



LEARNING to improve LEARNING:

Lessons from Early
Primary Interventions
and Evaluations
in India and
Sub-Saharan Africa

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INTRODUCTION

The global community has supported an unprecedented increase in school enrollments over the past two decades. Today, more children attend school than at any other time in history, in absolute numbers and as a share of school-age children. However, assessments of what children are learning in school show that far too often children are learning far too little. For example, in Uganda and Mali, only 1 in 50 second graders can read (Uwezo 2011, Early Grade Reading Assessment 2009). Even in the best performing states in India, fewer than half of 10- and 11-year-olds are proficient at four tasks: reading a simple passage, doing division, telling time, and handling money (ASER 2011). This lack of basic competencies undermines the productivity, health, and wellbeing that education is expected to deliver.

In response to overwhelming evidence of the learning crisis across the globe, parents, governments, and donors are increasingly asking: “What can we do to improve student achievement?” In particular, they are eager for solutions that will work within existing, resource-constrained school systems.

In 2006, when the Hewlett Foundation started the Quality Education in Developing Countries initiative, one of the initiative’s goals was to help answer precisely this question. From 2007 to 2013, combining resources with co-funding from the Bill & Melinda Gates Foundation, the Foundation supported eleven school-level approaches to improving early learning, accompanied by ten rigorous evaluations. The grants spanned India and five countries in Sub-Saharan Africa: Kenya, Uganda, Mali, Senegal, and Ghana. Most organizations focused on improving instructional practice, tackling head-on the fact that teachers are insufficiently prepared to teach reading and math in the early primary grades.

The studies funded by the Foundation constitute a significant contribution to existing evaluation evidence on how to improve student learning. Recent meta-analyses catalogue fewer than 80 randomized studies in the developing world that have examined learning as an outcome variable (McEwan 2013, Krishnaratne et al. 2013). Given the paucity of existing studies, it is still early days for building evidence on what works to improve learning.

The remainder of this paper provides a synthesis of what we know about how to improve learning outcomes. Three areas seem to be critical: (1) improved instruction; (2) strong teacher training and in-school mentoring; and (3) community engagement in learning. The paper concludes with recommendations for carrying this work forward, including ways the results could help shape the future research agenda.

WHAT WORKS TO IMPROVE LEARNING?

As evidence mounts that children enrolled in school are failing to learn even basic skills, parents, governments, donors, and others are clamoring for solutions. This section summarizes what answers have been generated through the evidence and experience of the Foundation’s grants. Many of the solutions discussed here are supported by rigorous evidence from external program evaluations. Others are supported by experiential evidence from implementation. A few are hunches that are worth testing and evaluating to learn more.

One particular challenge in getting a *nuanced* understanding of what works is that randomized evaluations are best suited for testing whether or not a full program works. Although some evaluations tested the value-add of certain program components, it is prohibitively expensive to test too many variations. Given that there are many details of program implementation that could not be explicitly tested, in drawing conclusions about what works it is important to look at both implementation experience and evaluators’ analyses.

Most of the studies funded by the Foundation focus on an area of intervention that seems most important for changing early learning: improving classroom pedagogy. Kremer et al. (2013) find that “providing additional inputs [to education] without changing pedagogy or governance has limited impact, whereas adapting teaching methods to reach the varied learning levels in developing countries is highly effective.” Similarly, McEwan (2013) finds that interventions with teacher in-service training are uniformly associated with higher student learning, on average. To complement this growing body of evidence that pedagogy and teachers’ skill in effectively and consistently implementing it in the classroom makes a difference, the Foundation’s investments suggest that:

1. Classroom instruction should follow the “ABC’s”: (a) **aim** at students’ ability levels; (b) **build** structured lessons with accompanying materials; and (c) **communicate** in a language that students understand.
2. Teachers need supportive teacher training, mentoring, and supervision.
3. Communities should be engaged, specifically on learning.

The chart below lists all of the programs and evaluations funded, and it highlights the principles tested within the programs.

Table 1. List of Programs and Evaluations Funded and the Principles They Tested

	Instruction that follows the ABC's			Strong teacher training & mentoring	Community engagement on learning
	Aim at students' ability level	Build structured lessons & materials	Communicate in a language students understand		
Aga Khan Foundation & African Population and Health Research Center: East Africa Quality Education Learning (Kenya & Uganda)		+	+	+	+
Institute for Popular Education & Research Triangle Institute: Read, Learn Lead (Mali)		+	+	+	+
Pratham & J-PAL: Read India (India)	+	+	+	+	+
Karnataka Government & Stanford University: Nali Kali (India)	+	+	+	+	
Harvard University: Health and Literacy Intervention* (Kenya)		+		+	
Innovations for Poverty Action: Teacher Community Assistant Initiative (Ghana)	+	+		+	+
Mango Tree & University of Michigan: Northern Uganda Literacy Program* (Uganda)		+	+	+	
Prajayatra & Stanford University* (India)				+	+
Raising Voices & London School of Hygiene & Tropical Medicine: Good Schools Toolkit* (Uganda)				+	+
Tostan & Stanford University* (Senegal)				+	+
Associates in Research and Education for Development & Dalberg (Senegal)		+	+	+	
Room to Read** (India)		+	+	+	
ADLAS** (Senegal)		+	+	+	+

* Final evaluation results not yet available.

**No external evaluation conducted.

Instruction that follows the ABC's

Classroom instruction is arguably the most critical influence on how much students learn in school. The evidence suggests several critical features of effective instruction, which can be broken down into the ABC's of instruction:

- **A**im at students' ability levels
- **B**uild structured lessons and materials
- **C**ommunicate in a language students understand

// Aim at students' ability levels //

In an overwhelming number of classrooms across the developing world, students' ability levels are far below the curriculum that is being taught. For example, half of fifth graders in India cannot read from a second grade textbook, but they are nevertheless expected to learn out of a much more difficult fifth-grade textbook (ASER 2013). Without a bridge from what they currently know to what they are expected to know, these children end up learning next to nothing. Several studies tested what happens when student instruction is more targeted and found this can have a big impact on student results.

For example, Pratham, an Indian NGO, helped the state government in Bihar run a summer camp for children who were performing below grade level. Pratham worked with local teachers to first test children's reading and math levels. Based on the results of the assessment, children were placed in learning groups with other children with similar abilities. Pratham provided teachers with activities and materials that could help children build from their current level up to higher levels. For example, children who could not read anything at all were given lots of instruction in recognizing letters and learning their corresponding sounds. By the end of the summer camp, which lasted only four weeks, an evaluation by J-PAL found that children who had attended were over 30 percent more likely to be able to read at least words or paragraphs than their peers who did not attend the camp (Banerjee et al. 2012). In fact, in one summer these children learned more than they did over the course of an entire school year—and they maintained their learning gains over the entire two years of the study.

Several years later, Pratham worked with teachers in the state of Haryana to group children by ability level during the regular school year. Another study by J-PAL showed students gained 0.15 standard deviations in reading and 0.135 standard deviations in math (J-PAL 2013).

Building in part off the success of Pratham's work in India, Innovations for Poverty Action worked in partnership with the Ghanaian government to implement a Teacher Community Assistants' Initiative in Ghana. The government hired local youth, and Innovations for Poverty Action trained them to conduct assessments and provide similarly targeted instruction to students who needed additional support. At the midline of that study, children who received this targeted

instruction during the school day were performing 11 percent better on reading than children in other schools who didn't get special instruction. Those children who got the instruction after school performed 16 percent better (Anaman et al. 2012).

All three of these studies suggest that by aiming at students' current abilities, instruction can catapult them to higher levels of ability instead of leaving them farther and farther behind. Providing instruction that effectively targets ability levels requires:

- Assessing where students are at the beginning.
- Setting goals for the next level of competency children should reach, and by when they should reach it.
- Providing clear instruction to take students to the next level, accompanied by materials at the appropriate level.
- Using regular assessment to check progress.

Teachers also need to be adequately incentivized and supported to target their instruction at students' current abilities. Despite the success of their summer camps, Pratham found that when they trained other teachers in Bihar to use the same methods and materials during the regular school year, it had little to no impact on student learning. The researchers hypothesize that this is because teachers were too preoccupied with covering the government curriculum to dedicate time to the sort of targeted instruction that Pratham was encouraging (Banerjee et al. 2012).

// Build structured lessons and materials //

Delivering effective lessons requires thoughtful preparation. Not only must teachers know what they want their students to learn, but they also have to decide how they will deliver that content in a way that their students will understand—and they need materials that will support that delivery. In most classrooms teachers are left on their own to do all of these complex tasks. Providing teachers with very clear guidance on structured lessons and materials not only makes their jobs easier, it also ensures that children are taught all the content they need to know in a meaningful sequence.

In Mali, the Institute for Popular Education developed an instructional approach for reading that guided teachers through seven steps for every lesson:

1. Review materials from the previous day.
2. Build phonemic awareness orally.
3. Exercise phonetic awareness.
4. Practice decoding vocabulary.
5. Practice reading familiar words.
6. Teacher reads a story.
7. Children read a story.

These steps helped ensure that children got practice in all the key skills necessary for literacy: phonics, vocabulary, fluency, and comprehension. They provided a routine for teachers to follow every day in the classroom. In addition, the Institute for Popular Education gave teachers a guide book that provided a systematic, progressive presentation of letters, syllables, and vocabulary words that should be covered. Every student was given their own readers, and the stories in them were sequenced to use the letters and words that had already been introduced to them.

An external evaluation by the Research Triangle Institute showed that students receiving the Institute's intervention improved 60 percent on the reading test (Spratt et al. 2012). Their peers who did not receive the intervention did not improve at all. These impressive gains are tempered by the fact that the overall performance of students remained low—the average student read at a slow pace of 11 words per minute—and the gains did not last beyond their engagement with the program. Students likely lost their initial gains because of the very poor quality of instruction they received in subsequent years (Gove and Cvelich 2011). That said, the effect sizes of the program's impact on learning outcomes are larger than those of any other program examined by McEwan (2013). In addition, other programs with similarly structured lessons and materials are also showing great promise. For example, in Northern Uganda, an organization named Mango Tree is implementing a similar program. Their internal monitoring data found that first graders in Mango Tree classes performed as well as or better than learners from nearby schools at the end of second grade. That means that these students were more than one year ahead in their literacy development.

The Institute for Popular Education and Mango Tree both got reading materials into the hands of every child. They made this affordable by simplifying the materials. For example, the Institute for Popular Education printed their stories on large sheets of papers that they folded in half to make four-page “books.” Mango Tree used a laser printer and stapler to make their short, black-and-white readers.

These programs suggest that the following elements are particularly important for building structured lessons and materials:

- Provide clear lesson guidance that makes teachers' jobs easier
- Provide a clear sequence for the materials (e.g. structure what letters/sounds are taught and when, with more frequent letters taught first so students can quickly start sounding out real words).
- Create routines that teachers follow from one lesson to the next.
- Provide materials that map to the lessons and are at the level for the child.
- Prioritize getting materials into the hands of every child over printing expensive materials.

In addition to *what* teachers teach, *how* they teach it is also important, including how they relate to their students. Raising Voices is working in hundreds of schools in Uganda to create a more

progressive relationship between teachers and their students by ensuring that classrooms are violence free and children participate in their school governance and the learning process. The London School of Hygiene and Tropical Medicine is testing this approach through a randomized evaluation that will measure whether such an approach improves children's learning outcomes (results forthcoming in 2014).

// Communicate in a language students understand //

One important aspect of aiming instruction to the level of the child is delivering instruction in a language that the child already understands. Extensive research across the developing world points to the importance of local language instruction, especially in the early grades (e.g. Ball 2010). Although none of the evaluations supported by the Foundation explicitly tested the impact of good mother-tongue reading and math instruction versus good reading and math instruction in a foreign language, they provide evidence that effective instruction in children's home languages can lead to learning gains.

In addition to all of the characteristics of the Mango Tree and Institute for Popular Education's models described above, another critical feature was that instruction and materials were given in the home language of the students. In Senegal, Daelberg ran a quasi-experimental evaluation of Associates in Research and Education for Development's bilingual education program and found that students who received reading and math instruction in their home language (Wolof or Pulaar) and French performed better on reading and math than their peers in traditional French-only classrooms.

Another example of instruction provided in the mother tongue is the Reading to Learn program implemented in Kenya and Uganda by the Aga Khan Foundation. Teachers in the Reading to Learn program followed five steps in their daily literacy instruction, starting by reading a full story, breaking it down into sentences, then into words, and finally into individual letters and their corresponding sounds, before building back up to the story again.

In Uganda, children were taught in Lango, the language they speak at home. An external evaluation by the African Population and Health Research Center showed that these children's literacy improved 0.2 standard deviations compared with children who did not receive the program. In Kenya, by comparison, children gained only 0.08 standard deviations in literacy (Oketch et al. 2012; Lucas et al. 2012). Children there were tested in Swahili, but although teachers were officially supposed to be teaching in Swahili, in reality much of the reading instruction that children received was actually in English.

Because of the complex differences between home language, the language of instruction, and the language of assessment in Kenya, it is hard to capture true student learning gains, let alone make a legitimate comparison between program effects in Kenya and Uganda. What we can be certain of is that decisions about which languages to teach in and which languages to test in should be informed by verifying the home languages of students, as well as by teachers' spoken and written

fluencies in home and instructional languages. These decisions make a critical difference in student learning outcomes and our ability to assess learning gains.

Nearly all of the instructional approaches supported by the Foundation featured instruction in local languages, and all of the organizations that took this approach felt it was a critical feature of their design. That said, governments face many complexities when they support local language instruction—from deciding how many languages to support in countries rich in linguistic diversity, to managing material development in many languages (which sometimes requires orthography development for languages that do not yet have a script), to responding to parental demand for instruction in official languages like English. The evidence from these interventions suggests that local language instruction is one component of effective instruction. What it does not help answer is how much children would gain if they received all the other components of effective instruction but were not taught in their home language. A study by the Research Triangle Institute that is now ongoing in Kenya is examining just this by comparing effective reading instruction in English to effective reading instruction in local languages. This area is ripe for further study on the cost effectiveness of different language decisions, as this type of evidence could help policymakers make difficult tradeoffs with constrained budgets.

Strong teacher training, mentoring, and supervision

As we have argued above, experience from the Foundation’s grantmaking suggests that effective student learning hinges on effective classroom instruction. Effective classroom instruction, in turn, hinges upon effective teacher training and mentoring. None of the evaluations explicitly tested variations on the substance, delivery method, or duration of teacher training. However, as shown in Table 1, teacher training and mentoring was a feature of every intervention funded by the Foundation. The organizations supported by the Foundation have therefore collectively amassed significant experience testing different training modalities. They unanimously agreed that a cornerstone of supporting better teaching is not only training teachers offsite, but also providing follow-up mentoring to teachers in the classroom. Training teachers well requires:

- Providing practical, hands-on training that covers both *how* to teach and *what* to teach (including ensuring that teachers have sufficient fluency in the language of instruction), as well as how to test children’s ability levels.
- Giving teachers doable activities that show positive results to help them “unlearn” their traditional teaching methods.
- Conducting regular visits to observe teachers in their classrooms and offer suggestions for improvement.
- Assessing learning levels of children during regular visits.

Good teacher training is critical, but it is also expensive. Foundation grantees experimented with some innovative delivery approaches. For example, in coastal Kenya, where Harvard University implemented and evaluated the Health and Literacy Intervention, teachers were given regular

guidance via text message. They were given additional cell phone minutes as an incentive to respond to questions posed in these messages. In Northern Uganda, Mango Tree developed videos to standardize training and provide examples of the method in practice in real classrooms. Mango Tree is planning an evaluation with colleagues at the University of Michigan that will specifically test different models for training and monitoring teachers. Future research should explore what frequency of support is optimal and how effective some of these cost-saving techniques might be for providing it. This sort of evaluation could significantly improve our understanding of cost-effective approaches to delivering good teacher training.

Community engagement in learning

Community support for learning can have a positive impact on student performance for at least two different reasons. First, communities can influence what happens in their children's schools and thereby reinforce the factors that support better classroom instruction that are discussed above. Second, because children's learning does not happen only in the classroom, parents and other community members can strengthen children's learning directly through their actions at home. The Foundation supported several interventions that focus primarily on changing the way communities engage with learning as a mechanism for improving student learning outcomes.

As an example of the community influencing what happens in schools, in the state of Karnataka in southern India, Prajayatna is working to build greater community ownership over local schools. Prajayatna staff helps facilitate community meetings during which parents and other community members discuss the status of their school and develop plans to improve it. They encourage the community to ask teachers to gather portfolios of student work and report regularly to the community on student performance. Preliminary findings from researchers at Stanford University and Catalyst Management Services show that when consistent community meetings occur, they have a positive impact on the effectiveness of school management and reading levels of children (final results forthcoming in 2014).

In terms of changing parental engagement at home, in Senegal, Tostan is working to promote behavioral norms that cultivate greater verbal interaction between parents and young children, including by encouraging even illiterate parents to look through books with their children. A different set of researchers from Stanford University is evaluating the effect Tostan's work has on vocabulary exposure and comprehension among children age 18 months to 3 years.

Forthcoming evaluation results will highlight new insights on the impact of community engagement on student learning. Experientially, what both of these programs have shown is the importance of finding good entry points for parents to engage in their children's learning. Both groups have worked to develop realistic "asks" of what community members can feasibly do to engage in their children's learning.

Constraints

The Foundation set out to demonstrate that it is possible to improve student learning in low-resourced settings and to build evidence on what ingredients are necessary for doing so successfully. The body of evidence amassed by the Foundation's investments has shown that it is indeed possible to improve learning. These results complement findings from other research that show when children are taught effectively, they can and do learn (e.g. McEwan 2013, Kremer et al. 2013, Krishnaratne et al. 2013, Gove and Cvelich 2011). That said, the results from evaluations of the interventions funded were not universally positive, and the interventions were not always as effective as hoped. The principles outlined above seem to be important ingredients for success, but organizations faced several constraints when trying to implement their work that limited their impact.

One major constraint was that teachers and students are frequently absent from school. In many cases this drastically limited the amount of instruction students actually received. For example, in Mali, lengthy teacher strikes cut instructional time by one-third. A further challenge was that even when teachers were in the classroom, sometimes their incentives were not well aligned to using the new methods that they had been trained in. For example, in India teachers are compelled to cover the government curriculum. This meant that they did not make time to implement Pratham's techniques. Both of these constraints point to a broader issue, which is that in many countries there is very little accountability for learning. Meta-analyses by Kremer et al. and McEwan (2013) both suggest that in addition to teacher training, interventions that better align teacher incentives can also influence student learning. One line of inquiry for future research is to look at interventions that not only change classroom instruction (improve teacher "skill") but also align teacher incentives for effective delivery of that instruction (increase teacher "will"). This research should be structured to assess both the independent and additive effects of tackling teacher "skill" and teacher "will."

These constraints are all factors that limit the possibilities for improving student learning at a large enough scale to confront the sheer magnitude of the learning crisis. They suggest that if learning is not regularly measured and held as the metric for success in education, it will continue to be difficult to ensure every child's right to learning.

RECOMMENDATIONS & CONCLUSION

The evidence that the Foundation's grantees have amassed regarding instructional approaches has shown that even under difficult conditions, when instruction is focused on specific competencies and delivered well, children can and do learn. We offer the following recommendations for translating these results into action.

First, **NGOs, evaluators, governments, and other funders** can apply the learning about what works while continuously measuring impacts on learning in new applications and environments. Although this body of evidence provides initial guidance on what works, as a recent review of the literature by the International Initiative for Impact Evaluation points out, “the challenge is that evidence on both learning outcomes and cost-effectiveness remains limited” (Krishnaratne et al. 2013). What we can explain through these evaluations is small compared to what we cannot explain. For example, why were there lasting learning gains for children in Bihar after just a summer of instruction, while learning gains in Mali disappeared over time? These paradoxes underscore the importance of context and continuing to test successful models in new places. In addition, future implementation and evaluation could push the envelope to learn more about:

- The cost effectiveness of different decisions about the language of instruction.
- Cost-effective modes and durations for teacher training and mentoring.
- The independent and additive effects of tackling teacher “skill” and teacher “will.”
- How to reach scale and how to plan for it from the beginning.

Second, **governments** can realign policy and practice to support the application of these lessons in their school systems. Key priorities might include:

- Simplify the curriculum. Ensure that it targets appropriate learning goals and can be delivered with sufficient flexibility for teachers to teach at their students’ levels.
- Develop a structured curriculum and supporting materials.
- Re-orient pre-service training to give teachers practical skills in instruction, including practical skills for teaching early-grade reading and math.
- Ensure adequate support to teachers in the classroom.
- Align teacher incentives with student learning, including by monitoring learning outcomes during classroom visits.
- Address teacher and student absenteeism and experiment with mechanisms for recovering lost learning time.

Third, **advocates** who are trying to promote a focus on equitable learning can use these lessons to demonstrate that success is possible and to shape their policy asks.

With growing awareness among governments and donors that children are not learning what they should be learning in school, there is demand for evidence about what improves learning, and there is hunger for tested solutions. This paper highlights the findings from a dozen experiments that tested large-scale solutions in six countries. Although the education sector is still far from having a sufficient body of knowledge that pinpoints the most effective ways to improve instruction across diverse settings, we have a compass that points to what to explore next. If we persist in our explorations, we are confident that student achievement will continue to rise, and children across the globe will be given a fairer chance at a prosperous future.

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