



RESEARCH BRIEF

The Effects of Tutoring on Children's Learning Outcomes in Nigeria

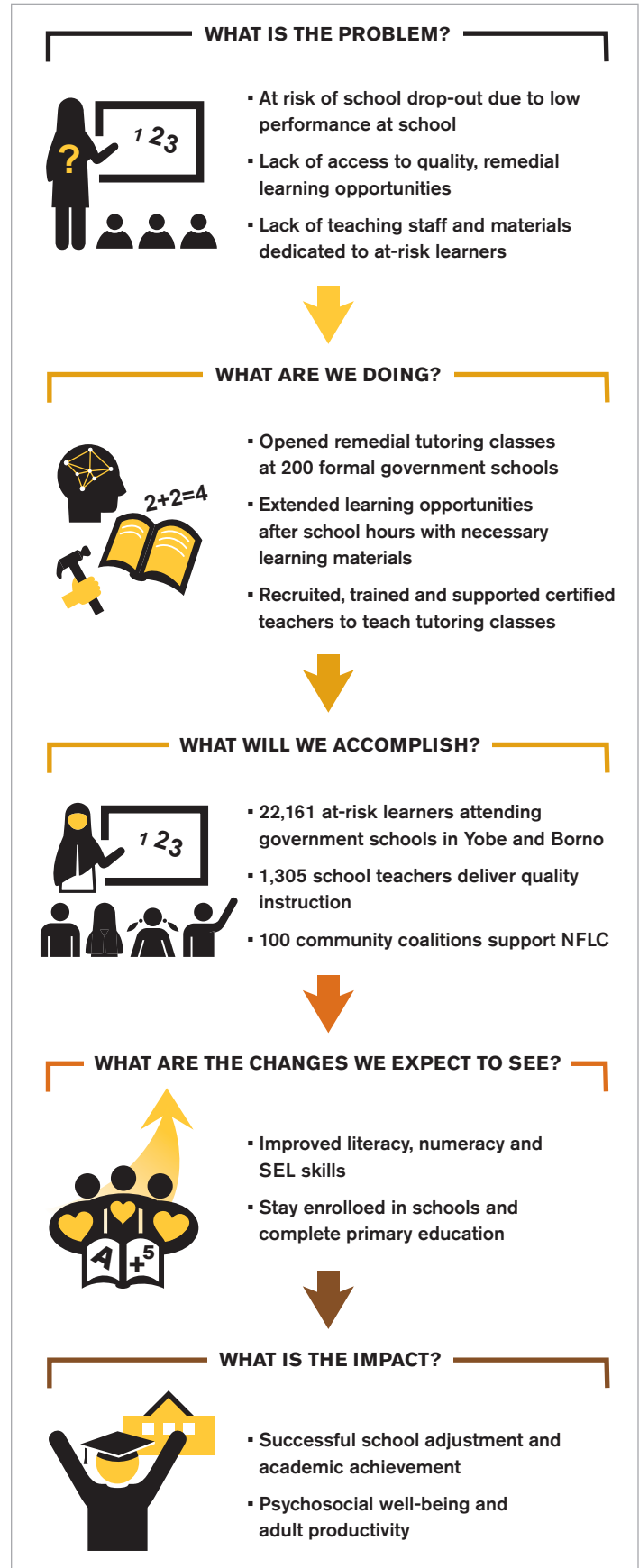
BACKGROUND

Ensuring universal access to equitable, high-quality education is a pillar of Sustainable Development Goal 4 (UNESCO, 2015).¹ But in many countries affected by conflict and crisis, including Nigeria, progress toward this goal is slow. More school-aged children and youth are out of school in Nigeria than any other country.² Even when children enroll in and attend school, they face poor quality learning opportunities and outcomes, a dynamic caused in part by limited learning materials, overcrowded classrooms and untrained teachers.³ Experiences with conflict by children and teachers alike compounds these challenges, and children in the crisis-affected northern states of Nigeria struggle even more to access schools and truly learn once they have enrolled. Recent educational statistics show that across Nigeria, more than half of children aged 5-16 cannot read a narrative or informational text with accuracy, whether that text is written in English or Hausa.⁴ But the problem was even more acute in conflict-affected northern Nigerian states like Yobe, where an estimated 90% of school-aged children cannot read.⁵ These numbers are astounding and unequivocal: millions of Nigerian children are being denied their human right to a high-quality education.

DFID EDUCATION IN EMERGENCIES REMEDIAL TUTORING PROJECT

The UK Department for International Development Education-in-Education (DFID EiE) tutoring project promotes the learning and retention of low-performing primary school children in Nigeria's conflict-affected northern states of Borno and Yobe. With DFID's support, the International Rescue Committee (IRC) and Creative Associates International provided 22,161 primary school children who were at risk of dropping out with remedial tutoring. This tutoring prioritizes the development of basic literacy, numeracy and social-emotional learning (SEL) skills. It was offered free of charge and took place after school, lasting 2.5 hours per session. Sessions occurred three times per week over the course of 21 weeks. Children who participated received supplementary learning materials and were taught by certified teachers who received professional pedagogy training through face-to-face trainings, monthly teacher-learning circles and on-site coaching visits by experienced teacher mentors from local ministries of education.

Figure 1. Theory of Change of DFID's EiE tutoring project



A RANDOMIZED CONTROL STUDY TO IDENTIFY THE EFFECTS OF TUTORING

As a part of a broader commitment to determine *what works, for whom, under what conditions* and at *what cost* for low-performing, at-risk, crisis-affected children to develop foundational literacy, numeracy and SEL skills, the IRC conducted a randomized controlled trial study with pre-pots data and both treatment and control groups. Children in the treatment group were low-performing students who received the opportunity to attend tutoring sessions. The control group consisted of children who were low-performing students and had been placed in a waitlist. Table 1 details the treatment contrast.

Table 1. Treatment and control contrast

Activities	Treatment	Control
4-day face-to-face training for master trainers + 2 days refresher	✓	-
4-day face-to-face training for tutors + 2 days refresher	✓	-
Coaching visits: one 2-hour visit per month	✓	-
3-day face-to-face training for coaches + 1-day refresher	✓	-
1-day training for community coalition + 1-day refresher	✓	-
1-day face to face training for civic society organizations	✓	-
Materials: scope and sequence, lesson plans for literacy, numeracy and SEL for 21-week program	✓	-
Children classes: 2.5 hours sessions, 3 times per week for 21 weeks <ul style="list-style-type: none"> ▪ 40-minute literacy ▪ 40-minute numeracy ▪ 30-minute SEL ▪ 20-minute break 	✓	-
Stipend for tutors: \$31 dollars per month	✓	-

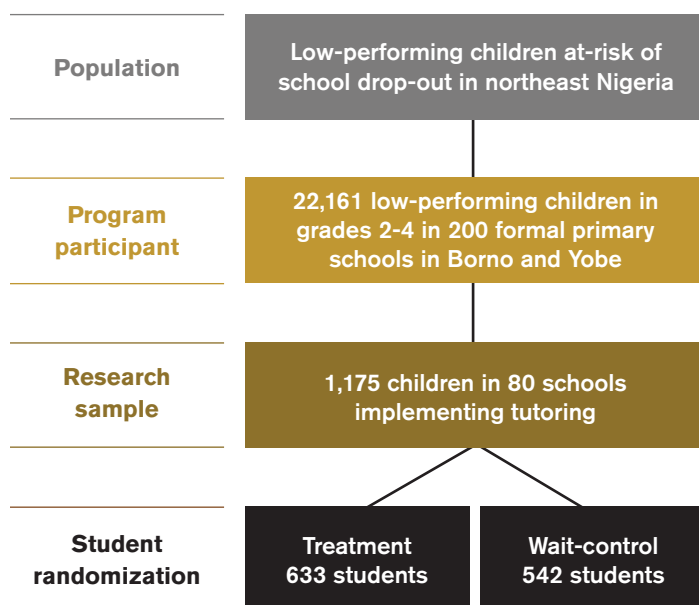
The research aimed to answer the following questions:

- What are the effects of tutoring on low-performing children’s literacy, numeracy and SEL skills?
- How do the tutoring effects vary for different sub-groups of at-risk children by sex, displacement experience, physical disability status, mother tongue language, socio-economic status (SES) and region?
- What are the baseline-endline changes observed in the instructional practices of teachers who taught tutoring classes?
- What is the cost-effectiveness of the tutoring program on children’s literacy, numeracy and SEL skills?

> Participants

The beneficiaries of the DFID EiE tutoring project were 22,161 children in grades 2-4, ages between 6-17. These children attend 200 government schools in the Yobe and Borno states and were previously identified as being at risk of drop-out due to low school attendance. The research sample used for the study included 1,175 children with 633 in treatment and 542 in control. These children were selected through a two-stage sampling process, in which we first randomly selected 80 schools that were going to implement tutoring and then randomized children to treatment and wait-control groups within each school. At the teacher level, we conducted classroom observations with 105 teachers who were teaching tutoring classes in the 80 research schools.

Figure 2. Sampling frame



> Instruments

- **Background information questionnaire** was used to collect children's demographic information, such as sex, socio-economic status (SES), displacement status and disability status.
- **Early Grade Reading Assessment (EGRA)** was used to assess children's literacy skills such as letter name identification, non-word reading, oral reading fluency and both listening and reading comprehension.
- **Early Grade Math Assessment (EGMA)** was used to assess children's math skills such as number identification, number discrimination, missing number, addition levels 1-2, subtraction levels 1-2 and word problems.
- **A battery of SEL assessments** was used to assess children's SEL skills, such as hostile attribution bias, anger and sadness dysregulation, emotional accuracy, depression and orientation toward conflict resolution (aggression, disengagement and problem solving).
- **Teacher Classroom Observation (TCO)** was used to assess teachers' instructional practices related to the use of instructional materials, teaching methods, promotion of student participation and provision of formative assessment and feedback.

> Analytic strategies

The data were analyzed by researchers from the IRC's Airbel Impact Lab in Stata. The student data were analyzed using a multi-level difference-in-difference regression model after controlling for various covariates including age, physical disability, mother tongue language, SES and home literacy environments. The teacher data were analyzed using a teacher random-effects model that controlled for variables such as years of teaching experience, sex and class-size. In order to estimate the cost of the tutoring program, the IRC's Best Use of Resource (BUR) team first estimated the total cost of each core project activity, then paired this data with monitoring data to determine cost per center and cost per student and finally, examined the costing data with results from the impact evaluation.



PHOTO: BRYAN ANSELM/IRC

MAIN FINDINGS

What are the effects of tutoring on low-performing children’s literacy, numeracy and SEL skills?

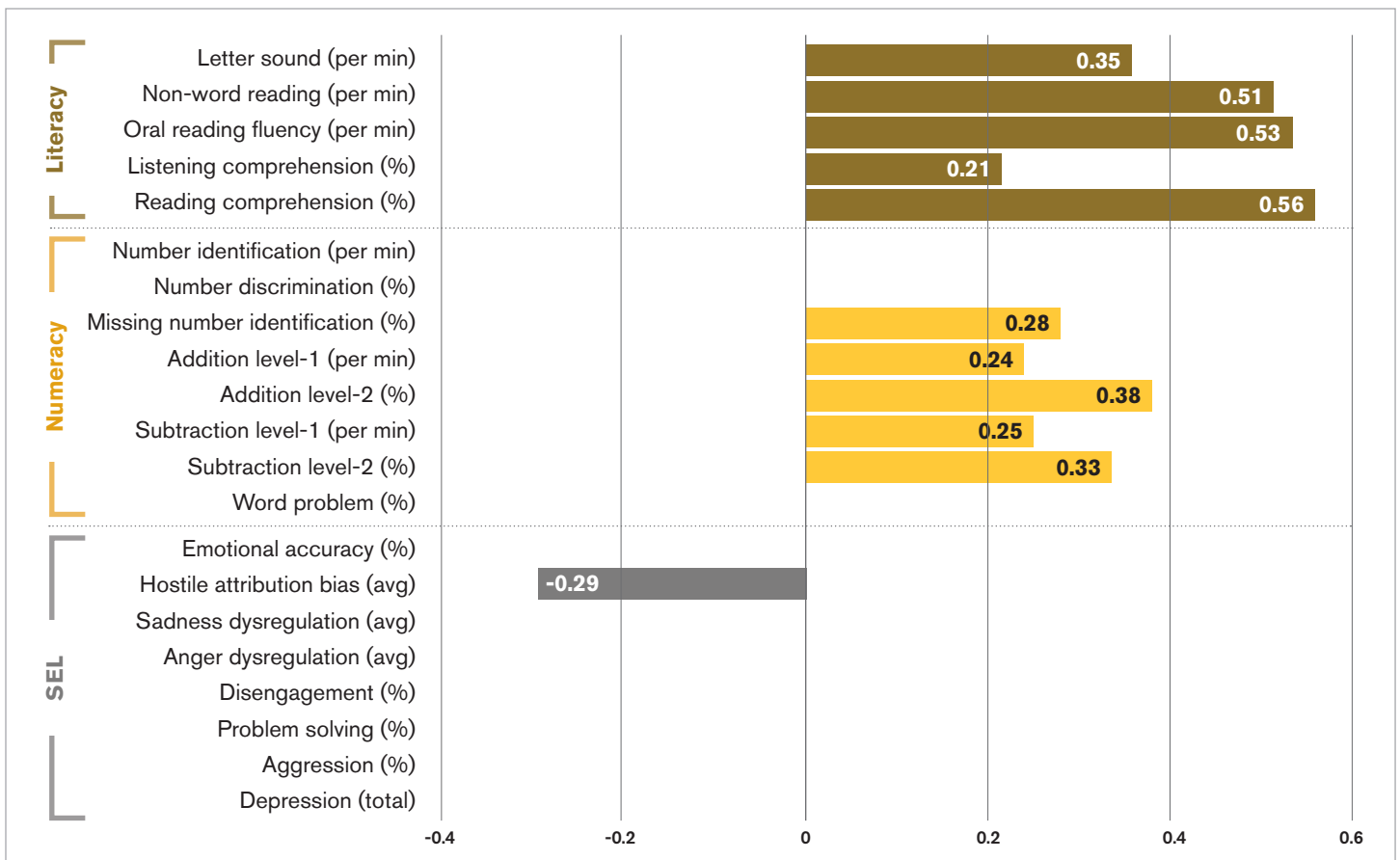
Our findings suggest that the tutoring is an effective intervention for improving low-performing children’s literacy and numeracy skills and on SEL effective at reducing hostile attribution bias. (See Figure 3)

- **Literacy:** the tutoring program resulted in positive, small to medium and statistically significant improvements in children's overall reading skills.
- **Numeracy:** the tutoring program resulted in positive, small and statistically significant effects in children's math skills in 5/8 EGMA subtasks.
- **SEL:** the tutoring program led to a statistically significant decrease in children's perception of others' actions as hostile in intent, a tendency known as hostile attribution bias that has been associated with later displays of aggression.⁶ The tutoring program resulted in no statistically significant changes in other SEL subtasks.



PHOTO: BRYAN ANSELM/IRC

Figure 3. Effects of tutoring on low-performing children’s literacy, numeracy and SEL outcomes



Note: We only present effects that were statistically significant (*p<.05 **p<.01 *** p<.001). Effect sizes are standardized mean differences observed between the tutoring and the control groups. Effect sizes of 0.2 are considered small, 0.5 are medium and 0.8 are large.

How do the tutoring effects vary for different sub-groups of at-risk children by sex, displacement experience, physical disability status, mother tongue language, SES and region?

- **Baseline:** children in Borno, especially female and disabled children from lower SES, exhibited significantly lower scores in listening comprehension, word problems, depression and emotional accuracy than able-bodied male children from higher SES families in Yobe. No difference was observed in other outcome areas. (See ▼ in Table 2 to identify groups who were more disadvantaged at baseline.)

- **Differential effects at endline:** tutoring had greater treatment effects on children from higher SES families who spoke Hausa in Yobe in various EGRA and EGMA subtasks, including letter identification, non-word reading, reading fluency, reading comprehension, number discrimination and addition level 2. (See ▲ in Table 2 to identify groups who benefited more from tutoring at endline.)

- **Reductions in equity gaps:** overall, the program was able to reduce some baseline literacy and numeracy equity gaps by region and home language in scales such as letter identification, non-word reading, and number discrimination. (◆ in Table 2 shows groups where we observed reductions in baseline equity gaps.)

Table 2. Baseline equity gaps, differential treatment effects, reduction in equity gaps

Outcomes	Tutoring vs Control											
	Sex		Displacement		Disability		Home language		SES		Region	
	Girl	Boy	IDP	Host	Disabled	Able-bodied	Non-Hausa	Hausa	Low	High	Borno	Yobe
EGRA	Letter identification									▲		◆
	Non-word reading							▲				◆
	Oral reading fluency			▲				▲				▲
	Listening comprehension										▼	
	Reading comprehension			▲				▲				▲
EGMA	Number identification											
	Number discrimination							◆				◆
	Missing number							▲				▲
	Addition 1											
	Subtraction 1											
	Addition 2		▲					▲		▲		▲
	Subtraction 2							▲				▲
Word problems									▲		▼	
SEL	Hostile attribution bias					▼						
	Sadness dysregulation				▲							
	Anger dysregulation							▲		▲		▼
	Disengagement											▼
	Problem solving											▼
	Aggression									▼		▼
	Depression							▲		▼		▼
	Emotional accuracy	▼								▼		▼

▼ identify groups who were more disadvantaged at baseline.

▲ identify groups who benefited more from tutoring at endline.

◆ shows groups where we observed reductions in baseline equity gaps.



PHOTO: TOM SAATER/IRC

RECOMMENDATIONS AND NEXT STEPS

- Non-formal programs and research targeted to support low-performing, crisis-affected children are an impactful intervention with the potential of being a cost-effective investment:** the research findings showed that fee-free remedial tutoring helped low-performing children in emergency settings such as Borno and Yobe improve foundational reading and math skills and lessen the tendency to interpret others' behaviors as having hostile intent. Long-term funding to non-formal alternatives such as tutoring programs holds promise to help children at risk of dropping out of formal schools with the additional supports they may need to learn and succeed in school. Additional costing information from other interventions in emergency settings will be needed to conclude that tutoring is cost-effective.
- Additional support for particularly disadvantaged groups remains necessary:** the sub-group analysis showed that children from higher SES families who spoke Hausa at home were able to benefit more from tutoring than children from lower SES families who did not speak Hausa at home; Hausa is the dominant language of instruction at government in northern Nigerian schools. We suggest extending additional tailored supports to non-House speakers, including the provision of tutoring in their home language.
- Review and contextualize SEL curriculum in non-formal programs:** while tutoring led to a decrease in participants' hostile attribution bias, the program is not yet having effects in other SEL skills. We recommend conducting further contextualization and adaptation of the SEL concepts and materials to ensure cultural relevance to the target population. Engaging local teachers in the revision process can be one effective way of successful contextualization.

What are the baseline-endline changes observed in the instructional practices of teachers who taught tutoring classes?

- There were no statistically significant baseline-endline changes in teachers' instructional practices, although this result could be due to the low inter-rater reliability⁷ observed in the TCO data.

What is the cost-effectiveness of the tutoring program on children's literacy, numeracy, and SEL skills?

- A total of £1,386,912 was spent over program start-up and implementation from October 2018 to May 2019. The cost per child who received tutoring was £63. The impact evaluation showed that tutoring had positive, and statistically significant results on children's reading skills, on some numeracy metrics and on hostile attribution bias suggests, which suggests that tutoring has the promise of being a cost-effective intervention.
- To estimate the cost of different ingredients of the tutoring program, we broke down the components of the tutoring intervention into (a) tutors including compensation, face-to-face training and teacher-learning circle, (b) learners, and (c) government engagement. Table 3 shows the total cost per program component, as well as the average cost of each component per child benefited.

Table 3. The total cost per program component

Cost-Efficiency by Program Component					
	Tutor Compensation	Face to Face Trainings	TLCs	Government Engagement	Learner Materials/Costs
Total	£ 214,404	£ 400,750	£ 363,598	£ 254,933	£ 153,228
Cost per Child by Activity	£ 9.67	£ 18.08	£ 16.41	£ 11.50	£ 6.91
	Tutors			Government	Learners
Cost by Component	£ 44			£ 12	£ 7

LIMITATIONS

- **Internal validity:** comparisons to identify whether the treatment and control groups were balanced in a set of baseline characteristics showed that randomization worked and the two groups were equal in expectation. At endline, we observed 15% attrition rate but it did not alter the balances in our sample and does not pose a threat to the internal validity of our findings. However, the true effects of tutoring might have been underestimated due to two reasons. First, tutors were teachers in formal schools and also taught children who were not part of the treatment during normal school hours. The pedagogical training that these teachers received in the tutoring project might have positively affected learning levels for children in the control group during school hours. Second, children in the treatment and the control groups were part of the same classrooms in school, so children in the control group could have improved their learning due to peer effects.
- **External validity:** the findings of this study are generalizable only to low-performing primary school children between 6-17 years in emergency settings, such as Borno and Yobe. The findings may not generalize to children of different age groups and school performance levels, to children attending other types of schools such as private schools or to children living in stable, high or middle income societies.
- **Statistical conclusion validity:** low reliability of the TCO data made it difficult to know real performance changes among the teachers in our sample due to measurement errors. This compromised our study's ability to make valid inferences about how pedagogical support provided in the tutoring project related to teachers' instructional practices.
- **Cost estimation:** cost estimates include only what was paid for by IRC and Creative. Costs that would have been incurred even in the absence of EiE are excluded. Goods and services provided in-kind, for example the cost of community contributed space or teacher time, are also not included in the estimates.



PHOTO: KELLIE RYAN/IRC

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ENDNOTES

¹ UNESCO. (2015). *World Education Forum 2015: Final report*. Paris: UNESCO.

² UNICEF. (2019). Education. Retrieved November 21, 2019, from <https://www.unicef.org/nigeria/education>

³ Anaduaka, U. S., & Okafor, C. F. (2013). The universal basic education (UBE) programme in Nigeria: Problems and prospects. *Basic Research Journal of Education Research and Review*, 2 (3): 42, 48.

⁴ Enighe, J.M., & Afangideh, M. E. (2018). Developing reading skills in beginning readers in Nigerian primary schools towards the millennium development goals. *Journal of Language Teaching and Research*, 9(6), 1160–1167.

⁵ RTI International. (2015). *Status of early grade reading In Sub-saharan Africa*. Retrieved from USAID website: <https://www.edu-links.org/resources/status-early-grade-reading-sub-saharan-africa>

⁶ J., Alsem, S. C., Verhulp, E. E., & De Castro, B. O. (2019). Hostile Intent Attribution and Aggressive Behavior in Children Revisited: A Meta-Analysis. *Child Development*, 90(5), 525–547.

⁷ Inter-rater reliability is a statistic that shows the level of consensus obtained between different enumerators who observed the same subject(s) or phenomena. To assess the inter-rater reliability of the TCO data, we used Cohen's Kappa. Kappa scores between .10-.20 indicate no agreement, .21-.40 indicate slight agreement, .41-.60 indicate moderate agreement, .61-.80 indicate substantial agreement, and .81-1 indicate almost perfect agreement. In our study, Kappa values of the TCO data ranged from 0.22 to 0.62, indicating weak to high inter-rater agreement.