

## Summary of the Evaluation of the Pilot Maths Project December 2024

### Context

In Uganda, early-grade mathematics education faces significant challenges. Many primary school teachers lack specialized training in mathematics, impacting the quality of instruction. A 2018 report by the Uganda National Examinations Board (UNEB)<sup>1</sup> revealed that a considerable number of teachers did not meet the required qualifications in numeracy.

Consequently, while some cognitively able students manage to succeed, often despite the teaching quality, a significant number fail to achieve basic proficiency in mathematics. UNESCO<sup>2</sup> reports that only 20% of Ugandan pupils at the end of primary school achieved the global minimum proficiency level in numeracy.

This context becomes even more problematic given class sizes of 100+ (which was the case in 50% of the project schools), a lack of textbooks (maximum in schools visited of one between three but often the teacher having the only textbook and, in grade 1-3, teachers not being maths specialists).

In addition, although Uganda has implemented a widely scaled Early Grade Reading (EGR) Programme, which covered 80% of public primary schools and benefitted over six million pupils, no comparable initiative exists for mathematics, underscoring the need for targeted interventions in foundational maths education. Again, in the schools visited and teachers interviewed no teacher had received previously CPD in mathematics.

### Project Details

The project was a partnership between RedEarthUganda and their UK partner RedEarthEducation. The two have been working together over a number of years in Uganda, and Masindi more specifically, carrying out various school improvement projects with a focus on teaching and learning. This project specifically aimed to improve the quality of teaching and learning of mathematics in 10 schools in P1 to P4 in the Masindi area of Uganda over three years. Two control schools were selected in the neighbouring district of Nakonsongola to assess impact (difference made) more effectively. In total, 50 teachers (43F 7M) were supported to improve their teaching of Mathematics and they in turn taught a total of 4787 pupils (2630M 2157F).

### Evaluation Methodology

The evaluation was carried out by the UK company Enable Ed. Enable Ed has significant experience in paid evaluation working with partners such as IRC, The British Council, UKAID, EU and US AID and uses the profits to also carry out low-cost evaluations of small NGO projects.

The evaluation team analysed baseline and endline project data. In addition, they carried out field visits to 4 schools observing 10 lessons, interviewing 4 headteachers and having focus group discussions with 14 teachers who were part of the project and 32 students on the impact of the project. In addition, a further focus group discussion was had with 4 teachers and 4 headteachers who were also part of the programme (but not part of the schools visited); the project and training manager and a focus group discussion was had with 5 members of

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<sup>1</sup> Uganda National Examinations Board (UNEB). (2018). *National Assessment of Progress in Education (NAPE) Report*. Retrieved from <https://www.education.go.ug/utsep/wp-content/uploads/2020/03/5.-NAPE-2018-Report.pdf>

<sup>2</sup> UNESCO. (2024). *Shining the spotlight on primary completion and foundational learning in Uganda*. World Education Blog. Retrieved from <https://world-education-blog.org/2024/04/18/shining-the-spotlight-on-primary-completion-and-foundational-learning-in-uganda/>

the district education office. Finally, a visit was made to one control school out of the project where 3 lessons were observed and interviews were had with the headteacher and a focus group discussion with 5 teachers.

## Project Activities

The project carried out the following activities

- ▣ 18 Days of Central Training covering a range of foundational mathematical topics (Place Value; Number Recognition; Four Operations; Mental Strategies in the operations; Resource Making)
- ▣ Supportive Lesson Observations (349)
- ▣ Demo Lessons in schools (90)
- ▣ In School Training Sessions (260)

The strength (identified by key stakeholders and collaborated with research) in this model of Continuous Professional Development was

- The training being carried in single-day sessions enabling teachers to **manageably** apply the new method. These were then followed by support visits to address any challenges. Where misconceptions arose, demonstration lessons were modelled to reinforce the training. This therefore enabled teachers to form 'habits' in the new methodology before being introduced to further pedagogy.
- The partnership between the two organisations with a UK mathematics specialist with some knowledge of a Ugandan context supporting in developing the training and at times delivering parts online.

## Impact of the Project

- ▣ Headteachers, Teachers and Inspectors reported **increased Teacher Confidence, Subject Knowledge, and Enjoyment in Teaching Mathematics**: *"I was a reluctant teacher of mathematics and not confident. Now I enjoy it."* (Project Teacher). *"Many non-specialist maths teachers start with the perception that maths is very difficult and this comes through in their teaching...that has now changed in the project schools."* (District Inspector). With enhanced subject knowledge, teachers reported feeling better equipped to address questions and adapt their instruction, making math lessons easier and more engaging
- ▣ **Improved quality of the Teaching of Mathematics**: Based on baseline and endline observations 93% of teachers who had a baseline and 3 years later endline showed significant improvements in their teaching and this was particularly the case with teachers who at baseline were assessed as particularly weak. A significant contributor to that, the project team anecdotally reported, was the individual coaching and mentoring of the teachers.

In terms of improvements, the biggest areas of improvement were

- The use of group work in lessons
- Independent pupil talk in the lesson
- The use of teacher made visual aids to enhance pupil learning
- Learning aids being used by pupils in the lesson
- The classroom having teaching and Learning aids on display made of local recycled materials

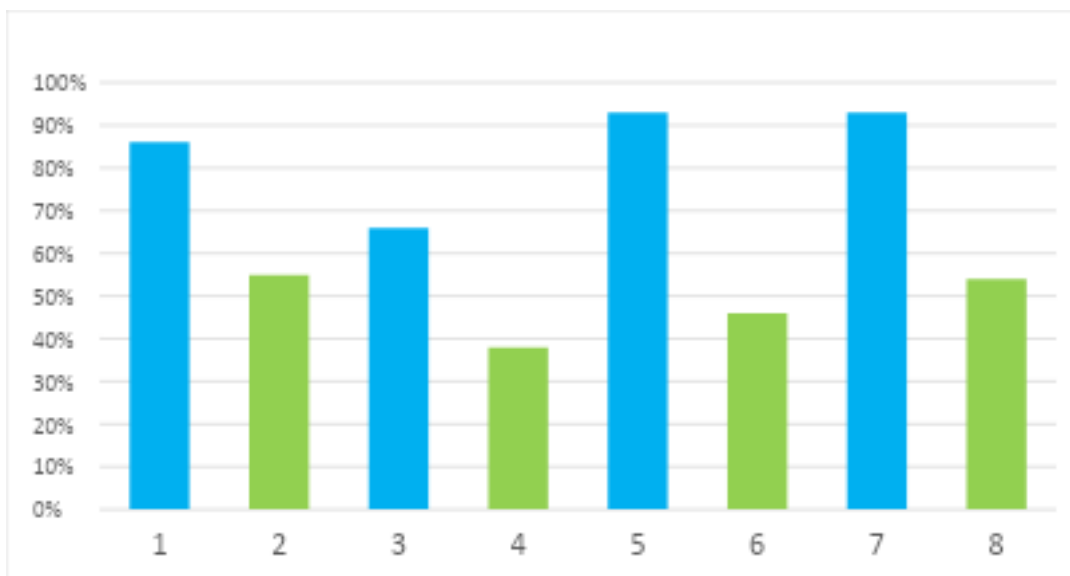
This was triangulated in the lesson observations carried out by the evaluation team and compared with those also observed in control schools. This highlighted

- Strong Modelling with nearly all lessons in the project schools the teacher had an aid which was only the case in one lesson of the controlled schools) and an appropriate length of time spent modelling.
- None of the control schools had any group work component in the lesson and, as part of that, the use of concrete learning materials (made out of local materials) to engage the learners. This was the prominent part of all the lessons in the project schools. (see pictures for examples). Teachers reported that this in particular supported children with special needs



- o In all the project schools (where it was possible to observe both the beginning and end of lessons) there was a clear opportunity for independent application at the end of the lesson to enable individual assessment. In the strongest of lessons, the questions in the independent application progressed in difficult.
- o The pace of a significant number of project lessons was strong and in doing so keeping students actively engaged. As part of the observations, the evaluator made a judgement of the % of students engaged in their learning after 15 minutes of the lesson. For control schools, this was on average 30% of students. For project schools (and at this stage this where students worked in groups), this was around 80% of students with the majority of lessons above 85%.

2 **Improved Learning Outcomes for Students in all grades:** The improved quality of teaching would suggest the likelihood of improved learning outcomes. Teachers anecdotally reported this and this was triangulated in learner assessments. At baseline., assessments showed little difference in the average score in assessments between control and project schools with in all years the average score was less than 20%. At endline, the following was found



All children in project schools who took both baseline and endline assessment improved and the average improvement was 72% points across all four grades. The gap between control and project schools was for P1: 31% points; P2:28% points; P3: 47% points and P4:39% points with an average gap of 35% points compared to 2% points at baseline.

- ❑ **Improved Equity in Learning Outcomes:** In Control schools, the key characteristic was the inequity of learning outcomes with some learners achieving as well as in project schools whilst more than half scoring 50% or less with some not scoring anything. However, in project schools only 2% of learners scored less than 50% in their assessments.

### **Value for Money**

Based on a budget of £18,000, this equated to a cost of £3.76 per pupil which, given both the improvements in children in foundational skills in maths and the equity of these **improvements, is, in the opinion of the evaluators, outstanding value for money.** However, in future projects, this is likely to slightly increase as, because of limited budget, in this project there was no contribution to indirect costs such as monitoring, management and finance. These were covered by the organisation.

### **Recommendations**

- 1) **Improve Monitoring and Evaluation of the Project:** Investigate investing in robust monitoring and evaluation (M&E) with stronger frameworks and alignment to Ugandan and international standards, such as the Global Proficiency Framework. Address limitations in sampling and data collection to enable more precise evaluations of equity, gender, and teacher performance. This could be carried out at the start of the academic year. Longitudinal assessments could also help evaluate the sustainability of outcomes.
- 2) **Develop Mathematical Fluency:** Integrate fluency strategies into teacher training and therefore lessons to improve knowledge retention, identify gaps, and build student confidence in mathematics. This approach supports mastery through systematic recall of prior learning.
- 3) **Develop a More Scalable Programme:** Design a scalable model to expand programme reach while maintaining effectiveness and fostering teacher autonomy. Collaboration with the district inspectorate for joint monitoring and integrated tools can enhance sustainability and capacity building.
- 4) **Develop School Leadership Training:** Provide systematic training for headteachers to strengthen instructional leadership and support for teachers. Evidence shows this improves teaching quality, morale, and long-term implementation of pedagogical improvements.
- 5) **Ensure Community Awareness is Part of All Training:** Raise awareness among parents about the value of education to improve attendance and engagement. Community sensitization aligns with evidence-based strategies for addressing barriers to school retention and aligns with long-term strategic goals.
- 6) **Restart the RedEarth Achievement Award:** Revive the Achievement Award to motivate educators, sustain teaching quality, and recognize progress. This programme is highly valued by districts for its proven impact on school improvement.
- 7) **Include Good Practice Visits:** Facilitate school visits to observe effective teaching practices, especially in mathematics. Peer learning through exposure to successful models enhances teacher development and supports scalable programme designs.
- 8) **Introduce Certificates for Training Completion:** Provide certificates for training and implementation to support teacher career development and recognition. This, the district reported, aligns with district priorities and aids in teacher promotion and placement.

## Overall Conclusions

Within Ugandan Education there exists, in layman's terms, a "lottery" as to whether either a teacher is able to teach high quality mathematics lessons (even more problematic given sometimes class sizes of 100+; a lack of textbooks and in grade 1-3, teachers not being maths specialists) or students have the cognition skills to easily acquire mathematics. If this happens, then students succeed; however, in national reports and also data from control schools this is often not the case. As a result, maths levels remain low and Uganda's commitment to Sustainable Development Goal 4 and their promise to increase the 'Proportion of children and young people: (a) in Grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in mathematics is extremely vulnerable.

This Pilot project, although limited in its reach (10 schools), clearly shows significant potential to overcome this issue especially given the equity of the improvement in both teaching and also outcomes for all learners rather than those who are cognitively able. Added to this is the exceptional value for money of the intervention (£3.76 per learner). We would therefore strongly recommend that

- ② greater evidence is collected to validate the findings of the pilot in terms of learning outcomes.
- ② the project is scaled up wider (and alongside this a more scalable programme developed potentially over 2 rather than 3 years).