Education

While almost everyone would agree that a good education is vitally important, schooling systems in low- and lower-middle-income countries are mostly failing to teach children basic reading and math. They have managed to get most children into school, but children are not learning. Almost <u>80% of students</u>—half a billion—are not even achieving minimal skills. Although the poorer half of the world has almost doubled its spending on each primary school student since 1990, learning levels have remained low.

Fortunately, the paper on which this chapter is based identifies two policies that can dramatically increase basic reading and math proficiency for a comparatively small cost.

We've invested a lot in schools-but not in learning

Schooling is not only transformative for a person but also for a country as a whole. Education is possibly the <u>single most important factor</u> in determining whether a nation is rich or poor. This is why every year, the world spends <u>about \$5 trillion</u> on education, with most of that money spent in rich countries.

Indeed, if an average low- or lower-middle-income country could provide schooling at the same level as the U.K. education system, it could make that nation at least <u>40% richer</u>. If all achieved such efficient primary schooling, altogether, these countries would be \$4 trillion richer each year.

Given the importance of education, the world has long worked to improve it—with notable successes. In 1800, 88% of the world's population <u>was illiterate</u>. Even in Europe, most people couldn't read and write. Today, <u>86%</u> of the world's adults are literate.

The MDGs were particularly helpful in closing education gaps. The goals <u>promised</u> to get all children into primary school, with a specific focus on girls, who are often left behind. Although the world didn't entirely achieve all children starting school, it <u>came close</u> in every region except sub-Saharan Africa. Even there, primary school enrollment expanded from 52% in 1990 to 80% in 2015. The gender gap in enrollment was almost eradicated in many parts of the world and reduced in Africa and southern Asia.

Yet, while the world has succeeded in getting most children and adolescents into school, many of them <u>aren't learning</u>. A substantial portion of students in poor and rich nations alike don't have a basic competency in math or reading—what's known as the <u>Minimum Proficiency Level</u>. For reading, this means being able to understand and analyze a text at a basic level.

Achieving a Minimum Proficiency Level for lower-primary students, for instance, involves reading the <u>sentence</u>, "Vijay has a red hat, a blue coat, and yellow socks." and being able to correctly answer the question: "What color is the hat?" Similarly, a basic level of math involves understanding that if two people equally <u>share six pieces of cheese</u>, each person gets three pieces of cheese.

Of the 467 million primary school pupils in the poorer half of the world, 364 millionin school today cannot pass even these simple tests.ⁱ Leaders and philanthropists across the globe are intent on helping these students learn what they need to, but many popular policies have had little effect.

Over recent decades, a common underlying assumption in education policy has been that more spending is the key. If we just pay for more teachers, pay each teacher more, and buy bigger and better classrooms, learning will improve. Yet, the evidence shows otherwise.

Spending has certainly increased. From 1990 to 2015, total government spending on education almost tripled from \$63 billion to \$173 billion. Part of this is due to the almost 50% increase in the number of children brought into school, from 324 million to 467 million, mostly because of higher enrolment. But even when adjusted for more children, government spending almost doubled per primary school student in low- and lower-middle-income countries, rising from \$196 to \$352 per student. This isn't a complete picture, given that in poorer countries, households pay perhaps a quarter of educational costsⁱⁱ—but government expenditures do cover most of the education spending and are better documented. Unfortunately, there is little evidence showing how this money was spent, but it is likely that a large portion went to higher wages for teachers.

Yet, learning outcomes changed almost imperceptibly. <u>Learning scores</u> in sub-Saharan Africa increased by less than 5% from 2000 to 2015. The gap between the poor and the rich world remained substantial—the average primary school student in sub-Saharan Africa would rank far below 99% of the same-grade students in North America. At the current rate of improvement, it will take 159 more years for primary schools in sub-Saharan Africa to catch up with the level that North American primary schools were at in 2015.

The problem was that the policies focused mainly on inputs—providing classrooms and teachers—rather than the output of better education. Look at, for example, the education spending increases in India and Indonesia, which together account for one-third of all primary school children from the world's poorer half.

In 2009, India passed landmark legislation <u>promising</u> free education for all children while increasing teacher numbers and setting up infrastructure requirements for schools, such as libraries and gender-specific toilets so that female students had safe and private bathroom facilities. Government spending per primary school pupil <u>increased</u> by 71% over just seven years and <u>succeeded in enrolling 10–15 million new students</u>. However, test scores didn't increase. In fact, the best estimate shows that reading and math test scores "<u>declined sharply</u>" after 2009, and the research shows that it is unlikely that this dip has been caused by the addition of weaker students.

Of course, achieving schooling for otherwise marginalized groups can have other valuable impacts, both delivering education and opportunity to these groups along with protecting them from child labor, family violence, or child marriage. But the large increase in school spending did not increase learning, arguably the crucial objective of education.

The same sort of thing happened in Indonesia when it increased education funding. In 2001, the government devoted 10% of its budget to schooling, and four years later, the Indonesian parliament <u>amended the nation's constitution</u> to require that 20% of the budget be spent on education. This more than <u>doubled education spending</u> from \$18 billion in 2005 to \$45 billion today. Indonesia increased the number of teachers from 2.7 to 3.8 million over only 11 years, leading the country to have one of the <u>lowest class sizes in the world</u>. It also doubled the average teacher's income. A <u>famous study</u> showed that this—unsurprisingly—improved teachers' satisfaction with their income and reduced their financial stress and dependence on second jobs. Unfortunately, it had absolutely no impact on student learning outcomes.

It can be surprising that these seemingly obvious and highly visible policies deliver no learning increases, but it's easy for well-intentioned initiatives to cost a lot of money for no learning benefit. Consider, for example, that one of the most highly visible global education campaigns in recent times was "One Laptop per Child," which generated vast attention with charismatic proponents, political buy-in, and satisfying narratives of poor children being provided with their very own computers. When the policy was <u>finally evaluated</u> with the gold standard of a randomized controlled trial, it revealed "no impacts on academic achievement or cognitive skills." Teachers even reported that pupils who received laptops were less likely to make an effort at school—a finding that has since <u>been supported</u> by larger studies.

A recent <u>World Bank review</u> of 150 possible education policies shows that fully half of these deliver no learning whatsoever. There are also many policies that deliver some learning benefits but at great cost, such as the construction of new schools, which reduces travel time and hence increases attendance, but are very expensive.

If most of our attention remains focused on inefficient policies, we're going to fail to meet our own goals to help students learn more.

SDG education promises won't be fulfilled until 2056

We need better education policies, and we need them fast. It would make a tremendous difference for the 70 million children in low- and lower-middle-income countries that come of age every year to enter school if we could ensure this is an experience of enrichment and learning.

World leaders promised in the education SDG to ensure that by 2030, "all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes." Of course, they promised this along with a dense list of other targets, including promises of pre-primary school, technical, vocational, and university education accessible also for persons with disabilities, indigenous peoples, children in vulnerable situations, better teachers, and many others, including the fantastically long and incomprehensible promise discussed in chapter 2.

These lofty targets are less a series of development objectives than a wish list of everything that would be great to have in the field of education. While well-intentioned, these targets come across as quite unrealistic in a world with limited means—even more so because the rest of the SDGs include similarly near-impossible promises across every other area of development.

Take the current status of SDG Education Goal 4, which shows how very far the world is from reaching these promises on schooling. According to the <u>Sustainable Development Report</u>, the world was already 83.1% of the way to fulfilling Goal 4 when the SDGs were adopted in 2015, but by the end of 2021, it had advanced by just a bit over one percentage point.

On this current trajectory, the world will only be 88.5% of the way toward achieving its education promises by the 2030 deadline. It'll be 2056 before we achieve it in full, as Figure 5.1 shows.

Though no income group will reach the education target by the 2030 deadline, how late they vary a fair amount by income. Low-income countries started at a very low level of 15% in 2000 but were at 36% in 2021. On pre-Covid trends (2015–2019), they are on track to reach 49% in 2030 and 100% before 2067. Lower-middle-income countries, on the other hand, are now at 77%

and are on track to reach 83% in 2030 and 100% before 2052. Rich countries are at 95%, but they have been backsliding slightly since 2016, so using the 2015–19 trend means they won't make the target at all.



Figure 5.1 Global fulfillment of SDG 4, Education, data from 2000–2021, trend after 2021, and the path to the 2030 goal.

But it doesn't have to be this way. The peer-reviewed paper on which this chapter is based finds two policies that can dramatically improve learning and for a relatively low cost, too. One helps students learn more effectively, while the other policy helps teachers teach better.

Helping students learn more: Teach at the right level

Perhaps the most pervasive feature of schooling around the world is that students are grouped according to age—with 8-year-olds in one class, 9-year-olds in the grade above, and so on. The idea is that pupils of the same age will be at approximately the same level and can therefore benefit from the same instruction.

This assumption is often wildly wrong. In many classes, especially in the poorer part of the world, the educational ability of children in the same grade varies widely. Take <u>the example</u> shown in Figure 5.2 with math classes from grades 6 through 9 in New Delhi, showing about 300 students in total.

In Grade 6, only two students were actually at the Grade 6 level, at the level they should be learning. The center of the class is at about Grade 3.5, with most students in Grades 4 and 3 and one student even in Grade 1. If the teacher instructs at a Grade 6 level, almost no one will follow the lessons or learn anything.

When teachers encounter this distribution of students, most will lower the lesson level to meet as many of the students as possible—in this case, around Grades 3 and 4. But this will still leave large parts of the class lost or bored. The net effect is that even a good teacher could only help some of the students somewhat. The students who get <u>lost</u> in the early grades may just never catch up and eventually drop out. As the students move up through future grades, they will only have learned a little. By Grade 9, they will only achieve, on average, just above the fourth-grade level.

One of the very best investments in education circumvents this vicious cycle: <u>Teach</u> according to students' learning level rather than age.

So, in that Grade 6 class in the New Delhi school, we should teach the two students who actually are at Grade 6 at the Grade 6 level. Many students in Grade 4 should start learning at the Grade 4 level, and the one student at the Grade 1 level should start there. This will help each student exactly where he or she is and let them learn the most each day.



Source: https://www.science.org/doi/abs/10.1126/science.abf6655



There are two ways to achieve this, and both have been extensively studied and tested. One uses technology like a tablet. For one hour a day, the students sit down, each with their tablet. The tablet contains software in the native language, and it can quickly assess the level of the student and start teaching right at that level. Since the software will be used by millions, it can be made to deliver a best-practice education that delivers very efficient and engaging instruction. Several such software packages exist, and they are easy and cheap to translate into other languages.

The students only experience this tablet learning for one hour a day. The rest of the school day keeps the traditional instruction with teachers in classrooms, where many are lost or bored. There are several reasons for this. First, this is the setup that has been studied, so this is what we know works. Second, it also allows many students to share the tablet over the day, decreasing the hardware costs. Third, many teachers are reasonably worried that technology may threaten their jobs. This is mitigated when it is only one hour a day, and teachers receive training in the software so that they can be present when the students use the tablets to help them with any technical problems.

When the students are retested after a year of this setup, they have learned much more than they did before. Remarkably, they have learned as much as they normally would have in almost three years.ⁱⁱⁱ Of course, this comes with significant costs. The tablets are quite expensive, even if shared with many other students; many places have little or no electricity and will need to install

solar panels to recharge the tablets; there are extra costs for locked storage space to prevent theft; and teachers need more training. Fortunately, most of the software already exists, and additional software, to be used by millions, costs little per student.

The other lower-tech solution to teaching at the right level is simply to have schools shuffle classes for one hour each day so that all students go to the class that is at their actual level. Sometimes, this requires more teachers, depending on the school; it also requires more testing, and it will sometimes lead to awkward social interactions with children of widely different ages in the same class. This approach has also been widely tested, and while it results in less additional learning than with the use of tablets, it is also cheaper. In total, one year of this approach delivers the learning equivalent to two years of normal schooling.

Helping teachers teach better: Structured pedagogy

It is hard to be a good teacher in low- and lower-middle-income countries. Teachers typically get <u>paid less</u> than the average for jobs requiring a similar level of skills. Many teachers are only slightly better educated than the children they teach. One <u>study</u> of African primary school teachers showed that nearly one-in-three math teachers could not do double-digit subtraction.

Just 10% of primary school teachers have a minimum knowledge of how to teach. That means their teaching is unstructured and unhelpful to the students. Less than half of the studied teachers explain the topic of the lesson at the start and summarize it at the end. Observers found that almost 40% of lessons appeared unplanned.

But there is a very simple and effective way to improve this called structured pedagogy. It helps teachers to teach better by providing them with a set of semi-scripted lesson plans, training in how to use them, and coaching them as they are used.

This has been documented to be effective in many studies. Since they all work differently for different courses and grades, let us just look at one <u>example</u> from Kenya that finds costs and benefits close to the middle of all costs and benefit findings. Incidentally, the outcome of this study was so successful that the entirety of Kenya has now adopted the piloted approach.

When the study was conducted, teachers across Kenya used many different approaches to teach students to read. The project aimed at finding a consistent and effective method that could easily be replicated by many teachers, with instruction given in both Swahili and English. Each teacher got 140 sequential, semi-scripted lesson plans in both languages, making it easier to plan lessons and follow the instructions.

The teacher also received a three-day initial workshop with guided opportunities to create new instructional materials, a problem-solving workshop that takes place four months after the commencement of the school year, and a refresher training the following school year. Finally, the teacher received weekly text messages providing brief instructional tips and motivation to implement lesson plans.

Implementing structured pedagogy is very affordable, and it delivers learning that is equivalent to almost one extra year of schooling.

More learning at low costs

These policies—teaching at the right level (with or without technology) and structured pedagogy—deliver phenomenal benefits for each dollar spent.

As Table 5.1 shows, structured pedagogy is particularly cheap. For one year, the extra cost per student is less than \$9. Yet this approach delivers almost one extra year of regular school learning that would normally have cost almost \$400.

Table 5.1 Annual costs and benefits per student in dollars and benefit-cost ratios.

	Cost	Benefit	BCR
Structured pedagogy plus teacher monitoring and coaching	8.90	935	105
Teaching according to learning level rather than age			
with technology	30.56	1,978	65
without technology	22.41	1,079	48
Average cost and benefit per student	20.62	1,331	65

Note: Future costs and benefits are discounted at 8%.

For each of these policies, the benefits derive from the lifelong improvements generated through education. If a pupil has learned more, he or she will generally be more productive when entering the workforce and have higher earnings all the way through life. Structured pedagogy's benefit for a student in the poorer half of the world is equivalent to a \$935 boost across his or her lifetime. (The increase in lifetime earnings will, of course, be much higher, but the overall increase is also far out into the future, so it has to be discounted.) Considering the policy costs only \$9, that means each dollar spent returns an incredible \$105 of social benefits.

Teaching at the right level delivers higher benefits but at a somewhat higher cost, even without technology. With technology, it costs \$31 per pupil per year but delivers so much learning that the higher income throughout her life is worth almost \$2,000 even with discounting—delivering \$65 of social benefits for each dollar spent. Without technology, each dollar still delivers a phenomenal \$40 of social benefits.

Nations will implement one or the other approach as is best for local conditions. Given that we don't know what those choices will be exactly, the authors of the paper on which this chapter is based estimate that one-third of students will be assigned to each of the three approaches. This means that the average cost will be almost \$21 and deliver more than \$1,300 of benefits—a benefit-cost ratio of 65.

There are currently 467 million children in primary school in low- and lower-middle-income countries. Assuming we could reach 90% of these children, this would cost about \$9 billion a year and would generate learning that is equivalent to more than an entire extra year of schooling. The benefit in terms of higher future income would be equivalent to an increase in income right now of \$560 billion each year.¹

Compare this to the current plausible outcome of the SDGs without these three policies. Despite the many different targets for education, it is likely that the vast number of extra resources for education will be spent on more inputs. For example, the <u>International Commission on Financing</u> <u>Global Education Opportunity</u> estimates that the extra funding required to meet the SDG targets will mostly be allocated to inefficient, business-as-usual approaches that are unlikely to generate extra learning—including raising teacher salaries, lowering student-teacher ratios, and expanding inputs. Specifically, it suggests the world would need to spend an extra \$146 per child in low-

¹ Across the decade to 2030, the cost of educators will rise but so will students' life-time earnings, which is why the average costs and benefits across the decade are slightly higher in Table 3.1

income countries and \$310 in lower-middle-income countries by 2030 to reach the SDG goal. This adds up to about a \$100 billion annual increase with little or no likely learning benefits.

We can do better for less

Although the world has made grand and enormously unrealistic education promises in the SDGs, we can still do a great deal to help the many students languishing in poor schooling systems. It's not too late to invest in policies that actually lead to better rates of learning. It is an incredibly opportunity to spend \$9 billion annually to more than double primary learning and generate more than half a trillion dollars of benefits.

The academic paper is entitled "Improving learning in low- and lower-middle-income countries." It is authored by

Noam Angrist, Blavatnik School of Government, University of Oxford Elisabetta Aurino, School of Economics, University of Barcelona Harry Anthony Patrinos, Education, World Bank George Psacharopoulos, Consultant Emiliana Vegas, Graduate School of Education, Harvard University Ralph Nordjo, Copenhagen Consensus Center Brad Wong, Copenhagen Consensus Center

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The paper is published in Cambridge University Press' *Journal of Benefit-Cost Analysis*, vol. 13, S1, 2023. You can access it here: https://copenhagenconsensus.com/halftime

ⁱ Based on low- and lower-middle income countries in Table 2,

http://uis.unesco.org/sites/default/files/documents/fs46-more-than-half-children-not-learning-en-2017.pdf, average for math and language, which is 78%, of 467 million primary school students in 2020, https://data.worldbank.org/indicator/SE.PRM.ENRL?locations=XM-XN

ⁱⁱ p. 60, https://www.unicef.org/media/50936/file/Investment Case for Education and Equity-ENG.pdf

p. 60, https://www.unicef.org/media/50936/file/Investment Case for Education and Equity-