

# NATIONAL NUMERACY PROGRAMME (NNP)

*Developing strong foundations in  
Mathematics for all children to succeed*



**NNP PILOT  
IMPACT EVALUATION**

**SUMMARY ENDLINE  
REPORT**

**APRIL 2023**

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## SUMMARY OF NNP ENDLINE REPORT

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**Programme:** National Numeracy Programme (NNP)

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### EVALUATION PURPOSE

The evaluation of the National Numeracy Programme (NNP) pilot conducted during the 2022 school year, aimed to:

- Gather information on participants' views about the programme,
- Assess the mathematics skills of learners in treatment schools participating in the NNP pilot compared with learners in comparison schools,
- Examine how teachers have changed their approach to mathematics instruction; and,
- Provide insight into the efficacy of NNP materials and the in-service teacher training methodology.

### PROJECT BACKGROUND

Led by the Malawi Ministry of Education (MoE) and funded by the United Kingdom's Foreign, Commonwealth & Development Office (FCDO), the four-year NNP aims to improve outcomes in mathematics so girls and boys have a solid foundation in basic skills to succeed in the rest of their schooling and fulfil their potential. The NNP aims to develop a new vision for teaching and learning mathematics in Malawi in which children experience mathematics as a meaningful, sense-making and problem-solving activity. Learners will be expected not only to know mathematics but also to understand the mathematics they know, apply it to solve unfamiliar problems, and reason and argue using the mathematics they develop.

The NNP is being implemented in three phases: inception, pilot, and scale-up. During the initial inception phase, the project developed:

- A vision for mathematics teaching and learning in Malawi;
- New teaching and learning materials for standards 1–4 for piloting;
- A plan for revising the curriculum and syllabus; and,
- A training methodology for piloting.

The pilot phase, which took place during the 2022 school year, involved piloting new materials and teacher training approaches in 200 schools across all divisions of Malawi.

### EVALUATION METHODS AND LIMITATIONS

The evaluation of the NNP pilot phase was conducted by US-based School to School (STS) with the Malawian Centre for Educational Research and Training (CERT) managing all in-country data collection. The evaluation used a mixed-methods, pre-post approach and a quasi-experimental design.

The Early Grade Mathematics Assessment (EGMA) was used to capture learners' numeracy skills. In addition, a range of quantitative tools as well as several qualitative tools were administered at

both baseline and endline. Treatment and comparison schools were sampled using a three-stage clustering random method.

The evaluation of the pilot had some limitations. The short time frame, 24 school weeks, for the evaluation between baseline and endline which amounts to no more than two-thirds of a typical school year in Malawi contributes to reduced variation in the data across timepoints.

In addition, the EGMA findings need to be interpreted with some caution. First, because the tool was administered to learners in a group-setting, and second, there are concerns regarding group administration with younger learners in standard 1 and 2 due to challenges with understanding task instruction and producing a written output.

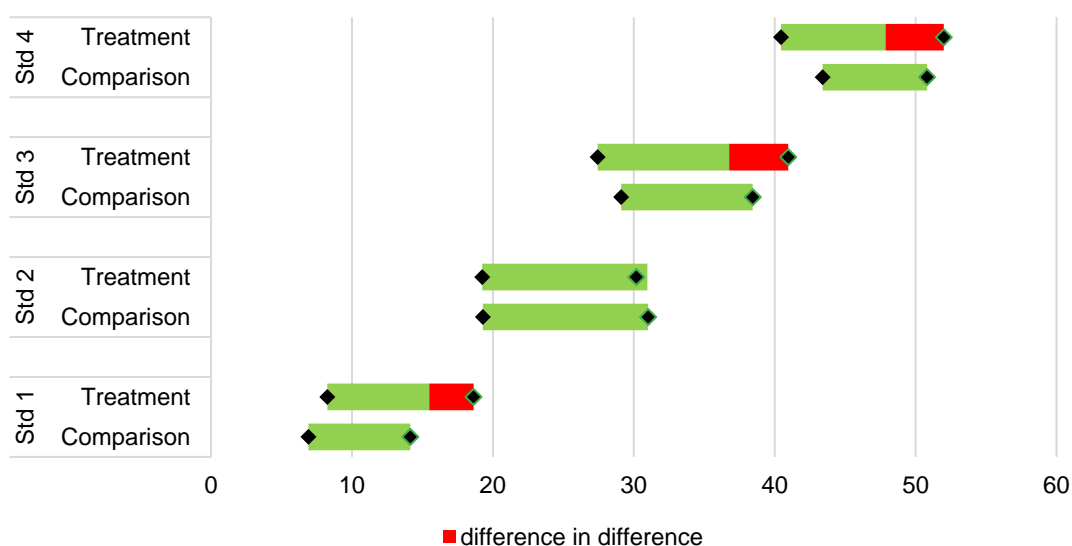
## FINDINGS AND RECOMMENDATIONS

### EGMA Findings

Using a difference-in-differences (DID) the average gain in EGMA scores for learners in treatment schools was compared with the respective gain in comparison schools from baseline to endline (approximately 24 weeks). Based on this analysis the change in EGMA for learners in treatment schools illustrated in Figure 1 changed by:

- Standard 1: 3.154 points (by 43% of the baseline score)
- Standard 2: -0.789 points (by -6% of the baseline score)
- Standard 3: 4.056 points (by 43% of the baseline score)
- Standard 4: 4.084 points (by 52% of the baseline score)

**Figure 1: Baseline to endline difference in difference analysis**



With the exception of standard 2, where no impact was detected, the gains that learners in treatment school achieved would have taken learners in comparison schools:

- Standard 1: an additional 20 weeks (47% of a school year) to achieve
- Standard 3: an additional 18 weeks (42% of a school year) to achieve
- Standard 4: an additional 20 weeks (47% of a school year) to achieve

Achievement targets for the NNP were developed in terms of Cohen's  $D$ <sup>1</sup>. Based on the short duration of the intervention (24 weeks) the NNP set a target of a mild to moderate impact in at least two standards. The target was achieved in three standards: standards 1, 3 and 4.

### Findings from interviews and classroom observation

Analysis of the teacher and learner questionnaires and classroom observation data found that:

- **At the endline teachers and learners at treatment schools reported more positive views about their engagement with NNP materials.** A greater proportion of both teachers and learners at endline than baseline reported that workbooks were enjoyable for learners to use, as well as easy to use. This finding may be related to several factors, including that classes have covered more material at endline and/or that teachers' and learners' increased familiarity has made them more confident in their engagement with materials.
- **Some learners continue to have difficulty understanding English in their workbooks.**
- **Nearly all teachers at treatment schools said they believe they are teaching mathematics differently due to NNP.** At endline 99.5% reported that the NNP had changed their approach to teaching mathematics.
- **The vast majority (87.5%) of teachers in treatment schools are delivering NNP lessons with fidelity.**
- **Teachers in treatment schools displayed a significantly higher quality of mathematics teaching compared with the teachers in comparison schools.** According to classroom observation data, teachers in treatment schools demonstrated a higher quality of instruction than teachers in comparison schools with respect to the extent to which they discussed mathematical methods and procedures and explained why they worked (methods/procedures); the extent to which they connected individual problems or examples (connections); and the extent to which they asked learners to provide responses in class (justification of learner response).
- **Significant differences in classroom practice emerged between teachers at treatment and comparison schools when they reflected on learning with learners.** Significantly fewer teachers in treatment schools told learners what they expected them to notice. And, significantly more teachers in treatment schools built on learner responses by asking them to explain how their observation helped them to complete the task. These findings indicate that reflection activities may be more profound in treatment schools, with active listening and learning from others more encouraged.

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<sup>1</sup> Cohen's  $D$  is often used to determine the size of the effect observed during an experiment. Typically, the values of Cohen's  $D$  are categorized as small ( $D = 0.2$ ), moderate ( $D = 0.5$ ) or large ( $D = 0.8$  or above). The sample size used in this independent evaluation only allows the detection of an effect that is 0.35 SD or greater (i.e. between a small and moderate treatment effect).

- **At endline:**
  - **Teachers credited training with providing them with the knowledge they needed to implement the NNP. This was corroborated by the NNP trainers.**
  - **A greater proportion of teachers (47.8% vs. 28.4% at baseline) agreed that the NNP teacher guide is 'easy to use.'**
  - **Most teachers (66.9% vs. 49.6% at baseline) said they felt prepared to implement the NNP.**
- **While nearly all teachers viewed the training videos as an asset, many teachers felt that the videos were not representative of their classes, with the videos featuring small classes with many high-performing learners.**

### Recommendations

- **Conduct an investigation to better understand why learners in treatment schools significantly outperformed their peers in comparison schools for specific mathematics skills and not as much on others.**
- **Make efforts to understand the reasons why, at endline, fewer teachers and learners believe the materials are difficult for learners.** Data collected to answer this question could inform efforts to mitigate the proportion of learners and teachers who may have initial difficulty with materials at scale-up.
- **Research the difficulties that some learners have with mathematics being taught in English.** More data is needed to determine the extent to which learners have issues with English as the language of instruction, including possible effects that this may have on EGMA performance
- **Identify possible enhancements to the training videos as well as access to appropriate devices by teachers to improve their ability to use them.**