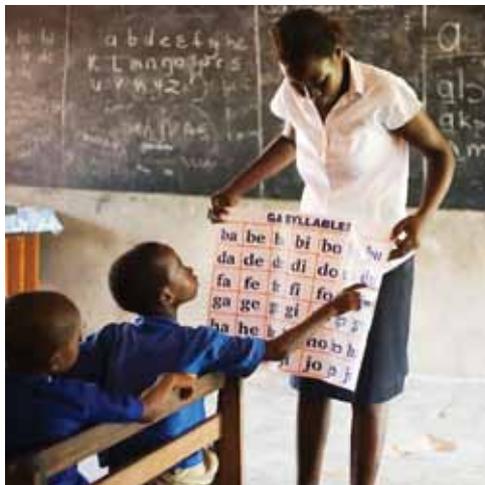


ACCRA, GHANA MAY 2012

EVIDENCE-BASED EDUCATION

POLICY MAKING & REFORM IN AFRICA



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EVIDENCE-BASED EDUCATION

POLICY MAKING &
REFORM IN AFRICA



WALK IN OBEDIENCE
AND WORK HARD

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IPA & J-PAL EDUCATION EVALUATIONS



Welcome

Dear Conference Participants,

On behalf of all of the organisers, speakers, and staff of this conference, it is our pleasure to welcome you to “Evidence-Based Education: Policy-Making and Reform in Africa” jointly organised by Innovations for Poverty Action (IPA), the Abdul Latif Jameel Poverty Lab (J-PAL), and the Ghana Education Service (GES). Through the evaluation of the Teacher Community Assistant Initiative and other efforts, the Government of Ghana has demonstrated its willingness to make further improvements in social programmes based on scientific evidence. This openness to new ideas and enthusiasm for change is what has brought all of us to Accra today for this conference.

This conference brings together leading development researchers, senior policymakers from African governments, and representatives from international development organisations, foundations and NGOs to discuss the importance of using scientific evidence from field evaluations to guide policy; to share the results of randomised evaluations of innovative education programmes that have proven to be highly effective; and to give these organisations an opportunity to provide input on the future research agenda.

We are hopeful that participants in this conference will take advantage of the opportunity to make use of the evidence we already have on education and to help fill evidence gaps. We also hope that the conference will result in successful collaborations between the various attending organisations, the scale-up of many highly effective social programmes, and wider use of rigorous evaluation methodologies that will continue to improve education throughout Africa.

Sincerely,
Benedicta Naana Biney, Director General, Ghana Education Service
Jessica Kiessel, Country Director for IPA Ghana
Kamilla Gumedde, Executive Director for J-PAL Africa

Conference Background

Much progress has been made towards achieving universal enrolment in primary schools. However, the education sector in Africa continues to face a number of challenges. Enrolment remains far below the Millennium Development Goal (MDG) target in some regions, and teacher absenteeism is rampant. Learning levels in schools are highly unequal, and many children attend school but learn very little. Enrolment rates drop dramatically when students reach secondary school, and few countries equip their graduates with the necessary skills to transition smoothly from school to productive work.

Tasked with improving the education sector with limited resources, practitioners, policymakers, and their development partners often find themselves divided and daunted by both the number of problems that they have to face and the large variety of potential remedies proposed. Without reliable information on which interventions work and which are more cost-effective, decision-makers are challenged when choosing whether to allocate funds to support school feeding, additional textbooks, improved teacher training, school monitoring, or technology.

While many unanswered questions related to how best to improve education remain, a number of important lessons have been learned in the last decade through rigorous field research. This body of evidence can help to guide policymaker and donor investments but often remains unknown (or unused) by key stakeholders.

There is a growing demand from African policymakers and practitioners for rigorous evidence to help ensure that programmes deliver what they promise. This conference is for people who believe in using evidence in policy-making, and who have come to Ghana to learn from country experiences and share lessons and challenges.

About the Organisers

The [Ghana Education Service \(GES\)](#) is responsible for the implementation of pre-tertiary educational policies of the government, to ensure that all Ghanaian children of school-going age, irrespective of tribe, gender, disability, religion, or political affiliation, are provided with quality formal education and training through effective resource management.

With the goal of creating an enabling environment in all educational institutions, the GES works to improve equitable access to education, bridge the gender gap, and improve the quality of teaching and learning.

[Innovations for Poverty Action \(IPA\)](#) is a non-profit dedicated to discovering what works to help the world's poor. Established in 2002, IPA partners with researchers in top universities and implementing organisations to design rigorous evaluations of anti-poverty programmes. When a programme has been tested and proven, IPA communicates the findings to development practitioners, policymakers, and donors and works with implementing partners and governments to bring those programmes to scale around the world.

IPA has research operations in over 45 countries around the world, and IPA country programmes have been established in 14 of these countries. These country programmes not only provide enhanced research support, but also ensure IPA research is aligned with local policy priorities and that evidence is shared locally as well as regionally and internationally.

The [Abdul Latif Jameel Poverty Action Lab \(J-PAL\)](#) was established in 2003 as a research centre within the Economics Department at the Massachusetts Institute of Technology (MIT). Since then, it has grown into a global network of researchers who are united by their use of randomised evaluations to answer critical policy questions in the fight against poverty. In 2010, J-PAL opened a regional office for Africa at the University of Cape Town, South Africa; it also has regional offices based at universities in Paris, France; Santiago, Chile; and Chennai and Delhi, India.

J-PAL's mission is to reduce poverty by ensuring that policy is based on rigorous evidence. It works to achieve this mission by conducting randomised evaluations, building the capacity of others to conduct rigorous evaluations, and informing policy by disseminating the lessons from J-PAL research to governments, international development organisations, NGOs, and foundations.

The Teacher Community Assistant Initiative (TCAI)

Ghana's Teacher Community Assistant Initiative is providing rigorous evidence on how remedial education programmes can improve learning outcomes.

While school enrolment rates in developing countries have significantly improved in the last decade, learning levels have not matched this progress. Teachers must manage classes that are large and include pupils with very different levels of preparation, hindering teachers' ability to target instruction appropriately. The 2009 National Education Assessment in Ghana showed that only 20 percent of grade 3 pupils reach expected proficiency levels in English, and 25.2 percent in maths, despite the fact that the government spends 23 percent of its budget on education. Cost-effective strategies to improve learning levels are urgently needed.

Studies in India and Kenya have shown that significant improvements can be achieved at relatively low cost by targeting the level of instruction to pupils' abilities, during or after school hours. Based on these insights, the Ghanaian Education Service (GES), in partnership with the Ghana National Association of Teachers (GNAT), and the National Youth Employment Programme (NYEP), are piloting and evaluating the Teacher Community Assistant Initiative (TCAI). This programme trains teachers and community assistants to teach to the learning level of their pupils through several different mechanisms. While the project is ongoing, it has already yielded several important lessons.

Governments can use rigorous evaluations to guide their education policies and improve pupil achievement. A two-year pilot of the TCAI programme will determine whether remedial education delivered through various mechanisms is effective, and what strategies deliver results for the lowest cost.

The TCAI evaluation is testing different combinations of interventions, providing policymakers with information on which components are responsible for programme impact. Randomly selected schools in four treatment arms are receiving various combinations of lessons targeted by pupil ability, a remedial pedagogy for the lowest performing pupils, teacher community assistants, and in-school or after-school activities.

Preliminary results show that community assistants teaching a remedial pedagogy focused on literacy and numeracy to the lowest-performing pupils are having a modest impact on pupils' basic skills. Because of delays in programme launch, these results were measured only ten weeks after the programme began, suggesting that even larger effects may be achieved over time.

The increases in test scores do not appear to be the result of smaller class sizes. Simply providing community assistants to split classes with the normal teacher had minimal impacts on pupil achievement.

TCAI Evaluation

To ensure that the schools in this evaluation were representative of Ghana as a whole, 42 districts were randomly selected from the 170 districts around the country. Across these districts 500 schools, representing 3.5 percent of Ghana’s basic schools, were randomly selected and allocated into one of four treatment groups, or a comparison group which received no new materials or services.

INTERVENTIONS

	TCA's	Targeted Lessons	Focus on Weakest Pupils	After School Hours
The In-School Remedial TCA's intervention provides in-school remedial classes through Teacher Community Assistants (TCAs) for two hours a day. TCAs provide targeted instruction in basic skills to promote literacy and numeracy among pupils in P1—P3. These remedial sessions are targeted to the weakest pupils in the class.	X	X	X	
The After-School Remedial TCA's intervention provides remedial classes focused on basic skills taught by TCAs after school hours, focusing on literacy and numeracy for pupils in P1—P3. These remedial sessions are targeted to the weakest pupils in the class.	X	X	X	X
The Normal Curriculum TCA's intervention tests the effect of smaller class sizes by pulling out pupils in P1—P3 at random to work with TCAs to review the teacher's lessons on literacy and numeracy for a few hours. The group pulled out is alternated with the teacher's group every other day.	X			
The Targeted Lessons Training for Teachers intervention trains civil-service teachers to develop their skills in providing small-group instruction targeted at pupils' actual learning levels in P1—P3.		X		

TRAINING TEACHERS AND TCA's. The during-school and after-school remedial TCA's, as well as teachers who received the targeted lessons training, were given one week of instruction in a pedagogy focusing on basic skills in literacy and numeracy; this pedagogy was adapted from the Indian education NGO Pratham with a local NGO, Schools for Life. The training included instruction in rapid testing methods to easily identify which children were in need of remedial activities, as well as classroom management, activity-based learning, and how to effectively use the teaching materials provided.

ORIENTATION & SENSITISATION. Head teachers, district education officials, and school management committees were given an orientation to the programme, explaining the purpose of the activities and how they could provide support.

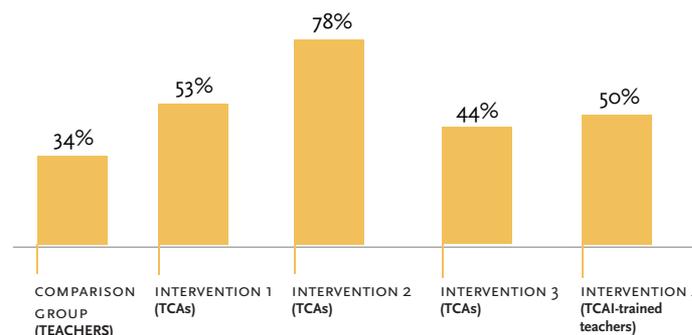
This included the distribution of mobile phones to schools, which could be used to submit monitoring data on teacher and TCA attendance, as well as the application of the basic skills instruction methodology.

TCAI Preliminary Results

Programme implementation was delayed by several months, and as a result children were exposed to only around 10 weeks of the interventions before the endline testing began. Moreover, only 35 percent of pupils were assigned to remedial classes in the in-school and after-school remedial TCA interventions, rather than the 50 percent that had been expected. This late start and low assignment rate means that the significant differences observed in some treatment groups was caused by an abbreviated version of the programme among only a portion of the intended beneficiaries.

TCAs had relatively high attendance at school, and they spent a significant portion of their time at school in class. The baseline survey showed that schools were actually closed 7 percent of the time, and when they were open there was a 25 percent absenteeism rate among classroom teachers. Although teachers who received targeted lessons training did not attend school any more than their counterparts in comparison schools, they did begin spending significantly more time in class. TCAs were absent an average 21 percent of the time across the three interventions which utilized them. Conditional on presence, TCAs were more likely to be teaching classes than their counterparts in the comparison group.

Figure 1: Time Spent in Class by Teachers and TCAs, when Present at School



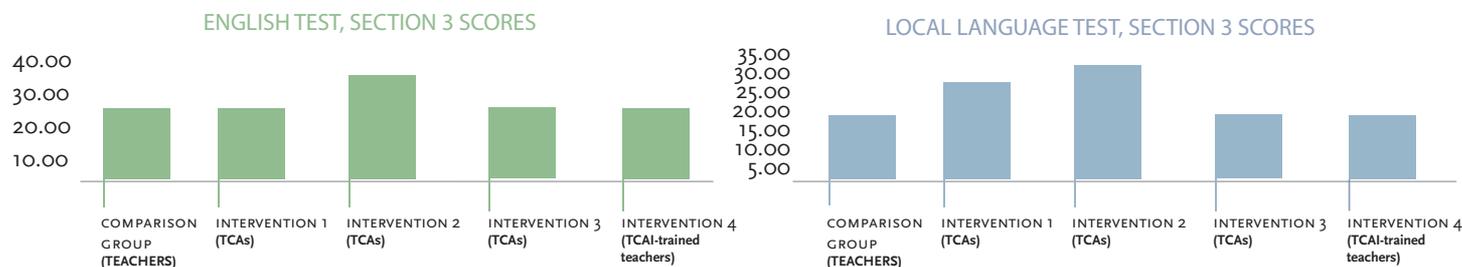
Having TCAs provide remedial instructions targeted to the lowest performing pupils had modest but significant impacts on basic skills in numeracy and literacy. The in-school and after-school remedial TCAs had by far the largest impact on pupil achievement. Pupils in schools that received in-school remedial TCAs saw increases in their average maths scores, as well as improvements on certain parts of the local language tests. Schools that received after-school remedial TCAs saw even larger effects, including increases in their scores on English tests (Figure 2).

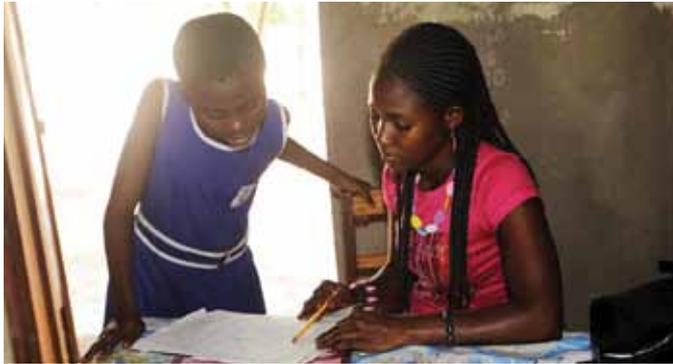
Simply training teachers to target their lessons, or reducing class size by adding a TCA, had minimal effects on test scores, suggesting that the impacts from the remedial TCAs were driven by the combination of intensive basic-skills instruction with groups of low-performing pupils. Pupils in intervention schools that received normal curriculum TCAs saw a slight increase

in their maths scores, though the effect was smaller than the increase in schools that received in-school and after-school remedial TCAs. However, this intervention had no effect on average English or local language scores (Figure 2). Similarly, providing targeted lessons training for teachers caused minimal improvements, and only for a small portion of the highest achieving pupils. This may be because teachers were unable to effectively target lessons when they had to deal with the entire class with their different learning levels.

The lack of impacts from the normal curriculum TCAs and the targeted lessons training suggest that the significant changes caused by the in-school and after-school remedial TCAs could not be the result of just smaller class sizes or instructors trained in providing targeted lessons, but must be caused by the combination of active basic-skills instruction practices that are targeted to low performing pupils.

Figure 2: Effects on English and Local Language Test Scores





Remedial classes taught by TCAs after school, when it was possible to do more intensive work on basic skills, were more effective than those taught during school hours. This is particularly true in deprived districts. While we might expect in-school programmes to perform better, due to better attendance and supervision, after-school remedial TCAs actually caused larger increases in test scores than in-school remedial TCAs. This result may be partially explained by the fact that after-school remedial TCAs spent significantly more time actually teaching than their in-school counterparts, possibly because they were less affected by classroom disruptions. Results also show that after-school remedial TCAs had a slight impact in deprived schools, while in-school remedial TCAs had no effect in these areas. This suggests that the lack of infrastructure in deprived schools may have prevented TCAs from finding the necessary space or materials to conduct intensive sessions during school hours, rendering the after-school programme more effective.

TCAI Policy Lessons

Preliminary results suggest that spending focused time on basic skills with the lowest-level learners can improve literacy and numeracy. This is in line with findings from other countries, including Kenya and India, where targeted instruction in basic skills have caused significant gains in learning. As the TCAI Pilot enters into its second year, the programme will continue to hone the TCA remedial pedagogy during and after school to strengthen this impact.

Early-grade reading can be affected with relatively inexpensive programmes. Given the current policy focus on improving literacy among younger children, these results suggest a possible way forward. The next year of evaluation will provide further evidence on the effectiveness of this type of programme, while also yielding lessons on successful implementation.

Community members with limited training can be effectively used to improve children's literacy and numeracy, when they are given the right tools to target their lessons to the lowest-achieving pupils. Existing service schemes, such as Ghana's Community Education Training Assistance, may be able to focus their training on targeted lessons for low-achieving pupils, and improve the effectiveness of their programming.

Why Randomise?

It is not always obvious which policy will have the most desirable effects on educational outcomes. Does performance-based pay for teachers improve learning, or cause “teaching to the test”? What is the best way to help students who are falling behind? Should scarce funds be spent on school uniforms, on treating ailments that keep students away from school, on textbooks, or on something else?

To design good policy, we need to know how well a policy is working and whether it provides good value for money. Are there alternative ways of achieving the same outcomes at a lower cost? Do some aspects of the programme have no impact and only add to the cost of the programme?

Random assignment offers a simple way to generate these insights. In randomised evaluations, individuals or schools are selected to receive a programme based on a lottery. Those who do not receive the programme form a comparison group. The two groups are similar in every respect, except that one group receives the programme, while the other does not.



If, after the programme is implemented, the group that received the programme has different outcomes (e.g. improved or worsened teacher attendance, higher or lower test scores), we know that this difference was caused by the programme. This clear attribution of what effects were caused by the programme gives us insights about its effectiveness.

The growth of randomised evaluations of development programmes is a relatively recent innovation, and the scope for introducing an element of randomisation into development programmes continues to gain recognition. When properly designed, randomised evaluations can provide insight not only into whether a programme works, but also into why it works.

Randomised evaluations can be implemented ethically when they avoid doing possible harm to study participants and avoid denying beneficial treatment to persons who would otherwise receive it. This is often possible because programmes tend to be oversubscribed, are scheduled to be rolled out in a gradual fashion, or are initially tested with pilot programmes. In those cases, randomisation is one of the fairest and most transparent ways of determining participation.

Conference Programme



MAY 14



14:00–14:30	WELCOME: Keynote speech by Mahama Ayariga, <i>Ghana Deputy Minister of Education</i>
14:30–16:00	PANEL 1: What Have We Learned About Improving School Participation?
	REVIEW OF EVIDENCE: Isaac Mbiti, <i>Assistant Professor, Department of Economics, Methodist University, US</i> PANELISTS: Reda Hamedoun, <i>World Bank</i> ; Leah Rotich, <i>Director of Basic Education, Kenya</i>
16:15–17:30	PANEL 2: What Have We Learned About Enabling Learning?
	EXPOSING THE ISSUE: Rakesh Rajani, <i>Head of Twaweza, Tanzania</i> REVIEW OF EVIDENCE: Abhijit Banerjee, <i>Professor of Economics, MIT</i> PANELISTS: Abdou Diao, <i>Director of Basic Education, Ministry of Education, Senegal</i> Madhav Chavan, <i>Chief Executive Officer, Pratham, India</i>
19:00–21:00	DINNER PRESENTATION: The Ghana Teacher Community Assistant Initiative (TCAI) Stephen Adu, <i>Director of Basic Education, Ghana Education Service, Ghana</i> Maame Nketsiah, <i>TCAI National Coordinator, Ghana</i> Honourable Abuga Pele, <i>National Coordinator, National Youth Employment Programme, Ghana</i>

MAY 15

7:45–8:00	WELCOME
8:00–9:30	PANEL 3: Supportive Learning Through Technology
	EXPOSING THE ISSUE: Julian Cristia, <i>Economist, Inter-American Development Bank</i> REVIEW OF EVIDENCE: Paul Glewwe, <i>Professor, Department of Applied Economics, University of Minnesota, US</i> PANELISTS: Shwetlana Sarbarwal, <i>Economist, World Bank</i>

MAY 15

9:30–9:50	BREAK
9:50–11:20	PANEL 4: Teacher Characteristics, School Governance, Accountability, and Incentives
	<p>EXPOSING THE ISSUE: Bidemi Carrol, <i>World Bank, Sierra Leone</i></p> <p>REVIEW OF EVIDENCE: Moussa Blimpo, <i>Postdoctoral Fellow, Stanford Institute for Economic Policy Research</i></p> <p>PANELISTS: Muktar Ogle, <i>National Coordinator, National Examination Council, Kenya</i> Yaw Nyarko, <i>Professor, Department of Economics, New York University, US</i></p>
11:20—12:50	PANEL 5: Evidence Gaps: Secondary Education and Girls
	<p>PANELISTS: Kehinde Ajayi, <i>Assistant Professor of Economics, Boston University</i> Rebecca Thornton, <i>Assistant Professor of Economics, University of Michigan</i></p>
12:50–13:30	LUNCH PLENARY: Philip Davies, <i>International Initiative for Impact Evaluation (3ie)</i>
13:30–15:20	PANEL 6: Evidence Gaps: Early Childhood Education
13:30–15:20	<p>PANELISTS: Orazio Attanasio, <i>Professor, Department of Economics, University College London, UK</i> Esi Sutherland, <i>Associate Professor, University of Ghana</i></p>
15:20–15:40	BREAK
15:40–17:10	PANEL 7: From Evidence To Action: Next Step For Scaling Up Evidence
	<p>COST EFFECTIVENESS: Iqbal Dhaliwal, <i>Director of Policy, J-PAL Global, US</i></p> <p>PANELISTS: Joseph Muvawala, <i>Director for Education, African Development Bank</i> Wendy Abt, <i>USAID</i></p>
17:00–17:30	CONCLUDING REMARKS Benedicta Naana Biney, <i>Director General, Ghana Educational Service</i>
MAY 16-19	EXECUTIVE TRAINING COURSE





Panel 1: How to Get Kids to Come to School

The cost-effectiveness of programmes to increase children's time in school varies widely, with informational campaigns and school-based deworming providing particularly high value for money.

Achieving universal enrolment in primary schools, and high attendance among those enrolled, has been a major policy focus in developing and middle-income countries for many years. The last decade has seen a massive increase in enrolment, in part due to the elimination of school fees in many places. But while enrolment has increased, students' daily attendance remains relatively low. Pockets of low enrolment also remain, particularly in remote or conflict-affected areas. Numerous strategies have been tried to reach these out-of-school children, with differing degrees of success. As different interventions incur drastically different costs, some programmes achieve schooling gains with much greater cost-effectiveness than others.

In contexts where no convenient schooling facilities exist, building schools has a large impact on enrolment. Few other interventions are possible unless there is a school for children to attend. However, when there are already many schools nearby, convenience does not seem to be as important as cost in the decision to send a child to school.

Parents are sensitive to the costs of schooling, and offering subsidies or incentives like school meals is effective, though not necessarily cost-effective, at improving participation. Programmes such as scholarships, free uniforms, or school meals have all been shown to be effective ways of getting kids into school, but they are not equally cost-effective.

Conditional cash transfers (CCTs) have been shown to increase student participation in a variety of contexts although the high costs of providing large transfers to families can reduce the cost-effectiveness of this approach. New evaluations are suggesting that even very small transfers can have comparable impacts on enrolment and attendance, at a much lower cost.

In many places, families are not aware of the economic returns to education, and providing them with information about the higher wages earned by graduates is very cost-effective at increasing time in school. Informational campaigns, targeted at parents or students, are the most cost-effective of the approaches examined so far by randomised evaluations.



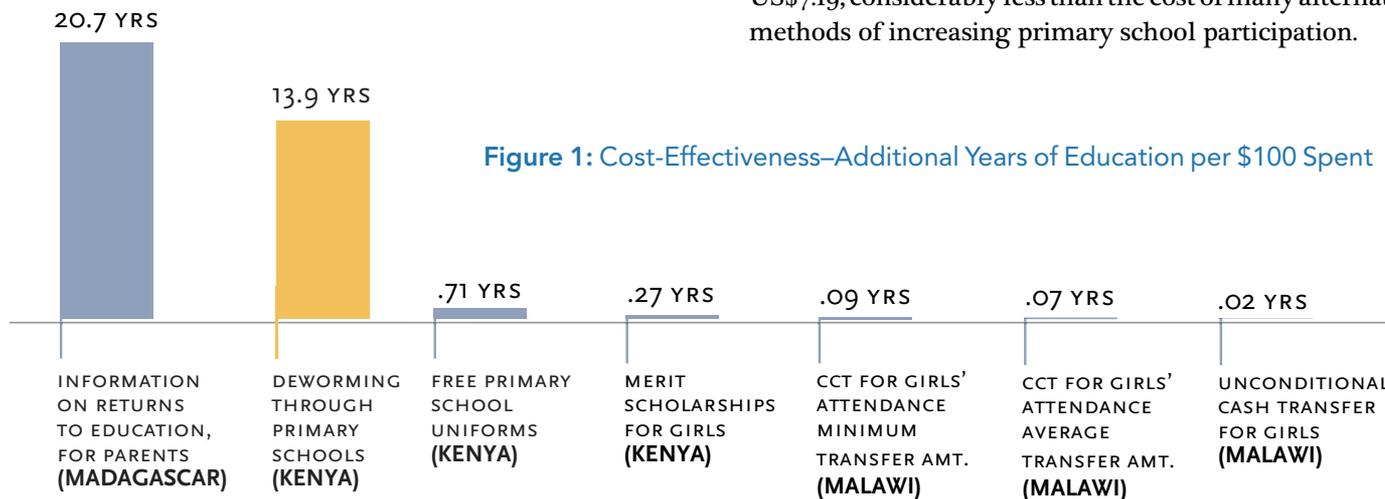
Addressing health barriers such as anaemia and intestinal worms, which keep children out of school, can be one of the most cost-effective ways to increase participation. These programmes also have significant long-term effects on children's health, nutrition, and productivity.

Featured Programme: School-based deworming in Western Kenya

Following a baseline prevalence survey, schools in Western Kenya with worm prevalence over 50 percent were mass treated with deworming drugs every six months. In addition to medicine, treatment schools received regular public health lectures, wall charts on worm prevention, and training for one designated teacher.

Results: Children were healthier and attended school more often, at minimal cost

Deworming reduced serious worm infections by half amongst children in treatment groups. As a result, school attendance increased by more than 7 percentage points, a 25 percent reduction in school absenteeism. The entire community benefited from “spillovers” of the deworming treatment, because medical treatment reduces the transmission of worm infections to other community members. Including the spillover benefits of treatment, the cost per additional year of school participation is US\$7.19, considerably less than the cost of many alternative methods of increasing primary school participation.



Panel 2: What Have We Learned About Enabling Learning?

Too many children are in school but not learning. Providing instruction that matches children's ability levels is a proven reform that is inexpensive and scalable.

Even when students are in school it is not a guarantee that they will be learning, given the poor quality of many schools across Africa. For example, the 2009 National Education Assessment in Ghana showed that only 20 percent of grade 3 pupils reach expected proficiency levels in English, and 25.2 percent in maths.

A seemingly obvious remedy would be to spend more on educational inputs, such as textbooks and flip charts, but there is little evidence that this by itself is an effective way to improve learning. A randomised evaluation in Kenya found that textbooks only had an effect on already high-achieving students. This highlights a common problem with educational systems in many African countries: oriented toward academically strong students, the curriculum leaves the majority of students behind.

Some of the most successful interventions tested by randomised evaluations have addressed this problem by gearing instruction toward students' actual ability levels, rather than the expectations of a rigid curriculum. The Indian NGO Pratham pioneered several programmes based on this idea, including remedial education for low-performing students and after-school reading classes led by local volunteers. Both interventions have been shown to significantly improve test scores, and Pratham's remedial programme served as a model for TCAI in Ghana. Similarly, an evaluation in Kenya found that placing students in different classes by learning level ("tracking") improved

test scores across the board (see Featured Programme on page 17). While the details of implementation may vary somewhat in the context of each country, the general principle of matching instruction to the level of students can be useful in many African countries.

Increasing students' motivation to learn, and teachers' motivation to teach, also appears to be important. A programme in Kenya boosted learning outcomes and teacher attendance by giving merit scholarships to girls (see Featured Programme on page 23). Offering teachers bonus pay tied to student performance on tests has been shown to increase average test scores in both Africa and India. However, care must be taken to avoid giving teachers incentives to "teach to the test." A performance pay system in Kenya increased scores only on incentivised subjects, did not affect teacher attendance or homework assignment, and led teachers to conduct more test preparation sessions.

Featured Programme: Tracking students by ability in Kenya

In 2005, 121 primary schools in Western Kenya that previously had only one first-grade class received funds for an extra teacher. The schools were randomly divided, with half assigning students to classes by initial test scores (“tracking”) and the other half assigning students to classes at random.



Results: Both high- and low-performing students improved their performance

After 18 months, students on both sides of the achievement spectrum did better in the tracking schools. Average test scores increased by 0.19 standard deviations in the upper-level classes and 0.16 standard deviations in the lower-level classes, compared to similar students in the schools with random division of classes. This suggests that the low-performing students benefitted more from having instruction at a more appropriate level than they did from having high-performing peers in the classroom.

Panel 3: Supportive Learning Through Technology

Technology can improve learning if it is interactive and is targeted to the learning level of the student. However, it is not always cost-effective.

Where teachers have little motivation and are poorly educated themselves, technology has the potential to improve the quality of teaching and learning in classrooms. While evidence demonstrates that technology has limited benefit in developed countries, where classrooms are relatively well functioning, evaluations of programmes in the developing world show more promising impacts. As many schools rely on rote learning and memorisation, technology has been shown to be an effective means of instruction when it can deliver an interactive approach which is tailored to a child's level of learning. Students can then progress at the rate at which they learn, rather than at a rate dictated by teachers.

As several countries are expanding the supply of computers in their educational institutions, it is essential to determine how best to introduce new technologies and encourage their usage in order to optimise learning gains. Evidence suggests that simply providing computer equipment and software is not enough, and that the varying circumstances that exist within schools, and the way in which programmes are integrated into them, can influence their effectiveness. For example, there is mixed evidence on whether it is better to use computer-assisted learning (CAL) as a replacement for or supplement to traditional classroom curricula. An evaluation of a CAL programme in Western India found that one hour per day of after-school CAL instruction significantly improved test scores, while students in a “pull-out” programme that replaced one hour of classroom time did significantly worse. However, another CAL programme in India that replaced classroom time had a large positive effect on test scores (see Featured Programme on facing page). These results underscore the importance of considering the relative productivity of learning environments and the effects that those differences will have on different types of students.

The One Laptop per Child (OLPC) programme has generated considerable interest in the effects of technology in the home. A study in Romania found that computer vouchers provided to low-income families had both positive and negative effects. Households with vouchers had lower school grades in maths, English, and Romanian, while they performed better in cognitive and computer skills tests. The authors suggest that how parents monitor computer usage may matter, and rules regarding homework may help to mitigate the negative effects of vouchers on school performance.

While academic studies have shown that computers in schools can significantly improve student test scores under some circumstances, they have also shown that technology is not always cost-effective. Depending on the context, computers may be more or less expensive than other inputs, so cost-effectiveness needs to be carefully considered before deciding whether to scale up technology to schools in the developing world. This applies to home computers in particular, where there are potentially even larger associated costs.

Featured Programme: Computer Assisted Learning (CAL) in India

Pratham, an education-oriented NGO in India, hired a team of instructors from the local community and provided them with five days of computer training. These instructors provided students in treatment schools with basic instruction on how to use a Computer Assisted Learning programme. Once familiar with the computers, students spent two hours per week of shared time (two children shared one computer) working independently with educational maths software that consisted of self-paced games.

Results: Students' maths scores improved after using the CAL software

Students who participated in the CAL programme had higher maths scores on average relative to the comparison group. The average impact of the programme was 0.36 standard deviations, a substantial achievement when compared to other education interventions. The improvement in maths scores persisted to some extent after one year.



Panel 4: Teacher Characteristics, Governance, & Incentives

If teachers and students are absent or unmotivated, investments in education can be wasted. Teachers respond to objectively administered incentives, from the government or from beneficiary groups with credible authority.

Motivating better teaching in schools involves complex interactions between students, teachers, parents, and institutions, each of whom is responding to a different set of incentives. There are many potential solutions to improving service delivery, but not all of the programmes rigorously evaluated have been able to improve outcomes.

Impersonally administered and direct incentives for attendance are the most effective at increasing teachers' time in school. When teachers in India were provided with cameras, and their salaries linked to showing daily photos with the pupils as proof of presence, teacher absenteeism halved and test scores went up. However, in settings when supervisors were given discretion over administering incentives, these programmes became entirely ineffective. In Kenya, school principals rewarded teachers whether they showed up or not, with no improvements in attendance.

Intrinsic motivation matters, too. Student incentives for good test performance in Kenya motivated students to study harder. When students and families became more motivated, (see Featured Programme on page 23) teachers came to school more often, and though only girls were eligible to win the scholarship, boys and academically weaker girls also benefited. However, when teachers' incentives were made conditional on student test scores in India and Kenya, absenteeism did not change. Test scores rose, but mainly due to extra test preparation.

Attempts to increase accountability to the poor have had varying results depending on the context and implementation. In India, informing communities of

the low levels of learning and high teacher absenteeism had no impact on the ability of local school committees to enforce teacher attendance. However, a programme in Uganda which created "report cards" for the health services in the area and then mobilised the community with specific "action plans" in coordination with an NGO was effective at increasing the attendance of health care providers.

Teachers need to believe they will be held accountable by monitoring bodies. A programme in Kenya gave community education committees funds to hire an extra teacher whom they had the power of hiring and firing, and these locally accountable teachers had significantly lower absence rates than the government civil service teachers. Moreover, the effects of the programme were even stronger when school committees were trained to monitor the teachers. Community monitoring where the community could not hire and fire teachers at will, such as the school committees in India, had no impact on teacher attendance.

Further research into governance systems and service provider performance is ongoing in Burkina Faso, the Gambia, Niger, and Uganda.

Featured Programme: Improving education management in Madagascar

In Madagascar, district administrators in treatment districts received operational tools and training that included forms for supervision visits to schools and procurement sheets for school supplies and grants. In some of these schools, the subdistrict head received similar tools and training, as well as information on the performance and resource level at each school. At the school level, several districts also introduced parental monitoring through school meetings, where the parent's association was expected to monitor the student evaluation reports, and put social pressure on the teachers to perform well based on "report cards". The report cards included information on the previous year's dropout rate, exam pass rate, and repetition rate. Community meetings were also held to develop action plans based on the report card.



Results: Only a bottom-up approach was effective at changing teacher behaviour and school results

The interventions targeted at the district and subdistrict level had minimal effects on the administrator's behaviours, or the schools and students under their responsibility, despite the fact that district and subdistrict heads used the tools provided fairly regularly. The interventions at the school level, however, led to significantly improved teacher behaviour and test scores. Additionally, student attendance increased by 4.1 percentage points.

Panel 5: Evidence Gaps–Secondary Education and Girls

More evidence is needed on the most effective ways to promote access and improve quality in secondary education, and to address the unique barriers faced by girls in Africa.

Most of the rigorous evaluations of education interventions to date have focused on primary schools, so relatively little is known about how to improve education at the secondary level. Much of the existing work on this topic has focused on conditional cash transfers (CCTs), which have been shown to improve attendance and enrolment at the secondary level. A CCT programme in Malawi provided transfers to 13- to 22-year-old girls and women as an incentive to stay in school, or return to school if they had dropped out. The programme increased the re-enrolment rate of drop-outs by two and a half times and cut the dropout rate almost in half.

Much more research is needed on secondary education in Africa. A randomised evaluation currently in progress will test the short- and long-term (over 10 years) impact of a scholarship for disadvantaged students to attend secondary school in Ghana. Other evaluations now underway are testing the impact of a training programme in negotiation skills for eighth grade girls in Zambia and a voucher programme for vocational education in Kenya. J-PAL has launched a Post-Primary Education Initiative to generate new research on interventions to improve secondary school access, quality, and relevance in developing countries (see page 25).

Future research could explore the following questions, among others:

- What barriers to secondary education are most important?
- How should we prioritise vocational versus traditional academic training?
- How important is informing parents and students about skills for which there is demand?
- Can mentoring be an effective supplement to classroom instruction?
- Can interventions such as remedial education and computer-assisted learning work in the secondary context, where the materials taught are more complex?

Another, overlapping field for additional research is the unique barriers faced by girls. In sub-Saharan Africa, there are only 79 girls for every 100 boys enrolled in secondary school, according to World Bank data. Policymakers have cited menstruation and lack of access to sanitary products as an issue, but a randomised evaluation in Nepal found that menstruation was not a serious attendance barrier, and a programme providing sanitary products had no effect on attendance. Girls' under-representation may also be a product of cultural norms and the economic trade-offs poor households must make when investing in their childrens' schooling. Further research is needed to test these and other possible barriers to girls' schooling, and solutions to them.

Featured Programme: Merit scholarship for high-performing girls in Kenya

The Girls' Scholarship Programme (GSP) paid school fees and awarded grants for grade 6 girls who scored in the top 15 percent of students in their district on academic exams. The programme was implemented at 64 randomly selected primary schools in Busia and Teso districts in Kenya. Several Teso District schools did not implement the programme, perhaps due to a lack of political support, and researchers only found significant programme effects in Busia.

Results: Learning gains at all levels

Test scores increased significantly at programme schools, not only for the girls receiving the scholarships, but also for students with little to no chance of winning, including girls with low pre-test scores and boys. The average increase in learning among girls in programme schools was roughly equivalent to about 0.2 years of additional schooling. One likely channel for these effects was greater effort by teachers: there was a large and significant increase in teacher attendance at programme schools. Anecdotal evidence suggests that parents became more involved in monitoring teacher performance; one Busia teacher reported that after the programme was introduced, parents would “ask teachers to work hard so that [their daughters] can win more scholarships.”







J-PAL's Post-Primary Education Initiative

J-PAL recognises the need to systematically build up our evidence on secondary education and will launch a new research initiative to inform future investments in education reforms. The Post-Primary Education (PPE) Initiative will generate new rigorous evidence on policies to increase access to, and improve the quality and relevance of, secondary, tertiary, and vocational education in developing countries.

With initial support from the MacArthur Foundation and the Douglas B. Marshall Jr. Family Foundation, J-PAL is currently writing a review paper to assess the current state of knowledge on post-primary education and identify the most important open questions for further research. After completing the review, J-PAL will seek additional funding for a programme of research to help address these questions. Funding will be granted to researchers in the J-PAL network through several rounds of competitive requests for proposal, with proposals evaluated in part on how well they address the knowledge gaps identified in the review paper.

J-PAL will seek partnerships with governments, international organisations, foundations, and NGOs for all phases of the PPE Initiative, including fundraising, research, and policy outreach. For further information about the PPE Initiative, please contact Shawn Powers, J-PAL Education Programme Manager, at smpowers@mit.edu.

Panel 6: Evidence Gaps–Early Childhood

Development during a child's early years has long-lasting effects later in life. Further research is needed to formulate policy in this area.

Recent evidence suggests that early-life events have long-lasting effects on the development of individuals. Outcomes such as social skills, emotional well-being, depression, participation in criminal activities, school readiness, academic achievement, cognitive development, long-run health outcomes, and economic well-being are believed to be affected by events in one's early years. Programmes that look to improve early childhood development (ECD) outcomes could have substantial long run effects, particularly in contexts with a multitude of risky environmental factors, such as malnutrition, infectious diseases, poor hygiene, and lack of parental stimulation, among others.

Most of the current evidence on how to improve ECD is focused on nutrition and child stimulation in the home. Both nutrition and psychosocial stimulation have been shown to be highly effective at improving developmental outcomes in Jamaica, where stunted children experienced improved cognitive and motoric development outcomes, especially when they received the programmes together. By age 17–18, the effects of stimulation had persisted for cognitive development as well as academic achievement, while the benefits of nutrition had disappeared.

While the list is growing, there are still a limited number of ECD programmes that have been rigorously evaluated in developing countries, especially in Africa. Moreover, there are still many unanswered questions on the mechanisms that lead to certain outcomes.

Future research could explore the following questions, among others:

- What other programmes can improve ECD outcomes other than nutrition and stimulation, such as group parent counselling, counselling in clinics, day-care etc.?
- There are still unanswered questions on how nutrition affects the development of cognitive and non-cognitive skills. For example, should iron be introduced to malaria-endemic areas?
- What is the role played by different inputs and their interactions on the formation of cognitive and non-cognitive skills?
- How do families invest additional cash they receive, e.g. through a conditional cash transfer programme, and does it affect children outcomes?
- How can we encourage families to shift investments to their children in their early years?
- What cost-effective interventions can be scaled up and sustained?





Featured Programme: Stimulation and nutrition for young children in Colombia

Researchers evaluated a programme targeted to children 12 to 24 months old, living in households that were beneficiaries of a national Colombian conditional cash transfer programme. Ninety-six towns, with about 16 eligible children on average per town, were randomly divided into four groups. Within each town households received either (1) weekly home visits that delivered child stimulation and developmental play; (2) nutritional supplements that provided iron, zinc, and vitamins A and D; (3) a combination of the stimulation and nutrition interventions; or (4) no intervention. The programme lasted 18 months, and home visits were run by community representatives, the Madres Lideres, who were trained to implement the programme.

Results: Stimulation is effective at improving ECD outcomes

After 18 months, preliminary results suggest that stimulation is very effective at improving cognitive development, receptive and expressive language, as well as the quality of the home environment (measured by games, activities and books). Children who were 19—24 months at the start of the programme seem to perform better in these outcomes than slightly younger children. The impact of nutrition supplementation on most outcomes seems very limited, whether alone or in combination with stimulation. The combined interventions do, however, have some demonstrated impact on the quality of the home environment.

Panel 7: From Evidence to Action–Scale-Ups

Strong policy-research partnerships can help foster interest from policymakers in governments, NGOs, foundations, and international aid agencies in scaling up effective programmes. This can happen in many different ways, and there is no one “recipe” for scale up. Some of the conditions that have contributed to scale-up of proven interventions include:

- **A policy organisation has the capacity to scale up its own programme after it is found to be effective.** This was the case for Mexico’s PROGRESA CCT programme, now known as Oportunidades. The strength of the evidence for the programme and the popular support it enjoyed helped the programme expand and survive a change in governments.
- **A policy organisation leverages evidence to raise funds to scale up its operations.** The Indian NGO Pratham used rigorous evidence on the success of its remedial education programmes (see page 16) to raise funds from foundations and expand its programming to cover more than 300 out of 600 districts in India.
- **A programme is found to be so cost-effective and easy to implement that other organisations choose to adopt it.** Simple, inexpensive, and effective school-based deworming programmes have been implemented in many countries (see next page).
- **An evaluation provides critical and timely evidence on a salient policy debate.** Several randomised studies have found that charging even small prices considerably decreased demand for insecticide treated bednets, without encouraging bednet use. This group of studies provided critical evidence in the midst of a raging debate on whether such preventive health products should be given for free or at a price. Over time, many organisations have switched their policy from charging for preventive health goods to providing them for free.

When implementers or funders are interested in scaling up an intervention that has been proven effective in a different context, J-PAL and IPA can often work with them to design a “policy pilot” that tests the effectiveness of the programme among a subset of their target population. This intermediate step has several benefits. First, funders and policymakers may be more likely to approve such pilot programmes to minimise the risk of committing large funds to an ineffective programme. Second, it enables testing of tweaks to the programme based on context-specific factors or the learning obtained from the original evaluation. Finally, when policymakers are actively engaged in the pilot, they can learn valuable lessons about how the programme needs to be implemented and which specific features of the programme are necessary to make it successful.

Scale-Up Case Study: Deworming

School-based deworming offers a case study in how scientific evidence can contribute to policy change.

In January 2007, IPA and J-PAL affiliates Michael Kremer and Esther Duflo presented the evidence on school-based deworming to the Young Global Leaders Education Task Force at the World Economic Forum Annual Meeting in Davos, Switzerland. In response, the Task Force launched Deworm the World (DtW), a joint initiative of Innovations for Poverty Action and the Partnership for Child Development. DtW advocates for school-based deworming treatment with policymakers and development partners, and provides technical assistance to governments to support the development and launch of sustainable, large-scale school-based deworming programmes.



DtW has coordinated strategic support for school-based deworming in 27 countries, whose governments decided to make deworming a policy priority given the strong evidence of its effectiveness and high worm prevalence within their countries. DtW has facilitated the distribution of 117 million deworming tablets to these country programmes. DtW's technical assistance and advocacy have contributed to the following large scale-up efforts:

Kenya: The Kenyan government, informed by the research on the effectiveness of deworming in their country, launched a school-based deworming programme in 2009 with technical assistance from DtW. This programme treated 3.6 million children across 8,200 schools in its first year.

In January 2012, the government announced the second phase of the programme, which is expected to treat five million school-aged children annually.

Bihar, India: In 2011, the State Government of Bihar, India conducted a massive deworming, with technical assistance from DtW and policy support from J-PAL. In September, 2011 the government announced that over 17 million school-aged children in the state were treated that year for intestinal worms.

World Food Programme: The World Food Programme announced in 2009 that it would incorporate deworming treatment in all of its school feeding programmes in locations where parasitic worms are prevalent.



J-PAL's Executive Education Course

Immediately following the conference, J-PAL and IPA will host a four-day Executive Education course on evaluating social programmes, with a focus on education. J-PAL conducts this course several times per year in different locations around the world. It is designed to provide a thorough understanding of randomised evaluations and pragmatic step-by-step training for conducting one's own evaluation. While the programme is centred around the why, how and when of randomised evaluations, it also imparts insights on the importance of a needs assessment, measuring outcomes effectively, quality control, and monitoring methods that are useful for all kinds of evaluations.

The Executive Education programme is designed for people from a variety of backgrounds: managers and researchers from international development organisations, foundations, governments, and non-governmental organisations from around the world, as well as trained economists looking to retool.

Key questions and concepts covered:

- Why and when is a rigorous evaluation of social impact needed?
- The common pitfalls of evaluations, and why randomisation helps to avoid them.
- The key components of a good randomised evaluation design.
- Alternative techniques for incorporating randomisation into project design.
- How does one determine the appropriate sample size, measure outcomes, and manage data?
- How to guard against threats that may undermine the integrity of the results.
- Techniques for the analysis and interpretation of results.
- How to maximise policy impact and test external validity.

The course strives to achieve these goals through a diverse set of integrated teaching methods. Expert researchers provide both theoretical and example-based classes complemented by group work where participants can apply key concepts to real-world examples. By examining both successful and problematic evaluations, participants will better understand the significance of various specific details of randomised evaluations. Furthermore, the programme offers extensive opportunities to apply these ideas ensuring that participants will leave with the knowledge, experience, and confidence necessary to conduct their own randomised evaluations.

More information about Executive Education, including future course dates, is available at:

www.povertyactionlab.org/course.

Stay in Touch with IPA & J-PAL

IPA and J-PAL's work could not be done without collaboration with our partners. We welcome inquiries from governments, international organisations, NGOs, and foundations about potential partnerships in research, training, and policy outreach. Potential opportunities for partnership include our Executive Education training course (see page 36), customised sector-specific evidence workshops, technical assistance on scaling up proven interventions, and occasionally, partnering on an evaluation with one of our research affiliates.



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For Further Reading

The Featured Programmes throughout this book are evaluated or discussed in the following academic papers and policy publications. Further information on other evaluations described in this book is available on J-PAL's searchable evaluations database: www.povertyactionlab.org/evaluations

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