Students in Jahazpur, Rajasthan, settle in for lunch during the Educate Girls DIB evaluation.

PHOTO: RYAN FAUBER

Educate Girls Development Impact Bond

Final Evaluation Report

10 June 2018

In Partnership with Children's Investment Fund Foundation, Educate Girls, Instiglio, and UBS Optimus Foundation

IDinsight
DATA. DECISIONS. DEVELOPMENT.

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About IDinsight

IDinsight helps people use rigorous evidence to improve lives. Our collaborations selectively deploy a large analytical toolkit to help clients design policies, test ideas, and implement effectively at scale.

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Primary school students studying outdoors in Bijoliya, Rajasthan.

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About the Educate Girls DIB Executive Summary

The Educate Girls Development Impact Bond

The world's first development impact bond in education

The Educate Girls Development Impact Bond was launched in 2015 and concluded in July 2018 with Educate Girls surpassing both of the impact bond's educational outcome targets. As the first development impact bond in education and the first development impact bond in Asia, lessons from this project are vital to the viability and design of future results-based financing models.

Development impact bonds

Development impact bonds (DIBs) are an exciting new tool for financing social programs. Traditional grants are often conditional on organizations delivering on predetermined inputs or activities. DIBs, on the other hand, shift the focus in development away from inputs to outcomes by tying funding to demonstrated social impact. In a DIB, an investor invests capital in a social program. If the program meets pre-determined impact targets, their investment is repaid, plus a return, by a donor.[1] As a result, the outcome payer only has to pay for results achieved, and the implementer receives funding that gives them the freedom to innovate and adapt their program to maximize impact.

Educate Girls DIB - Putting the model to the test

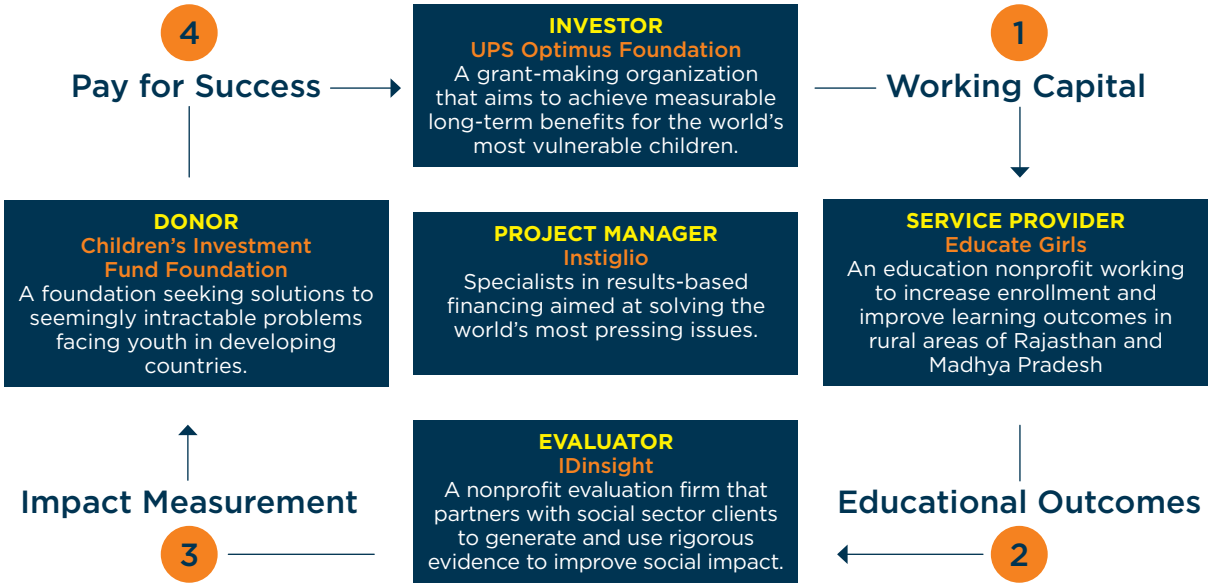
The Educate Girls Development Impact Bond was launched three years ago with the goal of improving education outcomes for primary school students in rural Rajasthan by funding programming by the nonprofit Educate Girls. In addition, this project provided an opportunity to test the DIB model and explore whether the proposed benefits outweigh the costs of setting up and maintaining this complex partnership.

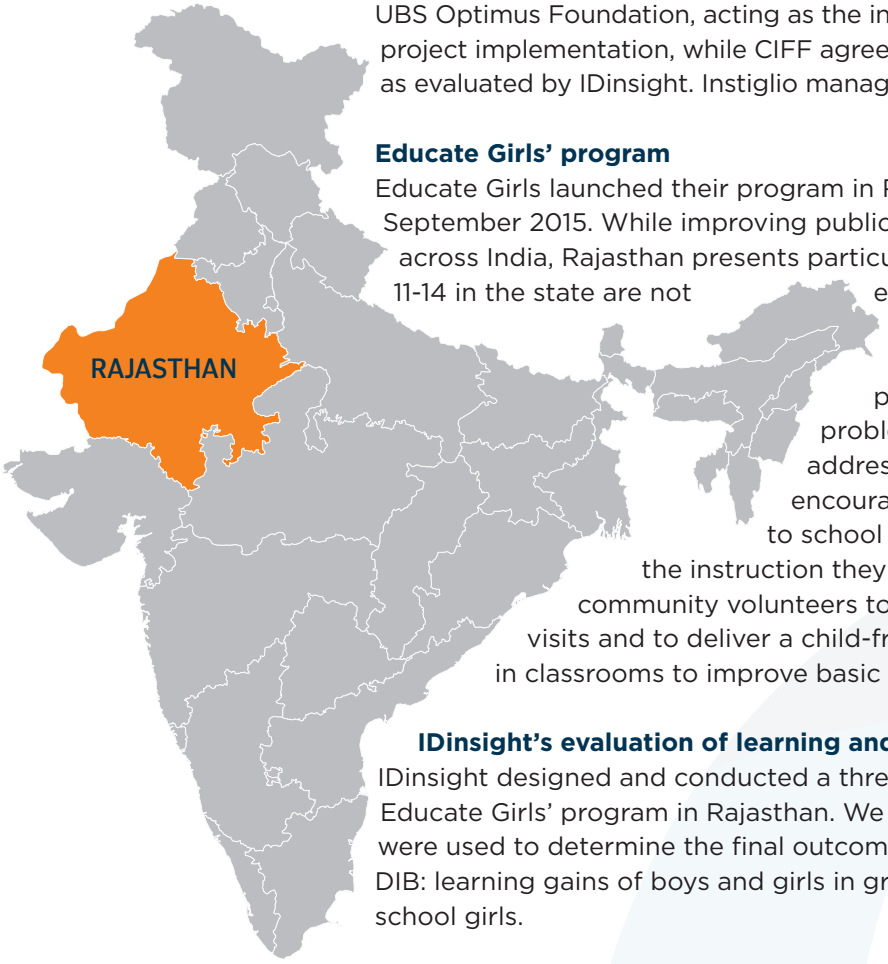
An IDinsight surveyor administers the ASER assessment to measure learning outcomes in Mandalgarh, Rajasthan.

PHOTO: RYAN FAUBER

1 Development impact bonds are similar in structure to social impact bonds (SIBs), in which the final outcome payer is a government body. SIBs were pioneered in the UK and have since spread to countries including the US, Canada, and Australia.

These common goals brought together the five main partners in the Educate Girls DIB





UBS Optimus Foundation, acting as the investor, financed Educate Girls' project implementation, while CIFF agreed to pay for educational outcomes as evaluated by IDinsight. Instiglio managed the project.

Educate Girls' program

Educate Girls launched their program in Rajasthan's Bhilwara district in September 2015. While improving public provision of education is a priority across India, Rajasthan presents particular challenges. 1 in 10 girls ages 11-14 in the state are not enrolled in school,[2] and less than a quarter of rural children in Grade 3 can read a Grade 2-level paragraph or solve a subtraction problem.[3] Educate Girls seeks to address these educational inequities by encouraging families to send their children to school and by improving the quality of the instruction they receive once enrolled. They train community volunteers to make door-to-door household visits and to deliver a child-friendly supplementary curriculum in classrooms to improve basic reading and math skills.

IDinsight's evaluation of learning and enrollment outcomes

IDinsight designed and conducted a three-year impact evaluation of Educate Girls' program in Rajasthan. We measured two outcomes which were used to determine the final outcome payments in the Educate Girls DIB: learning gains of boys and girls in grades 3-5 and enrollment of out-of-school girls.

2 ASER Centre (2016). Annual Status of Education 2016.
3 Ibid.

IDinsight's Three-year Evaluation

2015	2016	2017	2018
MARCH Random selection of treatments and control schools	**FEBRUARY** Year 1 assessment	**FEBRUARY** Year 2 assessment	**FEBRUARY** Year 3 assessment
AUGUST/SEPTEMBER Census of eligible out-of-school girls. Baseline assessment	**AUGUST** Validate additions to out-of-school girl census	**AUGUST** Validate additions to out-of-school girl census	**JULY** Final results release, which determine DIB outcome payments

Learning gains

Learning gains, which accounted for 80% of the final DIB payments, were measured in a randomized controlled trial, the gold standard of scientific evidence. The evaluation included a sample of ~12,000 students in grades 3 to 5 across 332 schools in 282 villages. Half of these villages were randomly assigned to receive Educate Girls' program while the other half formed the comparison group.

IDinsight assessed students on basic literacy and math skills using the Annual Status of Education Report (ASER) testing tool. Student assessments were conducted at the beginning of the project (baseline) and the end of the three following school years; if students were not present at school on the day of the assessment, our surveyors assessed them at their homes. Learning gains were calculated as the difference between a child's learning level at baseline and at their final assessment. The impact was calculated as the sum of learning gains of children in treatment villages minus the sum of learning gains of children in control villages. Tying payments to this aggregate effect (instead of an average effect), ensured that Educate Girls would not face a penalty for successfully enrolling new students in school. If these students scored lower on assessments, their scores could bring down the average test scores in treatment villages. By adding their scores to the total instead, Educate Girls had a clear incentive to get even low-performing students into school.

Surveyor and student reviewing the ASER tool during a home assessment in Bijoliya, Rajasthan while her family watches.

PHOTO: RYAN FAUBER

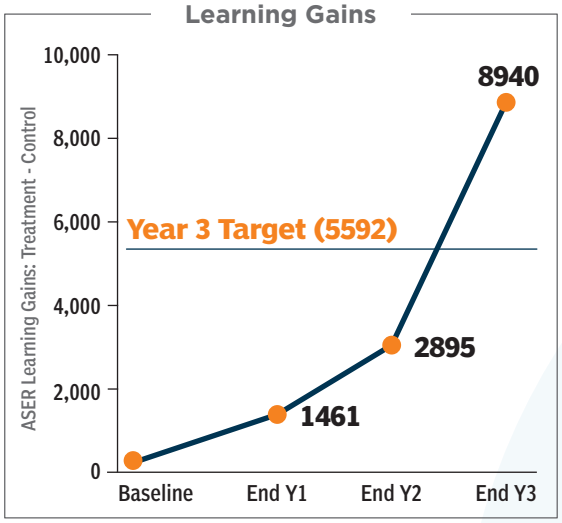
Enrollment

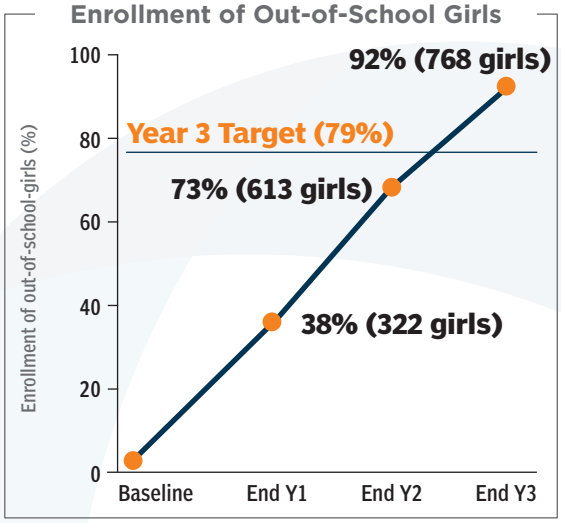
Enrollment of out-of-school girls, which accounted for 20% of the payments, was calculated as the percent of eligible out-of-school girls in treatment villages enrolled by the end of the program. At the beginning of each school year, Educate Girls submitted a list of all out-of-school girls ages 7-14 living in treatment villages, which IDinsight validated. At the end of each school year, Educate Girls reported successful enrollments and IDinsight validated all enrollments by visiting the schools and verifying the enrollment in the school register. Due to the cost of conducting a census of all households, the project partners decided against estimating enrollments in control villages. Thus, unlike the learning estimates, the enrollment estimates do not provide the causal effect of Educate Girls' program.

Final evaluation results

Educate Girls surpassed the three-year DIB targets for both learning gains and enrollment. These impressive results were not a foregone conclusion. While Educate Girls was consistently on track to meet the enrollment target throughout the DIB, progress against the learning target lagged behind. Two years into the three-year DIB, Educate Girls had reached just half the target. However, massive increases in Year 3 drove them to exceed the final target by 60%. The effects of Educate Girls' program on learning gains were large and statistically significant over the three-year program: Students in Educate Girls schools gained on average 28% more than students in control schools.

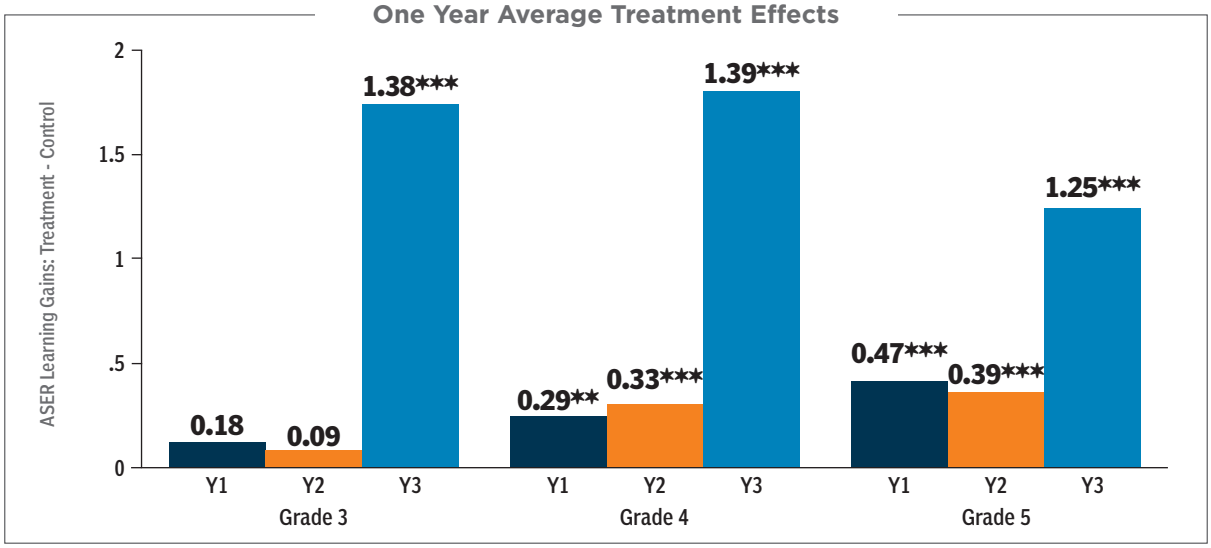
Empty school in Jahajpur, Rajasthan.
PHOTO: RYAN FAUBER



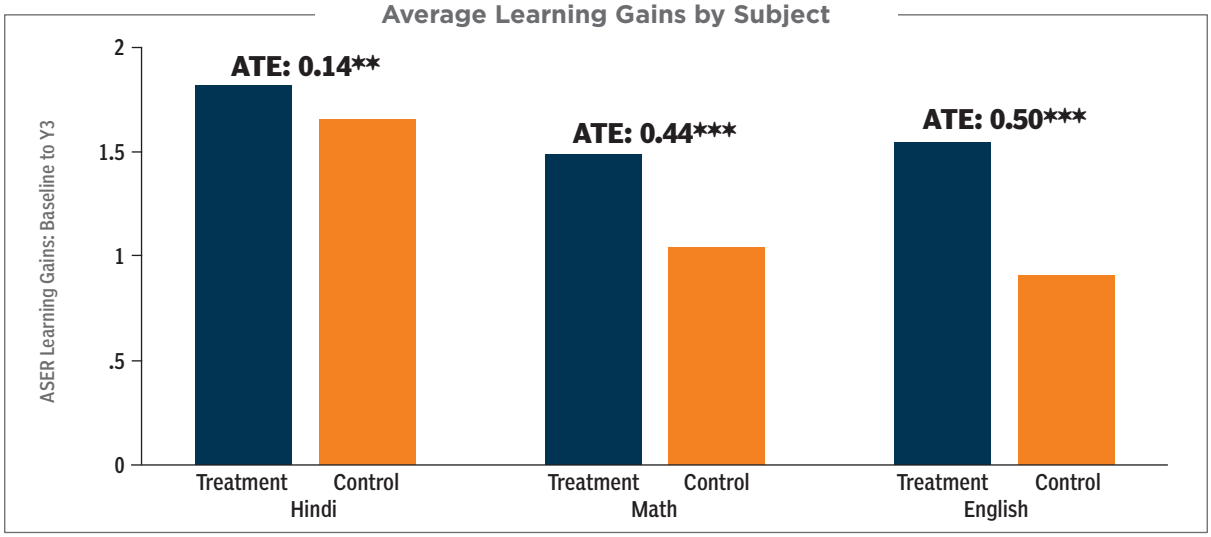


Data collected by IDinsight provides additional insights into this remarkable achievement

- Program particularly effective in Year 3. Across all grades, one-year effects in Year 3 far exceeded the effects in previous years. While impact increased with exposure, the largest gains in learning all took place in the final year.
- Program impact concentrated in math and English. While program impact was significant in all subjects, it was ~3 times larger in Math and English than in Hindi.[4]
- Program compares favorably to other education interventions. Students in Educate Girls' program gained an additional 0.31 standard deviations in test scores over the course of the three-year evaluation. According to an evidence review conducted by J-PAL, an increase in test scores of greater than 0.3 standard deviations is considered a large effect.[5]



This graph shows the one-year effects of Educate Girls' program broken down by grade and year. Across all grades, one-year effects in Year 3 far exceed the effects in previous years.[6]



4 * p < 0.1, ** p < 0.05, *** p < 0.01. Average treatment effects (ATEs) denote the mean difference in learning gains between students in program schools and students in control schools. Range bars denote 95% confidence intervals. The figure includes data from all end-of-year assessments.

5 Abdul Latif Jameel Poverty Action Lab (J-PAL) (2013). Improving Learning by Increasing Motivation, Targeting Instruction, and Addressing School Governance. J-PAL Policy Insights. Last modified April 2013. <https://www.povertyactionlab.org/policy-insight/improving-learning-increasing-motivation-targeting-instruction-and-addressing-school>.

6 * p < 0.1, ** p < 0.05, *** p < 0.01. Range bars denote 95% confidence intervals. Since we did not assess students at the beginning of grade 3 in Year 2 and 3, we calculate grade 3 treatment effects using baseline scores for those cohorts. The one-year comparison therefore assumes that any treatment effects for these cohorts occurred during Grade 3 only.

IDinsight survey team at a school in Mandalgarh, Rajasthan.

PHOTO: KATE STURLA

- Educate Girls' program in Year 3 was particularly effective in increasing test scores: In the final year, learning levels for students in program schools grew 79% more than their peers in other schools – almost the difference of an entire additional year of instruction.
- Prior to Educate Girls' program, almost none of the students in treatment and control group were able to solve a division problem. After the three-year program, half the students in the treatment group, but less than a quarter of students in the control were able to do so.[7]

DIB payments

UBS Optimus Foundation recouped its initial funding (USD 270,000) plus a 15% internal rate of return. The total payout of USD 144,085 will be reinvested in UBS Optimus Foundation's grantee programs, including a grant to Educate Girls.

Lessons for the evolving DIB landscape

What does the future of impact bonds look like?

The DIB landscape is evolving rapidly. As of August 2017, there were at least four contracted DIBs and 24 more in the design stage.[8] More recently, two billion-dollar outcome funds were announced: the Indian Education Outcomes Fund[9] and the Education Outcomes Fund for Africa and the Middle East.[10]

This rapid expansion provides many opportunities to continue to explore the possibilities of the DIB model — as well as potential pitfalls to avoid. Although the Educate Girls DIB is just one example, we believe it provides some clear lessons for future impact bonds.

7 The size of the treatment effect varied by grade and cohort. This statement is true of students who were enrolled in Educate Girls' program for all three years.
8 Gustafsson-Wright, E., Boggild-Jones, I., Segell, D., Durland, J. (2017). Impact Bonds in Developing Countries: Early Learnings from the Field.
9 https://www.livemint.com/Companies/A4NQEywF29INY47xU2VsnK/Global-Steering-Group-plans-twin-impact-funds-to-tune-of-1.html
10 https://www.devex.com/news/q-a-a-look-at-a-new-results-based-education-fund-for-africa-and-the-middle-east-92850

Entrance to a school in Bhilwara, Rajasthan.

PHOTO: ELIZABETH BRUCE

Students in Mandalgarh, Rajasthan, sitting down to a midday meal.

PHOTO: KATE STURLA

What can we learn from the Educate Girls DIB experience?

Lesson 1: DIBs' hidden superpower may be encouraging innovation

Although a DIB's focus on outcomes is usually framed as a way to promote accountability, it may be equally important in stimulating innovation. The massive increase in the effectiveness of Educate Girls' program in the final year suggests that the combination of implementer flexibility and rigorous evaluation can create conditions for rapid learning and improvements. For example, the first two years of the evaluation showed that children who were chronically absent from school were not benefitting from the program. In the third year, Educate Girls added home visits and remedial classes to better reach these students, and subsequently their gains were comparable to students who attended school regularly.

Lesson 2: Rigorous and responsible evaluation is key

The benefits of DIBs' laser focus on outcomes can only be realized if those outcomes are measured correctly. Less rigorous methods, such as before and after studies, risk reaching the wrong conclusion about whether targets are met. This damages the core value proposition of a DIB in the following ways:

- **Incorrect payments:** All parties must have full confidence that they will be paid based on actual performance, not other factors that affect outcomes. In the Educate Girls DIB, a control group was necessary to measure 'business-as-usual' learning gains in order to isolate the value-add of the Educate Girls program.
- **Ineffective or harmful program adjustments:** Faulty data could lead implementers to course correct in the wrong direction. In the Educate Girls DIB, learning gains in the treatment group were largest in Hindi; in the absence of a control group, which showed that students typically perform better in Hindi, Educate Girls may have incorrectly doubled down on their least effective subject.

Students' shoes lined up outside a school in Bhilwara, Rajasthan.

PHOTO: ELIZABETH BENNETT

- **Perverse incentives:** Everything from the type of assessment to choosing a sample shapes the incentives felt by the implementer. In the Educate Girls DIB, a simple decision to base targets on the average treatment effect (instead of the aggregate treatment effect) could have effectively penalized Educate Girls for their efforts to enroll the most marginalized children.
- **Reputational risk:** At least one SIB faced public backlash when money seemed to be going to a failed program after the rigor of the evaluation was called into question.[11]

There must be close coordination between the various partners when designing a DIB to minimize risk and maximize credibility and impact.

Lesson 3: The possibilities are endless

The launch of many new DIBs and several large outcome funds provides an exciting opportunity to experiment. While the Educate Girls DIB was expensive relative to the cost of the program, there are many opportunities to streamline and improve on the basic DIB model. Options currently being explored include creating much larger DIBs that benefit from economies of scale to keep administrative costs low;[12] small DIBs engineered to rapidly refine a program that, if successful, can then be scaled up; and creative tools to reduce the set-up costs of DIBs, such as setting fixed payments for certain outcomes (rate cards) or standardizing contracts.[13] We encourage creative thinking about how best to adapt DIBs to different contexts and needs, as well as careful documentation of lessons learned as this sector expands.

11 https://www.nytimes.com/2015/11/04/business/dealbook/did-goldman-make-the-grade.html
12 https://economictimes.indiatimes.com/industry/services/education/prince-charles-launches-education-impact-bond-for-india/articleshow/62821779.cms
13 http://gsgii.org/wp-content/uploads/2018/06/Final-IEOF-Business-Plan%E2%80%93May2018-.pdf

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Technical Report Evaluation Results

A Note on Grade and Student Cohort Labels

Over the course of the three-year evaluation, IDinsight tracked five different grades of students as they progressed through school. At Baseline, we assessed students in grades 1 through 5. In each subsequent Endline, we assessed students who were then in grades 3, 4, and 5 (the target grades for Educate Girls' programming). Since a student's grade changes year to year, student cohort labels can be ambiguous; for instance, "Grade 3" could refer to three different cohorts of students in the evaluation (students who were 3rd graders in Year 1, Year 2 or Year 3 of the evaluation). To remove this ambiguity, in this report we refer to student cohorts according to their grade in Year 1, unless explicitly noted otherwise. We attach the "Y1" suffix to grade labels to remind the reader of this convention. For instance, "2Y1" refers to students in grade 2 during the first year of the evaluation, who had progressed to grade 3 in Year 2 and grade 4 in Year 3.

Table 1 shows how each cohort progressed through school during the evaluation and how many years students in the treatment group were potentially exposed to EG programming. Gray cells indicate when the cohort was assessed by IDinsight.

Table 1: Student Cohorts During the Evaluation

Student Cohort Label	Grade Level at Each Year of Evaluation				Years of Exposure to EG Program
	Baseline	Y1 Endline	Y2 Endline	Y3 Endline	
Grade 1_{Y1}	1	1	2	3	1
Grade 2_{Y1}	2	2	3	4	2
Grade 3_{Y1}	3	3	4	5	3
Grade 4_{Y1}	4	4	5	6	2
Grade 5_{Y1}	5	5	6	7	1

Introduction

In this report, we present the results of IDinsight's three-year impact evaluation of Educate Girls' program in Bhilwara District in Rajasthan, India. The two outcomes described in this report – learning gains of students enrolled in grades 3-5 and enrollment of out-of-school girls – will determine the payments in the Educate Girls Development Impact Bond.[14] Educate Girls surpassed the DIB targets for both learning gains and enrollment.

Outcome 1: Learning Gains

By the end of Year 3, students in treatment villages gained an additional 8,940 ASER learning levels relative to students in control villages, representing 160% of the final target.[15]

Methodology: IDinsight conducted a three-year clustered randomized controlled trial in which we compared students in schools where EG operated with students in control schools. We assessed students on basic literacy and math competencies using the Annual Status of Education Report (ASER) testing tool; a student's score on ASER determined her "learning level," which is scored out of 16 points and forms the basis of the learning metric.
Results: On average, students in EG schools gained an additional 1.08 ASER levels compared to students in control schools ($p < 0.01$). Differences in aggregate learning gains between treatment and control schools were much greater in Year 3 (+6,045 learning levels) than in Year 2 (+1,434 levels) or in Year 1 (+1,461 levels).[16]

Outcome 2: Enrollment

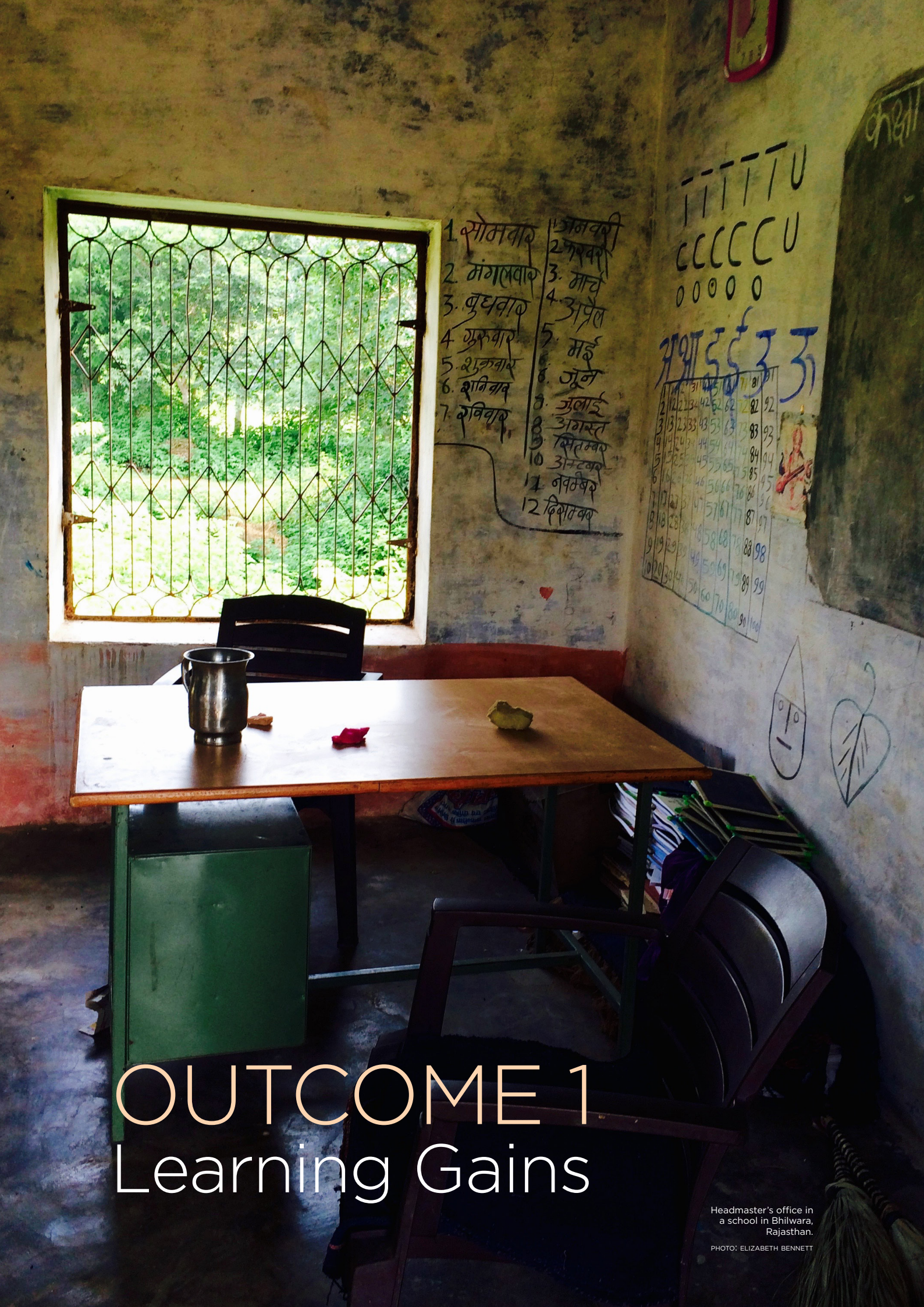
By the end of Year 3, Educate Girls enrolled 92% of all 837 eligible out-of-school girls in treatment villages,[17] representing 116% of the final target for enrollments.

Methodology: IDinsight used a simple pre-post comparison to verify enrollments of out-of school girls in treatment villages. Due to the cost of conducting a census of all households, the Working Group decided against estimating enrollments in control villages. Thus, unlike the learning estimates, the enrollment estimates do not reflect a causal effect of EG's program.
Results: Educate Girls enrolled 155 girls in Year 3, or 19% of all eligible out-of-school girls identified since the start of the evaluation. Including the 613 enrollments from Years 1 and 2, Educate Girls enrolled a total of 768 out of 837 eligible out-of-school girls.

Table 1: Summary of EG's performance against DIB targets

Outcome	Methodology	Target	Final Result	Performance as % of Target
Aggregate learning gains for all students in grades 3-5	Clustered (village-level) randomized controlled trial	+5,592 ASER learning levels above control group gains	+8,940 ASER learning levels above control group gains	160%
Enrollment of out-of-school girls	Pre-post comparison	79% of all eligible out-of-school girls	92% of all eligible out-of-school girls enrolled	116%

14 Approximately 80% of the outcome payments are based on changes in learning levels. Approximately 20% are based on changes in enrollment of out-of-school girls. See the Evaluation Design Memo for a full description of how payments will be calculated.
15 This target was revised down from 6,664 to 5,592 by the Working Group in Year 1. EG would have surpassed the original target by 34%.
16 This is a slight change from the result reported in the Year 2 Endline report (1,314 learning for Year 2, 1,498 for Year 1), reflecting updates to the data made in Year 3 as per Appendix 14.
17 At the beginning of the 2017-2018 academic year, Educate Girls identified 90 additional out-of-school girls along with 88 girls already on the list who had left the area of program coverage. This resulted in a final population of 837 out-of-school girls eligible for enrollment.



OUTCOME 1
Learning Gains

Headmaster's office in a school in Bhilwara, Rajasthan.

PHOTO: ELIZABETH BENNETT

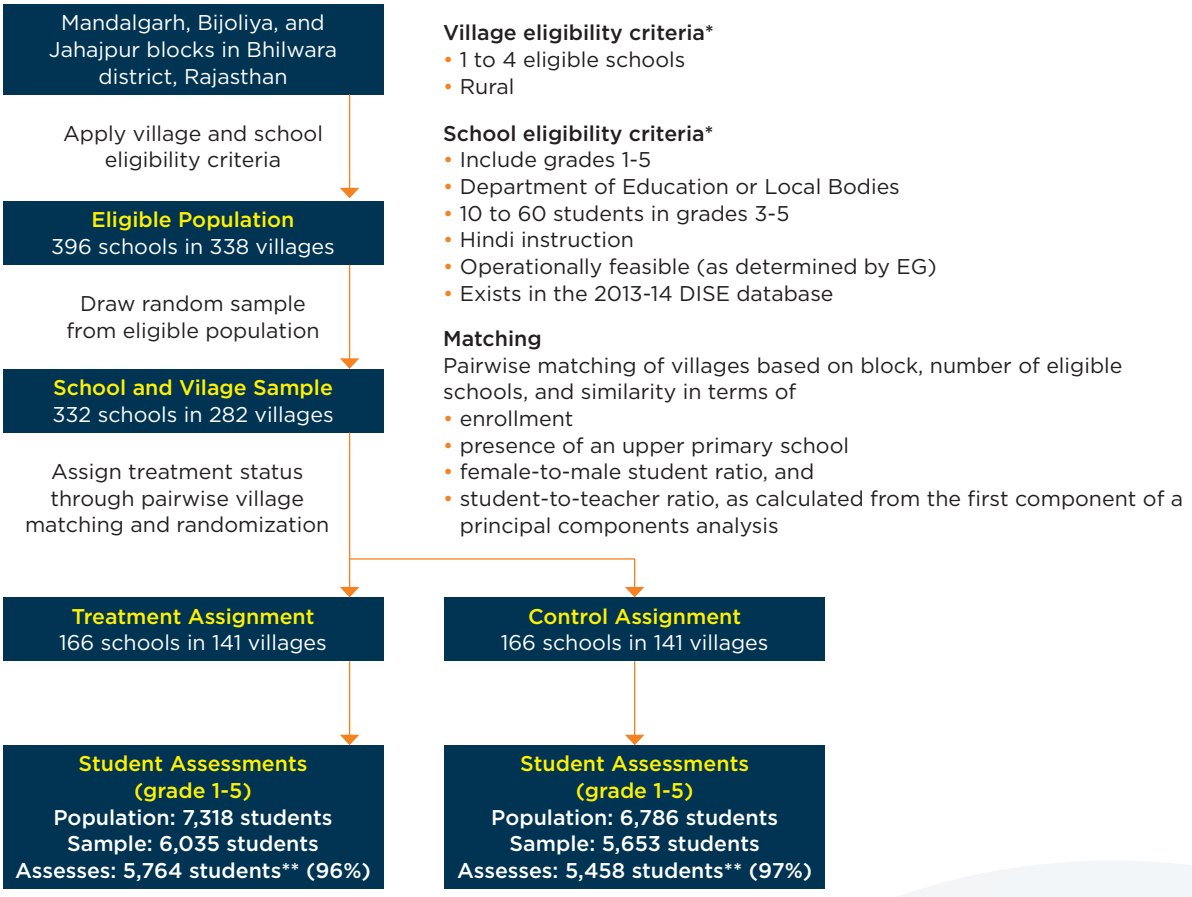
Methodology

IDinsight conducted a three-year randomized controlled trial, clustered at the village level, to estimate learning gains attributable to EG's program.[18]

Sampling and Randomization

The evaluation was conducted in 332 schools across 282 villages in rural Rajasthan, which were selected according to the process outlined in Figure 1, below.

Figure 1: Sampling and Randomization Protocol



Randomization
For each village pair, randomly assign one to treatment and one to control.

Student Sampling
Sample 100% of students in grades 1-2 and 69% of students in grades 3-5.

Timeline
- Baseline assessment in September 2015 before the start of EG's program
- Three assessments at the end of each academic year in February 2016 ,2017, and 2018

Assessment
Students were assessed at their home if they were absent of the day of the Endline assessment.

Note: * Village and school eligibility criteria are based on data in the 2014-15 DISE database unless otherwise indicated. ** Students are considered assessed if at least one Endline score is available.

18 See the Evaluation Design Memo for a full treatment of the methodology.

Our study population consists of all students who were enrolled in treatment or control schools at Baseline as well as students who enrolled during the evaluation.[19] In the results section below, we present average and aggregate results for the full sample of students unless otherwise indicated. In the appendix, to provide points of comparison with previous reports, we also present results separately for students present at Baseline (also called "Type I-III" in the Design Memo) and students absent at Baseline ("Type IV-V").[20] If students were absent from school on the day of the assessment then we assessed them at home.[21]

We separately report learning gains of newly enrolled girls from EG's out-of-school girl lists, which are included in aggregate learning gains calculations and DIB payments. Since we did not collect comparable data in control villages, we exclude these girls from the average treatment effect results.

The third and final Endline was conducted between February 2 and February 28, 2018 and is described in Appendix 3. Please refer to the Year 1 and Year 2 reports for further details on data collection in those years.

Student Assessments

Learning gains were measured using the Annual Status of Education Report (ASER) assessment tool (see Table 2 below and Appendix 18). The ASER assessment consists of three sections: Hindi, Math, and English. Each section consists of 5 levels (and a possible score of 1 to 5 points). IDinsight added one additional level to the Hindi section ("Story Plus") to reduce "ceiling effects," in which the highest score on a section underestimates a student's true ability. The highest possible total score on this assessment is thus 16 points (5 + 5 + 6); the lowest possible score is 3 points (1 + 1 + 1).

Table 2: Learning Levels as Measured by ASER

Level	Hindi	Math	English
1	Beginner	Beginner	Beginner
2	Letters	Numbers 1-10	Capital letters
3	Words	Numbers 11-99	Lowercase letters
4	Paragraph	Subtraction	Words
5	Story 1	Division	Sentences
6	Story Plus	—	—

Calculating Learning Gains

The change in learning levels for each student is calculated by subtracting his or her total score at Baseline from his or her total score at Endline,[22] with the following caveats:

19 For students in grades 1 and 2 at Baseline, we attempted to assess all students in the population. For students in grades 3, 4, and 5 at Baseline, due to budgetary constraints we assessed a random sample of 69% of students in the population, stratified by gender and grade. During analysis we apply appropriate sample weights to these students' outcomes to recover population-level learning gains. For example, if 60% of eligible students in a school-grade-gender cohort were sampled, then their learning gains are multiplied by 1/60% = 1.66 in the final analysis. If 100% of eligible students in a school-grade-gender cohort were sampled (as with all grade 1 and 2 students), then their learning gains were multiplied by 1/100% = 1 in the final analysis.

20 While secondary to the full sample results, we believe that distinguishing between students present at Baseline versus absent at Baseline is a useful robustness check. Students who were present at Baseline form a consistent sample throughout the three-year evaluation and are thus comparable between treatment and control schools. On the other hand, students who were absent at Baseline are composed of both students who were absent but enrolled at Baseline and students who enrolled in schools later. Since EG's programming includes enrollment activities, students who were absent at Baseline are not directly comparable between treatment and control schools, limiting our ability to make causal claims about their learning gains.

21 Due to cost and logistical constraints we did not assess students in grade 5 at Baseline who were absent on the day of the assessment and had graduated out of the program after Year 1. Per the Working Group's decision in Year 2, the learning gains of these students were imputed based on the learning gains of students in grade 5 who were present on the day of the Baseline assessment.

22 This is a difference-in-differences estimator. For more information, see the Evaluation Design Memo.

- Baseline scores for students in treatment and control schools who were not present at Baseline are imputed to be the lowest score possible (a score of 3) and any additional learning levels achieved by those students at Endline are assumed to be gains.
- Students with no Endline score from any round are not included in the analysis (466 students).
- For students who were assessed during multiple Endlines (for example, students who were in grade 3 during Endline Year 1, grade 4 during Endline Year 2, and grade 5 during Endline Year 5), only the final Endline score is counted.[23]
- We apply sampling weights to each group of students according to the proportion of students selected for assessment from this group.

Findings

We present both average treatment effects and aggregate treatment effects.[24] Average treatment effects are the difference in average learning gains between treatment and control students,[25] and are particularly useful for understanding the magnitude of the program's impact and comparing it to other interventions. Aggregate treatment effects are calculated by adding up learning gains of all students in treatment schools and subtracting learning gains of all students in control schools, and therefore account for differences in the number of students in treatment and control schools due to EG's enrollment activities and other factors.[26] The final Development Impact Bond payments are based on aggregate treatment effects.

Learning Gains against the DIB Target

Students in EG schools gained on average an additional 1.08 ASER learning levels compared to students in control schools ($p < 0.01$).[27] Learning gains for students in EG schools are 28% or 0.31 standard deviations larger than gains for students in control schools, comparing favorably with primary school programs aimed at improving test scores in rural India.[28]

With these large learning gains, EG exceeded the three-year DIB aggregate treatment effect target. By the end of the three-year program, students in treatment villages had gained an additional 8,940 learning levels relative to students in control villages, representing 160% of the final target of 5,592. Figure 2 shows year-to-year growth in the difference in aggregate learning gains between treatment and control students, with more than two-thirds of the difference occurring in year 3.

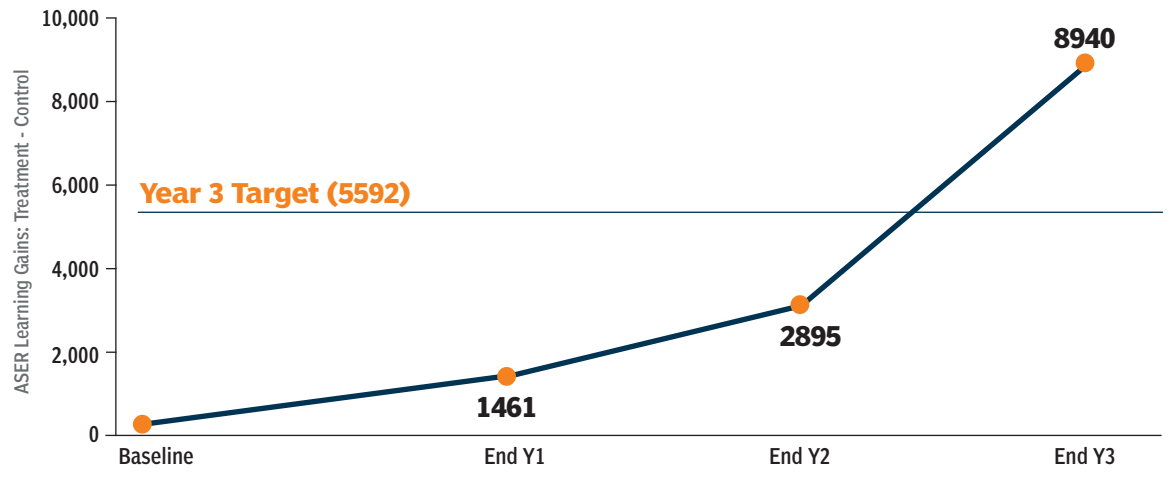
These differences resulted from a combination of increased learning and increased enrollment in treatment schools, though relatively more from learning. By the end of Year 3, our study population included 7,318 students in treatment schools and 6,786 students in control schools, reflecting a modest increase in enrollment due to EG's program. The majority of this difference can

23 33 students who should have graduated out of the program were retained. We assessed these students during their additional retention year and use their final score to calculate learning gains.
24 We present average and aggregate results for the full sample of students unless otherwise indicated. In the appendix, to provide points of comparison with previous reports, we also present results separately for students present at Baseline (also called "Type I-III" in the Design Memo) and students absent at Baseline ("Type IV-V"). We separately report learning gains of newly enrolled girls from EG's out-of-school girl lists, which are included in aggregate learning gains calculations and DIB payments. Since we did not collect comparable data in control villages, we exclude these girls from the average treatment effect results.
25 Technically, we control for Baseline learning levels in a linear regression rather than subtracting Baseline learning levels from Endline learning levels.
26 By using aggregate treatment effects as the DIB payment metric, EG was incentivized to enroll out-of-school students even if their learning levels were very low and would bring down the school average.
27 The difference in learning gains is statistically significant at the 1% level. This means that the probability of observing this difference due to random chance, if the treatment effect is zero, is less than 1%. Since this probability is very low, we reject the null hypothesis that the gains in learning levels were equal in program and control villages. Due to randomization we can reasonably expect that, on average, the only difference between students in treatment villages and students in control villages is that the former have been exposed to Educate Girls' program. Balance checks presented in the Baseline report show that there are no statistically significant differences between the control and treatment groups across any of the variables collected.
28 According to an evidence review of education evaluations in developing countries conducted by the Abdul Latif Jameel Poverty Action Lab, an increase in test scores of less than 0.1 SD is typically considered to be a small effect, while an increase of more than 0.3 SD is considered a large effect, and an increase of more than 0.5 SD a very large effect. Among the programs included in the evidence review, the Balsakhi Program, a remedial tutoring education intervention implemented in schools in Vadodara and Mumbai, may be the most similar to EG's program. In that evaluation, the Balsakhi program increased average test scores by 0.28 standard deviation (Banerjee et al. 2007). The same evaluation found no discernible impact of reducing class sizes on test scores. Other evaluations of primary school programs in rural India have found effects on math and language test scores ranging from 0.16 to 0.47 standard deviations (e.g. Duflo, Hanna, and Ryan 2012; Muralidharan and Sundaraman 2012; Banerjee et al. 2007).

be explained by the 421[29] out-of-school girls EG reported enrolling in grades 3 to 5 in treatment schools during the study. Excluding learning gains among these newly-enrolled girls, students in treatment schools gained 7,719 more learning levels than their peers in control schools, representing 86% of the difference in aggregate learning gains between treatment and control schools.

Appendices 10 and 11 provide additional detail about how aggregate learning gains break down across grade and student type.

Figure 2: Aggregate Learning Gains (Treatment-Control) by Year



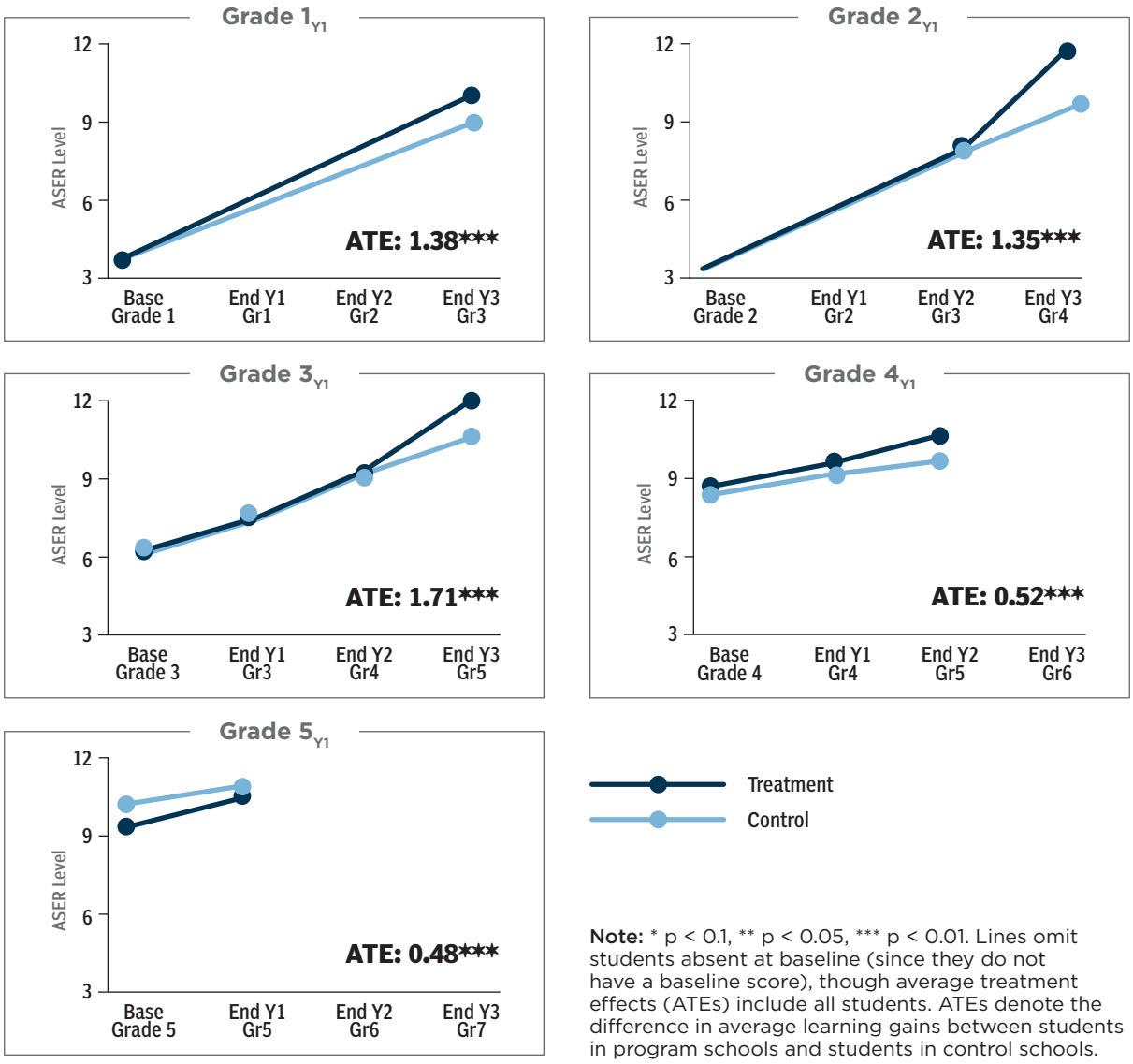
Learning Gains by Cohort

Treatment effects vary across grades and years. Figure 3 shows average learning gains for treatment and control students by grade at Baseline.[30] Grade 1Y1 refers to students who were in grade 1 at Baseline, Grade 2Y1 to students who were in grade 2 at Baseline, and so forth. Each year, EG's program targeted students in grades 3-5. Hence, students in Grade 1Y1 entered the program for the first time in Year 3, and Grade 5Y1 students exited the program after the first year. Students in Grade 3Y1 were the only cohort to receive the program for all three years.

Figure 3 provides two major insights. First, program impact increases with years of program exposure. Students in Grade 3Y1, who were exposed to EG's programming for all three years, had the largest learning gains of any cohort. Second, EG's intervention in Year 3 was far more effective than in previous years.[31] Students who participated in the program in Year 3 benefitted 2-3 times more than their peers who had aged out of the program prior to Year 3. Treatment students in Grades 2Y1 and 3Y1 grew an astonishing 79% more during the final year of the program than their peers in control schools.

29 While girls enrolled from the list of eligible out-of-school girls were counted towards the enrollment target regardless of their grade, their learning gains were only assessed if they were in grades 3-5 at the time of one of the Endline surveys.
30 Figure 3 omits students who were absent at Baseline since these students were only assessed during the Year 2 and Year 3 Endlines. In Appendix 6, 7, and 11 we present final results for all student types.
31 The structure of the Development Impact Bond gave EG the flexibility to revise its teaching intervention throughout the three-year project.

Figure 3: Average Learning Levels by Cohort

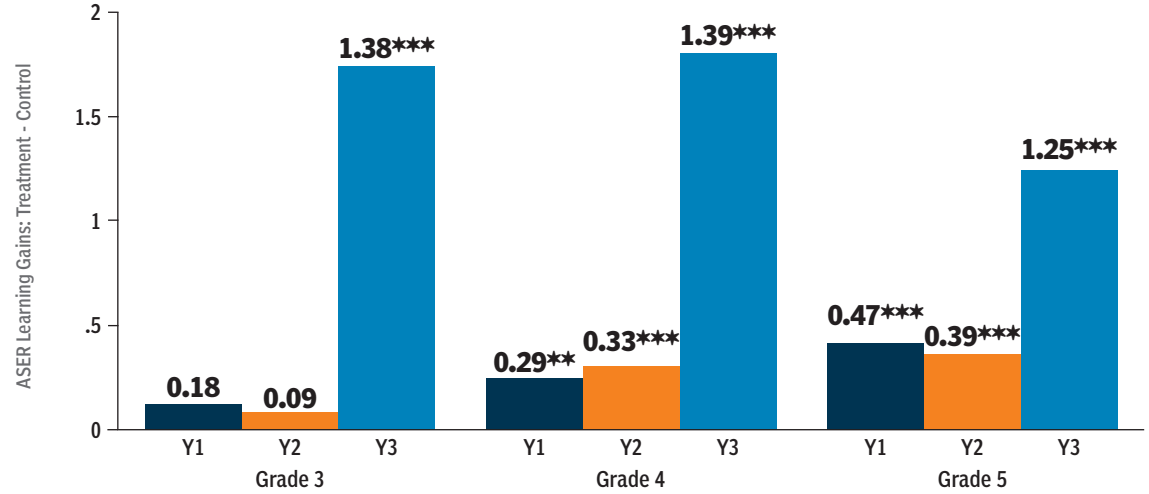


Note: * p < 0.1, ** p < 0.05, *** p < 0.01. Lines omit students absent at baseline (since they do not have a baseline score), though average treatment effects (ATEs) include all students. ATEs denote the difference in average learning gains between students in program schools and students in control schools.

Figure 4 shows the effect of EG's program on learning gains by project year for each grade targeted by EG (grades 3-5). Hence, each bar denotes the additional learning gains achieved in program schools within that year compared with gains among comparable students in control schools. For instance, the first bar shows the difference in average learning gains (+0.18) for students in Grade 3 during the first year of the program (2015-16, corresponding to cohort 3Y1), and the second bar shows the difference in average learning gains (+0.09) for students in Grade 3 during the second year of the program (2016-17, corresponding to cohort 2Y1).

Across all grades, the one-year effects of the program in Year 3 far exceed the effects in previous years. The difference is greatest for students in Grade 3: whereas the program did not have a statistically significant effect on learning gains for Grade 3 students in previous years, in the final year of the program Grade 3 students made gains comparable to older peers.

Figure 4: One-Year Average Treatment Effects by Grade and Year

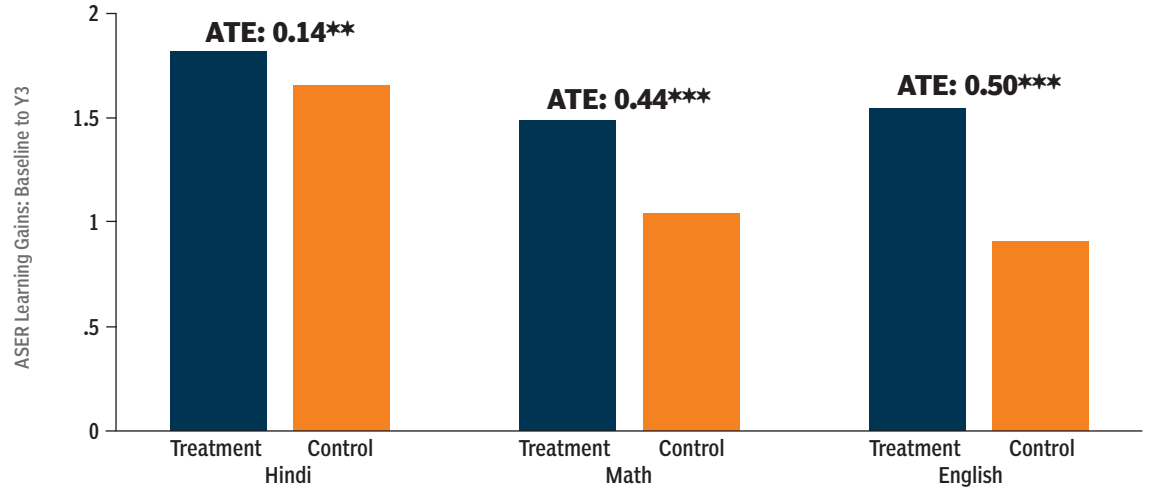


Note: * p < 0.1, ** p < 0.05, *** p < 0.01. Range bars denote 95% confidence intervals. Since we did not assess students at the beginning of grade 3 in Year 2 and 3, we calculate grade 3 treatment effects using baseline scores for those cohorts. The one-year comparison therefore assumes that any treatment effects for these cohorts occurred during Grade 3 only. The yearly average treatment effects for each cohort do not sum exactly to the overall average treatment effect for that cohort since the yearly average treatment effects do not account for students who have dropped out or have been retained.

Learning gains by subject, gender, and geography

Figure 5 shows average learning gains for all students by subject and treatment status. Program impacts were concentrated in Math and English, where the treatment effects were approximately 3 times larger than in Hindi.[32] Appendix 12 further shows that students with low baseline scores, especially in Math and English, benefitted the most from EG's program. As in previous years, average treatment effects were larger for students in Bijoliya block than for students in Mandalgarh and Jahajphur. Girls benefitted slightly more than boys (+1.13 vs. +1.04).

Figure 5: Average Learning Gains by Subject and Treatment Status



Note: * p < 0.1, ** p < 0.05, *** p < 0.01. Average treatment effects (ATEs) denote the mean difference in learning gains between students in program schools and students in control schools. Range bars denote 95% confidence intervals. The figure includes data from all Endlines. For a subject-wise analysis of average treatment for Year 3, see Appendix 8.

32 Appendix 7 shows treatment effects separately for students present at Baseline and absent at Baseline.

OUTCOME 2
Enrollment of Out-of-School Girls

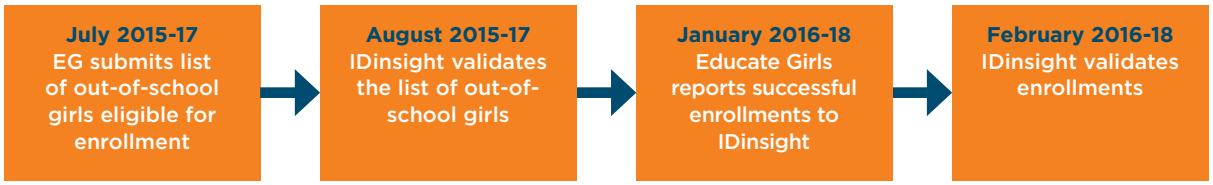
Girls walk to school in Bhilwara, Rajasthan.

PHOTO: KATE STURLA

Methodology

Educate Girls compiled and maintained a census of out-of-school girls in treatment villages, which IDinsight validated each year according to the process shown in Figure 6. Due to budgetary constraints, the DIB Working Group decided not to conduct a parallel census of out-of-school girls in control villages. As a result, we cannot rule out the possibility that other factors besides the Educate Girls program influenced enrollment in treatment villages.

Figure 6: Enrollment Verification Process

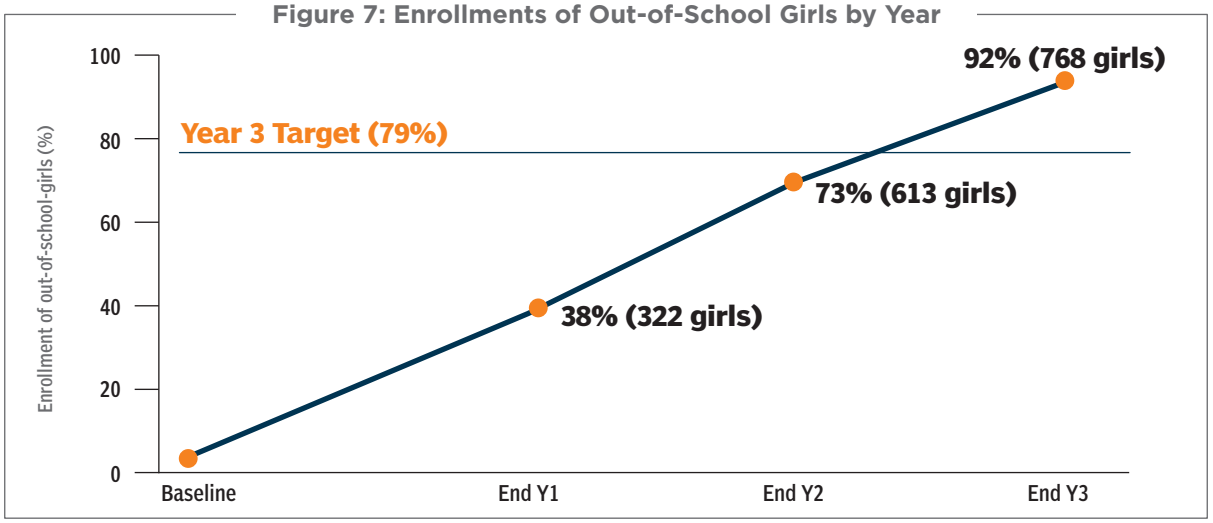


To validate enrollment each year, IDinsight surveyors visited each school in which a girl was reported enrolled and presented the headmaster with a form that included the girl's name, caste, age, and father's name. Headmasters were requested to verify this information by signing the IDinsight form as well as by showing surveyors the register.

Findings

Figure 7 shows the results of this validation exercise. Including the enrollments from Year 1 and Year 2, EG enrolled 768 out-of-school girls, representing 92% of the 837 eligible[33] out-of-school girls.[34] EG exceeded the enrollment target of 79% by 13 percentage points, or 16%.

Figure 7: Enrollments of Out-of-School Girls by Year



Note: Percentages refer to the percent of enrolled girls relative to the Year 3 target of 837 eligible girls. The list of eligible out-of-school girls was updated each year to include newly-eligible girls and exclude newly-ineligible girls.

33 Girls are eligible for enrollment if they are between 7 and 14 years old, live in treatment villages, and have not previously been reported enrolled by Educate Girls.

34 In Year 3 EG reported enrolling 155 girls, including four girls whose enrollment in the Rajasthan State Open School (RSOS) will be verified in July 2018. IDinsight was able to verify 148 of the Year 3 enrollments for an error rate of 2%, well below the threshold of 10%. Hence, all 155 girls reported by EG are counted towards the target.

Conclusion

Teaching materials on display in a school in Bhilwara, Rajasthan.

PHOTO: ELIZABETH BENNETT

Educate Girls exceeded the 3-year DIB targets in both learning and enrollment. Students in program villages gained an additional 8,940 ASER learning levels relative to comparable students in control villages, surpassing the learning target set by the Development Impact Bond by 60%. The effects of Educate Girls' program on learning gains were large and statistically significant over the three-year program: Students in EG schools gained on average an additional 1.08 learning levels, or 28%, compared to students in control schools.

Learning gains were higher for treatment students than for control students across all grades and subjects, with relatively higher gains in Math and English than in Hindi and relatively larger treatment effects among students who were exposed to the program for more years. EG's program in Year 3 was particularly effective in increasing test scores.
By the end of the three-year project, Educate Girls had enrolled 768 out-of-school girls, representing 92% of all identified out-of-school school girls eligible for enrollment. Educate Girls thus exceeded the enrollment target of 79% by 16%.

References

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Duflo, E., Hanna, R., & Ryan, S. P. (2012). Incentives Work: Getting Teachers to Come to School. American Economic Review, 102(4), 1241-78.

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Appendix

Appendix 1: Description of Educate Girls' Intervention

Enrollment: Educate Girls delivers a comprehensive community intervention to enroll girls into school. This intervention includes identification of out-of-school girls through door-to-door surveys, explanation of the value of schooling to their parents and to the community, and multi-channel engagement with households with unenrolled girls. Educate Girls also uses multiple interventions to improve school attendance and prevent drop-outs, such as frequent parent counselling sessions and working with School Management Committees to improve school infrastructure. It also identifies girls who have dropped out and works with the community to re-enroll them into school.

Learning: Educate Girls trained volunteers to deliver a child-centric curriculum one to five times a week to boys and girls in Grades 3-5. Volunteers were often drawn from the villages in which they worked. They were incentivized with a small number of skill and career development opportunities, such as free English classes and the possibility of being hired by EG in the future.

In Year 3, EG rolled out a new curriculum called "Gyan Ka Pitara" ("Knowledge Box"). As part of this new curriculum, EG increased the number of teaching sessions per day and conducted home visits to reach students who were frequently absent from school or who needed remedial tutoring. In addition to the thrice yearly rounds of student assessments conducted previously in Years 1 and 2, EG conducted three additional rounds of ASER assessments in Year 3. These additional assessments led EG to identify areas of improvement, which informed adjustments to the clustering of schools for program implementation, the training of volunteers, and the content of remedial classes. School teachers were also more involved in programming in Year 3 through school meetings and block review meetings.

Appendix 2: Description of Student Types

The Evaluation Design Memo outlines five student types, which together make up the full population of students assessed in the evaluation. The interpretation of student types slightly deviates from what is suggested in the Evaluation Design Memo,[35] but was held constant throughout the three Endline data collection exercises and analyses.

Consolidated Student Group	Student Type	Status at Baseline	Status at Endline
Students Present at Baseline	Type I	Enrolled in Grades 1-5	Enrolled, present at school, assessed
	Type II	Enrolled in Grades 1-5	Enrolled, absent at school, assessed
	Type III	Enrolled in Grades 1-5	Not assessed (enrolled or unenrolled, present or absent)[36]
Students Absent at Baseline	Type IV	Absent or unenrolled	Enrolled, present at school, assessed
	Type V	Absent or unenrolled	Enrolled, absent at school, assessed[37]
Newly Enrolled Girls	--	Unenrolled	Enrolled by EG; present or absent

Appendix 3: Data Collection for the Year 3 Endline

IDinsight conducted the third and final Endline between February 2 to February 28, 2018, according to the following protocol:

35 For example, Type III students are considered to be students who drop out from the sample (i.e., their last Endline score is not available) rather than students who dropped out of school.
36 Most students not assessed at Endline are students who dropped out from school and permanently or temporarily migrated. However, students enrolled in school were also sometimes unable to be assessed (for example, if the child was ill or the child or family did not consent to being assessed).
37 Some Type IV/V students may not have been assessed during their last Endline. As with Type III students, we include their latest available score in the calculation of learning gains.

- IDinsight visited a total of 325[38] schools.[39]
- Out of a sample of 8,237 students (4,211 in treatment, 4,026 in control), we successfully assessed 7,655 students in grades 3-5, or 93% of all sampled students (92% in treatment, 93% in control).
- We also assessed 198 newly enrolled girls in grades 3-5, representing 73% of the newly-enrolled girl population of 272 girls eligible for assessment in Year 3.[40]
- 74% of students were assessed at the school while 26% were assessed at their home. In the majority of cases in which we were not able to assess a child at their home, it was because the family had moved temporarily or permanently to areas too far for surveyors to reach.[41]
- Children were presented with paper copies of the ASER assessment and their answers were recorded on smartphones via the SurveyCTO electronic data collection interface used in the Baseline and previous Endline assessments. Information about school infrastructure and staffing was collected from the headmaster or head teacher in each school or by direct observation.

Appendix 4: Descriptive Student Statistics

	Variable	Average (All)	Std. Dev. (All)	Average Treatment	Average Control	p-Value of Difference
Children Present at Baseline	Grade (1-5)	3.09	1.39	3.1	3.08	0.48
	SC or ST caste (fraction of total)	0.48	0.5	0.48	0.48	0.9
	Age	8.2	1.74	8.19	8.21	0.64
	Female (fraction of total)	0.49	0.5	0.49	0.49	0.69
	Hindi Level (1-6)	2.68	1.69	2.66	2.71	0.5
	Math Level (1-5)	2.4	1	2.36	2.43	0.11
	English Level (1-5)	1.91	1.05	1.89	1.93	0.47
	English Word Comprehension (fraction answering correctly)	0.18	0.39	0.12	0.24	0.11
	English Sentence Comprehension (fraction answering correctly)	0.41	0.49	0.35	0.44	0.39
Children Absent At Baseline	Grade (1-5)	1.95	1	1.98	1.93	0.19
	SC or ST caste (fraction of total)	0.52	0.5	0.5	0.54	0.3
	Age	7.41	1.52	7.42	7.4	0.76
	Female (fraction of total)	0.51	0.5	0.51	0.52	0.61
Newly Enrolled Girls	Grade (1-5)	2.92	1.31	-	-	-
	SC or ST caste (fraction of total)	0.51	0.5	-	-	-
	Age	9.59	2.13	-	-	-

Note: The p-value indicates the likelihood of the difference in means between treatment and control being this large (or larger) by random chance if the difference in means was zero. Age and grade of students absent at Baseline and newly enrolled girls were imputed by subtracting the number of years passed since Baseline. For example, an 8-year-old child in grade 3 during Year 3 Endline is shown as a 6-year-old child in grade 1 in this table.

38 There were 332 schools in the original sample. In two cases, treatment and control schools merged. Per the Working Group's decision, IDinsight dropped schools affected by treatment/control merges from the sample (a total of four schools). There were three other in-sample merge cases (treatment school closed and merged with another treatment school or control school closed and merged with control school), which reduced the number of schools to be visited by an additional three schools to 325 schools. In these in-sample merge cases, IDinsight found and surveyed the affected students at home or at their new school. For more information on how school merge cases were dealt with, please refer to Appendix 16.

39 In keeping with the pairwise matching design described in the Baseline Report, students in control villages were in most cases assessed in the same week and by the same surveyors as their treatment equivalents to reduce time and surveyor effects.

40 Many girls enrolled by EG dropped out again and/or permanently migrated, making it harder for surveyors to assess them.

41 If available, we use the most recent assessment of these children for the calculation of learning gains.

Appendix 5: Average Treatment Effects as ASER Levels and Standardized Effects

Grade at Baseline	Years of exposure to EG program	Average learning gains				
		Treatment students	Control students	Difference	Difference (std effects)	p-Value
1	1	5.97	4.59	1.38	0.46	<0.01
2	2	6.76	5.40	1.35	0.41	<0.01
3	3	6.13	4.43	1.71	0.50	<0.01
4	2	3.59	3.06	0.52	0.16	<0.01
5	1	1.32	0.84	0.48	0.28	<0.01
Total		**4.96**	**3.88**	**1.08**	**0.31**	**<0.01**

Note: Treatment effects are presented as raw differences in scores and as standardized effect sizes. Standardized differences are calculated by subtracting the control mean and dividing by the control standard deviation for each grade. Standardized effects reflect the magnitude of gains in the treatment group relative to the distribution of learning gains and are useful for benchmarking treatment effects against impact estimates from outside programs. The p-value indicates the likelihood of the difference in means between treatment and control being this large (or larger) by random chance if the treatment effect was zero.

Appendix 6: Average Treatment Effects by Baseline Grade and Student Type

Grade	All students		Present at Baseline		Absent at Baseline	
	Difference	p-Value	Difference	p-Value	Difference	p-Value
1	1.38	<0.01	1.44	<0.01	1.36	<0.01
2	1.35	<0.01	1.55	<0.01	1.23	<0.01
3	1.71	<0.01	1.70	<0.01	1.72	<0.01
4	0.52	<0.01	0.69	<0.01	0.39	0.36
5	0.48	<0.01	0.48	<0.01	–	–
Total	**1.08**	**<0.01**	**1.07**	**<0.01**	**1.26**	**<0.01**

Note: "Difference" shows the raw difference in learning gains between students in treatment villages and students in control villages (treatment-control). The p-value indicates the likelihood of the difference in means between treatment and control being this large (or larger) by random chance if the treatment effect was zero.

Appendix 7: Average Treatment Effects by Subject and Student Type

Subject	All Students		Present at Baseline		Absent at Baseline	
	Difference	p-Value	Difference	p-Value	Difference	p-Value
Hindi	0.14	0.03	0.14	<0.01	0.19	0.17
Math	0.44	<0.01	0.45	<0.01	0.49	<0.01
English	0.50	<0.01	0.48	<0.01	0.58	<0.01
Total	**1.08**	**<0.01**	**1.07**	**<0.01**	**1.26**	**<0.01**

Note: The table shows subject-wise average treatment eff ects for all students. "Difference" shows the raw difference in learning gains between students in treatment villages and students in control villages (treatment - control). The p-value indicates the likelihood of the difference in means between treatment and control being this large (or larger) by random chance if the treatment effect was zero.

Appendix 8: Average Treatment Effects by Subject and Student Type for Year 3

Subject	All Students		Present at Baseline		Absent at Baseline	
	Difference	p-Value	Difference	p-Value	Difference	p-Value
Hindi	0.20	0.04	0.21	0.02	0.21	0.13
Math	0.59	<0.01	0.66	<0.01	0.53	<0.01
English	0.68	<0.01	0.72	<0.01	0.65	<0.01
Total	**1.47**	**<0.01**	**1.59**	**<0.01**	**1.39**	**<0.01**

Note: The table shows subject-wise average treatment effects for students assessed in the Year 3 Endline (students in Grades 1Y1, 2Y1, and 3Y1). "Difference" shows the raw difference in learning gains between students in treatment villages and students in control villages (treatment - control). The p-value indicates the likelihood of the difference in means between treatment and control being this large (or larger) by random chance if the treatment effect was zero.

Appendix 9: Total Aggregate Learning Gains from Baseline for All Student Types

	By Year 1 Endline	By Year 2 Endline	By Year 3 Endline
Total	1,461	2,895	8,940
Share of Target (5,592)	26%	52%	160%

Note: Results by Year 1 and Year 2 slightly deviate from the results reported after the Year 2 Endline (2,812 learning by Year 2, 1,498 by Year 1), reflecting updates made in Year 3 as per Appendix 14.

Appendix 10: Aggregate Learning Gains by Baseline Grade, Year, and Type

Grade at Baseline	Year 1 Difference from Baseline	Year 2 Difference from Baseline	Year 3 Difference from Baseline
Present at Baseline, Types I-III			
1			856
2		162	877
3	237	642	1905
4	400	949	
5	549		
Total	**1,186**	**2302**	**5136**
Absent at Baseline, Types IV-V			
1			920
2		-245	583
3	–	64	938
4	–	31	
5	–	96	
Total	**-**	**-54**	**2583**
Newly Enrolled Girls			
1		–	227
2		130	254
3	93	178	401
4	81	238	
5	101		
Total	**275**	**647**	**1221**

Note: Scores in bolded text represent the cohort's final score. While the total aggregate gains are consistent, the sub-aggregate gains of some student types may differ by one learning gain from the numbers reported in Appendix 10 text due to rounding weighted gains at different steps of the calculation. Appendix 10 represents the final result.

Appendix 11: Breakdown of Learning Gains from Baseline by Grade and Type

		Grade at Baseline					
		1	2	3	4	5	All
Present at Baseline, Assessed at Endline Type I-II	Population	1044	1213	1843	1878	2009	7989
	Sampled	1044	1213	1275	1311	1374	6218
	Average treatment effect	1.44	1.58	1.74	0.75	0.48	
	p-Value	<0.01	<0.01	<0.01	<0.01	<0.01	
	Aggregate gains	**856**	**828**	**1862**	**896**	**549**	**4991**
Present at Baseline, Not Assessed at Endline (Type III)	Population	89	77	121	83	29	399
	Sampled	89	77	94	64	24	348
	Population: Assessed in Y1 but not Y2 or Y3			52	67		119
	Sampled: Assessed in Y1 but not Y2 or Y3			43	51		94
	Average treatment effect (Y1)			-0.14	0.71		
	p-Value (Y1)			0.69	0.23		
	Aggregate gains (Y1)			**-7**	**53**		**46**
	Population: Assessed in Y2 but not Y3		41	56			97
	Sampled: Assessed in Y2 but not Y3		41	43			84
	Average treatment effect (Y2)		1.54	1.64			
	p-Value (Y2)		0.00	0.06			
	Aggregate gains (Y2)		**49**	**49**			**98**
Absent at Baseline, Assessed at Endline (Type IV/V)	Population	1872	1484	838	685	–	4879
	Sampled	1872	1484	569	455	–	4380
	Average treatment effect	1.36	1.22	1.72	0.39	–	
	p-Value	<0.01	<0.01	<0.01	0.36	–	
	Aggregate gains	**920**	**651**	**969**	**31**	**96**	**2667**
Absent at Baseline, Not Assessed at Endline (Type IV/V)	Population	63	89	153	113		418
	Sampled	63	89	96	74		322
	Population: Assessed in Y2 but not Y3		59	63			
	Sampled: Assessed in Y2 but not Y3		59	37			
	Average treatment effect (Y2)		-0.34	0.57			
	p-Value		0.91	0.10			
	Aggregate gains (Y3)		**-68**	**-15**			**-83**
Newly Enrolled Girls	Population/Sampled	71	103	98	88	61	421
	Assessed in Y1 but not Y2 or Y3			1	2	52	55
	Average treatment effect (Y1)			1.00	6.00	1.94	
	Aggregate Gains (Y1)			**1**	**12**	**101**	**114**
	Assessed in Y2 but not Y3		15	8	75	0	98
	Average treatment effect (Y2)		1.20	1.63	3.01		
	Aggregate Gains (Y2)		**18**	**13**	**226**		**257**
	Assessed in Y3	48	72	78			197
	Average treatment effect (Y3)	4.73	3.28	4.96			
	Aggregate Gains (Y3)	**227**	**236**	**387**			**850**
Total	**Aggregate Gains**						**8940**

Note: The calculated learning gains in this table represent the final result. The sub-aggregate gains of some student types may differ by one learning gain in other tables due to rounding weighted gains at different steps of the calculation of aggregate learning gains. In Year 1, the Working Group decided to impute learning gains for students not present at Baseline in grade 5 since they were not included in the Year 1 sample and would have graduated from the program in Year 2. The Working Group agreed to err on the side of overestimating learning gains for this group by assuming that the effect of Educate Girls' program on students not assessed at Baseline in grade 5 were the same as the effect on students assessed at Baseline.

Appendix 12: Sub-Group Analysis by Caste, Grade, Block, and Baseline Scores

	Subgroup	Average (Treatment)	Average (Control)	Difference	p-Value of Difference
Caste Category	General	5.90	4.58	1.31	<0.01
	OBC	4.78	3.86	0.91	<0.01
	SC	5.14	3.88	1.26	<0.01
	ST	4.64	3.78	0.86	<0.01
Gender	Boy	5.02	3.98	1.04	<0.01
	Girl	4.90	3.77	1.13	<0.01
Block	Bijoliya	4.98	3.35	1.62	<0.01
	Jahajpur	5.00	4.22	0.78	<0.01
	Mandalgarh	4.91	3.77	1.14	<0.01
Hindi Score at Baseline	1	2.01	1.86	0.15	0.09
	2	2.07	1.91	0.16	<0.01
	3	1.86	1.50	0.36	0.06
	4	1.17	1.06	0.10	0.08
	5	0.61	0.60	0.01	0.73
	6	-0.25	-0.16	-0.10	0.03
Math Score at Baseline	1	1.82	1.36	0.46	<0.01
	2	1.39	0.91	0.49	<0.01
	3	1.04	0.62	0.42	<0.01
	4	0.42	0.26	0.16	0.02
	5	-0.13	-0.33	0.20	<0.01
English Score at Baseline	1	1.76	1.19	0.57	<0.01
	2	1.40	0.97	0.42	<0.01
	3	0.83	0.48	0.35	<0.01
	4	0.50	0.13	0.37	0.03
	5	-0.23	-0.30	0.07	0.63
Total		**4.01**	**2.94**	**1.07**	**<0.01**

Note: Newly-enrolled girls are omitted from all analyses and students absent at baseline are omitted from the analysis of performance at baseline. For the subgroup analyses by caste category, gender, and block, mean values represent total learning gains (across all subjects). As a reminder, students who are absent at baseline are imputed the lowest possible score (3 out of 16 points), which explains the high learning gains for subgroups including those students (since this imputation is done for both Treatment and Control students it does not affect the unbiasedness of the ATE estimator). For the subgroup analyses by baseline scores, mean values represent learning gains in the respective subject (for students present at baseline). The p-values in this table are the likelihoods that, if the treatment effect is zero, then the difference in means between treatment and control could be this large by random chance.

Appendix 13: Assessment Location of Students

Student Type	At School	At Home
Students Present at Baseline	78%	22%
Students Absent at Baseline	73%	27%

Appendix 14: Newly Enrolled Girls since Baseline

	By Year 1 Endline	By Year 2 Endline	By Year 3 Endline
Girls Enrolled	322	613	768
Girls Eligible for Enrollment	744	835	837
Share of Girls Enrolled against Final Target (837 Girls)	38%	73%	92%
Share of Target (D=C/79%)	48%	92%	116%

Appendix 15: Changes to Year 1 and Year 2 Results

IDinsight made updates to the data from Year 1 and Year 2, leading to small changes in the calculated aggregate learning gains by Year 1 and 2. These changes represent 0.01% (Year 1) and 2.1% (Year 2) of the final target.

- Students in grades 4 and 5 at Baseline were expected to progress to grades 6 and 7 by Year 3. However, 32 students from Baseline grades 4 and 5 were still in grades 3-5 at the time of the Year 3 Endline, and thus assessed this year. Likewise, two students from Baseline grade 5 were still in grade 5 during the Year 2 Endline. We included these assessments in the final calculation of learning gains, leading to changes in the learning gains of students in grades 4Y1 and 5Y1 despite these cohorts generally not being part of the Year 3 student assessments.

- 26 children present at Baseline subsequently dropped out of school and were later enrolled by EG. We shifted these students from Type I-III to the Newly Enrolled Girls category. Since 100% of Newly Enrolled Girls were sampled, their sampling weight was changed to 1. The remaining Type I-III students in the cohorts from which these students were removed kept their original sampling weights.

- During the third round of student assessments, we identified 64 students who were listed twice on our student lists. While none of them have been assessed twice, removing these duplicates affects sampling weights.

- We made updates to school assignments for several students who were incorrectly attributed to schools with similar names (e.g., Ragunathpura vs. Ragunathpra and Rampuriya vs. Rampuria) leading to small changes in sampling weights.

Appendix 16: Descriptive Statistics of Schools Surveyed in Year 3

Variable (* indicates average if answer to preceding question is "yes")	Average (All)	Std. Dev. (All)	Average (Treatment)	Average (Control)	p-Value of Difference
# of Headmasters (Appointed)	0.32	0.47	0.31	0.32	0.97
# of Headmasters (Observed)	0.3	0.46	0.31	0.29	0.69
# of Teachers (Appointed)	2.88	1.82	3.01	2.75	0.24
# of Teachers (Observed)	2.52	1.76	2.6	2.44	0.53
# of Parateachers (Appointed)	0.12	0.41	0.11	0.12	0.79
# of Parateachers (Observed)	0.08	0.28	0.08	0.08	0.85

Variable (* indicates average if answer to preceding question is "yes")	Average (All)	Std. Dev. (All)	Average (Treatment)	Average (Control)	p-Value of Difference
Existence of SMC	1	0	1	1	
# of SMC Members*	11.34	3.68	11.5	11.18	0.53
# of SMC Meetings*	12.6	55.39	15.55	9.54	0.32
Mid-Day Meal Served	0.84	0.37	0.87	0.82	0.23
School Kitchen Available	0.95	0.21	0.95	0.96	0.78
Observed Food Served	0.84	0.37	0.83	0.84	0.74
Evidence of Mid-Day Meal	0.73	0.44	0.73	0.73	0.97
# of Pucca (Permanent) Rooms	5.69	2.47	5.64	5.74	0.69
# of Rooms for Teaching	2.56	1.83	2.55	2.57	0.94
Play Area	0.72	0.45	0.7	0.74	0.43
Usable Equipment in Play Area	0.15	0.36	0.15	0.15	0.86
Sports Equipment	0.91	0.89	0.8	1.03	0.02
Library Books	0.75	0.83	0.79	0.71	0.39
Children Using Books*	0.7	0.46	0.71	0.68	0.77
Handpump/Tap	0.66	0.47	0.69	0.64	0.25
Handpump in Usable Condition*	0.83	0.37	0.84	0.83	0.93
Source of Drinking Water	0.46	0.57	0.43	0.48	0.4
Electricity	0.46	0.5	0.44	0.47	0.61
Electricity at Visit*	0.66	0.47	0.67	0.66	0.95
School Wall/Boundary	0.5	0.5	0.5	0.5	0.96
Computers	0.03	0.18	0.04	0.03	0.99
Children Using Computers*	0.27	0.47	0.17	0.4	0.14
Tables and Chairs Available	0.06	0.24	0.06	0.06	0.8
Dari (Carpet) for Seating	0.97	0.16	0.97	0.97	0.98
Usable Blackboard	1	0	1	1	
Other Learning Materials in Classroom	0.92	0.27	0.93	0.9	0.42
Common Toilet	0.21	0.41	0.18	0.24	0.13
Girls Toilet	0.94	0.23	0.95	0.94	0.64
Boys Toilet	0.93	0.26	0.92	0.93	0.66
Total Enrollment Grades 1 to 5	**45.18**	**23.31**	**45.63**	**44.71**	**0.79**

Note: Data from 320 schools from Year 3 Endline. The p-values in this table are the likelihoods to observe differences in means between treatment and control this large (or larger) by random chance if there were no mean differences between treatment and control schools.

Appendix 17: Merged Schools

Treatment-Control Merge Cases

As per the Working Group's decision from 2017, in cases where a treatment school closed and merged with a control school or a control school closed and merged with a treatment school, students have not been assessed after the school merge occurred. However, all learning gains that were captured before the schools merged are included in the calculation of outcome payments.

Treatment school closed and merged with control school				
School	**DISE Code**	**School Merged With**	**DISE Code**	**Year**
G.P.S. NAYA GAU	8241011209	G.P.S.JORA JI KA KHERA	8241011601	Y2
Control school closed and merged with treatment school				
School	**DISE Code**	**School Merged With**	**DISE Code**	**Year**
G.P.S. HIMMAT PURA	8241115802	G.P.S. BHEROO KA RADHA	8241115902	Y2

Out-of-Sample Merge Cases

In cases where an in-sample school merged with an out-of-sample school, we continued to assess all sampled students from the in-sample school. IDinsight did not assess any students that were previously enrolled in out-of-sample schools.

Treatment school closed and merged with out-of-sample school			
School	**DISE Code**	**School Merged With**	**Year**
G.P.S. GOPALPURA	8241000106	G.P.S. MAGANPURA	Y2
G.P.S. MANAK CHOUK	8241107804	G.G.U.P.S. MAHUO	Y2
G.P.S NANA BABA KA JHUPRA	8241009202	G.P.S. BHAIRU KA KHERA	Y2
G.P.S. PIPALDA	8241108802	G.S.K.P.S. RAMPURIYA	Y3
Control school closed and merged with out-of-sample school			
School	**DISE Code**	**School Merged With**	**Year**
G.P.S. KANJORA KA JOPARA	8241102603	G.S.S.S. RAJGARH SARTHALA	Y3
G.P.S. BAGTHALA	8241100801	G.S.S.S. RAJGARH	Y3
Out-of-sample school closed and merged with in-sample school			
School	**School Merged With**	**DISE CODE**	**Year**
G.P.S. LAXMIPURA	G.U.P.S. DAGARIYA	8241028401	Y3
G.P.S. RATANPURA	G.P.S. JAJARPURA	8241116801	Y3

In-Sample Merge Cases

In cases where a treatment school merged with another treatment school or a control school merged with another control school, IDinsight continued to assess all sampled students from both schools.

Treatment school closed and merged with another treatment school				
School	**DISE Code**	**School Merged With**	**DISE Code**	**Year**
G.P.S. BHIL BASTI	8241112602	G.P.S. MEENA KA JHONPARIYA	8241111606	Y2
G.P.S. BILIYA KA JOPHDA	8241102002	G.U.P.S. BILIYA	8241102001	Y2
Control school closed and merged with another control school				
School	**DISE Code**	**School Merged With**	**DISE Code**	**Year**
G.P.S. BHARJI KA KHERA	8241104601	G.U.P.S. SHAKTA JI KA KHERA	8241104801	Y2

Appendix 18a: ASER Testing Tool for Hindi in Year 3 Endline

Hindi Assessment: Levels 0-5

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गाना खुश

मौसी

आलू खेत

दिन

अक्षर

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ह झ

स

रानी नदी किनारे रहती है।

नदी में बहुत मछलियाँ हैं।

रानी उनको दाना देती है।

वे सब मजे से दाना खाती हैं।

कहानी 1
राजू नाम का एक लड़का था| उसकी एक बड़ी बहन व एक छोटा भाई था| उसका भाई गाँव के पास के विद्यालय में पढ़ने जाता था| वह खूब मेहनत करता था| उसकी बहन बहुत अच्छी खिलाड़ी थी| उसे लम्बी दौड़ लगाना अच्छा लगता था| वे तीनों रोज साथ-साथ मौज-मस्ती करते थे|

कहानी 2
एक लड़का रोज सुबह एक बूढ़ी महिला को तालाब के किनारे देखता था| वह महिला रोज छोटे छोटे कछुवों की पीठ को साफ़ करती थी| एक दिन उस लड़के ने इसके पीछे का कारण जानने का मन बनाया| उसने महिला के पास जाकर कहा, "नमस्ते आंटी! आप हमेशा इन कछुवों की पीठ क्यों साफ करती हैं?" महिला ने बोला, "इन कछुवों की पीठ साफ़ करते हुए मैं सुख शांति का अनुभव लेती हूँ|" इन कछुवों की पीठ पर जो कवच होता है उस पर कचरा जमा हो जाता है| जिसकी वजह से इनकी गर्मी पैदा करने की क्षमता कम हो जाती है| लम्बे समय तक अगर ऐसा ही रहे तो ये कवच कमजोर भी हो जाते हैं| इसलिए मैं कवच को साफ़ करती हूँ| यह सुनकर लड़का आश्चर्य से बोला, "आपके अकेले के बदलने से तो कोई बड़ा परिवर्तन नहीं आयेगा|" महिला ने संक्षिप्त में जवाब दिया, "भले मेरे इस कर्म से कोई बड़ा बदलाव नहीं आयेगा लेकिन इस एक कछुवे की जिन्दगी में तो बदलाव आयेगा |" इसलिए हमें छोटे बदलाव से ही शुरुआत करनी चाहिए|

All assessments except of Hindi level 5 developed by ASER Centre (www.asercentre.org)

Appendix 18b: ASER Testing Tool for Math in Year 3 Endline

Maths Assessment (Version A): Levels 0-4

Number recognition 1 – 9	
1	4
7	3
6	9
5	2

Number recognition 10 – 99	
52	83
37	27
55	28
91	65
36	43

Subtraction 2 digit with borrowing	
56 − 29	64 − 39
43 − 28	45 − 17
93 − 76	75 − 57
52 − 15	66 − 49

Division 3 digit by 1 digit
8) 979
6) 823
7) 975
4) 513

All assessments except of Hindi level 5 developed by ASER Centre (www.asercentre.org)

Appendix 18c: ASER Testing Tool for English in Year 3 Endline

English Assessment : Levels 0-4

D	U	G
M		R
S	Z	L

i	t	x
a		y
n	h	c

hen	old
sit	
run	bag
fox	

What is your name?

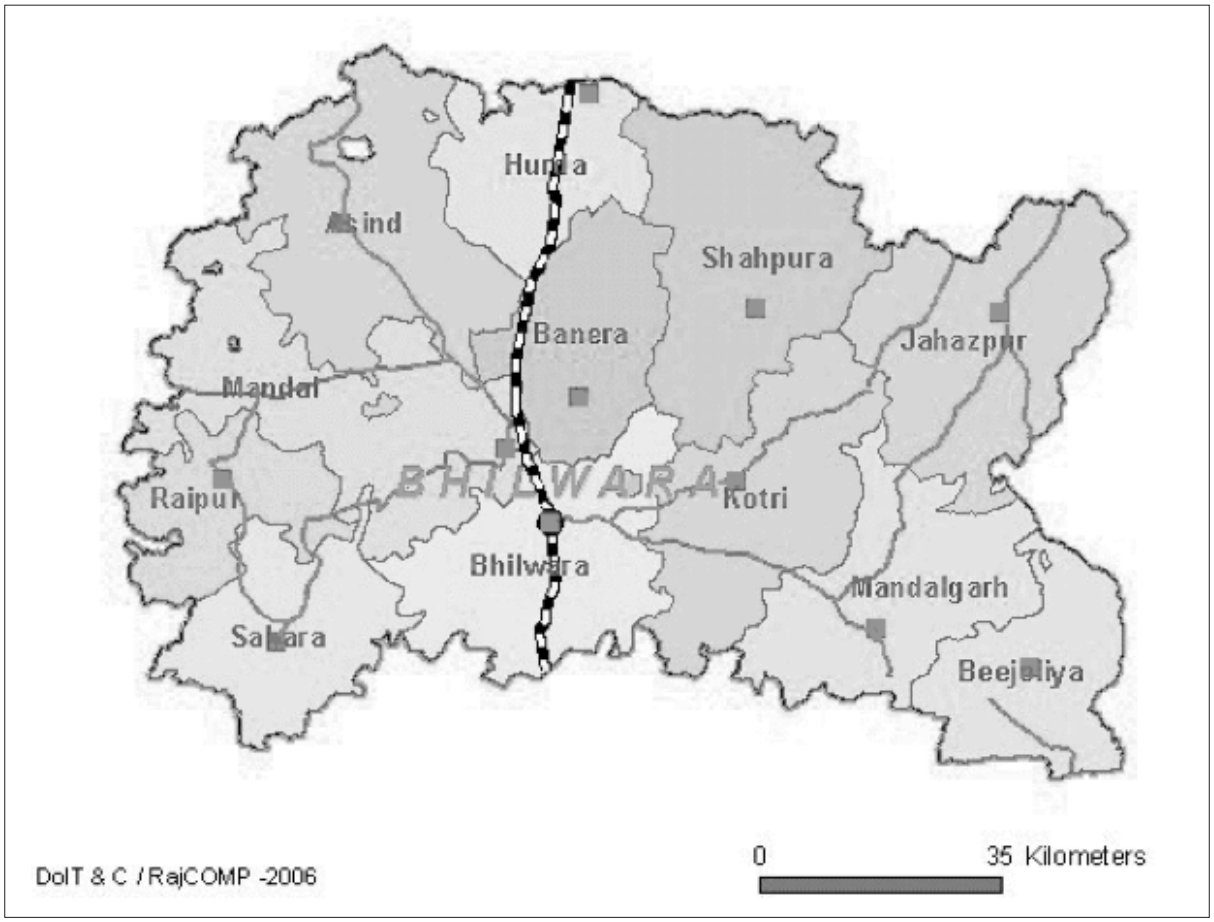
This is a big bus.

I like to sing.

I have a sister.

All assessments except of Hindi level 5 developed by ASER Centre (www.asercentre.org)

Appendix 19: Map of Bhilwara District



Note: "Beejoliya" and "Jahazpur" are alternative spellings of Bijoliya and Jahajpur, respectively.

A student stands outside her school in Mandalgarh, Rajasthan.

PHOTO: KATE STURLA

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