# LEARNING POVERTY IN THE TIME OF COVID-19: A CRISIS WITHIN A CRISIS

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*This brief summarizes the results of simulations estimating the potential impacts of the COVID-19 pandemic in learning poverty. Of 720 million primary school age children, 382 million are learning poor, either out of school or below the minimum proficiency level in reading. COVID-19 could boost that number by an additional 72 million to 454 million. In a post-COVID-19 scenario of no remediation and low mitigation effectiveness for the effects of school closures, simulations show learning poverty increasing from 53 percent of primary-school-age children to 63 percent.*

Temporary school closures in more than 180 countries have kept nearly 1.6 billion students out of school, further complicating global efforts to reduce learning poverty. Although most countries have made heroic efforts to put remote and remedial learning strategies in place, learning losses are accumulating rapidly. Countries and regions have responded in various ways, but they have found it difficult to reach even half the students. Students currently in school stand to lose $10 trillion in labor earnings over their working lives.[1] That is one-tenth of global GDP, or half the United States annual economic output, or twice the global annual public expenditure on primary and secondary education.

A little over a year ago, the World Bank and UNESCO Institute for Statistics (UIS) launched a new multidimensional indicator, learning poverty, based on the concept

that every child should be in school and be able to read and understand an age-appropriate text by age 10.[2] This formulation reflects the aspiration of Sustainable Development Goal 4 that all children must not only be in school, they must also be learning.

Of 720 million primary school age children, 382 million are learning poor, either out of school or below the minimum proficiency level in reading. COVID-19 could boost that number by an additional 72 million to 454 million. In a post-COVID-19 scenario of no remediation and low mitigation effectiveness for the effects of school closures, simulations show learning poverty increasing from 53 percent of primary-school-age children to 63 percent.

Most of this increase seems to occur in lower-middle-income and upper-middle-income countries, especially in

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East Asia and the Pacific, Latin America, and South Asia. Countries that had the highest learning poverty before COVID-19 (predominantly in Sub-Saharan Africa and in the low-income country group) might have the smallest absolute and relative increases in learning poverty, reflecting how great the learning crisis was in those countries before the pandemic.

Measures of learning poverty and learning deprivation sensitive to changes below the minimum proficiency level, such as gap and severity measures, show differences in learning loss regional rankings. Sub-Saharan Africa stands to lose the most. Countries with higher inequality among the learning poor, as captured by the proposed learning poverty severity measure, could need far greater adaptability to respond to broader differences in student needs.

# 1 Learning poverty: A measure of deprivations of schooling and learning

In a recent paper, Azevedo (2020) complements other COVID-19–related simulations by looking at the learning poverty measure. The main drivers of these simulations are school closures, mitigation and remediation effectiveness, and the income shock to economies and households, which affect two main transmission channels—learning losses and student dropouts at primary age.

Learning poverty is defined through deprivations of schooling and of learning. Each requires a specific threshold or standard from the education domain. The deprivation of schooling is ordinal and has enrollment as its threshold. Its measurement is simple, since children attending school are directly observable, and the measure is dichotomous, since a child can be in only one of two states—in school or out of school (figure 1).

The deprivation of learning is more complicated. It cannot be directly observed and is measured as a cardinal latent variable using large-scale standardized assessments, which are used to derive a measure of minimum proficiency based on a desired and agreed set

**Figure 1: Learning deprivation and poverty (horizontal axis only)**
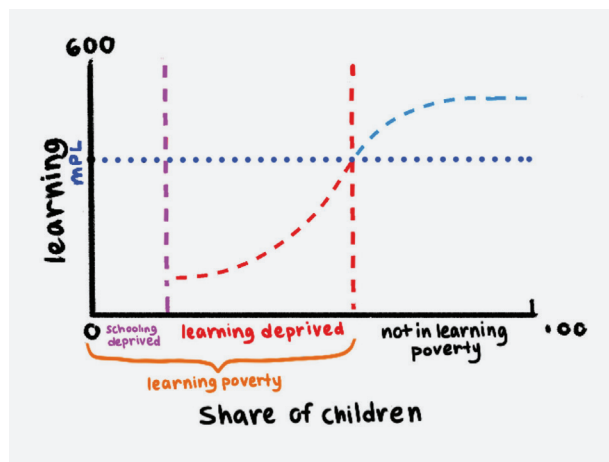


of competencies, leaving a potential space for ambiguity. This ambiguity is solved by using the SDGs definition of minimum proficiency level.

The headcount rate uses the number of children below either deprivation threshold divided by the total number of children in the age category. This ratio, learning poverty, is extremely simple and clear for policymakers to interpret, given the observable nature of school enrollment and the use of an agreed common standard of proficiency defined in the context of the SDGs.

Countries can improve this measure by reducing the learning deprivation as they raise proficiency levels for children below the minimum proficiency threshold, or they can reduce schooling deprivation by expanding coverage and bringing their out-of-school population into the system.

However, the learning poverty headcount ratio has limitations. It seems plausible that children or education systems with lower scores among the poor are worse off, other things being equal, but the poverty headcount ratio (the share of children in learning poverty) cannot capture that. The learning poverty gap or learning deprivation gap, are measures that capture the average learning shortfall among students below the minimum proficiency level. This measure indicates the average increase in learning required to eliminate learning poverty (figure 2).

**Figure 2: Learning deprivation and poverty gap and severity (shaded area)**
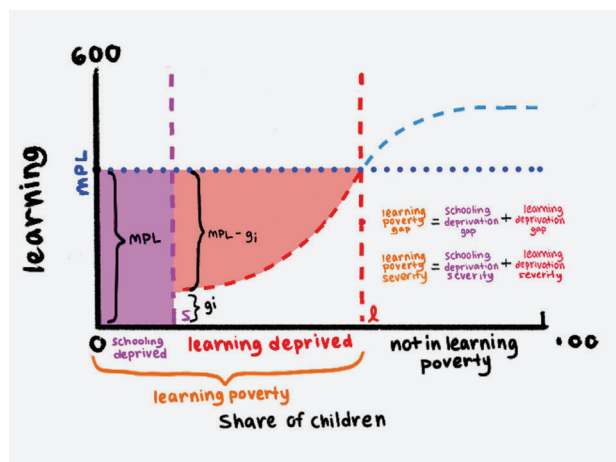


But any average gives an incomplete picture in an unequal world. By construction, the gap measure cannot capture the changes in the learning inequality among the learning poor or deprived students. To tackle this limitation, the learning poverty severity or learning deprivation severity measures are introduced (figure 2). This measure captures the inequality of learning among the learning poor population and can indicate how flexible the education system must be to both identify student needs and offer appropriate learning opportunities. Understanding such heterogeneity can be of critical importance for an effective strategy to reduce learning poverty.

So, simulating the effect of COVID-19-related school closures on learning poverty requires simulating the effects on both learning and schooling deprivations. The simulation results here are based on three complementary measures: the learning poverty headcount rate, the learning poverty gap, and the learning poverty severity are presented. The learning poverty headcount ratio is the share of 10-year old who are not in school (schooling deprived) or are below the minimum proficiency level (learning deprived) (figure 1). The learning poverty gap is the distance of the average student from minimum proficiency (figure 2). The learning deprivation severity, a measure sensitive to the learning inequality, is the gap squared in relation to the minimum proficiency squared (figure 2). This measure, by providing greater weight to students with the largest learning gaps, is able to differentiate the distribution of learning among the learning poor.

The learning poverty headcount ratio is suitable for countries and regions with average to lower levels of learning poverty. The learning poverty gap and the learning deprivation severity are particularly relevant for high learning poverty settings, such as Sub-Saharan Africa and the low-income country group.[3] Since the second and third measures are sensitive to changes in learning that might happen below minimum proficiency, they are the only measures that can capture the effects of shocks in countries where most of the students are already learning deprived.

The simulations add three main contributions: the focus on learning at the end of primary, the inclusion of school enrollment effects due to the household income shock, and the inclusion of a remediation effectiveness component. Mitigation is the effectiveness of government responses while schools are closed, considering what the government is offering and the ability of households to take up what is on offer, given the availability of connectivity assets such as radios, televisions, mobile phones, computers, and the internet. Remediation reflects policies that might be implemented when schools reopen. It is assumed to be equally effective across all country income levels.

In what follows we summarize the results from Azevedo (2020) in terms of three scenarios that are illustrative of potential global and regional increases in learning poverty.

- In the optimistic scenario about 60 percent of the school loss will be fully remediated and about 40 percent of the school loss while schools are closed will be fully mitigated in high-income countries, but in the developing world, 30 percent.

- In the intermediate scenario about 30 percentage points of the 70 percent school loss will be fully remediated and about 20 percent of the school loss while schools are closed will be fully mitigated in high-income countries, but in the developing world, 15 percent.

- In the pessimistic scenario, there is no remediation and about 10 percent of the school loss while schools are closed will be fully mitigated in high-income countries, but in the developing world, 7 percent.

One important empirical question remains. Are these complementary measures empirically relevant? That depends on whether countries with:

- The *same* learning poverty level have *different* learning poverty gaps (figure 3, panel A).
- The *same* learning poverty gaps have *different* learning poverty severity (figure 3, panel B).

Figure 3 illustrates those points using the latest available data from 99 countries in the learning poverty database with indicators available for the learning poverty gap and learning poverty severity.[4] The figure shows a wide range of learning poverty gaps among the poor in countries with similar levels of learning poverty (panel A): Several countries have around 70 percent learning poverty, but the Philippines's learning poverty gap among the poor is almost three times Nicaragua's. This suggests that the effort required to tackle learning poverty in the Philippines might be greater than in Nicaragua.

But this is not the whole story. It's also important to look at inequality or learning poverty severity. For example, learning poverty severity in Nicaragua is almost 10 times that in the Philippines, suggesting a far greater level of heterogeneity among the learning poor students in the latter. This finding supports the empirical relevance of the measures and the importance of clarity on which specific properties are needed when choosing one. For policy, the strategies to reduce learning poverty could differ considerably if the levels of the learning poverty gap or learning poverty severity are drastically different.

Strategies to reduce learning poverty could considerably if the levels of learning poverty gap or learning poverty severity are drastically different. Countries with the same level of learning poverty but higher learning poverty severity will need far greater flexibility in learning (and schooling) strategies to adapt to the needs of children with a wider range of learning (and schooling) needs than countries with the same level of learning poverty but a higher learning poverty gap.

## Figure 3. Relationships between learning poverty, the learning poverty gap, learning poverty severity, the learning deprivation gap, and the learning severity gap

A. Countries where students are at the same level of learning poverty, require very different levels of effort (learning poverty gap).

B. Countries that require the same average effort (learning poverty gap); have very different levels of learning poverty inequality among students below the MPL.
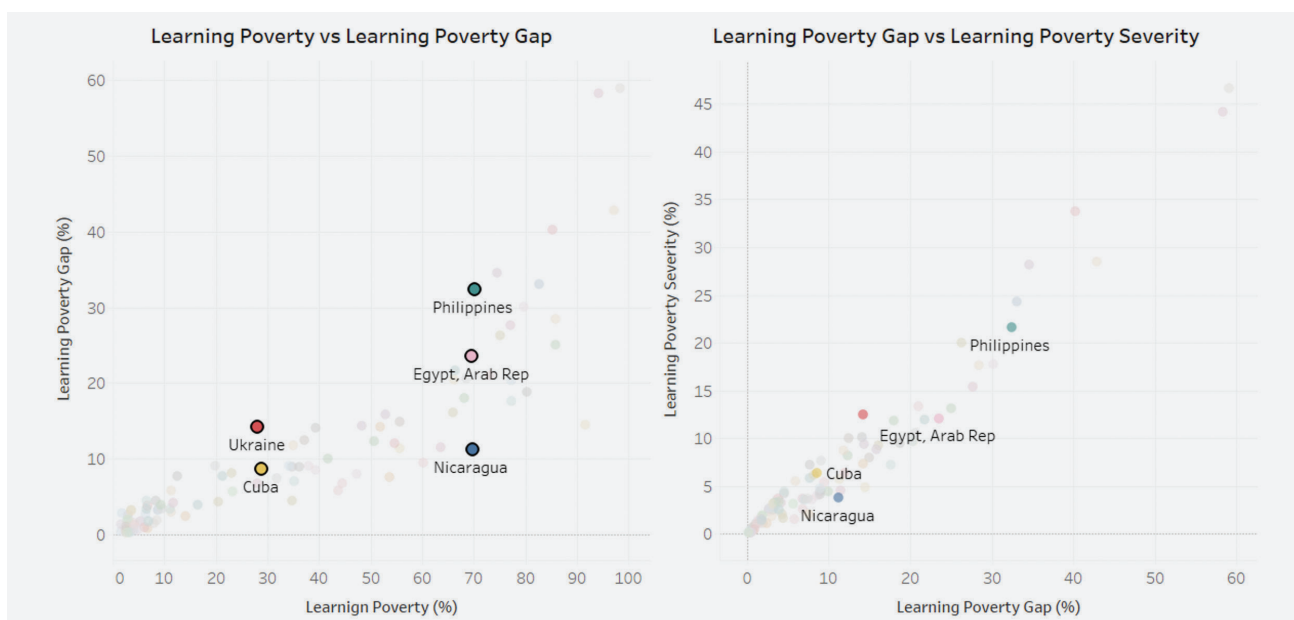


*Note:* Learning deprivation gap and learning deprivation severity refer to measures computed exclusively from information from the learning dimension of the indicator. Learning poverty gap and learning poverty severity also take into consideration out-of-school information. Each point represents one country assessment (N = 99). Source: Azevedo (2020) http://hdl.handle.net/10986/34654

The learning poverty severity measure is also directly relevant to policy debates on effective strategies to address the challenge of tacking large learning deficits accompanied by significant heterogeneity in within-grade student learning levels.[5] Just like computer assistant learning data can be extremely powerful to characterize the mean and variance in grade-level preparation of students,[6] measures such as learning poverty severity or learning deprivation severity can characterize both the mean and variance in grade-level preparation of students at the educational-system level. By being sensitive to both the level and changes in the learning heterogeneity among low performing students, this measure can help align incentives for educational systems to deploy and monitor the effectiveness of interventions designed to tackle this challenge.

As school systems reopen, it will be critical to meet students where they are on learning and to monitor changes in the learning distribution among the learning poor, given that evidence suggests that a significant source of inequality is within groups. For that, learning poverty severity is the appropriate measure. The use of these complementary measures is supported by both their properties and empirical relevance.

## 2 Protecting the learning of the most vulnerable

Most governments and development partners are working on identifying, protecting, and supporting the learning of the most vulnerable members of the COVID-19 generation, such as children in the bottom of income distribution, with less access to assets and connectivity, or who were already in learning poverty prior to the pandemic. Countries' initial conditions matter, and the size of the learning distribution does not say much about how vulnerable the youth of different countries are. A headcount measure, such as learning poverty, provides a focus on the base of the distribution, which is critical for prioritizing actions to support those who were suffering the most before the COVID-19 learning crisis. But that measure does not say how much learning is being lost by the children already experiencing learning poverty—for that, the learning poverty gap is an important measure. Then, as school systems reopen, it will be critical to meet student needs and to monitor changes in the learning distribution among the learning poor—for that, learning poverty severity is the appropriate measure.

*Figure 4: Learning poverty simulation results*
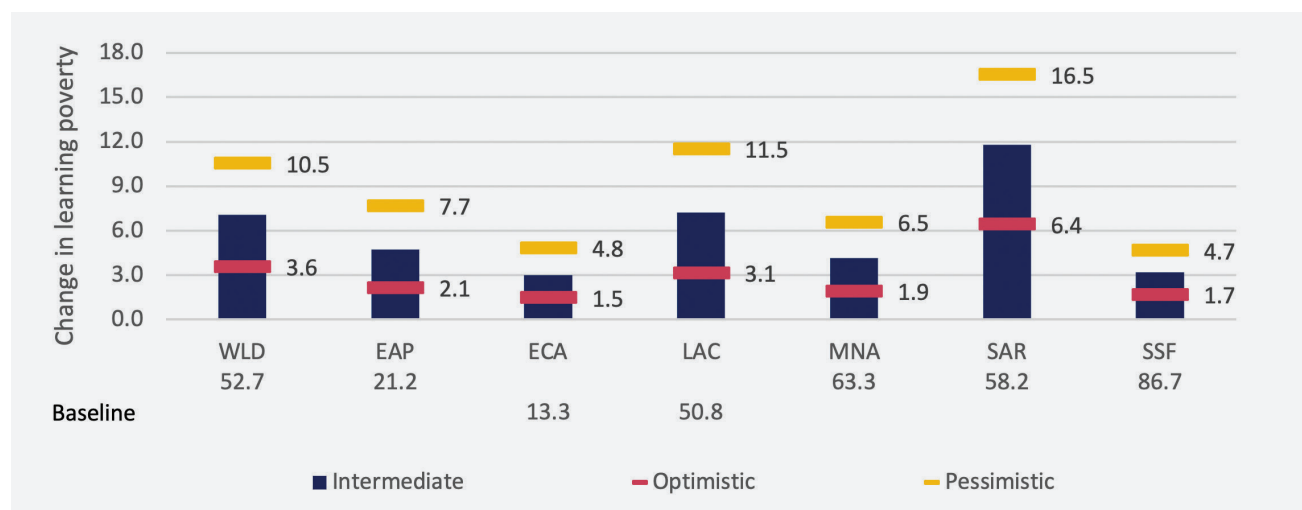


*Note:* All underlying numbers can be found in annex table A.1 in Azevedo (2020)
*Source:* Author's calculations.

The pessimistic scenario assumes no remediation and very low mitigation effectiveness in low- and middle-income countries, learning poverty increases by 10 percentage points, from 53 percent to 63 percent (figure 4). Sub-Saharan Africa and Europe and Central Asia have the smallest absolute increase of learning poverty, 5 percentage points, while South Asia has the largest (17 percentage points), followed by Latin America (12 percentage points). Sub-Saharan Africa also has the smallest relative increase, 5 percentage points, while East Asia and the Pacific and Europe and Central Asia have the largest (more than 30 percentage points), suggesting that the children in the upper-middle-income and lower-middle-income countries are likely to become the new learning poor. This result only reinforces the understanding that Sub-Saharan Africa was already experiencing a massive learning crisis before COVID-19 in which children were not learning as much when schools were still open.

A complementary and relevant set of measures are the gap and the severity. To avoid the confounding of policies required to improve schooling, in what follows we focus on the learning deprivation. Sub-Sharan Africa and the Middle East and North Africa are the two regions where students are on average the farthest behind in the minimum proficiency level, with a learning deprivation gap of approximately 20 percent (figure 5, horizontal axis). This rate is double the global average (10.5 percent), four times that in East Asia and Pacific (5 percent), and more than ten times that in Europe and Central Asia (1.3 percent). This average learning gap is equivalent to what students are expected to learn, in the respective regions, in a full academic school year. In the pessimistic scenario, the learning gap for the average student in low- and middle-income countries could increase by 30 percent; and in East Asia and the Pacific and Latin America, the regions with the largest relative increase, close to 40 percent.

The gap measures are not distribution-sensitive and cannot distinguish between an increase in the learning gap driven by students near the threshold and one driven by those at the very bottom of the learning distribution. The Sub-Saharan and Latin American increases in the learning gap might be qualitatively different if, in one set of countries, the pandemic were pushing many children marginally below the deprivation threshold and in the other, it were further deepening the deprivation of those already far below the threshold.

**Figure 5: Pre-COVID, the Middle East and North Africa and Sub-Saharan Africa had the greatest challenge, as both the gap and severity of learning are the highest**
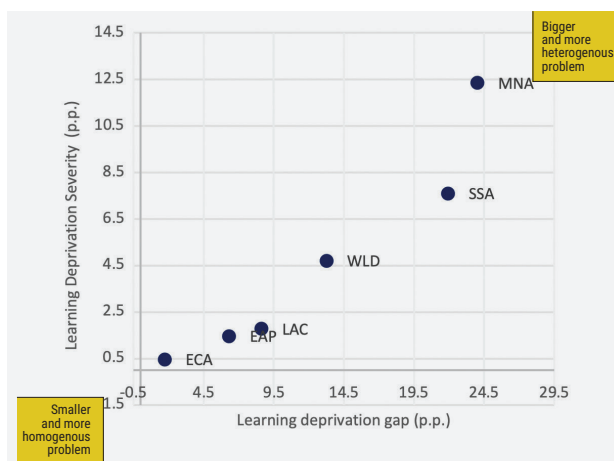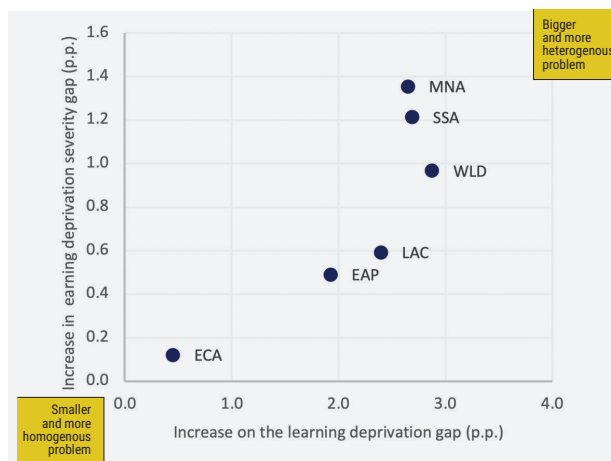


**Figure 6: Post-COVID, the learning gap might widen by about the same in several regions, but the severity could increase the most in the Middle East and North Africa and in Sub-Saharan Africa**



*Note:* Variances in the types of Arab script pose specific challenges to teaching and assessing learning in the Middle East and North Africa. All underlying numbers can be found in annex table A.2 in Azevedo (2020).

Severity measures can distinguish among these qualitatively different types of impacts. Results for Latin America, for the Middle East and North Africa, and for Sub-Saharan Africa suggest that on average, students in those regions are experiencing a similar increase in the learning gap, of approximately 2.5 percentage points (figure 5, horizontal axis). But the learning gap fails to take into account the inequality of learning among the learning deprived. This means that a hypothetical reduction of 20 learning points is fully equivalent, whether for students just below the minimum proficiency level or at the very bottom of the learning distribution. This can hide significant differences in the complexity of the challenge (figure 6, vertical axis).

Through the lens of learning severity, a measure sensitive to differences in learning poverty severity, two distinct groups emerge: Latin America, with a learning severity increase of 0.5 percentage points, and the Middle East and North Africa, with an increase greater than 1 percentage point (figure 6, vertical axis). The results support the idea that the consequence of this crisis is qualitatively different for Sub-Saharan Africa and the Middle East and North Africa than for Latin America. So, students in the latter group might fall much farther, relative to the MPL, than those in the former group.

## 3 Strategies for reducing learning poverty

In absolute terms, Sub-Saharan Africa and the Middle East and North Africa remain the two regions that face the greater challenge to reduce learning deprivation, given the magnitude of the problem and the heterogeneity of their respective learning deprived students. In Latin America, the new learning poor seem to have fallen much closer to the minimum proficiency level. Moreover, the depth of learning deprivation in Sub-Saharan Africa could increase three times more than the number of new learning deprived children in the region. This is almost three times the global average, and four times more than

in Europe and Central Asia. These results suggest an increase in the complexity and the cost to tackle the learning crisis in the continent.

Countries with the same level of learning poverty but a higher learning poverty gap will need a far greater effort to bring children above the minimum proficiency level. At the same time, countries with the same learning poverty gap but different learning poverty severity will need far greater flexibility in learning (and schooling) strategies to better align their education systems with student needs.[7] They can accomplish this by setting clear goals, instructional coherence, teacher support and contextual salience. Both Sub-Saharan Africa and the Middle East and North Africa seem to have the biggest and more complex challenges in terms of learning deprivation, and those are also the regions where both the learning deprivation gap and learning deprivation severity could increase the most.

This finding suggests that COVID-19 could qualitatively change the learning crisis in the African continent, since students will come out of this pandemic in a much deeper learning crisis than before, falling farther behind the minimum proficiency levels established under SDG 4. This greater depth of the learning crisis in Sub-Saharan Africa and elsewhere will require qualitatively different policy responses of far greater complexity and cost.

Governments, development partners, teachers, students, and parents must work together to deploy effective mitigation and remediation strategies to protect the COVID-19 generation's future. School reopening, when safe, is critical, but not enough. The simulation results show major differences in the distribution of learning. The big challenge will be to rapidly identify and respond to each individual student's learning needs in a flexible and adaptive way and to build back educational systems more resilient to shocks, using technology effectively to enable learning both at school and at home.

# References

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## Endnotes

1. Azevedo et al (2020).
2. World Bank (2019).
3. For more details see Azevedo (2020).
4. All learning assessments used are anchored in a standard deviation of 100 points, this should be sufficient to have the FGT-class of measures to be minimally comparable. Of course, within country temporal comparisons, assuming temporal comparability of the assessments, are the ideal case. All gap measures are relative to the test-specific minimum proficiency level (MPL). One interesting aspect is that once the gap conversion is made, the measure becomes test-independent, and can be presented independently of any scale. One important assumption when doing cross country comparisons, which is shared with global poverty monitoring, is that the learning (income) marginal sensitivities of the cardinal variable are the same. So, improving one learning point, is equally hard (or equally well captured) across all assessments (or different measures of income and consumption).
5. Muralidharan et al. (2019), Rodriguez-Segura et al (2020), and Azevedo and Goldemberg (2020) use a range of different standardize learning assessments from developing and developed countries to show that most learning variation are within school or even classrooms.
6. Muralidharan et al. (2019).
7. Hwa et al (2020).

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