learning. For example, in Misiones province in Argentina high student dropout rates were widespread, but some schools seemed to buck the trend. A closer look at these “positive deviants” revealed very different relationships between teachers and parents. When other schools adopted the more constructive approach to parent-teacher relations used by the successful schools, their dropout rates fell significantly.<sup>122</sup> Burundi, while recovering from a civil war, used an adaptive approach to find the right way to get textbooks to schools. It reduced delivery times from over a year to 60 days—then replicated that approach in other areas.<sup>123</sup>

Incentives are important in determining whether systems innovate and adopt emerging solutions at scale. Systems that are closed, that limit the autonomy of teachers and schools, and that judge performance by the extent of compliance with rules governing resource use often provide little room for innovation. By contrast, more open systems that pay more attention to overall outcomes and reward progress in raising outcomes are more likely to see greater innovation and the diffusion of new approaches across the education system.<sup>124</sup>

To make a difference at the system level, such innovations need to be packaged with good metrics and with system-level coalitions for learning. Without both, any improvements from innovation are likely to prove short-lived or limited to local areas. But with such support, a virtuous cycle becomes possible as systems follow these steps:

- Set learning as a clearly articulated goal and measure it.
- Build a coalition for learning that gives the political space for innovation and experimentation.
- Innovate and test approaches that seem the most promising for the given context, drawing inspiration from the evidence base and focusing on areas that promise the biggest improvements over current practice.
- Use the measure of learning, along with the other metrics of delivery, as a gauge of whether the approach is working.

**Figure O.15** Coherence and alignment toward learning



Source: WDR 2018 team.

- Build on what works, and scale back what doesn't, to deliver short-term results that strengthen the long-term resolve of the coalition for learning.
- Repeat.

The payoff to doing what needs to be done is a system in which the elements are coherent with each other and everything aligns with learning (figure O.15).

Increased financing can support this learning-for-all equilibrium, if the various key actors behave in ways that show learning matters to them. This is a big “if” because higher levels of public spending are not associated statistically with higher completion or even enrollment rates in countries with weak governance.<sup>125</sup> Ensuring that students learn is even more challenging, and so there is little correlation between spending and learning after accounting for national income. It is easy to see the reason for this because of the many ways in which financing can leak out—whether because money never reaches the school, or because it pays for inputs that don't affect the

teaching-learning relationship, or because the system doesn't prioritize learning for disadvantaged children and youth. More financing for business as usual will therefore just lead to the usual outcomes. But where countries seriously tackle the barriers to learning for all, spending on education is a critical investment for development, especially for those countries where overall spending is currently low, as recent major studies of global education have emphasized.<sup>126</sup> More children staying in school longer and learning while there will undoubtedly require more public financing for education. An injection of financing—either from domestic or international sources—can help countries escape the low-learning trap, if they are willing to take the other necessary steps laid out here.

**Implications for external actors**

External actors can reinforce these strategies for opening the political and technical space for learning. In the realm of information and metrics, for example, international actors can fund participation

in regional learning assessments (such as PASEC in West Africa or LLECE in Latin America) or global learning assessments (such as PISA or TIMSS) to spotlight challenges and catalyze domestic efforts for reform. External actors can also develop tools for tracking the proximate determinants of learning to aid in feedback loops. Domestic financing usually makes up the bulk of education financing, so a high-leverage entry point for international actors is to fund better information that will make domestic spending more effective. In the realm of innovation and experimentation, external funders such as the World Bank can provide results-based financing that gives countries more room to innovate and iterate their way to achieving better outcomes.

## Learning to realize education's promise

By showing that learning really matters to them, countries can realize education's full promise. Beyond being a basic human right, education—done right—improves social outcomes in many spheres of life. For individuals and families, education boosts human capital, improves economic opportunities, promotes health, and expands the ability to make effective choices. For societies, education expands economic opportunities, promotes social mobility, and makes institutions function more effectively. In measuring these benefits, research has only recently focused on the distinction between schooling and learning. But the evidence confirms the intuition that these benefits often depend on the skills that students acquire, not just the number of years in the classroom. Economies with higher skills grow faster than those with schooling but mediocre skills; higher literacy predicts better financial knowledge and better health, beyond the effects of schooling; and poor children are more likely to rise in the income distribution when they grow up in communities with better learning outcomes.

Taking learning seriously won't be easy. It's hard enough to work through the technical challenges of figuring out what will promote learning at the level of the student and school in any context, let alone tackle the political and technical challenges of working at scale. Many countries struggling with the learning crisis may be tempted to continue with business as usual. After all, they may reason, development will eventually improve learning outcomes: as households escape poverty and schools take advantage of better facilities, more materials, and better-trained teachers, better learning outcomes should follow.

But waiting out the learning crisis isn't a winning strategy. Even though national income and learning are somewhat correlated at lower levels of development, higher incomes do not invariably lead to better learning outcomes. And to the extent that development does bring better learning and skills, it is partly because development has been accompanied by a willingness to tackle the political impasses and governance challenges that hamper learning. Ultimately, then, those challenges are not avoidable. Furthermore, there's no need to wait for learning. At every level of income, there are countries that not only score better than others on international assessments, but also—and more important—show from the quality of their education systems and their policy making that they are committed to learning.

The future of work will place a premium on learning. Rapid technological change has led to major shifts in the nature of work, leading some to declare this a new era—the Second Machine Age or the Fourth Industrial Revolution. In the extreme versions of this vision, all but a few jobs could disappear, decreasing the value of skills for most people. But the seismic changes predicted have yet to permeate the high-income countries, let alone the low- and middle-income ones. More important, no matter how the demand for skills changes in the future, people will require a solid foundation of basic skills and knowledge. If anything, rapid change will increase the returns to learning how to learn, which requires foundational skills that allow individuals to size up new situations, adapt their thinking, and know where to go for information and how to make sense of it.

\* \* \*

Countries have already made a tremendous start by getting so many children and youth into school. Now it's time to realize education's promise by accelerating learning. A real education—one that encourages learning—is a tool for promoting both shared prosperity and poverty elimination. That type of education will benefit many: children and families whose positive schooling experience restores their faith in government and society rather than eroding it; youth who have skills employers are seeking; teachers who can respond to their professional calling rather than to political demands; adult workers who have learned how to learn, preparing them for unforeseeable economic and social changes; and citizens who have the values and reasoning abilities to contribute to civic life and social cohesion.

## Notes

1. Uwezo (2014). In all countries, the test was administered in English. In Kenya and Tanzania, it was also administered in Kiswahili, and the highest score (English or Kiswahili) was used in the assessment of proficiency. English is the language of instruction in Kenya and Uganda.
2. ASER Centre (2017).
3. WDR 2018 team, using data from the Programme for International Student Assessment (PISA), 2015 (OECD 2016).
4. WDR 2018 team, using data from the Third Regional Comparative and Explanatory Study (TERCE), 2012 (UNESCO 2013).
5. UNESCO (2016).
6. World Bank (2011).
7. Barro and Lee (2013).
8. Pritchett (2013).
9. Pritchett (2013).
10. Gove and Cvelich (2011).
11. Crouch (2006).
12. Castillo and others (2011).
13. ASER Pakistan (2015a, 2015b).
14. Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) results for grade 6 students in 15 countries in 2007 (Hungu and others 2010).
15. Programme d'Analyse des Systèmes Éducatifs de la Confemem (PASEC) results for grade 6 students in 10 francophone countries in 2014 (PASEC 2015).
16. ASER Centre (2017).
17. RTI International (2009).
18. World Bank (2016b).
19. Muralidharan and Zieleniak (2013).
20. Spaul and Kotze (2015).
21. Singh (2015).
22. *Minimum proficiency* is defined as one standard deviation below the mean of the harmonized assessment scores.
23. These numbers are based on analysis of the data in "A Global Data Set on Education Quality," a data set made available to the WDR 2018 team by Nadir Altinok, Noam Angrist, and Harry Athony Patrinos, 2017. These averages do not include China or India because of lack of data.
24. UNESCO (2016).
25. UIS and EFA (2015).
26. Banerjee, Jacob, and Kremer (2000); Hanushek and Woessmann (2008); Rivkin, Hanushek, and Kain (2005).
27. Alderman, Orazem, and Paterno (2001); Andrabi, Das, and Khwaja (2008); Farah (1996); Kingdon (1996); Orazem (2000); Tooley and Dixon (2007).
28. Hanushek, Lavy, and Hitomi (2008).
29. STEP surveys (World Bank 2014).
30. Lupien and others (2000); McCoy and others (2016); Walker and others (2007).
31. Coe and Lubach (2007); Garner and others (2012); Nelson (2016).
32. Black and others (2017). *Stunting* is defined by the World Health Organization (WHO) as a height-for-age z-score of less than two standard deviations below the median of a healthy reference population.
33. Paxson and Schady (2007); Schady and others (2015).
34. Hanushek (1992); Rockoff (2004).
35. Bau and Das (2017).
36. Bruns and Luque (2015).
37. UIS (2006).
38. Chang and others (2013).
39. Abadzi (2009); EQUIP2 (2010).
40. Bold and others (2017).
41. Hanushek (1995); Mingat and Tan (1998); Tan and Mingat (1992); Wolf (2004).
42. Glewwe and others (2011); Hanushek (1986); Kremer (1995).
43. Sabarwal, Evans, and Marshak (2014).
44. Lavinias and Veiga (2013).
45. Robinson, Lloyd, and Rowe (2008); Waters, Marzano, and McNulty (2003).
46. Bloom and others (2015). Management areas include operations, monitoring, target setting, and people management.
47. Bruns, Filmer, and Patrinos (2011); Orazem, Glewwe, and Patrinos (2007); World Bank (2003).
48. Data extracted from U.S. Agency for International Development's Demographic and Health Survey (DHS) StatCompiler, <http://www.statcompiler.com/en/>.
49. Park (2016).
50. Todd and Mason (2005).
51. Chisholm and Leyendecker (2008).
52. World Bank (2003).
53. Andrews, Pritchett, and Woolcock (2017).
54. Grindle (2004).
55. Evans and Yuan (2017).
56. The team thanks Kai-Ming Cheng for suggesting this formulation.
57. Dweck (2008).
58. Save the Children (2013).
59. Guilfoyle (2006).
60. Jacob (2005).
61. Fausset (2014).
62. UIS (2016).
63. OECD (2011).
64. Jacob (2007).
65. Solano-Flores, Contreras-Niño, and Backhoff Escudero (2005).
66. Muralidharan and Sundararaman (2011).
67. De Smedt (2014); Insel and Landis (2013); Kuhl (2010).
68. Dua and others (2016).
69. Evans and Popova (2016).
70. Gertler and others (2014).
71. Calculations carried out for WDR 2018. See Evans and Yuan (2017).
72. Pritchett and Sandefur (2013).
73. Deaton and Cartwright (2016).
74. Romer (2015).

75. Duflo, Hanna, and Ryan (2012); Muralidharan and Sundararaman (2011).
76. Das and others (2013).
77. The evidence is from countries ranging from the United States to Argentina, Bangladesh, China, and Uganda, among others (Berlinski, Galiani, and Gertler 2008; Engle and others 2011).
78. Berlinski and Schady (2015); Bernal and others (2016); Grantham-McGregor and others (2014).
79. Baird and others (2014); Fiszbein and Schady (2009); Morgan, Petrosino, and Fronius (2012).
80. Snilstveit and others (2016).
81. Blimpo (2014); Kremer, Miguel, and Thornton (2009). Direct financial incentives have been less successful in high-income countries (Fryer 2011), although alternate designs that deliver incentives immediately after the test have worked (Levitt and others 2016).
82. Barrera-Osorio and Filmer (2013).
83. Avitabile and de Hoyos (2015); Nguyen (2008).
84. ILO (2015).
85. Bragg (2014).
86. Calcagno and Long (2008); Martorell and McFarlin Jr. (2011); Scott-Clayton and Rodriguez (2014).
87. Tandon and Fukao (2015); World Bank (2013, 2016a).
88. Layton (2015).
89. Bruns and Luque (2015); Mulkeen (2010).
90. Darling-Hammond and others (2009).
91. Lauwerier and Akkari (2015).
92. Banerjee and others (2007); Conn (2017).
93. Abadzi and Llambiri (2011); Ciaccio (2004); Leder (1987).
94. Banerjee and others (2016); Pritchett and Beatty (2015).
95. Banerjee and others (2007); Duflo, Dupas, and Kremer (2011); Kiessel and Duflo (2014); Muralidharan, Singh, and Ganimian (2016).
96. Andrabi, Das, and Khwaja (2015); de Hoyos, Garcia-Moreno, and Patrinos (2017).
97. Snilstveit and others (2016).
98. Linden (2008).
99. Piper and others (2015).
100. Barrera-Osorio and Linden (2009).
101. Glewwe, Kremer, and Moulin (2009); Sabarwal, Evans, and Marshak (2014).
102. McEwan (2015).
103. Muralidharan, Singh, and Ganimian (2016).
104. Cristia and others (2012); De Melo, Machado, and Miranda (2014).
105. Lavinias and Veiga (2013).
106. Fryer (2017).
107. Bloom and others (2015).
108. Bruns, Filmer, and Patrinos (2011).
109. Pradhan and others (2014).
110. Bouguen and others (2013).
111. Bold and others (2013).
112. Chang and others (2013); de Ree and others (2015).
113. Liang, Kidwai, and Zhang (2016).
114. For example, in Mozambique, after the World Bank's Service Delivery Indicators revealed very low levels of teacher knowledge and very high levels of absenteeism—results that were picked up by the local media—the

government launched a program (ultimately supported through a loan from the World Bank) to address these issues.

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117. Bruns and Luque (2015).
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122. Green (2016); Pascale, Sternin, and Sternin (2010).
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