

## Background Paper The Learning Generation

# Memo on Evidence in Education Education Systems and Interventions

This paper was prepared for the International Commission on Financing Global Education Opportunity as a background paper for the report, *The Learning Generation: Investing in education for a changing world*. The views and opinions in this background paper are those of the author(s) and are not endorsed by the Education Commission or its members. For more information about the Commission's report, please visit: [report.educationcommission.org](http://report.educationcommission.org).

# **Memo on Evidence in Education: Education Systems and Interventions**



FACULTY OF  
ECONOMICS  
AND BUSINESS



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## Executive Summary

Getting children into school is a necessary and vital first step to prepare an increasingly skilled workforce and sustain long-term socioeconomic development. However, enrollment does not always directly translate to attendance, learning, and effective school governance. A more comprehensive public policy that is geared towards ensuring the overall quality of education is needed. Undergirding this memo is J-PAL Southeast Asia's core philosophy that effective and efficient education policy should be grounded in findings from rigorous evidence-based research.

Drawing from dozens of randomized evaluations conducted across the developing world, including in Indonesia, J-PAL Southeast Asia puts forward a list of policy recommendations to identify what forms of government programs can be effective in improving education. Specifically, this memo seeks to shed light on some of the most effective strategies that the Government of Indonesia could explore to: (1) get children to attend school regularly, (2) increase student learning outcomes in primary school, and (3) improve school governance.

Considering limited resources available to Indonesia and other developing countries, J-PAL Southeast Asia also estimates cost-effectiveness of proposed programs by juxtaposing the aggregate impact of each program with its aggregate implementation cost. This exercise provides policymakers with a useful starting point in the decision-making process by generating a common measure to help compare programs evaluated across time and places (bearing in mind the importance of context).

A summary of practical policy recommendations that Indonesian policymakers can consider in order to improve education includes:

### *Recommendations: Student Participation*

- **Student participation in school is sensitive to perceived costs and benefits of education.**
- In areas where few schools exist, **creating more schools to reduce the distance children have to walk** can be a very effective way to increase enrollment and attendance.
- **Programs that provide cash or in-kind transfers, even small ones, increase enrollment and attendance.** Tweaking the design details, such as when transfers are given, can improve the effectiveness of these programs.
- **Providing parents and students with examples of the benefits of educations, such as information about how much people with more schooling earn or examples of job opportunities,** can increase student participation where parents and students underestimate the benefits of education.
- **School-based nutrient supplements and deworming programs** can increase attendance at very low cost.

### *Recommendations: Student Learning Outcomes*

- Programs that match the level of instruction to students' initial learning level ("**Teaching at the Right Level**") can be very effective, and have been the most consistently cost-effective, at improving student learning. Models include tracking, remedial teaching, and learning camps.
- Programs that **provide rewards to increase students' motivation to learn** can produce large learning gains at a relatively low cost.
- Solely adding inputs—such as computers, textbooks, and even teachers—is not sufficient, but **combining inputs with changes in pedagogy** can lead to large gains in learning.

- **Technology which is interactive, targeted to students' level of learning, and integrated** into the education system has the potential to improve learning—and can be a surprisingly cost-effective tool.

***Recommendations: Improving School Governance***

- **Incentives for teachers** can be an effective—and cost-effective—strategy for improving student learning, but the impact depends heavily on how the incentives are structured and enforced.
- **Locally hired contract teachers** can produce significant learning gains at relatively low cost.
- Under the right conditions, **community monitoring** can be a very cost-effective strategy for improving learning, particularly **when people feel they have the ability and a clear avenue to affect change.**

J-PAL Southeast Asia notes the fundamental importance of education to the development goals of Indonesia, as reflected in the government's investment in human capital development. J-PAL Southeast Asia strives to support the government in realizing the returns of this investment by designing evidence-based strategies outlined above. Systematically using the results from rigorous research to inform policy can increase the impact of and innovation in education policy by directing more resources to effective programs.

# **Memo on Evidence in Education: Education Systems and Interventions**

## **I. Introduction**

This document shares existing evidence on education from high-quality research for the purpose of providing best practices in the sector to the International Commission on Financing Global Education Opportunity Initiative, which is co-convened by Indonesian President Joko Widodo. The Commission has three thematic agendas: (1) the Case for Investment for Education; (2) Education Systems and Interventions; and (3) Financing for Education. This memo features lessons from Abdul Latif Jameel Poverty Action Lab (J-PAL) affiliated professors' research related to the topic of Education Systems and Interventions. All of the studies included in this memo are high-quality randomized evaluations conducted in various countries, with an emphasis on the South and Southeast Asia regions and also including other regions where relevant.

Impact evaluations typically measure program effectiveness by comparing the outcomes of a group that receives a program (individuals, communities, schools, etc.) against a group that does not. Randomized evaluations use random assignment to determine who is in each group. Because of randomization, the groups do not differ systematically at the outset of the evaluation, and therefore any difference that subsequently arises between them can be attributed to the program rather than to other factors. Randomized evaluations are therefore a particularly rigorous way to measure impact.

[J-PAL](#) is a network of over 140 affiliated professors and 7 offices around the world. J-PAL conducts randomized evaluations to ensure that policy is informed by scientific evidence. [J-PAL Southeast Asia](#), based at the University of Indonesia, leads J-PAL's research and policy work in the region. Since its establishment in 2003, the J-PAL network has 195 completed and ongoing randomized evaluations in the Education sector in countries around the world.

The evidence presented in this memo addresses three main questions:

1. Which interventions most effectively get children into school?
2. What programs are most effective at increasing student learning outcomes in primary school?
3. What interventions are effective in improving school governance?

There are five sections in this memo. *Section One* introduces the policy questions and summarizes the key policy lessons from J-PAL's randomized evaluations in education. *Section Two* reviews evidence in improving student participation in school in depth. *Section Three* looks at evidence in increasing student learning outcomes in more detail. *Section Four* discusses evidence in improving school governance. *Section Five* examines the key policy lessons and recommendations in more depth.

An executive summary of the key policy lessons emerging from J-PAL's randomized evaluations in primary education is provided here:

## **Student Participation: Policy Lessons**

- Student participation is sensitive to perceived costs and benefits of education.
  - The costs of education are immediate and easy to observe. As a result, even small changes in costs can have important impacts on participation.
  - Costs are not just monetary, but also include effort and travel time to school. When school is far away, reducing travel time can help boost participation. This can be particularly important for girls and in areas where security is an issue.
  - The effort cost of attending school is higher for a child who is sick and lethargic. Health interventions that reduce student morbidity, such as school-based nutrient supplements and deworming programs, may be among the most effective ways of boosting school participation.
  - Programs that address perception gaps or make the benefits of education more salient can change behavior at low cost. Examples include telling students about the availability of scholarships and presenting examples of future job opportunities.
  - However, it appears to be difficult for parents to accurately perceive the quality of education their children are receiving. Improving the quality of education (as measured by gains in test scores) does not always translate into improved participation, at least in the short run.
- Children, not just their parents, are important to consider when designing policies to address school attendance.
- These general lessons apply equally to boys and girls. Although more girls are out of school than boys, general programs that seek to increase schooling for all tend to help girls as much as or even more than boys.

## **Student Learning Outcomes: Policy Lessons**

- Programs that focus on basic skills and direct instruction toward children's actual learning levels have been the most consistently effective and cost-effective at improving learning outcomes. Models include tracking, remedial teaching and learning camps.
- Programs that provide rewards to increase students' motivation to learn can produce large learning gains at a relatively low cost.
- Adding inputs—such as computers, textbooks, and even teachers—is not sufficient to improve learning without additional reforms.
- Combining inputs with changes in pedagogy can lead to large gains in learning.
- While providing computers alone has had little effect on learning, technology has the potential to improve learning—and can be a surprisingly cost-effective tool—if it is interactive, targeted to students' level of learning, and integrated into the education system.

## **Improving School Governance: Policy Lessons**

- Incentives for teachers can be an effective—and cost-effective—strategy for improving student learning, but the impact depends heavily on how the incentives are structured and enforced. Increasing teacher pay without putting additional incentives in place has not been shown to improve student learning in Indonesia.
- Locally hired contract teachers can produce significant learning gains at relatively low cost.
- The evidence on increasing community involvement in schools is mixed, but under the right conditions, community monitoring and school-based management can be cost-effective strategies for improving learning, particularly when people feel they have the ability and a clear avenue to affect change.



J-PAL also hosts a [Post-Primary Education Initiative](#), which funds randomized evaluations that develop and test innovative solutions for improving access, quality, and relevance of post-primary education in developing countries. While there are fewer completed studies about post-primary education to date, the J-PAL report, “[Expanding Access and Increasing Student Learning in Post-Primary Education in Developing Countries: A Review of the Evidence](#)” summarizes the state of the evidence in post-primary education.

### The Power of Evidence for Policy Effectiveness

Investing in randomized evaluations and systematically using the results to inform policy can increase the impact and innovation of education policy by channeling more resources to effective programs. J-PAL has collaborated with several national ministries of education to generate new evidence about what works and institutionalize the use of this evidence in decision-making. One promising model pioneered by the Ministry of Education of Peru and J-PAL Latin America is [MineduLAB](#). It is an innovation lab for education policy housed within the ministry that was started with strong support from J-PAL Latin America and is now run by the government. The lab pilots and evaluates the effectiveness and cost-effectiveness of education innovations in partnership with academic researchers so that the government can learn whether the policies work before scaling them up.

For those seeking more in-depth resources on this body of evidence, J-PAL affiliated researchers have produced several useful reviews. Karthik Muralidharan, Co-Chair of J-PAL’s Education Program and Associate Professor of Economics at the University of California, San Diego has published two review papers. One draws lessons from the body of evidence on improving education outcomes in developing countries.<sup>1</sup> The other summarizes lessons learned from education evaluations, highlights key open questions for future research, and provides guidance on how to design and implement high-quality field experiments in education.<sup>2</sup> Rachel Glennerster, Director of J-PAL and Co-Chair of J-PAL’s Education Program, and co-authors summarized the cost-effectiveness of interventions to improve learning in the developing world.<sup>3</sup>

## II. Evidence in Improving Student Participation

Achieving universal primary education has been a major policy focus in developing countries for the last few decades. The main question is: Why aren’t children in school? From 2000 to 2015, the portion of primary school age children (6-12 years old) enrolled in school rose from 83 percent to 91 percent<sup>4</sup> and enrollment rates of children age 12-16 rose from 53 to 65 percent.<sup>5</sup> Despite these gains, pockets of low enrollment remain, particularly in remote or conflict-affected areas. As of 2015, 57 million children of primary school age were out of school.

It is important to note that even where enrollment is high, many children do not attend school regularly. For example, although the national primary school enrollment rate in India was above 96 percent in 2014, on average 29 percent of enrolled students were absent during unannounced visits to schools.<sup>6</sup>

Evidence from a substantial body of randomized evaluations provides practical lessons on ways to increase participation in school, often at quite low cost per child. A number of general lessons stand out.

### Student participation is sensitive to perceived costs and benefits of education

- **The costs of education are immediate and easy to observe.** As a result, even small changes in costs can have important impacts on participation.

- **Costs are not just monetary, but also include effort and travel time to school.** When school is far away, reducing travel time can help boost participation. This can be particularly important for girls and in areas where security is an issue.
- **The effort cost of attending school is higher for a child who is sick and lethargic.** Health interventions that reduce student morbidity may be among the most effective ways of boosting school participation.
- **Programs that address perception gaps or make the benefits of education more salient can change behavior at low cost.** Examples include telling students about the availability of scholarships and presenting examples of future job opportunities.
- **However, it appears to be difficult for parents to accurately perceive the quality of education their children are receiving.** Improving the quality of education (as measured by gains in test scores) does not always translate into improved participation, at least in the short run.

**Children, not just their parents, are important to consider when designing policies to address school attendance.**

**These general lessons apply equally to boys and girls.** Although more girls are out of school than boys, general programs that seek to increase schooling for all tend to help girls as much as or even more than boys.

J-PAL will be publishing a Policy Bulletin reviewing the evidence in school participation will be available [here](#) in February 2017.

## Evaluations

**This section reviews 51 randomized evaluations from 27 low- and middle- income countries in Asia, Africa and Latin America that tested programs designed to increase school enrollment and attendance from preschool through secondary school.** Some programs had effects beyond participation in schools, such as increasing test scores, improving nutritional status, or transferring income to the poor. However, this section focuses only on impacts on enrollment and attendance, in order to draw general lessons about what types of strategies are most effective in improving student participation.

### Lesson 1: Distance matters, especially for girls

Many of the areas of the world with low school enrollment are remote or are affected by conflict. Sometimes the distance to school is so far that attendance is impossible. Even when the journey is possible, distance can deter attendance. The time, effort, and risk of a long trip to school is immediate, salient, and has to be faced every day.

**In areas where few schools exist, creating new local schools is a very effective way to increase enrollment and attendance.** In **Afghanistan**, researchers examined the impact of the Partnership for Advancing Community Education in Afghanistan (PACE-A) program, which introduced “village-based schools” in remote areas.<sup>7</sup> Introducing a school in the village led to an increase in enrollment rates from 27 to 69 percentage points (a 156 percent increase). Similarly, in areas in **Pakistan** where no school existed within 1.5 kilometers,<sup>8</sup> granting per-student subsidies to local entrepreneurs to establish new private schools led to an increase in enrollment rates from 26 to 56 percent.

In both the Afghanistan and Pakistan examples, distance to school was reduced without the government building new schools. In Afghanistan, communities provided space for a school while an international nongovernmental organization provided educational materials (such

writing utensils, notebooks, and government textbooks) and training for teachers. In Pakistan, the government subsidized the private entrepreneurs to identify appropriate school facilities and find qualified teachers.

**Reducing distance to school is particularly helpful for girls.** The “village-based schools” program in Afghanistan improved enrollment rates among girls by 17 percentage points more than among boys, eliminating the gender gap in enrollment. In Pakistan, having local schools raised girls’ enrollment by 5 percentage points more than boys’ in the first year (in the second year, rising enrollment for both boys and girls across the province eliminated the gender gap in the comparison group, causing the two-year impact of the intervention to be equal for both genders).

While these two evaluations were conducted in contexts where security was a concern, the results are consistent with the findings from well-identified, non-experimental studies in more secure contexts including **Indonesia**<sup>9</sup> and **India**<sup>10</sup>. In remote areas of Indonesia, building more schools in the 1970s reduced the distance that children traveled to school, and ultimately increased total education attainment and their wages as adults. In India, a program that provided bicycles to secondary school girls reduced travel time, leading to an increase in enrollment and in the number of girls who passed the official state exam to complete secondary school.

**Lesson 2: School participation is sensitive to costs and incentives. Programs that pay for school fees or provide cash or in-kind transfers, even small ones, improve enrollment and attendance**

While most countries have eliminated fees for public primary schools, in practice, parents often have to pay for uniforms, textbooks, school supplies, or other fees. Families may also face opportunity costs of sending children to school if they would otherwise be working for wages, helping on the farm, or performing household chores. Even small incentives, or removing small costs, can have large impacts. If the objective is simply increasing enrollment and attendance at school, smaller incentives can be just as effective and a better value.

**Where school fees do exist, eliminating them can lead to large increases in participation.** School fees are much more common in secondary school than primary: 63 percent of low-income countries and 22 percent of middle-income countries charge secondary school tuition, compared to only 6 percent of high-income countries.<sup>11</sup> These fees can be a substantial barrier to education. In **Ghana**, a program provided full secondary school scholarships to low-income, academically qualified students.<sup>12</sup> Five years on, girls and boys who had received a scholarship were, respectively, 34 percentage points (75 percent) and 36 percentage points (63 percent) more likely to have ever enrolled in senior high school than students who did not receive a scholarship. The percentage of girls completing senior high school rose from 25 percent (in the comparison group) to 58 percent (with scholarship), while for boys it rose from 32 percent to 71 percent.

**Conditional Cash Transfers (CCTs) have been widely tested and are consistently effective at increasing participation.** Over 30 countries have conditional cash transfers (CCT) programs that provide households with cash if children go to school and do regular health checkups.<sup>13</sup> Many of these large transfer programs have been assessed using randomized evaluations. Results from randomized evaluations of CCTs in Burkina Faso,<sup>14</sup> Cambodia,<sup>15</sup> China,<sup>16,17</sup> Colombia,<sup>18</sup> Ecuador,<sup>19</sup> Honduras,<sup>20,21</sup> Malawi,<sup>22</sup> Mexico,<sup>23,24,25</sup> Morocco,<sup>26</sup> Nicaragua,<sup>27,28,29</sup> Nepal,<sup>30</sup> and Tanzania<sup>31</sup> have been highly consistent across countries, with all 18 RCTs finding positive impacts on school participation. For the most part, CCTs have larger

impacts on schooling where schooling levels are lower to begin with. In **Indonesia**, a longer-term evaluation of the *Program Keluarga Harapan* (PKH) program by the Indonesian National Team for the Acceleration of Poverty Reduction (TNP2K) found that the conditional cash transfer program increased gross enrollment in secondary school, helping children stay in school during the transition from 6<sup>th</sup> to 7<sup>th</sup> grade.<sup>32</sup>

When analyzing the costs and benefits of CCTs, the transfers themselves arguably should be excluded from the costs of CCTs because they represent both a cost and a benefit. Indeed, transferring money to the poor is arguably the main objective of these programs. Even excluding transfers, however, CCTs still have relatively high costs per year of schooling. These cost-effectiveness analyses suggest that CCTs should primarily be seen as social assistance programs that also increase attendance, rather than cost-effective solutions to problems of school participation.

**CCT design details matter.** A new generation of evaluations have shown that small changes in the design of traditional CCT programs can make them more effective. In Colombia, timing the payments to coincide with deadlines for school fees and designing the transfers to incorporate incentives for student achievement led to larger increases in student enrollment and attendance than traditional cash transfers. In Malawi, a small CCT of \$5 per month prompted a similar increase in enrollment as a CCT of \$15 per month and was more cost-effective.

**Providing small noncash incentives linked to schooling can be effective and cheap because of low monitoring cost.** Free school uniforms, scholarships to cover school fees, and free school meals have all been shown to increase enrollment and attendance. In **Kenya**, school uniforms cost about \$6 each, 1.6 percent of local average annual household income. While uniforms are not officially required, students face strong social pressure to wear them to school. Sixth grade girls who received free uniforms for two years<sup>33</sup> were 3.1 percentage points (16 percent) less likely to drop out after three years than their peers who did not receive uniforms (19 percent of whom dropped out).

**Programs that provide students with meals if they attend school have been effective at boosting participation.** In **Jamaica**, a program that provided free breakfast to grades 2-5 improved attendance by 3.1 percentage points (4.6 percent) among previously undernourished children and 1.9 percentage points (2.6 percent) among children who were adequately nourished at the start of the program. Free school meals and take-home rations for girls in **Burkina Faso** increased enrollment by 4 and 5 percentage points, respectively, over a base of 25 percent.<sup>34</sup> A similar program in **Uganda** that provided school meals and take-home rations to primary schools in Internally Displaced Persons camps raised morning attendance by approximately 9 percentage points (12 percent) and afternoon attendance by 14-15 percentage points (31-32 percent).<sup>35</sup>

### **Lesson 3: Interventions that aim to improve health and nutrition effectively increased attendance**

All over the world, children miss school when sick. But poor children also often suffer from long-term conditions including anemia, parasites, and malnutrition that can sap their energy and reduce school participation over time. Programs in India and Kenya that addressed these chronic health issues had large, positive impacts on school attendance.

### **Addressing anemia and worm infections increases school attendance**

Over 870 million preschool- and school-age children are at risk of parasitic worm infection, and approximately 598 million preschool- and school-age children are affected by anemia. As a result, school-based deworming and iron pills can be extremely effective and efficient programs to improve attendance in these contexts.

When the Indian NGO Pratham provided preschoolers with vitamin A and iron supplementation and deworming medication<sup>36</sup>, weight increased among participating children by roughly 1.1 pounds and preschool participation rates increased by 5.8 percentage points (an 8 percent increase from a baseline attendance rate of 71 percent). The gains were most pronounced among the most anemic students. Combined with the fact that intestinal worms were rare among preschoolers at baseline, this suggests the program worked by reducing anemia.

In western **Kenya**,<sup>37</sup> a program that treated children for intestinal worms in primary schools where worm infection was high improved student attendance by 8.5 percentage points, reducing absenteeism by more than a quarter. A long-term follow-up found that children in treated schools were enrolled for an additional 0.29 years of schooling.<sup>38</sup> Because deworming children also reduces worm prevalence, school-based deworming also increased attendance among untreated students.

**Deworming and iron pills are the most cost-effective programs at increasing school participation included in this analysis.** Because the program in Kenya was implemented through existing schools, and the deworming pills cost only a few cents, it yielded 12.5 additional years of schooling for every \$100 spent. Similarly, the program in **India** that provided preschool students with vitamin A and iron supplements and deworming medication bought 2.7 years of school for every \$100 spent. Policymakers in governments and non-governmental organizations around the world have used this evidence and scaled up school-based deworming to over 190 million children since 2009. Deworming programs are only relevant for contexts where worms are prevalent.

For example, this might be relevant for Indonesia, where Indonesia's Control of Vector-Borne Disease Directorate has stated the prevalence of intestinal worms at 28 percent,<sup>39</sup> and some countries in Southeast Asia, where WHO has mapped a burden of 372 million children suffering from intestinal worms.<sup>40</sup>

### **Lesson 4: Programs that address perception gaps or make the benefits of education more salient can change behavior at low cost**

When making decisions about investing in education, parents and students must weigh the expected costs and benefits. However, costs are usually immediate, while benefits can be hard to judge and not top-of-mind. A number of programs that reframed costs and benefits of education increased attendance. Some were designed to address inaccurate perceptions (for example, by providing information on scholarships), while others may have worked by making the potential benefits of education more salient.

A study in the **Dominican Republic**<sup>41</sup> showed that more than 40 percent of eighth-grade boys did not expect their future earnings to be different if they completed secondary school. Boys with low perceived returns to secondary education were also more likely to drop out. Researchers found that informing them of the average wages earned by people in their area

based on education levels raised their own perceived returns to education and led to an average increase of 0.2 years of schooling per child over the next four years.

Because information was delivered through one-on-one discussions and required an extensive survey of local wages, the Dominican Republic program was relatively expensive, generating 0.24 additional years of schooling per \$100 spent. However, if operated at scale, allowing the cost of the survey to be spread among more beneficiaries, the program could achieve 2.6 additional years of schooling per \$100 spent.

However, **in areas where parents and children do not underestimate the benefits of education, providing information may not be effective at increasing student attendance**, as exemplified through a study in **China**.<sup>42</sup>

**Examples can be powerful in changing perceptions.** Providing parents and students with information about future employment opportunities and how to access them can improve aspirations and increase investment in education. In **India**, researchers tested the impact of sending recruiters to hold information sessions for women that included information about jobs in the business process outsourcing (BPO) industry, the compensation levels, necessary qualifications, and how to apply.<sup>43</sup> Women in villages where recruiters held information sessions expressed a greater interest in working throughout their lives, even after marriage and childbirth, indicating shifting aspirations toward work as a longer-term career. Another program in India that established a quota system for female village leaders<sup>44</sup> saw similar changes in aspirations. The presence of a female leader in their village significantly increased parents' aspirations for their daughters and female adolescents' aspirations for themselves.

**Having examples of future career opportunities for women and the presence of female leaders led parents and students to invest more in their education.** In villages that received BPO information sessions, girls aged 6 to 17 were 5 percentage points (7 percent) more likely to be enrolled in school. The share of young women aged 18 to 24 enrolled in private, fee-based vocational or training programs rose from 0.5 percent in comparison villages to 3.3 percent. Villages where the village leader position was reserved for a women saw no gender gap in enrollment between boys and girls, compared to a 6 percentage point gap in enrollment in comparison villages. Having a woman as a village leader also eliminated the gender gap in reading and writing, while in comparison villages, boys were 4 percent more likely to be able to read and write.

### **Lesson 5: Student motivation is important for boosting enrollment and attendance**

The discussion about school enrollment and attendance often focuses on parents' decisions, but student motivation can also be important. Many of the effective programs covered in this bulletin likely work in part because they motivate students, and students have some influence on their own enrollment and attendance.

A program in **Kenya** that sought to enlist student motivation to improve education outcomes offered merit-based scholarships worth \$19.20 per year for two years to sixth-grade girls who scored in the top 15 percent on district-wide exams.<sup>45</sup> This program increased attendance in the year prior to the final awards by 3.2 percentage points for girls, a reduction in absenteeism of one quarter given baseline attendance rates of 87 percent. The impacts were not confined to girls who were already doing well (i.e. most likely to win the scholarship). Attendance of teachers also improved, leading to some positive learning spillovers for the classroom as a whole.

### **Lesson 6: Greater involvement of communities in school management has mixed results on participation**

Getting communities more involved in the management of their local schools might motivate them to send children to school more regularly. These interventions might change parents' perceptions of the benefits of education by increasing the information available to them, or they might improve school quality by strengthening accountability systems, thereby increasing the real benefits of attending school. However, programs designed to increase community involvement in schools are hard to make work. When community monitoring and school-based management programs do work, they can improve both learning and participation; when they don't, they often improve neither.

Out of seven studies testing community monitoring or school-based management interventions, four programs improved participation (in **Uganda**,<sup>46</sup> **the Gambia**,<sup>47</sup> **Madagascar**,<sup>48</sup> and **Mexico**<sup>49</sup>). Of these, three also improved learning (Uganda, Madagascar, and Mexico). One program, in **Indonesia**,<sup>50</sup> did improve learning but had no impact on dropout, which was already very low. Three studies found no improvement in learning (in **Niger**,<sup>51</sup> **India**,<sup>52</sup> and **the Gambia**) and of these two did not improve participation (Niger and India).

### **Lesson 7: Improving education quality can, but does not always, change the perceived benefits of education and increase student participation in the short term**

The quality of schooling is low in many developing countries. In India, for example, close to 20 percent of children in third grade cannot read a word. Parents and children might therefore conclude that investing in sending kids to school is not worthwhile. If school quality improves so that children in class learn more, do parents and children respond by enrolling and attending more? Of nine interventions focused only on school quality (i.e. the program did not attempt to increase participation) that *successfully* increased test scores and also measured participation, four evaluations (in **Uganda**, **Pakistan**,<sup>53</sup> and two programs in **Kenya**<sup>54</sup>) found student participation responded to improved quality. Five (in **Indonesia**, **India**,<sup>55,56,57</sup> and **Kenya**) found no statistically significant response, at least in the short run.

One reason that quality improvements may not translate into higher participation challenge may be that parents and students find it hard to judge the quality of education in the short run. Indeed, as noted in Lesson 6, many of the programs that improved quality and increased student participation included an element of community monitoring or school based management, which may have helped parents perceive the increases in quality. Whether increasing education quality on its own has a more consistent impact on student participation over a longer time period, when parents have longer to learn the benefits of improved schooling, has yet to be evaluated.

### **Lesson 8: Increased spending on inputs, such as adding computers to classes, does not increase participation**

If parents and children struggle to accurately assess school quality, they might take more inputs (such as computers, textbooks, or teachers) to mean a higher quality of education, and thus participate more. Students might want to go to school more if there are new books and computers. However, an examination of studies that evaluated increasing inputs found no consistent impact on test scores<sup>58</sup> or attendance. Programs that provided textbooks in Kenya<sup>59</sup> and Sierra Leone<sup>60</sup>, laptops in Peru,<sup>61</sup> libraries in India,<sup>62</sup> and infrastructure investments in Bolivia<sup>63</sup> did not impact enrollment or attendance.

### **9. These general lessons apply equally to boys and girls**

Since more girls are out of school than boys, it is important to examine the gender implications of these different strategies. Do general education programs help girls equally, or does increasing girls' participation require a gender-targeted approach?

Policymakers have cited gender-specific cultural barriers, such as restriction on girls' mobility during menstruation, as a limitation on girls' educational attainment. As we discuss above, mobility issues can mean girls' attendance is more sensitive to distance to school than boys. There is less high-quality evidence on other gender-specific barriers such as menstruation as a barrier. A program in Nepal sought to improve girls' attendance by providing 7<sup>th</sup> and 8<sup>th</sup> grade girls with sanitary products.<sup>64</sup> The evaluation found that, on average, menstruation was not a key barrier: girls only missed 0.35 days of school out of a 180-day school year due to their period. Although girls reported liking the product, it had no impact on closing this small attendance gap.

Disaggregating results of the studies discussed in Section II by gender shows that most programs that improved school participation overall were at least as effective—if not more effective—for girls as they were for boys. In the few contexts where boys had lower attendance rates at baseline than girls, program impacts were larger for boys than for girls. In other words, general programs tend to help the most disadvantaged gender most.



## Cost-Effectiveness

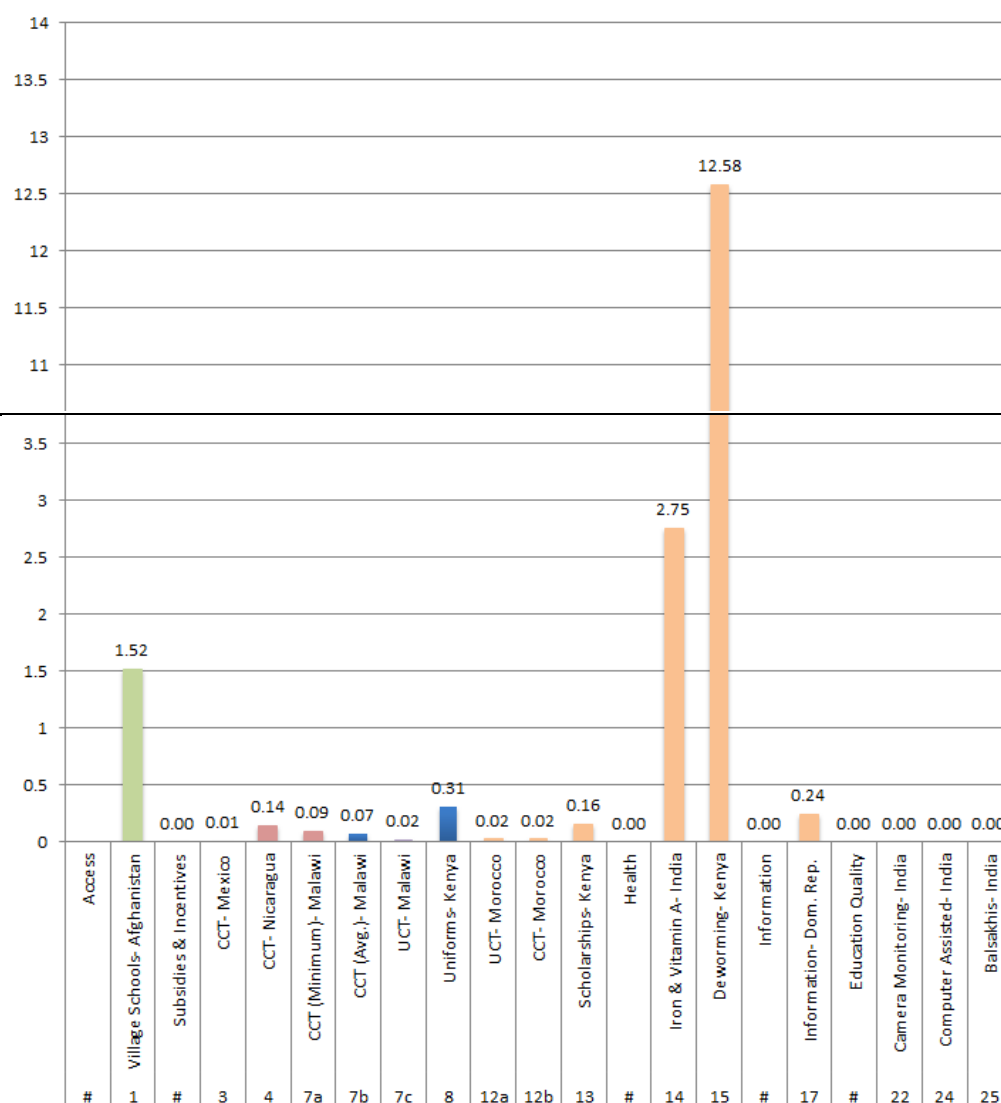
In addition to considering what programs are most effective at improving student attendance, J-PAL has also completed analysis on the cost-effectiveness of the programs for which the authors have provided cost data (Figure 2). Cost-effectiveness analysis (CEA) calculates the ratio of the amount of “effect” a program achieves for a given cost. In this case we use additional years of schooling achieved per \$100. Additional schooling can come through higher enrollment or through already-enrolled children attending more frequently.

Cost-effectiveness analysis (CEA) summarizes complex programs in terms of a ratio of costs to impacts. While we provide relative rankings, CEA does not, by itself, provide sufficient information to determine any policy or investment decisions. For example, the relative rankings may be different if relative input costs vary by country (for example, the cost of teachers’ salaries versus computers). However, CEA can serve as a useful starting point in the decision-making process, including by highlighting the types of programs that tend to be the most cost-effective and by establishing cost-effectiveness benchmarks. Detailed data are available on J-PAL’s website and readers are encouraged to input relevant local costs and undertake sensitivity analysis.

To calculate cost-effectiveness, it is necessary to make several assumptions. J-PAL’s cost-effectiveness analyses focus on the perspective of policymakers considering which program to implement<sup>65</sup>. This determines the selection of discount rates, exchange rates etc. Evaluation costs are excluded from “program costs.” The assumptions, full cost-effectiveness calculations, as well as background information on each of the studies in this bulletin, are available on the J-PAL website.

When interpreting cost-effectiveness, it is important to bear in mind that some programs, particularly CCTs, achieve other objectives than improving student participation. Additionally, programs will tend to be more expensive in richer countries, not least because attendance rates tend to be higher to begin with.

**Figure 1: Cost-Effectiveness of Programs to Improve Student Participation  
(Additional years of education per \$100 spent)**



### III. Evidence in Increasing Student Learning Outcomes in Primary School

In recent decades, most regions of the world have achieved large increases in primary school enrollment. However, for many children, being in school does not guarantee that students are learning. In rural India, for example, the 2014 Annual Status of Education Report (ASER) finds that for the sixth year in a row, over 96 percent of children ages 6-14 years were enrolled in school.<sup>66</sup> Yet nearly four out of five students in grade three are more than one grade level behind in reading. Similarly, the 2013 Uwezo annual assessment report finds that while 89 percent or more of children in grades 1-3 are enrolled in school in Kenya, Tanzania, and Uganda, less than one third of Grade 3 students possess basic literacy and numeracy skills. Similar education surveys and measurement tools have found comparable learning levels among children in Mali, Pakistan, and Senegal.

Why are so many students not learning? And what can be done to solve this problem? There are many reasons why students aren't learning, and the solutions to these problems are not obvious: Students may not have access to schools or resources, but would hiring additional teachers or providing school supplies help to improve student learning? Rigid and overly ambitious curricula may not match the learning levels or needs of students, but how should curricula or teaching methods be changed?

#### Evaluations

**This section reviews 19 randomized evaluations from 10 low- and middle- income countries in Asia, Africa, and Latin America examining how education programs impact student learning outcomes.**

#### **Lesson 1: Programs that provide rewards to increase students' motivation to learn can produce large learning gains at a relatively low cost**

A merit scholarship program in western **Kenya**,<sup>67</sup> which awarded grade six girls who scored well on exams a grant to cover school fees and supplies for two years, led to a 0.27 standard deviation improvement in exam scores. The impact was not limited to the highest-performing girls—lower-performing girls also saw improvements in their test scores.

In the urban slums of **Gurgaon, India** researchers varied both the recipient of an incentive (parent v. child) and the form of the incentive (money v. toy) in a program that offered prizes if the child reached a literacy goal after two months.<sup>68</sup> At the post-test, on average, children who were reached by the program announcement were 27 percent more likely to achieve the program goal, and scored 0.61 standard deviations higher than children who were not reached. Incentives to parents were more effective when parents were more able to teach their children and motivate them to learn, while incentives to children were more effective when their parents were less able to teach and motivate them.

#### **Lesson 2: Adding inputs—such as computers, textbooks, and even teachers—are not sufficient to improve learning without additional reforms**

Even if students are attending and motivated to learn in school, they may lack the basic resources to complement their efforts. One seemingly intuitive way to improve learning outcomes would be to spend more on these inputs. However, across four different types of resources provided to schools, there is little evidence to suggest that such investments help the majority of students.

**Basic classroom inputs:** Adding basic classroom inputs to schools and doing nothing else to change the learning environment is consistently ineffective at raising test scores. Providing classrooms in **Kenya** with flipcharts<sup>69</sup> or textbooks<sup>70</sup> had no impact on average test scores. A textbook distribution program in **Sierra Leone** had no impacts on learning outcomes, in large part because a large majority

of the books were stored rather than distributed to students.<sup>71</sup> In **India**,<sup>72</sup> a program that provided schools with new or updated libraries as well as a trained librarian similarly had no significant impact on students' reading test scores.

**Information and Communication Technology:** Despite large investments,<sup>73</sup> research shows that ICT interventions that are not well integrated into the learning process have little effect on test scores. An evaluation of the One Laptop Per Child (OLPC) program in **Peru**<sup>74</sup> found no effect on math and language test scores, despite significant increases in computer use at school and at home. In **Colombia**, the Computers for Education program<sup>75</sup> provided donated computers to public schools and trained teachers to use them in the classroom, especially for Spanish instruction. An evaluation found no significant impact on test scores in Spanish or other subjects, and surveys of students and teachers found that most of the computer use under the program was for the purpose of learning computer skills rather than language skills. These findings suggest that simply providing computers is no guarantee of increased learning in subjects other than computer literacy, and highlight the importance of integrating technology into classroom activities.

**Teachers:** Adding additional teachers to classrooms reduces pupil-teacher ratios and can allow teachers to focus more on fewer students. Indeed, several studies in developed countries have found that reducing class sizes can lead to significant test scores gains. Despite these findings and the large class sizes often seen in developing countries, evidence suggests that reducing pupil-teacher ratios does not, by itself, improve test scores.

A program in **India**<sup>76</sup> that used local volunteers to pull lower-performing children out of the classroom for more focused instruction for half the day, reducing the class size by 50 percent, did not lead to any test score gains among the students who stayed in the classroom with their regular teacher. Similar results were found for a program in **Kenya**<sup>77</sup> that provided school committees with funds to hire an additional teacher on a short-term contract. Roughly halving the class size for grades one and two (from a starting point of 82 students per class) did not lead to any improvements in test scores for students who remained with the regular civil-service teacher.

**Flexible grants:** Despite the mounting evidence that inputs alone are an ineffective learning tool, it may be possible to improve the quality of poor schools by providing them with flexible cash transfers. The principals and community leaders are likely to have a deep understanding of the needs of their schools and are in a potentially good position to put these resources to efficient use. Yet, even programs that gave schools discretionary grants to purchase the inputs they felt were most important for their students produced little, if any, gains in test scores.

A program in **Indonesia**,<sup>78</sup> which provided school committees with an approximately US\$870 grant and support to identify how the funds could best be used to address the needs of the school, had no impact on learning outcomes. A similar program in the **Gambia**,<sup>79</sup> which provided schools with a grant of US\$500 to spend on any activities or inputs broadly related to learning or teaching, did not lead to any change in student test scores. In **India**,<sup>80</sup> schools were provided grants according to the number of students in the school (around US\$3 per student per year), and had the freedom to decide how to spend the funds on inputs directly used by children. While average student test scores improved 0.09 standard deviations in the first year, the effects disappeared in the second year. The potential positive impacts were offset because households anticipated the additional funds and significantly reduced their education spending in year two of the program.

### **Lesson 3: Combining inputs with changes in pedagogy can lead to large gains in learning**

One reason why additional resources may not impact learning is that the inputs, and/or the instruction they were intended to support, did not reflect the needs of most students, or were not combined with the right incentives. For example, while the textbook study in **Kenya** had no impact on the average student, it did improve learning outcomes for already high-achieving students. A growing body of evidence suggests that deliberate efforts to improve the quality of instruction through the combination of materials and changes in pedagogy or teacher training can yield large effects on student learning.

An evaluation in the **Philippines**<sup>81</sup> that provided additional inputs matched to students' learning levels, accompanied by changes in pedagogy, led to significant test score improvements. An NGO provided grade four classes with a set of 60 storybooks and trained teachers to hold a one-month "read-a-thon." During the 31 days, teachers held hour-long daily reading sessions that include activities such as dramatic storytelling, literary games, and individual silent reading, and encouraged students to read as many of the books as possible. At the end of this short program, students saw an average improvement of 0.13 standard deviations in reading test scores. Including the cost of the reading materials and teacher training, the program was moderately cost-effective at 0.11 standard deviations per US\$10.

The Reading to Learn (RTL) program is a five-step approach to reading instruction with the goal of improving reading skills among those behind grade level. Two simultaneous evaluations were conducted in **Kenya** and **Uganda**,<sup>82</sup> where teachers first received two weeks of training on the use of the instructional method and local-language materials, management of large classes, and learning assessment. Second, the program endowed classrooms with reading and numeracy learning materials in the languages of instruction, including mini-libraries, book corners, and lockable storage facilities. In Uganda, the RTL program improved written literacy scores by 0.2 standard deviations and oral literacy by 0.18, while in Kenya, oral literacy scores improved by 0.08.

### **Lesson 4: While providing computers alone has had little effect on learning, technology has the potential to improve learning—and can be a surprisingly cost-effective tool—if it is interactive, targeted to students' level of learning, and integrated into the education system**

Information and communication technologies (ICT), especially computers, have been widely discussed as a way to encourage more interactive learning, particularly in developing countries where the quality of teaching is often poor and many schools rely on rote learning and memorization. While simply providing computers alone has had little effect on student learning, technology interventions have the potential to improve learning if they are interactive, targeted to students' level of learning, and integrated into the education system.

An evaluation in **India** suggests that technology can be effective when it is tailored to the student's learning level.<sup>83</sup> In a computer-assisted learning (CAL) program in government schools in Vadodara, India, pairs of students spent two hours per week playing educational games that emphasized basic math skills. The program allowed children to learn at their own pace, and increased math scores by 0.35 standard deviations after only one year. Even though computers added a relatively large cost, the impact of the program was sufficiently large to make it still moderately cost effective at 0.15 standard deviations per US\$10. If the program were implemented in schools that already had computers—as was actually the case in Vadodara—it would produce a cumulative test score gain of 0.44 standard deviations for every US\$10 spent.

Another program in **China**<sup>84</sup> that was complementary to the normal school day led to substantial learning gains in a short period of time. The intervention involved computer-assisted math remedial tutoring sessions which were designed to complement the regular in-class math curriculum. Under teacher supervision, students had two 40-minute CAL sessions per week during lunch break or after

school. The content emphasized basic competencies in the uniform national math curriculum through animated videos and math games. The program ran for one semester only and improved math test scores by 0.14 standard deviations. Low performing students and those with less-educated parents benefited more from the program.

**Lesson 5: Programs designed to match the level of instruction to students' initial learning level have been very effective, and the most consistently cost-effective, at improving student learning**

Many of the interventions found to be effective in the previous three lessons changed the learning model or process to more adequately reflect the needs of the student. In fact, some of the most successful interventions tested by randomized evaluations have addressed learning gaps by gearing instruction toward students' actual learning levels, rather than the expectations of a rigid curriculum. "Teaching at the right level" has been implemented using several models in multiple settings, and the following nine studies provide rigorous evidence on how classes and teaching methods that are adapted to children's learning levels can improve learning outcomes.

One of the first programs to be evaluated was a targeted tutoring program in **India**,<sup>85</sup> which brought in lightly trained tutors ("Balsakhis") to work with the lowest-performing students in rural schools. At the end of the second year, students saw an average increase in test scores of 0.28 standard deviations, while initially low achieving students saw a gain of 0.40 standard deviations. Because the program relied on modestly paid local volunteers and used whatever space was available (free classrooms, playgrounds, or even hallways when necessary), it was a very low-cost intervention, achieving a 0.30 standard deviation improvement in math and language test scores for every US\$10 spent.

A supplementary reading camps program led by community volunteers outside of school hours was also highly effective. After one year, children who could not read anything prior to the program were 7.9 percent more likely to be able read at least letters. Those in the treatment villages who could read only letters at the beginning of the program were 3.5 percent more likely to read at least words or paragraphs, and 3.3 percent more likely to read stories. Children who began the program unable to read anything and attended the camp were 60 percentage points more likely to be able to read letters after a year than similar children in a comparison village.

Another program called "Read India" was evaluated under several different implementation models.<sup>86</sup> Several of the models implemented through government teachers did not have significant impacts as teachers continued to focus on other tasks, such as completing the standard curriculum, maintaining attendance registers, or managing school meals. Providing materials alone and teaching training and materials had no effect on learning outcomes. The in-school volunteer intervention in the state of Uttarakhand also had no effect, apparently because volunteers were asked to substitute for the teachers or were prevented from doing their job.

However, the interventions that created a dedicated time to focus on teaching at the right level yielded more positive results. Summer camps raised math and reading test scores by 0.08 standard deviations while the outside-of-school volunteers improved test scores in all five areas tested (AESR Reading, AESR Math, fluency, written Hindi, and written math) and increased overall scores by 0.11 standard deviations.

Using an iterative process, researchers and implementing partners have developed two successful, replicable models to scale up this type of pedagogical approach within a government school system in India.<sup>87</sup> In one model, teachers were trained in the Teaching at the Right Level approach and implemented it during a dedicated hour. In the other model, volunteers from the original implementing partner conducted high-intensity, short-burst "learning camps" for 40 days, in school

and during school hours, with additional 10-day summer camps. Both models improved student learning. These two models provide blueprints that can be replicated inside other government systems.

### **Effectiveness of Teaching at the Right Level (TaRL) to build literacy and numeracy skills**

- The TaRL approach involves assessing children's literacy and numeracy skills and then grouping them according to learning level rather than grade level. Each group is taught starting from its current competency level, and level-appropriate learning activities and materials are used.
- TaRL has been implemented using several models in multiple settings and has yielded positive impacts on learning. In-school programs and after-school programs led by community volunteers have proven to be successful, as have in-school programs led by government teachers. Summer camps run jointly by government teachers and volunteers have also been successful.
- Focused training and ongoing on-site support of teachers and volunteers have proved to be effective in raising learning levels when children were taught by level.
- Re-grouping by learning level across grades in school to allow children to learn at their own pace can also enhance achievement. In Kenya, when students in first grade were split up according to their initial learning level, children at all achievement levels learned more. In Haryana, one hour per day of targeted reading instruction had a significant positive effect on students' basic reading levels.

## **IV. Evidence in Improving School Governance**

Why does governance matter? Another explanation for the low learning levels in many developing countries may be the weak governance of the education system and limited effort on the part of teachers and administrators to improve learning outcomes. In many developing countries, teachers and school administrators are seldom held accountable by the local community, and teacher absenteeism is rampant. For example, a national survey in India in 2003 found that during unannounced visits, 25 percent of teachers were absent from school and, of those who showed up, only about half were actually teaching.<sup>88</sup> If teachers and administrators are absent or unmotivated, investments in education can be wasted. Motivating better teaching in schools involves complex interactions between students, teachers, parents, and institutions, each of whom responds to a different set of incentives. Several programs aimed at improving service delivery have been implemented with varying degrees of success.

### **Evaluations**

A growing body of evidence shows that performance pay, contract teachers, and empowering parents can be effective in increasing education outcomes. **This section reviews 10 randomized evaluations from four low- and middle- income countries in Asia and Africa, examining how to improve school governance.**

#### **Lesson 1: Incentives for teachers can be an effective—and cost-effective—strategy for improving student learning, but the impact of incentives depends heavily on how they are structured and enforced**

Performance-based pay or bonus pay that is objectively administered and connected to some kind of directly observable conduct, such as teacher attendance, can be very effective at changing teacher behavior and improving student learning. When teacher salaries in NGO-run schools in rural **India** were linked to attendance, verified by having the teachers taking daily photos of themselves with their students, teacher absenteeism fell by half.<sup>89</sup> The program increased math and reading scores by

an average of 0.17 standard deviations at a relatively low cost. The program produced a test score gain of 0.22 standard deviations for every US\$10 spent.

When incentives are tied directly to student test scores, there is some risk of “teaching to the test.” A program in **Kenya** that provided prizes, such as a suit, tea set, or bed linens, to teachers whose students performed well on district exams highlights this risk.<sup>90</sup> In the second year of the program, once teachers understood how the program worked, students saw significant improvements in district exam performance. However, scores increased only in subjects linked to the incentives, and no changes were seen in either teacher attendance or frequency of homework assignments. Instead, teachers ran more test-preparation sessions, raising concerns that the higher test scores simply reflected increased rote learning. Perhaps confirming this concern, students did not see any significant improvements in performance on NGO exams, which were not tied to the incentives, in the first or second year, and one year after the program ended, there was no longer any measurable program impact on district exam scores.

The risk of teaching to the test may be mitigated through the design of the test on which the incentives are based. An incentive program in **India**<sup>91</sup> provided teachers with bonuses based on their students’ test score performance, but in order to assess whether any impact of the program could be attributable to “teaching to the test,” the test on which the bonuses were based included both mechanical questions (designed to reflect rote learning) and conceptual questions (designed to capture deeper understanding of the material). After two years, students in incentive schools saw significant improvements on both the mechanical and conceptual components of the test, suggesting that the gains in test scores represented an actual increase in learning. Students in incentive schools also saw learning gains in subjects for which there were no incentives, suggesting possible positive “spillovers” in learning benefits.

Increasing teacher pay without putting additional incentives in place has not been shown to improve student learning in **Indonesia**.<sup>92</sup> In a randomized evaluation conducted in partnership with the government, researchers found that doubling teacher’s pay improved teacher satisfaction with their income, reduced the incidence of teachers holding outside jobs, and reduced self-reported financial stress. Yet teachers in treated schools did not score better on tests of teacher subject knowledge, and did not report any increase in effort, attendance, or teaching hours. Most importantly, doubling teacher pay led to no improvements in test scores in math, language, or science, suggesting the unconditional salary increase did not improve learning.

## **Lesson 2: Locally hired contract teachers can produce significant learning gains at relatively low cost**

Locally-hired contract teachers are different from regular teachers in many ways, and their attributes may vary substantially by country. They may have lower levels of education, training, and pay than regular teachers. But they may also be from the same village with closer connections to the community, live closer to the school, and be more accountable due to the renewable nature of the job contract. Potentially because they are on short-term contracts and thus have better incentives to perform successfully, adding an extra teacher on a short-term contract can produce significant learning gains. In fact, local contract teachers often outperform regular civil-service teachers.

A program in **India**<sup>93</sup> that provided an extra contract teacher in rural primary schools led to an average improvement in language and math test scores of 0.10 and 0.16 standard deviations at the end of the first and second year of the program, respectively. The program was also relatively cost effective, producing a test score gain of 0.18 standard deviations per US\$10 in year one and 0.12 standard deviations in year two.



One risk with hiring contract teachers is the potential for a counterproductive response from the regular civil-service teachers. In the same study in **Kenya**, civil-service teachers decreased their own effort: the probability that they would be found in class teaching during a random visit decreased from 58 to 45 percent. However, empowering the local school committee through school-based management (SBM) training helped to mitigate this negative response. The 90-minute SBM training covered how to interview and select job applicants, monitor and assess teachers' effort and performance, and perform a formal review of the contract teacher's performance to decide whether to renew her contract.

**Lesson 3: The evidence on community involvement in school management is mixed, but under the right conditions, community involvement can be a cost-effective strategy for improving learning, particularly when people feel they have the ability and a clear avenue to affect change**

Attempts to increase teacher accountability and improve student learning through community involvement in school management have had mixed results. Community-based monitoring and school-based management interventions are hypothesized to affect school outcomes by acting on one or both of two mechanisms: the information available to community members, and the community's willingness to act collectively upon available information to improve school performance.

However, programs designed to increase community involvement in schools are hard to make work. When community monitoring and school-based management programs do work, they can improve both learning and participation; when they don't, they often improve neither. Evidence suggests that providing additional resources or information is insufficient to increase community engagement and improve education quality if community members are not given a clear avenue or sufficient power to affect change.

It is a widely held belief that providing information to citizens is a powerful tool for improving public services. This is particularly prevalent in the education sector, where advocates claim that informing parents about school performance is key to improving school quality. In **Pakistan**, researchers ran a market-level experiment that increased information through the dissemination of school and child level test scores.<sup>94</sup> The two-page report card reported raw test scores for the child in English, Mathematics and Urdu as well as her quintile rank across all tested children on the first page. The second page reported scores for all the schools in the village, with their quintile rank and the number of children tested. Parental knowledge improved as a result of the intervention, as perception of quality became better aligned with school test scores. In villages that received the report cards, the average child's test score increased by 0.11 standard deviations or 42 percent of the average yearly gain; this persisted for at least two years after the intervention.

In **India**, informing people about the low levels of learning and high teacher absenteeism in their communities, telling them about what they were entitled to, and even giving them specific information about how they could intervene, had no impact on either parents' engagement or student test scores.<sup>95</sup> Programs in **Indonesia**<sup>96</sup> that provided school committees with funds for educational materials or infrastructure improvements, either alone or in combination with a training program, also had no impact on learning outcomes.

However, as discussed above, when local school committees in Kenya were empowered through school-based management (SBM) training, learning outcomes improved significantly. The SBM program reduced the tendency for civil-service teachers to cut their effort in response to the introduction of a contract teacher by 50 percent, and reduced the ability of civil-service teachers to secure the contract teacher position for a relative. In the absence of the SBM training, about a third of the contract teachers hired were relatives of existing civil-service teachers in the school, and students of these teachers appear to have learned less than students of other contract teachers.

In **Indonesia**, pairing the additional funds (or funds plus the training program) with interventions to empower the local school committee increased community engagement and raised student learning levels at a very low cost. One intervention consisted of a series of facilitated meetings between the village council, the school headmaster, and the school committee, with the aim of increasing the stature and influence of the school committee. After 18 months, students saw an average test score gain of 0.17 standard deviations. Because the intervention required only two visits from the implementing organization to facilitate the meetings in each village, it was very cost-effective, producing a cumulative test score gain of 3.25 standard deviations for every US\$10 spent. Combining this “linkage” intervention with a second intervention—direct election of school committee members to increase the legitimacy and authority of the committee—led to even larger test score gains of 0.23 standard deviations. However, the combined intervention was slightly less cost-effective at 1.32 standard deviations per US\$10.

## **Cost Effectiveness**

Figure 2 shows J-PAL’s estimates of the cost-effectiveness of the programs reviewed in sections III and IV of this memo. The cost-effectiveness of each program is measured as the ratio of the aggregate impact of the program—the average test score improvement per student multiplied by the number of students impacted—to the aggregate cost of implementing the program. The numbers presented in the graph represent the total number of standard deviations gained across any sample size for US\$10.

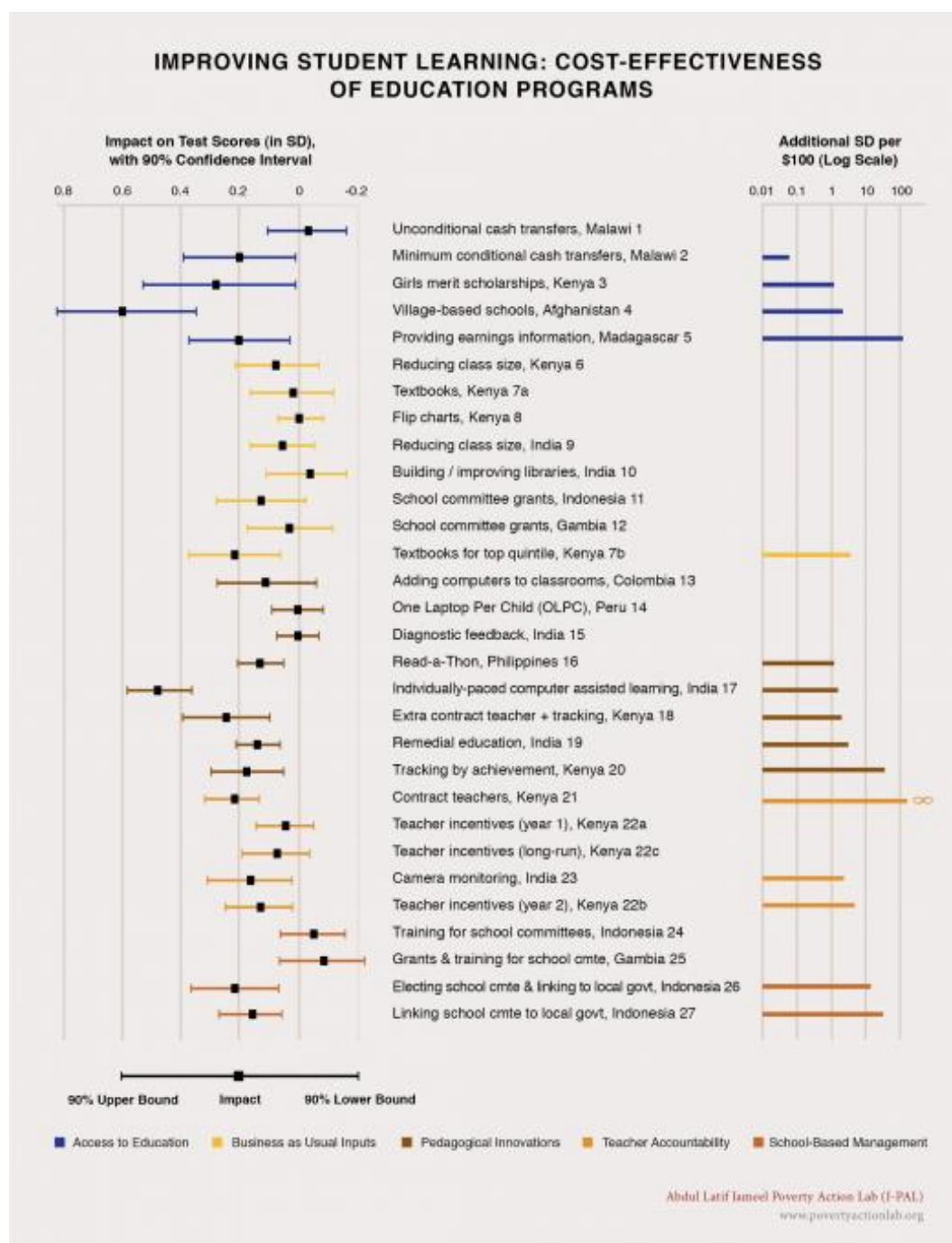
Cost-effectiveness analysis summarizes complex programs in terms of an illustrative ratio of costs to impacts, and allows us to use this common measure to compare programs evaluated in different countries and in different years. While we provide relative rankings, CEA does not, by itself, provide sufficient information to determine any policy or investment decisions. For example, the relative rankings may be different if relative input costs vary by country (for example, the cost of teachers’ salaries versus computers). However, CEA can serve as a useful starting point in the decision-making process, including by highlighting the types of programs that tend to be the most cost-effective and by establishing cost-effectiveness benchmarks. Detailed data are available on J-PAL’s website and readers are encouraged to input relevant local costs and undertake sensitivity analysis.

The key takeaways from this cost-effectiveness analysis are:

- Improving access to education can, but does not necessarily, lead to learning gains, and the cost-effectiveness of such programs is highly variable.
- Programs that combine increased access to education with an increase in student or teacher motivation significantly improve learning at a low cost.
- Just reducing class size or providing additional resources—such as textbooks or flipcharts—is consistently found to have no impact on test scores for the majority of students.
- Programs that focus on basic skills and direct instruction toward children’s actual learning levels are the most consistently cost-effective at improving learning outcomes.
- The impact of programs focusing on teacher accountability is mixed, but those that did lead to significant learning gains are quite cost-effective.

To enable policymakers to get a better sense of what drives these cost-effectiveness estimates and how cost-effective similar programs might be in their context, the detailed spreadsheets underlying the calculations presented here are available at <http://www.povertyactionlab.org/policy-lessons/education/increasing-test-score-performance>.

**Figure 2: Cost-effectiveness Analysis of Programs to Improve Student Learning in Developing Countries**



## **V. Policy Lessons and Recommendations**

### **1. On Improving Student Participation**

#### **Policy Lessons**

Policymakers need to focus not just on school enrollment but also on whether enrolled children are attending school regularly. While enrollment rates in primary and secondary education have risen sharply, many children attend school irregularly. Available data suggest that at the primary school level in many countries more days of schooling are lost to enrolled children not attending regularly than to children not being enrolled in school. Enrollment becomes a relatively larger problem at older ages.

A large body of evidence on different strategies for promoting student participation can help policymakers choose approaches that are right for their context. Policymakers wanting to address low enrollment or intermittent attendance of students can draw on over various RCTs studies across many countries, as well as detailed cost-effectiveness data, to craft effective strategies that meet their specific needs and local challenges:

#### **Policy Recommendations**

There are a number of practical cost-effective ways to improve enrollment and attendance:

- Distance matters, especially for girls. In areas where few schools exist, creating more schools to reduce the distance children have to walk is a very effective way to increase enrollment and attendance. This is particularly important for girls in areas where security is an issue.
- School participation is responsive to costs and incentives. Programs that provide cash or in-kind transfers, even small ones, consistently increase enrollment and attendance. Tweaking the design details, such as when transfers are given, can improve the effectiveness of these programs. Results are mixed on whether transfers are more effective when they are conditional on attendance.
- Providing parents and students with examples of the benefits of education, including providing information about how much people with more schooling earn and examples of job opportunities, can increase student participation where parents and students underestimate the benefits of education. Increasing the expected returns to education also increases investment in education.
- Improving health and nutrition increases attendance. School-based nutrient supplements and deworming programs can increase attendance at very low cost.

### **2. On Improving Student Learning Outcomes in Primary Schools**

#### **Policy Lessons**

Programs that focus on basic skills and direct instruction toward children's actual learning levels are the most consistently effective and cost-effective at improving learning outcomes. There are many different ways to improve targeting of instruction: classes can be divided by initial achievement level; volunteers can pull struggling students out of the classroom for more targeted instruction during the school day or can hold extra sessions after school hours; or computers with software that adjusts to the level of the students can be added to the classroom. Each of these programs can be delivered relatively inexpensively and have been shown to substantially improve test scores.

In the absence of changes in classroom organization or pedagogy, programs that reduce class size or provide additional resources—such as textbooks, flipcharts, or uniforms— consistently have no impact on student test scores. In the presence of weak teacher incentives and rigid curricula

focused on the top students, reducing the size of the class will likely not lead to improvements in student learning. Similarly, giving students inputs that they are not equipped to use—such as books they cannot read—will not help them learn. Instruction programs, and the associated inputs (textbooks, reading books, etc.), need to be geared toward students' actual learning levels.

### **Policy Recommendations**

- Programs that match the level of instruction to students' initial learning level (Teaching at the Right Level/TaRL) have been very effective, and the most consistently cost-effective, at improving student learning. Models include tracking, remedial teaching and learning camps.
- Programs that provide rewards to increase students' motivation to learn can produce large learning gains at a relatively low cost.
- Adding inputs—such as computers, textbooks, and even teachers—is not sufficient to improve learning without additional reforms.
- Combining inputs with changes in pedagogy can lead to large gains in learning.

While providing computers alone has had little effect on learning, technology has the potential to improve learning—and can be a surprisingly cost-effective tool—if it is interactive, targeted to students' level of learning, and integrated into the education system.

## **3. On Improving School Governance**

### **Policy Lessons**

The cost-effectiveness of education programs can vary widely, even among programs that have a positive impact, making cost-effectiveness analysis a critical step in selecting programs for implementation. When making policy decisions, it is important to first determine which programs have been rigorously shown to have a positive impact. This is not enough, however, as even programs that have been proven effective may not be the best policy option when costs are considered. Information on current learning levels, local enrollment and attendance patterns, and institutions must also be taken into account when considering which program is best for a particular area. Combining contextual information on which problems are the most pressing and rigorous cost-effectiveness estimates can provide insight into which programs will provide the greatest value for money in a particular situation.

Providing incentives and empowering the local community to hold service providers accountable can improve learning. Implementation clearly important, though we do not fully understand the mechanisms, and community monitoring could become more effective when people were given specific tools and clear avenues to effect change.

### **Policy Recommendations**

- Incentives for teachers can be an effective—and cost-effective—strategy for improving student learning, but the impact depends heavily on how the incentives are structured and enforced.
- Locally hired contract teachers can produce significant learning gains at relatively low cost.
- The evidence on increasing community involvement in schools is mixed, but under the right conditions, community monitoring and school-based management can be cost-effective strategies for improving learning, particularly when people feel they have the ability and a clear avenue to affect change.

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