KWARA LEARN
LEADING EDUCATION ACHIEVEMENT & REFORM NOW

Measuring the Continued Progress of KwaraLEARN

Evidence from government schools in Kwara State by the end of the 2023-24 school year after 2 years and one term of programme implementation

Dr Henry Owolabi, Sylvester Mchihi, Keuna Cho, and Priscilla Lu

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Executive Summary

To elevate learning outcomes across the state, the Government of Kwara launched KwaraLEARN in May 2022 as a comprehensive programme that supports all aspects of public Primary education.

By the end of the 2023–24 school year, the programme has expanded state-wide to serve more than 186,000 pupils from 1,599 schools across all 16 LGAs.

After 2.33 years of KwaraLEARN, end-of-year learning levels in literacy and numeracy are substantially higher than they were before the programme.

- In Primary 4, reading fluency rates increased by 15 cwpm – amounting to a gain of an additional 1.6 years of schooling.
- In nearly all grades, there are fewer non-readers than there were before the programme.
- Average ICAN scores increased by 12 percentage points – amounting to a gain of an additional 1.33 years of schooling.
- Improvements were seen for both simple operations, like addition without carrying or subtraction without borrowing, as well as for more complex operations, like addition with carrying and subtraction with borrowing.

There were large increases in enrolment in the original cohort of schools that joined KwaraLEARN in 2022 – 24% in Primary and 46% in Progressive schools.

Prior to the launch of the programme, the public Primary education system was experiencing a severe learning crisis.

27% of Primary 4 pupils could not read a single word from a class-level passage. In maths, **60% of Primary 4–6 pupils could not correctly answer two-digit subtraction problems** like 78 – 29, even though this skill should have been mastered by Primary 2, according to Nigerian Educational Research and Development Council (NERDC) curriculum benchmarks.

KwaraLEARN is supporting growth in both Primary-model and Progressive-model schools.

Progressive schools began with much lower learning levels than Primary schools, but demonstrated similar patterns of growth.

After large gains at the launch of the programme, learning levels are being maintained year-on-year.

- Previous studies found rapid progress during the first 10 weeks of the programme and the strong growth in the subsequent school year. Now, longitudinal monitoring finds that end-of-year learning levels are being maintained year to year.
- Programmatic improvements – such as a more cohesive English syllabus, more precise targeting of instructional levels, and coaching teachers to preview lessons – are under way in order to drive greater learning gains in 2024-25 and beyond.

2.33 Years of the KwaraLEARN Programme, In Numbers

1.6 years

Reading fluency gains equivalent to an additional 1.6 years of schooling for Primary 4

24%

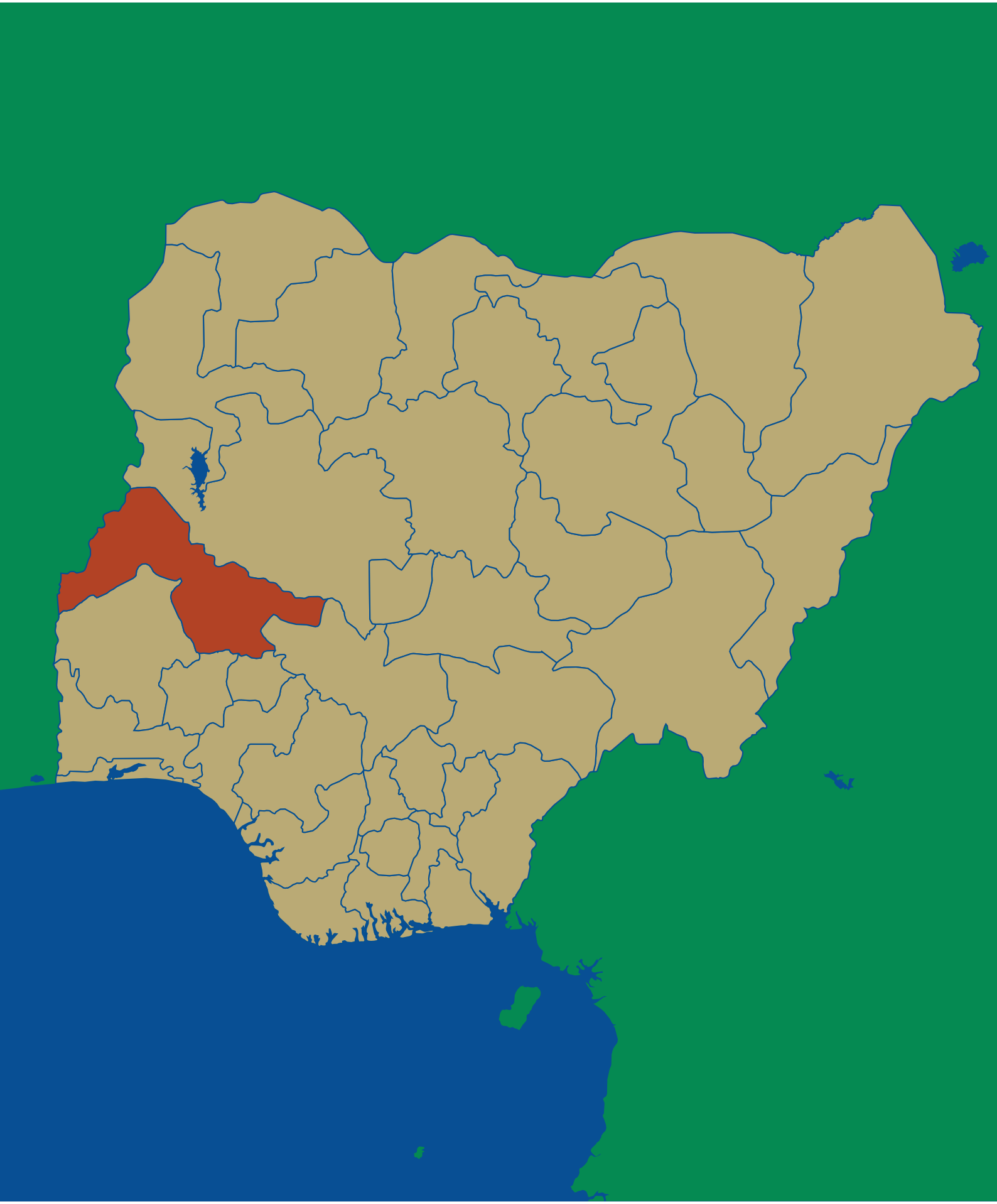
24 percentage point reduction in non-readers at Progressive school

1.33 years

Mathematics gains equivalent to an additional 1.33 years of schooling

24%

Enrolment increased by 24% in fully-staffed schools, and by 46% in Progressive schools



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I. Preamble

Foreword from Governor AbdulRahman AbdulRazaq

Education is of paramount importance for prosperous development. With a strong educational foundation, the children of Kwara State will be able to navigate a knowledge-based economy and engage competitively with their peers worldwide. Recognising this, my administration has highly prioritised education, investing heavily in policies and programmes that improve the public education system as a whole. Through our steadfast commitment to education, we are paving the way for children in Kwara State – now and in the future – to acquire the knowledge and skills necessary to thrive as individuals and as contributing members to their communities.

In our pursuit to build excellence in the state's government schools, my administration launched the Kwara Leading Education Achievement and Reform Now (KwaraLEARN) programme. KwaraLEARN is a holistic initiative that targets every aspect of the basic education system. It combines a scientifically backed curriculum, training and support for teachers, and integrated technology in classrooms as well as system-wide management. By improving the quality of teaching and learning, and by increasing the efficiency of the public Primary education system, KwaraLEARN works on multiple levels to propel our education system towards exceptional learning outcomes.

First implemented in April 2022, KwaraLEARN initially spanned 365 public Primary schools across four LGAs. Now, after more than 2 years of implementation, the programme is operating in 1,599 schools across all 16 LGAs in the state, and has provided robust training to over 7,000 teachers who are now equipped with the tools and skills to facilitate effective learning for children. In the 2023-24 school year alone, more than 186,000 children benefitted from the programme.

Most importantly, the programme has achieved tangible results. Children from every corner in the state who, in the past, could not read a single word, are now taking off in their learning journey. They are displaying improved mathematics skills. Teachers are more consistently present in classrooms than they were before the programme. Officials of SUBEB are able to monitor teacher accountability, thanks to the technology-equipped "situation room" installed in the SUBEB office. I am proud to say that the impressive achievements of the Kwara State public Primary schools have been featured on several world stages, including the 2023 United Nations General Assembly and the 2024 Education Ministers Conference of ICESCO (Islamic World Educational, Scientific, and Cultural Organization).

For the great achievements of this programme so far, I must commend the enthusiasm and commitment of the entire Kwara State Universal Basic Education Board (SUBEB), captained by the able chairman Professor Shehu Raheem Adaramaja. I also commend the immense contributions of the Ministry of Education and Human Capital Development, under the helm of the Honourable Commissioner, Hajia Sa'adatu Modibbo Kawu. They have shown a great determination to undertake all that is required to bring about the most profound changes to Kwara's education system in a generation. Many thanks to all the teachers, children and parents of the KwaraLEARN schools, for their trust in us. I commend their willingness to work with the government and our technical partner to transform the public education sector in our state. My final thanks goes to NewGlobe Educational Services International, our technical partner, who have availed Kwara State of their renowned technology-enabled methods.

The findings of this report are exciting and encouraging. They provide detailed insight into the tremendous strides that have been made thus far, and affirm that our dedicated efforts have already yielded fruit. At the same time, this report tells us that there is still much work ahead, and identifies areas for further improvement. Our children are the future entrepreneurs, innovators, and leaders of Kwara and of Nigeria, and we will not cease our work until they have every tool necessary to realise their full potential. It is my hope that you will find the report useful in your assessment of the progress that the Government of Kwara State is making to deliver excellent education to all of our children.

AbdulRahman AbdulRazaq
Governor, Kwara State

Acknowledgements

This study owes its successful completion to the support and instrumental contributions of many people. First, we would like to thank The Executive Governor of Kwara State Mallam AbdulRahman AbdulRazaq for his commitment to the transformation of public education in Kwara and for creating an enabling environment for us to conduct this study. We sincerely appreciate the Executive Chairman of the Kwara State Universal Basic Education Board (KWSUBEB) Professor Shehu Raheem Adaramaja and his entire team, as well as Honourable Commissioner for Education and Human Capital Development Hajia Sa'adatu Modibbo Kawu and Permanent Secretary of the Ministry of Education and Human Capital Development (MOEHCD) Mrs Rebecca Olanrewaju Bake for the partnership and guidance they provided throughout the planning and execution of this study.

Many thanks to the Director Planning, Research and Statistics for KWSUBEB Alhaji Abdulkadir Zakariyau and the KWARA SUBEB desk officer for KwaraLEARN Mrs Ahmed Salimot Adeoti for their commitment to the rigorous process of our measurement and evaluation system. We would also like to thank all school head teachers and teachers who welcomed the study teams into their schools and classrooms. We are grateful for the input and guidance of Dr Shannon May, Tim Sullivan, Savannah Tierney, Marlee Mullane, and the entire KwaraLEARN team including Laide Abel, Femi Oyinloye, Segun Sanusi, and Gbenga Oyebajo.

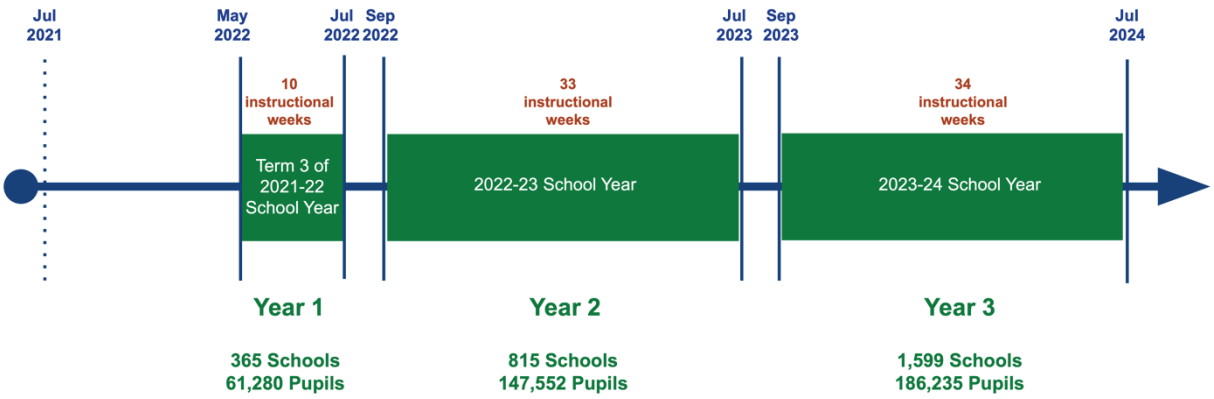
Finally, we owe our deepest gratitude to the field team, the backbone of this project: Oladayo Olaluwoye, Peter Falohun, Ridwanullahi Idress, Mikail Masud Olawale, Sheriff Awokunle, Otusanya Moyosola Joseph, Opayinka David, Olawepo Hajarat, Arowana Sulaiman Alabi, James Adewale, Yahaya Joke Kudirat, Omotayo Mudashiru, Yusuff Adewole Rasheed, Ahmed Salimot Adeoti, Abdulkareem Adekunle Olayinka, Yusuf Aliyu Balogun, Faruq Busaeri Elega, Abdullahi Muhammed, Nureni A Sharafadeen, Abdulrasheed Bukola Balliyqiz, Kareem Abduraufu, Abolarin Grace Aramide, Olabanre Funmilola O, Agboola Islamiyat, Hannifah Omolara Balogun, Idowu Funmilayo, Adeyemi Omobola, Aminu Munirat, Bilkis Raheem, Oluwabunmi Fahuwa and Adulsemiu Zuliyat.

II. Introduction

Overview of KwaraLEARN

The Kwara State Government put forth a bold vision to transform the quality of public education across the state by launching the Kwara Leading Education Achievements Reform Now (KwaraLEARN) programme in May 2022. A comprehensive, coherently designed programme that strengthens all aspects of public Primary education, KwaraLEARN establishes a framework for effective management of the education system, improves teachers' pedagogical skills and professionalism, and raises pupils' learning levels across all subjects through adaptive approaches and a focus on foundational learning. (For a complete description of the programmatic elements that comprise KwaraLEARN, see Appendix B). Since its launch, the programme has undergone large-scale expansion, and now reaches more than 186,000 pupils in nearly 1,600 schools.

Timeline of Programme Expansion



Prior to the launch of KwaraLEARN, foundational learning levels were extremely low. The majority of pupils could not read at all; nearly three-quarters (74%) of Primary 1 pupils were unable to read a single word from a grade-level passage ("non-readers"), and even by Primary 4, more than one-quarter (27%) were non-readers. Most pupils were also unable to solve maths problems using age-appropriate subskills. For details, see Appendix G.

Since the launch of KwaraLEARN in May 2022, dramatic improvements have been seen across educational outcomes. At the end of the 2021-22 school year, after the first 10 weeks of the programme, the percentage of non-readers was reduced by 33%. By the end of the following (2022-23) school year, after a total of 43 weeks of the programme, there were large gains in foundational literacy and numeracy; Primary 4 pupils were reading as fluently as Primary 5 pupils had been reading before the programme, and across most numeracy skills, KwaraLEARN pupils were doing better than their peers one grade ahead before the programme. There were improvements in operational metrics as well, such as increases in pupil enrolment, teacher attendance, quality of instruction, and complete delivery of lessons. These achievements have been documented in previous reports.

Measuring the Impact of the Programme

A key component of the KwaraLEARN programme is the systematic monitoring of the gains achieved across educational outcomes and the identification of areas that require further attention. To track the progress achieved from the programme's launch through the end of the 2023-24 school year, this study longitudinally follows the initial cohort of schools that joined KwaraLEARN in May 2022. For full methodological details, see Appendix C.

Within the 32 schools that were visited, a representative subsample of pupils – roughly 40 pupils per school, or 7 per grade – were assessed on foundational literacy and numeracy, for a total sample of 1,254 pupils. For each grade, pupils' learning levels at the end of the 2023-24 school year are compared to levels that would have been observed for their grade-level peers before the programme. In addition to assessments of pupil learning, data were collected on operational metrics such as enrolment, pupil attendance, teacher attendance, and teachers' complete delivery of lessons ("lesson completion"). Responses to structured interviews from teachers, head teachers, pupils, and parents are also included.

The Current Study

This study documents educational outcomes observed through the end of the 2023-24 school year. As the following sections of this report will demonstrate, KwaraLEARN has had a positive impact across a wide range of educational outcomes thus far. Unless otherwise noted, the main results in this report are for schools that are fully staffed – that is, those that are employing a one-teacher-one-classroom ("Primary") model where pupils in a given classroom are all at the same grade-level, in accordance with official state policy. As a temporary support for schools that are understaffed, KwaraLEARN implements a multigrade ("Progressive") teaching model (see Appendix B for details); their results are summarised in a separate section.

III. Cumulative Programme Impact

As of the conclusion of the 2023–24 school year, there has been remarkable progress across educational outcomes. Longitudinal monitoring reveals that the **average learning levels achieved in each grade at the end of the 2023–24 school year, compared to end-of-year levels achieved in the same grades before the programme** (i.e. 2021)**, are substantially higher**. Notable achievements include higher reading fluency rates and lower shares of non-readers in most grades, as well as higher mathematics scores. These improvements attest to the positive impact of the programme – **after 2.33 years of implementation, KwaraLEARN has strengthened schools' effectiveness so that each rising cohort of pupils is achieving higher than the last**.

> *I am excited because I always understand what we are being taught.*
>
> - Pupil L, Akerebiata LGA

> *They motivate us when we answer questions correctly, and our teachers come to class more often."*
>
> -Pupil N, Ilorin South

> *Teaching and learning is now very interesting as there is a strong connection between between the lesson guides, the curriculum, and the textbooks, which aids easy lesson delivery for teachers and better understanding for learners.*
>
> -Head teacher U, Ilorin South

Foundational Literacy

Average reading fluency rates have increased across classes

At the end of the 2023-24 school year, pupils can read more fluently than their peers before the programme. Average reading fluency scores are now 7 cwpm higher than before the programme (not shown), and improvements were seen across grades. For example, a typical Primary 4 pupil is now reading nearly 15 more cwpm of a Primary 2-level passage than a typical P4 pupil would have at the same point in the year before the programme (Figure 3.1) – which amounts to an additional 1.6 years' worth of learning. Results were similar when pupils were assessed using grade-level passages (see Appendix H, Figure H.1).

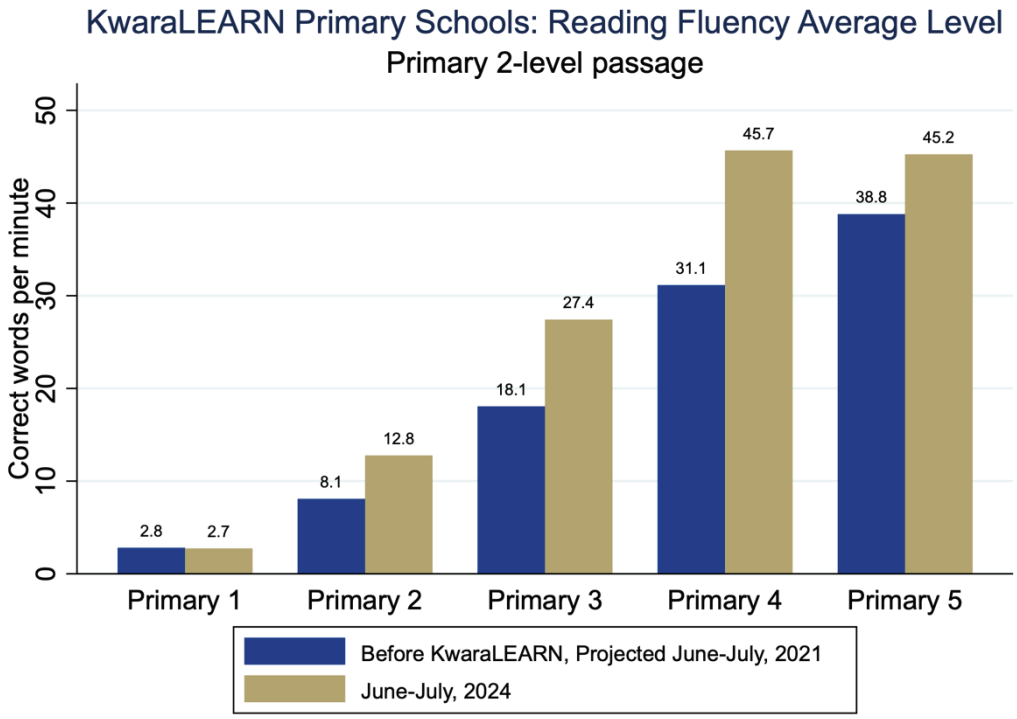


Figure 3.1

Not only were there sizeable gains since before the programme for most grades, but absolute levels as of the end of the 2023-24 school year are approaching important thresholds. For example, pupils in Primary 4 and 5 are now reading ~45 cwpm, a rate of fluency at which children can begin to comprehend what they read (Abadzi, 2011).

I can now read fluently.

-Pupil E, Akerebiata LGA

There are good academic interactions between the teachers and learners. Due to that, it helps the learners in terms of pronunciation in English.

-Teacher C, Moro LGA

We are impressed by the new methods of KwaraLearn because pupils are now able to read and answer independently.

-Teacher B, Ilorin West

The proportion of non-readers in a typical classroom has decreased

Across grades, there are now fewer non-readers than there were before the programme, by 7.3 percentage points. There has been a reduction in non-readers in most grades; for example, the share of non-readers in a typical P3 classroom at the end of the 2023-24 school year is 16 percentage points lower than in a typical P3 classroom before the programme (Figure 3.2). Results are similar when pupils were assessed using grade-level passages (see Appendix H, Figure H.2).

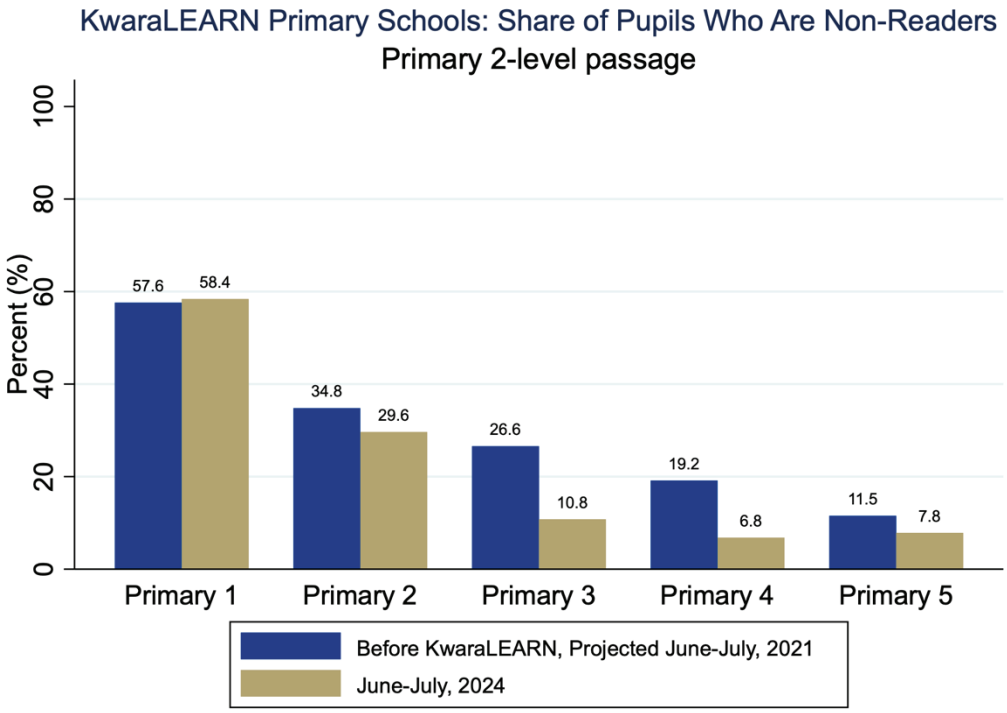


Figure 3.2

Foundational Numeracy

Pupils' foundational numeracy proficiency has substantially improved

Average ICAN scores in each grade are higher at the end of the 2023-24 school year than they were before the programme (Figures 3.3-3.4). In fact, for most grades, pupils are now scoring higher than their peers one grade level above had before the programme. For example, a typical P3 pupil at the end of the 2023-24 school year is far outscoring a typical P4 pupil at the end of the 2021-22 school year – and in fact is performing nearly as well as a typical P5 pupil had at that time.

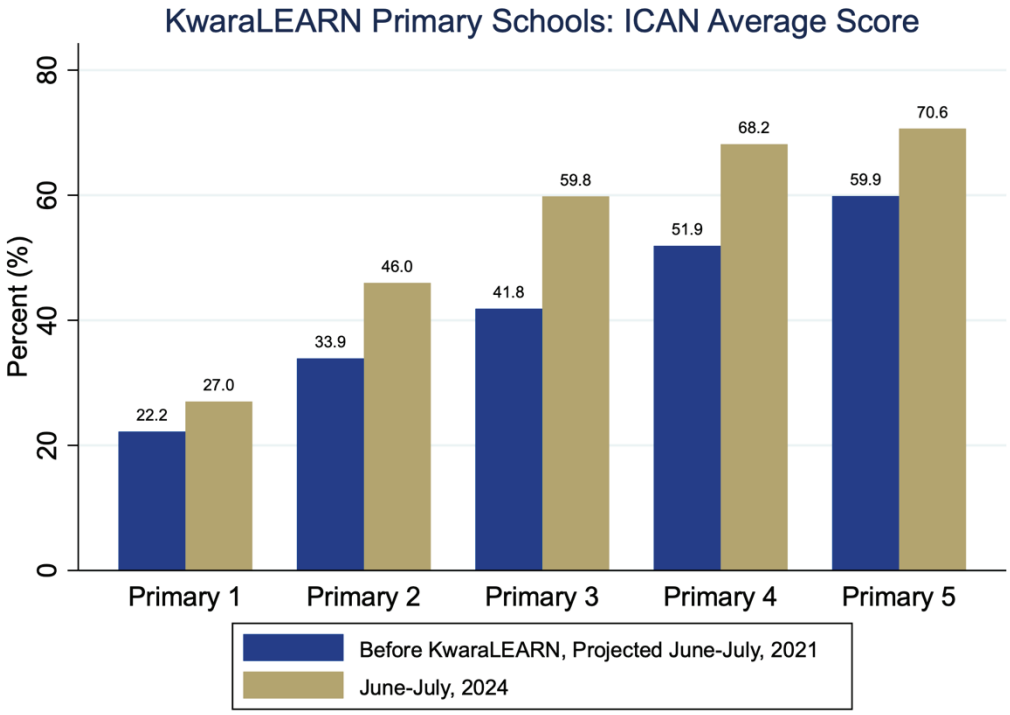


Figure 3.3

Increases in ICAN scores were driven by improvements in both simple and more complex skills (for complete results across all grades, see Appendix H, Figure H.3-H.4). For example, on simple operations such as 9÷3 (i.e. exact, one-digit short division with no remnant), a typical P3 pupil at the end of the 2023-24 school year scored 32 percentage points higher than P3 pupils did before the programme – nearly double (Figure 3.4). To put these results into context, an 8 percentage-point gain on the ICAN is the equivalent of "levelling up" one subskill – for example, going from being able to recognise numbers (but unable to perform more complex skills) to being able to add single-digit numbers. Therefore, a 32 percentage-point improvement is tantamount to gaining four additional subskills.

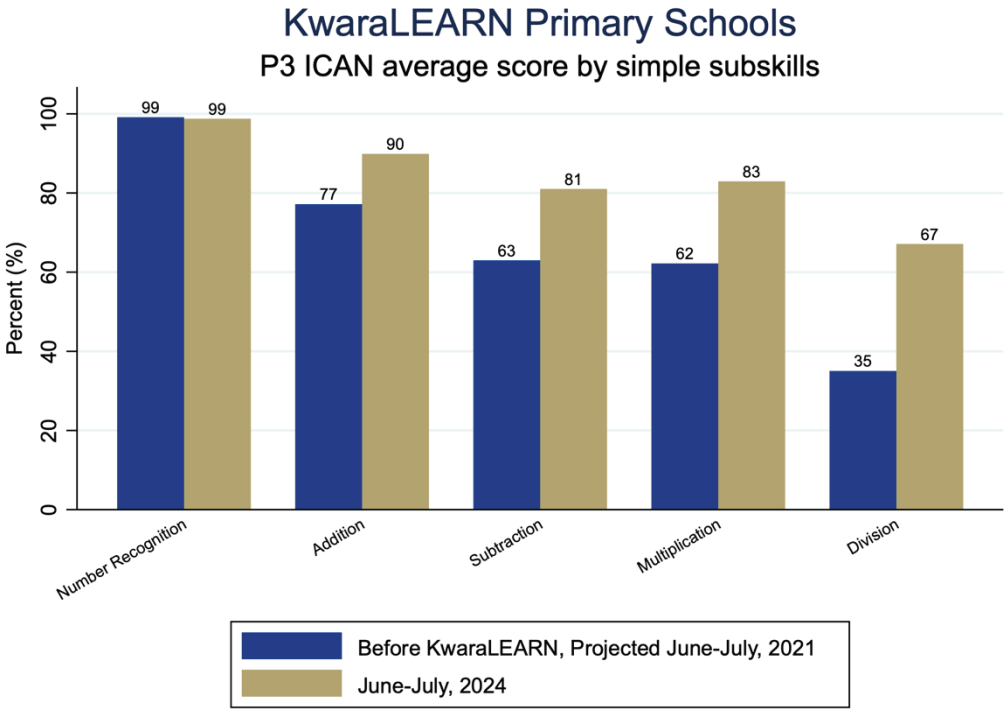


Figure 3.4

Given that this type of simple division is a skill that Primary 3 pupils should master, both according to global proficiency standards as well as the NERDC (see Appendix E), these results demonstrate that the KwaraLEARN programme has been successfully propelling pupils towards meeting curricular expectations.

> *There is a clear improvement most especially in mathematics.*
>
> -Teacher I, Edu LGA

On slightly more complex operations such as 93÷7 (i.e. short division of a two-digit dividend by a one-digit divisor with a remnant), a typical P4 pupil at the end of the 2023-24 school year scored 21 percentage points higher than P4 pupils before the programme (Figure 3.5). This is an increase of more than fourfold – which, given the low levels before the programme, represent huge strides.

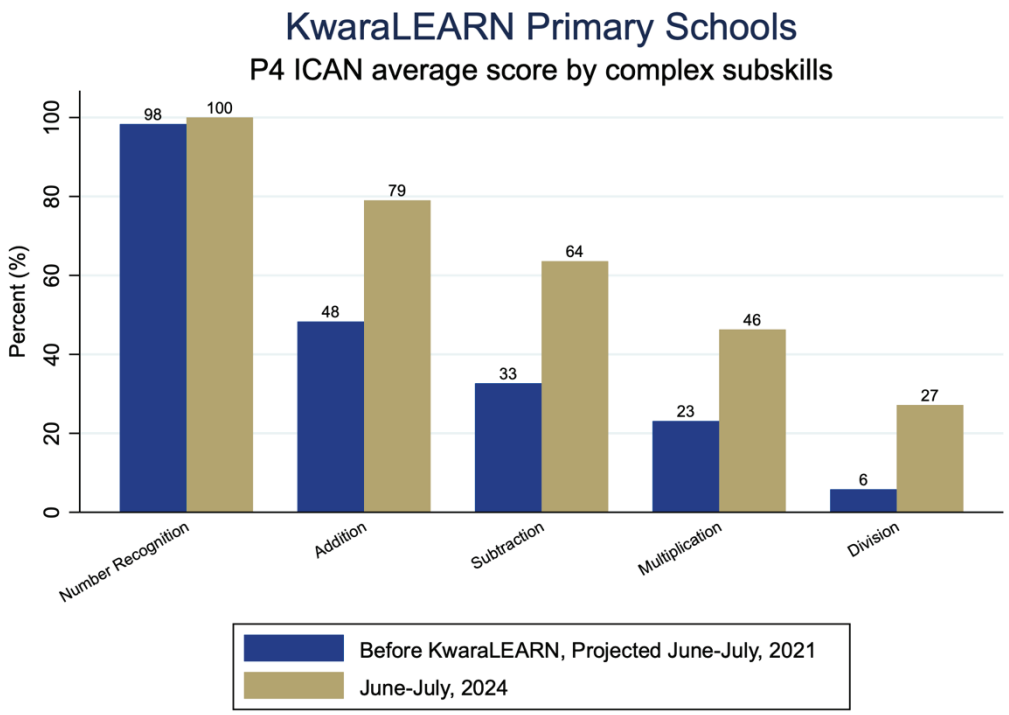


Figure 3.5

That said, in absolute terms, the levels achieved by the end of the 2023-24 school year are still short of curricular expectations. The NERDC deems this type of complex division to be a skill that Primary 4 pupils should master (Appendix E). The fact that Primary 4 pupils are still scoring 27% on this problem, on average, indicates that further improvement is needed if pupils are to meet benchmarks.

Summary of Cumulative Impact

After 2.33 three years of implementation of the KwaraLEARN programme, substantial improvements have accumulated across many aspects of public Primary education. In the original cohort of schools that have been part of the programme since its launch in May 2022, learning levels are considerably higher at the end of the 2023-24 school year than they were before the programme. In other words, KwaraLEARN schools have become more effective than they were three years prior in their ability to guide pupils towards strong end-of-year outcomes.

IV. Additional Insights

Having established the positive overall impact of the programme, it is also helpful to examine trends over time as well as any patterns of variation across subgroups. This section of the study describes year-on-year changes in learning levels and enrolment, results for understaffed schools implementing the Progressive model, and comparisons of results across genders and regions.

Learning Outcomes

Year-on-year trajectories are positive overall

For most grades, there has been a steady upwards trend in end-of-year learning levels since before the programme.[1] For example, average reading fluency levels in Primary 4 began at 31.1 cwpm before the programme, then rose to 34.5 cwpm in 2022, 38.3 in 2023, and 45.7 in 2024 (Figure 4.1). This pattern held true for Primary 2 and 3 as well. In Primary 5, there was a large spike in 2023, after which reading fluency returned to a more moderate – though still higher than 2022 – level. For Primary 1, there was a similar, though smaller, spike in 2023, after which levels were again similar to those seen before the programme.

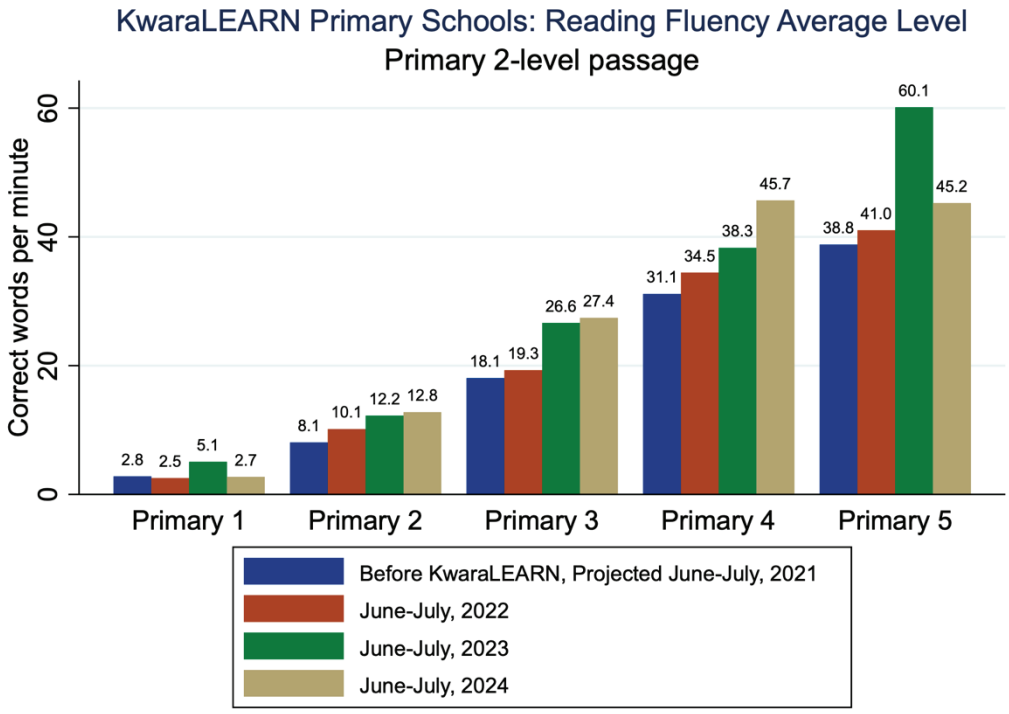


Figure 4.1

[1] Results in this section are for schools implementing the "Primary" (1 teacher : 1 classroom) model; results for Progressive schools are presented in a separate section.

In mathematics, trajectories were positive overall. For example, the average ICAN scores for Primary 3 pupils began at 41.8 before the programme, then rose to 47.5 in 2022, 53.9 in 2023, and 59.8 in 2024 (Figure 4.2). That said, similar to the patterns seen for reading fluency, yearly improvement was not as steady in some grades; for example, for Primary 2 and Primary 5, scores in 2023 were slightly higher than in 2024, though the differences are small. For Primary 1, there was a large spike in 2023 followed by a return in 2024 to more moderate levels, though still higher than before the programme.

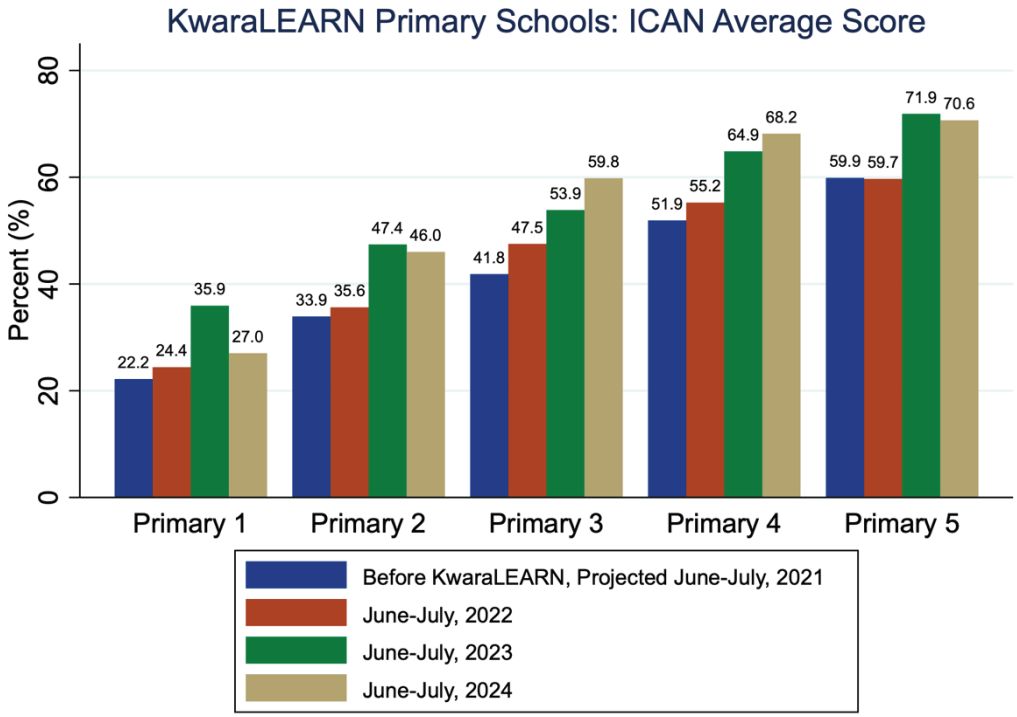


Figure 4.2

As previously stated, the KwaraLEARN programme has undergone large-scale expansion. Even though this report only follows the original cohort of schools that joined at the programme's launch – i.e. it does not include results from schools that have had less time to benefit from the programme – it is still to be expected that the rapid improvements seen during the initial stages of programme should taper off. Indeed, in Kwara State, the 2022-23 school year appears to represent a peak period during which the programme had the largest measurable impacts on learning. After this, the fact that average end-of-year learning levels are continuing to rise in some grades – and are being sustained in others – is a notable achievement.

Gender parity has been maintained

Having established that KwaraLEARN's overall impact has been positive, it is also important to ensure that benefits have been equitable. A comparison of reading fluency and maths outcomes across genders reveals that boys and girls made similar progress between 2021 and 2024 (see Figures 4.3-4.4).

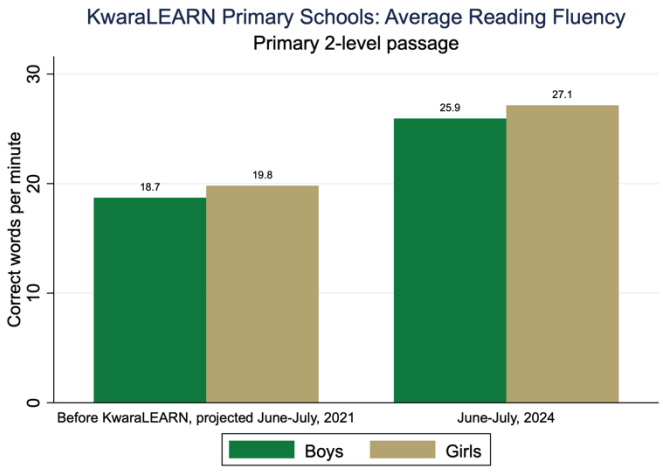


Figure 4.3

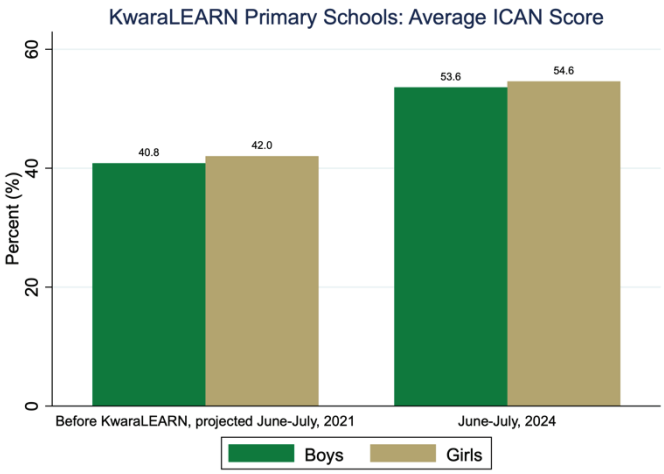


Figure 4.4

Learning outcomes are roughly similar across regions

There were slight differences in learning outcomes across regions. Table 4.1 summarises the changes in learning levels between the end of the 2020-21 school year (i.e. before KwaraLEARN) and the end of the 2023-24 school year, for fully-staffed schools (for results disaggregated by grade, and for Progressive schools, see Appendix H, Tables H.6 and H.7). The three regions (Ilorin East, Ilorin West, and Offa) saw similar improvements in reading fluency between 2021 and 2024, with Ilorin East trailing slightly behind the other two when pupils were tested using grade-level passages. However, Ilorin West had the largest reduction in non-readers, and the largest improvement in ICAN scores. That said, it is worth noting that the variation across regions is smaller than the variation across grades (see Appendix H, Table H.6), suggesting that there may not be any systematic differences in how well KwaraLEARN is supporting learning in one region versus another.

Table 4.1: Changes in learning levels between June/July 2021 and June/July 2024, by region

Subskill		Ilorin East	Ilorin West	Offa
Reading Fluency (Correct words per minute)	Primary 2 passage	8	8	8
	Grade-level passage	4	10	8
Non Readers (Percentage points)	Primary 2 passage	-7	-10	-7
	Grade-level passage	1	-10	-6
Average ICAN Score (Percentage points)		12	17	10

Changes in Enrolment

Enrolment has greatly increased in the original cohort of schools

Enrolment has steadily increased over the years in the original cohort of schools that joined KwaraLEARN in 2022 (Figure 4.5).[2] Since these numbers are for the first cohort of schools only, this means that the increases do **not** reflect additional schools or LGAs being added due to programme expansion. Instead, these enrolment increases – **a 24% average increase across the same set of Primary-model schools followed over three years** – could be the result of more children enrolling who otherwise would not have, or fewer children dropping out who otherwise would have. As a note, similar increases can be seen when the analysis is restricted to the 31 schools in the sample (see Appendix H, Figure H.8).

For system-wide improvements in learning outcomes, not only do schools need to provide high-quality instruction, but pupils also need to be enrolled in those schools to benefit from the instruction. Therefore, this increase in enrolment is in itself a notable achievement. Head teachers and KwaraLEARN staff, when interviewed, reported that as parents became more familiar with the KwaraLEARN programme and its positive impact on learning, some withdrew their children from private schools and enrolled them in public schools implementing KwaraLEARN, and some may have decided to keep their children enrolled when they might otherwise have withdrawn. Thus, the observed increases in enrolment reflect positive perceptions of KwaraLEARN schools by the community, which in turn are driven by positive results achieved in the programme.

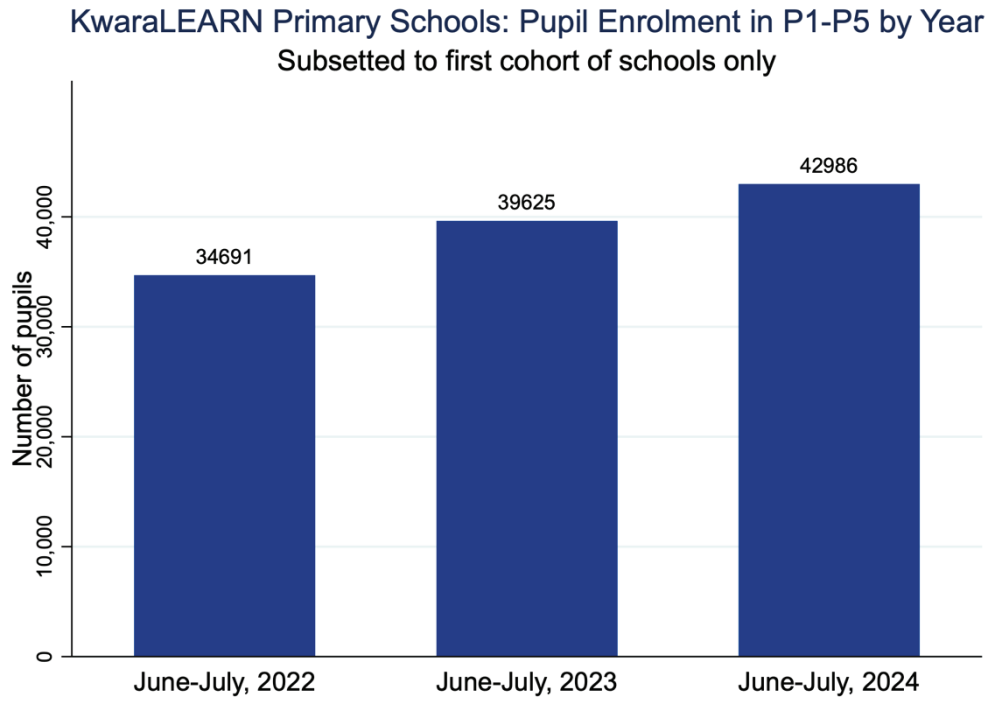


Figure 4.5

[2] Results here are for fully staffed schools implementing the 1 teacher : 1 classroom ("Primary") model. Results for Progressive schools can be found in a later section.

Despite sizeable increases in enrolment – which require that each school, with the same (or similar) resources and capacity as in previous years, has had to serve considerably larger numbers of pupils, likely with a range of levels, and all of whom were new to the KwaraLEARN method – **learning levels at the end of the 2023-24 school year remain similar to those at the end of the previous (2022-23) year**.

A comparison of the distribution of ICAN scores at the end of the 2023-24 school year and at the end of the previous year illustrates that the variability in scores has increased (Figure 4.6). That is, at the end of the 2023-24 school year, there are more pupils **at both ends of the distribution** – high-performers scoring in the 80%-100% range as well as low-performers scoring in the 0%-20% range – than there were at the end of the previous year. Because this study does not track individual-level learning outcomes, it is unknown who the additional low- and high-performers are. However, the increased range of levels in the current year, and the presence of additional high-performers, are clear indications that learning levels are **not** simply stagnating, as the averages-only graph (i.e. Figure 4.1) may seem to suggest.

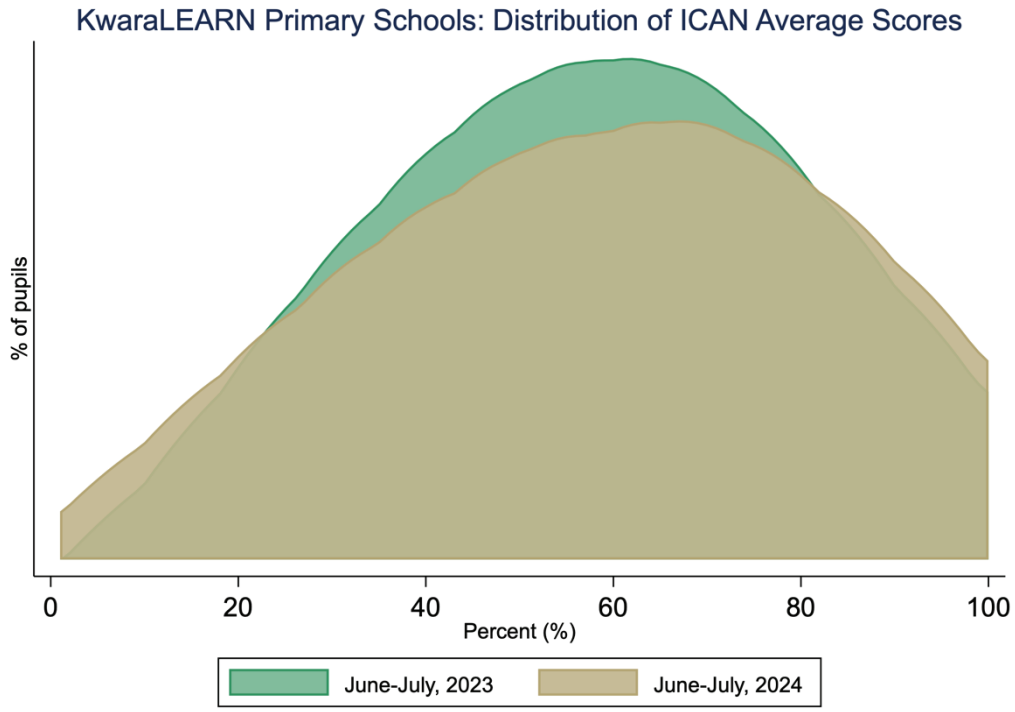


Figure 4.6

Operational Metrics

Having established that KwaraLEARN has successfully maintained positive impact through large increases in enrolment in the original cohort of schools as well as through expansion into new schools in other LGAs, it is also helpful to examine operational metrics – such as teacher attendance, pupil attendance, and lesson completion – to understand how well the programme has been implemented as intended.

Throughout 2023-24, teacher attendance remained high, staying above 90% for much of the year (Figure 4.7). Interviews with pupils confirm that teachers were present when they needed to be, and head teachers have confirmed these improvements as well.

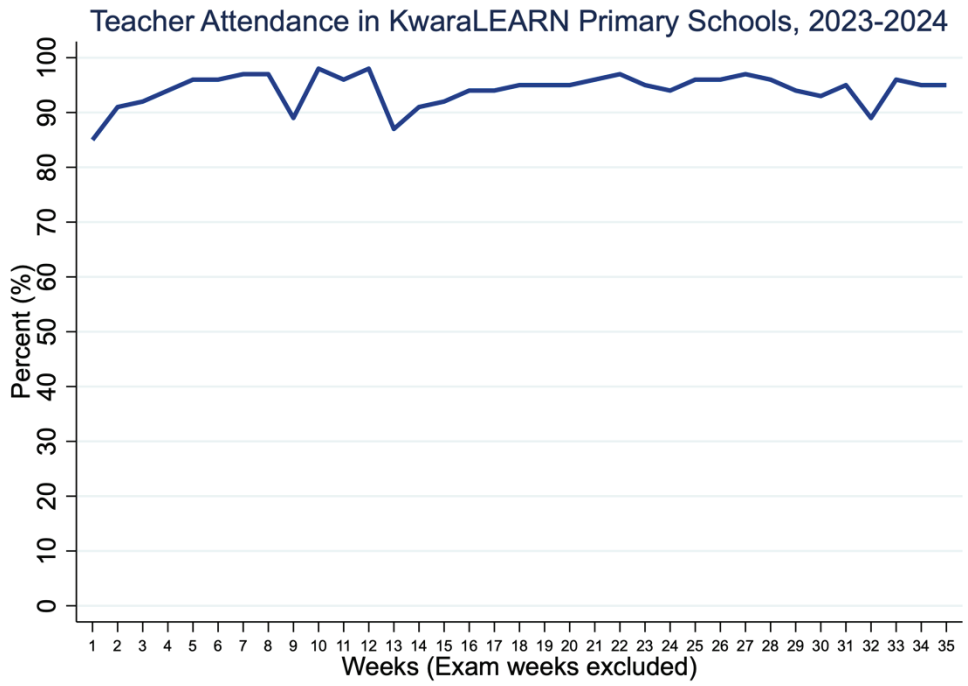


Figure 4.7

> *The teacher does come early, unlike before the KwaraLEARN programme.*
> -Pupil A, Asa LGA

> *[Our teacher] comes to teach us more often than before.*
> -Pupil F, Ekiti LGA

> *The Programme has tremendously made school management easy for us as headteachers. Teachers are now punctual to school and teach more due to less burden of preparing lessons notes while pupils' participation in the classroom has greatly improved.*
>
> -Head teacher A, Ilorin South

In contrast to teacher attendance, pupil attendance was less consistent, starting below 65% and trending slightly upwards overall with a few dips during several points (Figure 4.8). Lesson completion rates were relatively high overall, though they decreased over the course of the year (Figure 4.9).

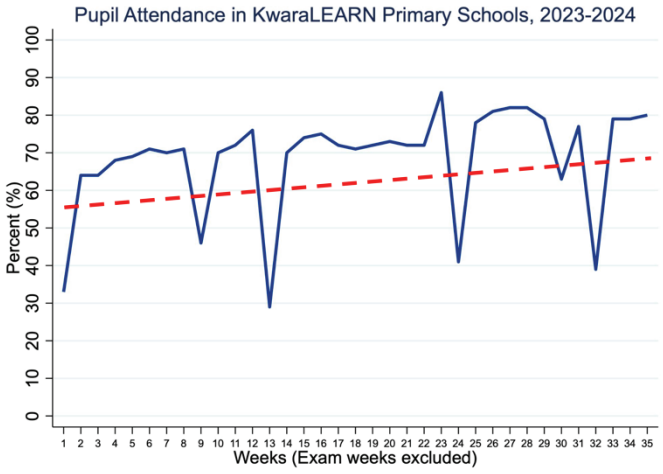


Figure 4.8

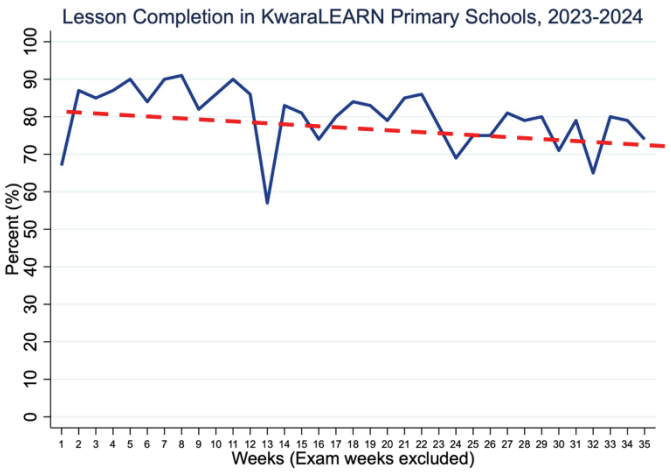


Figure 4.9

Ultimately, the combined patterns of teacher attendance, pupil attendance, and lesson completion resulted in a slight decrease in the amount of instruction that pupils received over the course of the year. For example, the average Primary 4 pupil went from receiving 36 minutes of high-quality English instruction in week 1 to 28 minutes by the final week of Term 3 (Figure 4.10). As a result, the average pupil missed out on 36 hours of high-quality instruction, equivalent to 54 full lessons, compared to if lesson delivery had remained consistent.

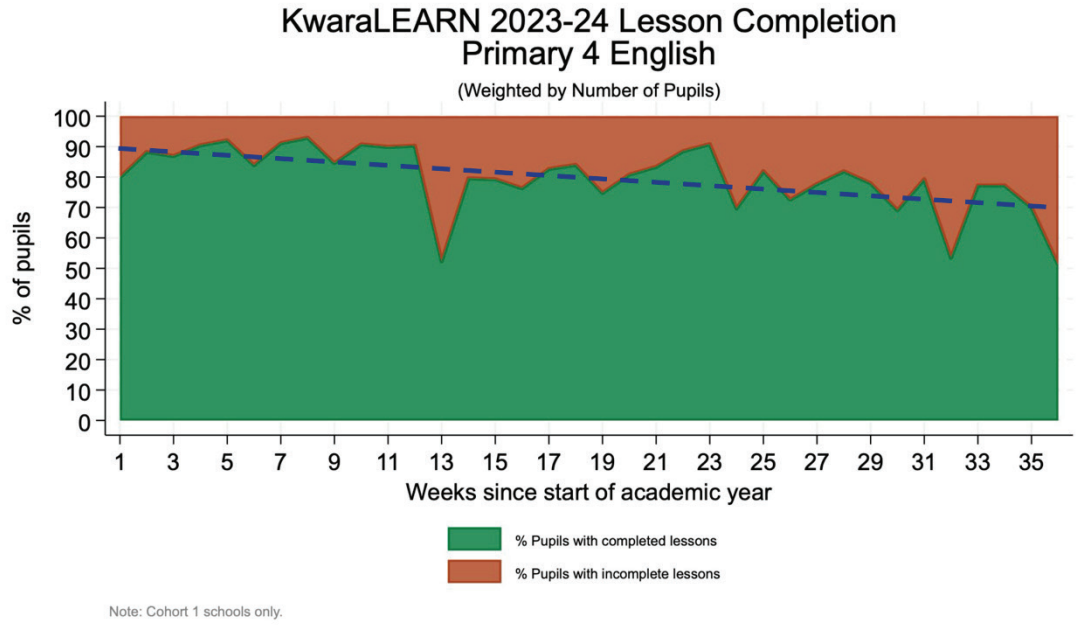


Figure 4.10

Similarly, in Maths, due to steady decreases in lesson completion rates, the average P4 pupil went from receiving 35 minutes of high-quality Mathematics instruction in week 1 to 28 minutes by the final week of Term 3 (see Appendix H, Figure H.9). As a result, the average pupil missed out on a total of 15 hours of high-quality instruction throughout the year, equivalent to 22 full lessons, compared to if lesson delivery had remained consistent.

While it is somewhat expected that a programme might yield the most dramatic results at the beginning of its implementation and subsequently taper in impact over time, it is also evident that in the case of KwaraLEARN, the comparatively lower learning levels (for some grades) observed at the end of the 2023-24 school year as compared to the end of the previous school year may in part be a result of declining lesson delivery rates. Sustaining high fidelity of programme implementation will be crucial in the coming years if KwaraLEARN is to drive educational improvements as designed.

Supporting Understaffed Schools Through a Multigrade ("Progressive") Model

Within the Kwara State public Primary education system, there are schools that have low teacher staffing relative to the number of grades and streams offered. That is, in these schools, there are fewer teachers than streams (groups of pupils in a classroom who would learn from one teacher, typically grouped by grade level). This means they cannot employ the "Primary" staffing model – as is the official state policy – in which one teacher is assigned to a classroom with pupils who are all in the same grade level. KwaraLEARN supports these schools by implementing the "Progressive" model.

While the "Primary" model assigns one teacher per classroom (in which all pupils are enrolled in the same grade), the "Progressive" model uses multigrade teaching, in which classrooms have a single teacher and pupils from two or more grade levels.[3] This ensures that every pupil has a teacher delivering high-quality instruction during every lesson of the day, but creates challenging instructional conditions (especially if the teacher is covering three or more grade-level pupils in a single classroom - which might be the case in schools with even more significant staffing shortages). While the Progressive model is employed so that KwaraLEARN can support even those schools that are not in compliance with state policy, this is a temporary solution. In the medium-term, there must be strategies to adequately staff these schools - including through additional teacher recruitment (and assignment to understaffed schools) and through data-driven teacher reassignment (within acceptable geographic boundaries - for example, within LGAs).

This section describes the progress and challenges observed in Progressive schools – which, before the programme, had much lower average learning levels than fully-staffed schools, and whose progress followed a different trajectory.

[3] In Kwara State, schools implementing multigrade teaching can have as few as one head teacher assigned to a classroom with pupils from all six grade levels.

Learning levels in Progressive schools are higher than before the programme, but have declined after initial bursts

In Progressive schools, reading fluency levels before the programme were much lower than in Primary-model schools, with even the upper grades averaging fewer than 3 cwpm (Figure 4.11, blue bars). At the end of the 2023-24 school year, after 2.33 years of programme implementation, pupils in each grade are reading 1.5 cwpm more than their grade-level peers before the programme (Figure 4.11, gold bars); for example, a typical Primary 5 pupil in a Progressive school at the end of the 2023-24 school year can now read at more than double the fluency rate that a typical Primary 5 pupil in a Progressive school could before the programme (Figure 4.11). However, it should be noted that this is a small amount in absolute terms; this growth only amounts to an additional 2.7 cwpm gained, and the final reading fluency rate of 5 cwpm at the end of the fifth year of school is far from sufficient to enable pupils to engage effectively with written learning materials in any subject.

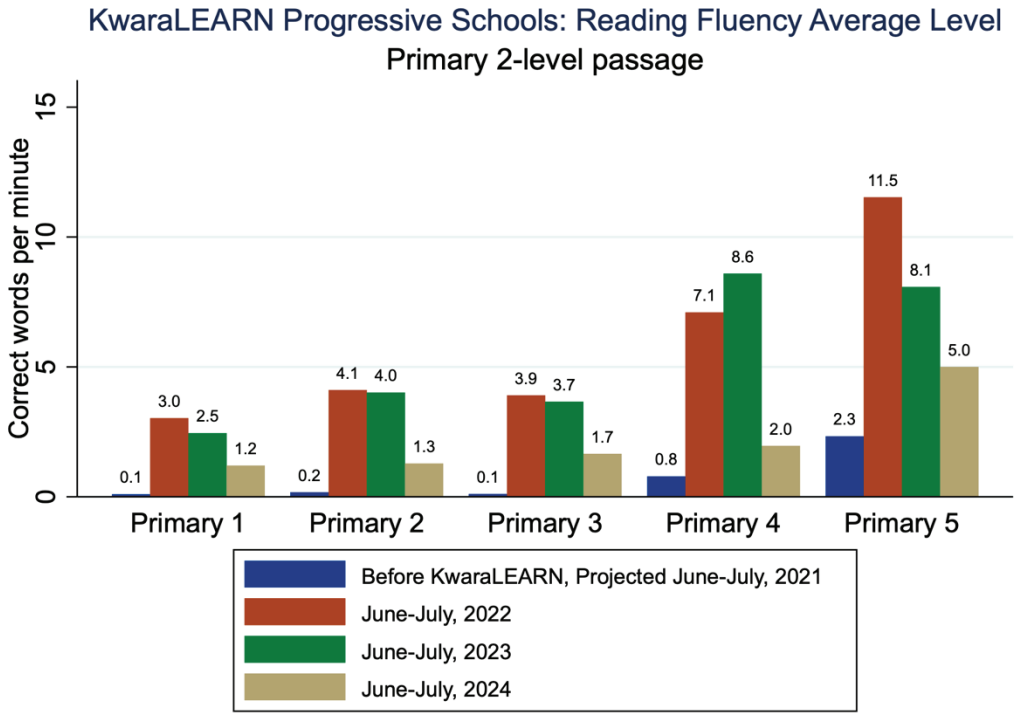


Figure 4.11

Furthermore, end-of-year reading fluency levels in Progressive schools have not risen steadily over the lifetime of the programme, as was observed in fully-staffed schools. Pupils across all grades are now reading less fluently than their grade-level peers could at the end of the previous year; in fact, for all grades except Primary 4, Progressive schools appear to have peaked at the end of the 2021-22 school year. As noted earlier, it is somewhat expected that the rapid improvements seen during the initial stages of a long-running programme should taper off or decline. Nevertheless, the stark difference in the trajectories seen in Progressive schools as compared to those in fully-staffed Primary schools reinforces the need to improve staffing so that all children have access to the education they need.

Despite the fact that improvements in average reading fluency have been quite small, there has been a dramatic reduction in the share of non-readers, which has decreased by 23.6 percentage points overall since before the programme. This is not surprising, given that the vast majority of pupils in Progressive schools were non-readers before the programme. In a typical P3 classroom, the share of non-readers has decreased from 95% before the programme to 59% at the end of 2023-24 (Figure 4.12, blue vs. gold bars); in other words, P3 classrooms in Progressive schools have gone from seeing near-universal illiteracy among its pupils before the programme to now only three in five. While this is still far from the ultimate goal of having every child learn to read, it represents a clear change in the positive direction.

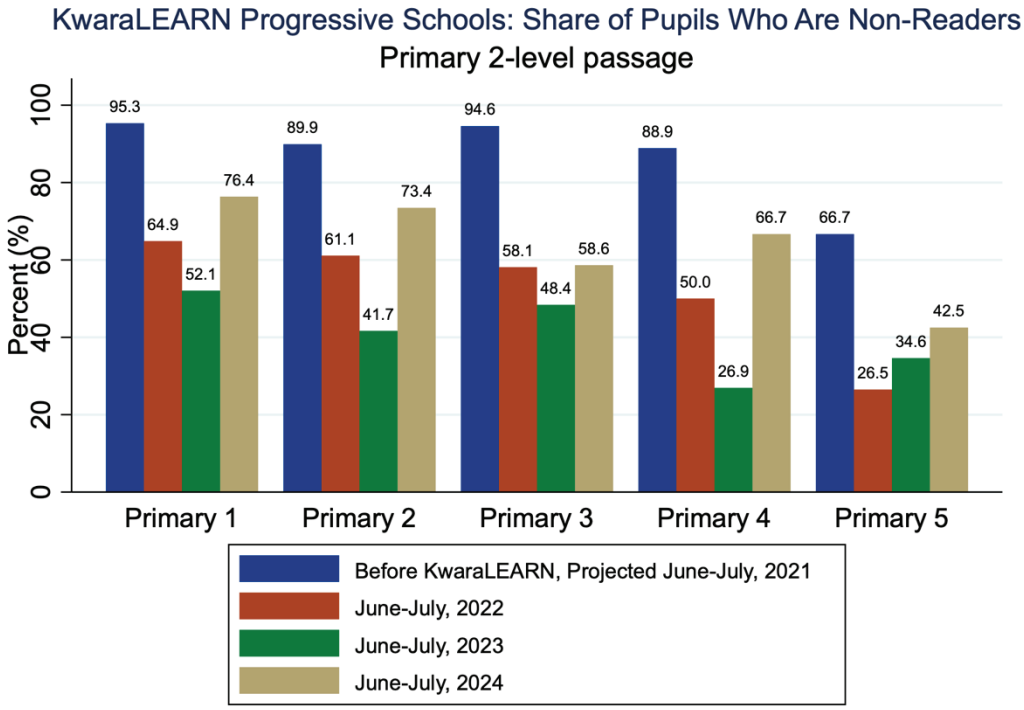


Figure 4.12

Progressive schools saw overall improvement in mathematics as well. Across grades, pupils are outscoring their grade-level peers before the programme (Figure 4.13, blue vs. gold bars). In fact, a typical P3 pupil is now scoring higher on the ICAN than P5 pupils had before the programme.

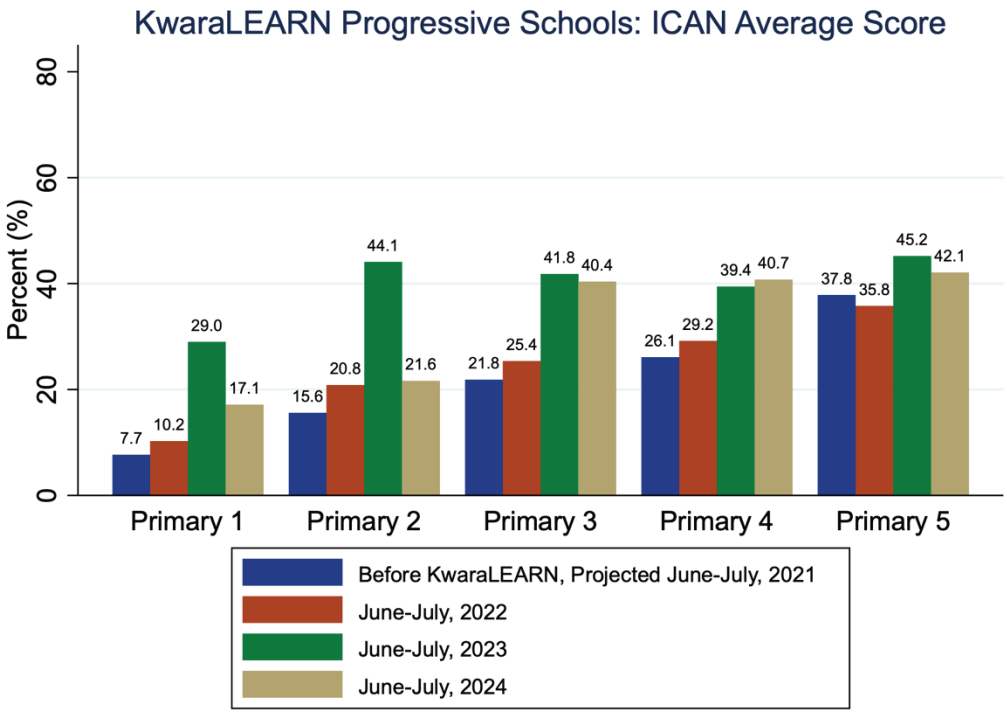


Figure 4.13

That said, end-of-year learning levels have not followed steady upwards trajectories. The programme appears to have supported Progressive schools most effectively during the 2022-23 school year, when pupils in almost all grade levels – particularly those in Primary 1 and 2 – achieved higher end-of-year ICAN scores than grade-level their peers in other school years.

While overall trajectories for mathematics are more positive than those for reading, these results still speak to the need to address staffing shortages so that Progressive schools can eventually operate the 1 teacher : 1 classroom model, as is official state policy.

Huge increases in enrolment in Progressive schools may explain tapering impact

In a trend similar to that observed in Primary-model schools, **enrolment in Progressive schools of the original cohort has increased** over the years (Figure 4.14). In fact, the **increase has been even greater in Progressive schools (46% since 2022) than in Primary-model schools (24%)**. Again, these numbers are for the first cohort of schools only, meaning that the increases do **not** reflect additional schools or LGAs being added due to programme expansion. These enrolment increases – a 46% average increase across the same set of Progressive schools over 2.33 years – likely reflect the community's positive perceptions of KwaraLEARN schools. Additionally, enrolment numbers disaggregated by grade level (see Appendix H, Table H.10) reveal that younger cohorts are larger than older cohorts, and are progressing through the grades as expected. Together, these data represent noteworthy achievements in broadening access to high-quality education.

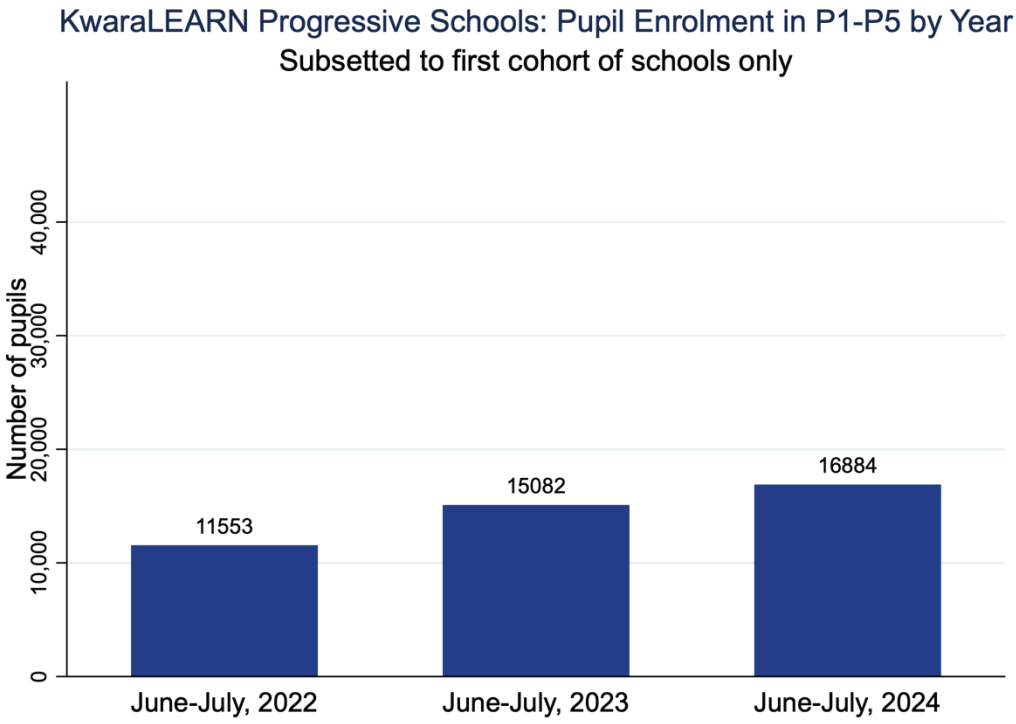


Figure 4.14

That said, in Progressive schools – where staffing is already more sparse than in their Primary-model counterparts, in some cases with just one teacher covering all grade levels – large increases in enrolment are likely to pose an even greater challenge in terms of aligning instructional levels to meet pupils' needs. Given this, it is not surprising that in recent years, overall levels have slightly declined in reading (see Figures 4.11-4.12) and have stagnated in mathematics (see Figure 4.13).

Lesson completion rates were lower in Progressive schools than in Primary schools

Throughout 2023-24, teachers in Progressive schools delivered lessons to completion at a lower rate than did teachers in schools implementing the Primary-model (Figures 4.9 & 4.15). While teacher attendance and pupil attendance in Progressive schools were similar to attendance in Primary-model schools (Appendix H, Figures H.11 and H.12), the markedly lower lesson completion rate in Progressive schools was a likely driver of differences in learning outcomes between the two school types.

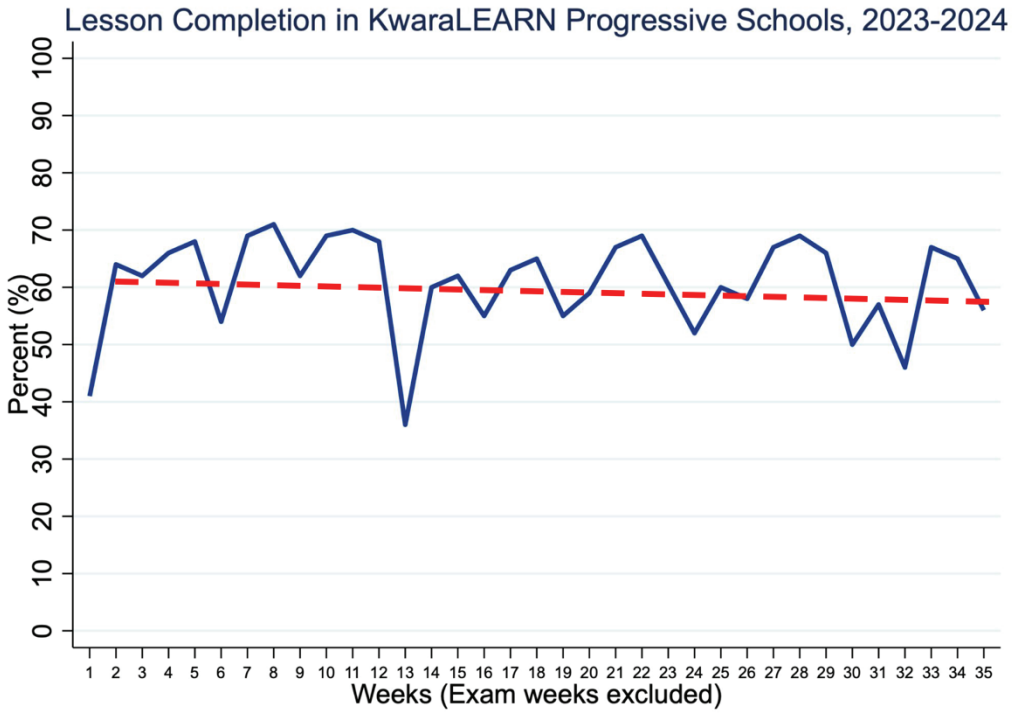


Figure 4.15

The large increases in enrolment – signifying that many pupils are new to KwaraLEARN, or even to schooling – combined with the fact that teachers are not using the instructional supports available to them as much as their peers in Primary-model schools, indicate a clear need for extra support for Progressive schools. First, teacher capacity across Kwara State must be redistributed where possible so that all schools can implement a 1 teacher : 1 classroom model. Second, these schools must be supported – with extra engagement and supervision – to fully leverage the materials and practices available to them, so that pupils attending them can receive the high-quality education they deserve.

V. Looking Ahead

After two years and one term of implementation, the KwaraLEARN programme has made strides in improving the educational landscape within the state, effectively adapting its approach to meet the specific needs of both pupils and school staff. In turn, pupils' learning levels at the end of the 2023-24 school year are much higher than they were before the programme's launch. Across Progressive- and Primary-model schools, foundational literacy improved, with average reading fluency rates increasing and the share of non-readers decreasing for most grades. Foundational numeracy also improved, with average ICAN scores increasing for most grades, and improvements being evident in both the simplest mathematical operations as well as slightly more advanced operations. These findings, among other improvements, demonstrate the positive impact of the continued educational investments made by the Kwara State Government.

However, more work is required in order to sustain the positive trends — and build upon them — in the coming years of the programme. Despite considerable improvements in foundational literacy and numeracy, average skill levels are not yet meeting national curricular expectations. Progressive schools, while having seen large improvements relative to pre-programme levels, are still seeing lower learning levels in absolute terms relative to Primary-model schools. While learning levels have risen overall, progress has not been even across grades. Year-on-year progress has slowed, possibly due to a decline in programme implementation. Based on these findings, KwaraLEARN has been working to further improve the programme for the 2024-25 school year and beyond, so that learning gains will continue to accumulate. For instance, KwaraLEARN is further enhancing pupils' literacy skills by streamlining English language instruction through a more cohesive course offering, as well as by promoting reading instruction in other subjects (e.g. Science). KwaraLEARN is also improving assessment systems to ensure that instructional levels are more precisely targeted to pupils' current learning levels, and will leverage up-to-date staffing data to better identify schools that could benefit from implementing the multigrade teaching model. Most importantly, KwaraLEARN is continuing to support high fidelity of day-to-day programme implementation, so that the strong results seen in the early phases of the programme can be sustained.

Increasing literacy through a more cohesive English course structure

Even after substantial improvements over the course of three years, English literacy levels are still falling short of curricular expectations, both by NERDC standards and by international benchmarks (see Appendix B). To facilitate even greater gains in literacy, KwaraLEARN has been providing English instruction through a more cohesive course structure. Previously, English instruction had been delivered through two independently-designed courses – syllabus English, which covers grade-level content that may be far above many pupils' reading levels, and supplemental English, which provides supplemental instruction aligned with pupils' current reading levels but may not comprehensively cover all syllabus topics. For some grades, starting in 2024-25, KwaraLEARN has been offering two English courses - a levelled reading course and a levelled language course - that are explicitly designed to run in parallel and reinforce each other. This coherence across the two courses reduces duplication of content, leaving extra time that can be spent on building additional literacy skills, such as oral language, which is a key component in the development of reading comprehension. Both courses will be aligned with pupils' current levels so that all instruction is accessible. Importantly, the new courses cover NERDC syllabus content for each respective grade, while simultaneously building fundamental literacy skills.

Promoting ‘learning to read’ across the curriculum

While English lessons are the most important pathways to strengthening foundational literacy skills, those lessons occupy roughly one third of the school day. This is a greater proportion than is seen in most education systems, reflecting foundational learning as a core priority of the programme as well as the persistence of learning gaps in upper grades. However, as a standalone approach, this reliance solely on English courses to improve literacy is insufficient to close the considerable gaps that exist between current literacy levels and grade-level proficiency standards. It is critical to embrace an approach to ‘learning to read across the curriculum’, in which courses outside of English offer pathways to both ‘learn to read’ as well as ‘read to learn’.

One key area where this investment is taking form is in lower-grade Science. Specifically, Science has adopted a new course structure, supplemented by new, high-quality, textbooks with reading passages tightly aligned to the reading course levels. This is in stark contrast to typical textbooks from commercial publishers, which are often written far above grade level (some lexile analyser tools show that the actual difficulty level of text in Primary 1 and 2 books is closer to Grade 8). This new course adopts a dual-priority approach. First, it builds critical content knowledge, which is essential for reading comprehension. Children with background knowledge of a passage tend to read more effectively than those without such knowledge, making Science proficiency foundational not only for syllabus mastery but also for reading proficiency. Second, the new Science course adopts key ‘learning to read’ strategies, including recurring reading practice with texts aligned to the exact decodability level of English textbooks used by that pupil. The course also uses evidence-based instructional strategies like ‘duet readings’ and rich imagery to support language and vocabulary development. In this way, KwaraLEARN is creating a literacy-rich environment across the school day in order to maximise and optimise ‘literacy moments’ and build towards literacy and language development for all pupils.

Continued support for Progressive schools

Within the Kwara State public Primary education system, there are schools that have fewer teachers than classrooms. These schools had extremely low learning levels before the KwaraLEARN programme, and although they made large improvements relative to their starting points – for example, with Primary 5 pupils more than doubling their English reading fluency rates since before the programme – they still ended the 2023-24 school year with much lower levels, on average, than their fully-staffed counterparts (and low levels in absolute terms). To support these schools, KwaraLEARN has offered the Progressive school model, in which multigrade instruction assigns a single teacher to two or more grade-level classrooms, thus ensuring that every pupil has a teacher delivering high-quality instruction during every lesson of the day.

While the official policy in Kwara State is a 1:1 model – that is, one teacher for each classroom – the KwaraLEARN programme continues to support schools with low staffing by employing a multigrade instruction model. The instructional programme at Progressive schools is fine-tuned to best meet the needs of pupils in those schools. Specifically, that includes the ongoing levelling of English and Maths instruction based on learning levels specifically in Progressive schools (given that these often differ from median levels in schools using a single-grade teaching model). It also entails course design updates to ensure that the instructional programme is both cohesive and maximally beneficial for pupils. Teaching and learning materials are updated within each given grade-pair in order to ensure that no pupil repeats the same instructional programme for two consecutive years (even if learning in the same multigrade classroom in consecutive years), and also that all pupils master the comprehensive syllabus over the course of their Primary school career.

KwaraLEARN is using dynamic, up-to-date data on school-level staffing to implement the Progressive model in schools where it is required (and inversely, phase it out in schools where it is no longer required) to ensure that schools continue to receive the right level of support (multigrade vs single-grade) based on their unique staffing realities and in response to any recent changes to teacher arrivals / departures. However, implementation of the Progressive model for low-staffed schools is only a temporary solution for an untenable situation. Moving forward, Kwara State must work towards ensuring that all schools are fully staffed, so that all pupils can receive the high-quality instruction they deserve.

The first-order priority should be system-wide increases in teacher hiring, ensuring that these new teachers are assigned to the areas and schools with greater need. While this is by far the most impactful policy alternative in the medium-term, there are other policy actions in the short-term that would improve the utilisation of existing human resources in the system. Kwara State could allocate existing teacher capacity more effectively across schools in the state to improve teacher staffing in areas where these transfers are not very logistically challenging for teachers, and as such, vacancies can be filled in a fiscally neutral manner. Working with its technical partner, KwaraLEARN could leverage geospatial and school staffing data to identify potential transfers of teachers from schools with teacher surpluses to nearby schools with teacher shortages. Thoughtful implementation of the potential transfers identified by this tool will maximise the number of children that benefit from public Primary education in Kwara State.

Strengthening day-to-day programme implementation

Key metrics indicate that fidelity of implementation of the KwaraLEARN programme has decreased during the 2023-24 school year. For example, lesson completion rates declined steadily throughout the year. As a result, over the course of the year, the average pupil missed out on 36 hours of English instruction and 15 hours of Maths instruction relative to if lesson delivery had remained steady. This loss likely contributed to the tapering learning gains in 2023-24, as compared to the large cumulative gains since the launch of the programme.

Improving fidelity of implementation of the programme itself is the single most important lever to improve learning during future years. Improving teacher attendance results in more classrooms with a trained teacher leading instruction each day. Improving lesson delivery leads to more productive learning time informed by high-quality teacher guides and printed learning materials. Improving pupil attendance means that there are more pupils present to benefit from these impactful lessons. By investing in these three pillars - alongside other key operational areas like ensuring textbook availability and usage - the programme can ensure more productive learning time in schools and improve the learning experience of pupils.

In 2024-25 and beyond, KwaraLEARN is putting in place additional measures to improve fidelity of programme implementation. This includes establishing procedures to ensure consistent lesson preview, rather than simply stating expectations for lesson completion. In this process, supervisors will coach teachers to look over lesson plans before they teach that content, then follow up with them to ensure that teachers are consistently previewing lessons. Supervisors will also coach head teachers to celebrate teachers who preview their lessons regularly and to hold accountable those who do not. By supporting lesson preview, KwaraLEARN will enhance teachers' rates of lesson completion, thus ensuring that pupils receive the high-quality instruction that the programme aims to deliver.

Learning from experience and setting intentions for the future

The KwaraLEARN programme is a bold initiative from the Government of Kwara State. During its 2.33 years of operations, it has enabled pupils to be on faster, higher learning trajectories than what they could have expected from non-KwaraLEARN education. The large impact on foundational literacy and numeracy outcomes — through a large-scale system-wide transformation of education — is a laudable achievement by the government. The impressive progress of the KwaraLEARN programme during its first 43 weeks has validated the ongoing investments made by Kwara State in transforming its education system. The evidence in this report confirms that children who have not yet received high-quality education can quickly and significantly advance their learning when provided with the proper support. In addition to the main findings reported above, supplementary data obtained during the course of this evaluation provide strong signals of even greater educational success to come as the KwaraLEARN programme matures and incorporates additional schools in need of transformative interventions.

That said, despite the improvements observed by the end of the 2022–23 school year, more work is required in order to sustain, and build upon, these positive trends in the coming years of the programme. As a data-driven programme, KwaraLEARN will continue to conduct similarly large-scale, rigorous evaluations for the upcoming school years. These rounds of data collection will give the Kwara State Government further insight into the impact of the programme: what is going well, and what needs to be strengthened. Continued investments to address differences in learning levels between Primary and Progressive schools, refine instructional levelling, support the development of foundational skills in other core subjects, and ensure consistent classroom coverage and pupil attendance — if done correctly — will drastically improve the quality of teaching and learning across Kwara State.

Through sustained support of the KwaraLEARN programme, and by applying the learnings from rigorous evaluations like this one towards ongoing programme improvement, Kwara State will continue to provide rich, nurturing learning environments across the state, where pupils of all backgrounds will have the unprecedented opportunity to learn in school and thrive academically.

VI. Appendix

Appendix A: Glossary of Key Terms and Abbreviations

Key Terms

absenteeism	When either a pupil or teacher fails to report for or remain at school as scheduled, regardless of reason.
automatic decoding	The ability to rapidly, effortlessly and accurately recognise a written word upon seeing it (Pikulski & Chard, 2005).
baseline	The conditions existing prior to an intervention or at the beginning of a period of time, against which changes can be measured, monitored, and evaluated (OECD, 2022).
benchmark	A reference point or standard against which outcomes can be assessed, established based on comparable data, or what can be reasonably inferred to have been achieved under a similar set of circumstances (OECD, 2022).
cohort	A group of pupils who are in the same grade and attend a school implementing the KwaraLEARN model. (e.g. All Primary 2 pupils attending all KwaraLEARN schools in the 2023-24 school year)
correct words per minute **'cwpm'**	A metric used to measure oral reading fluency by the number of words read correctly, out loud, from a given passage.
curriculum	A planned sequence of lessons, designed to foster pupils' proficiency in content and/or skills. A curriculum typically includes instructional content, activities, and processes for assessing learners' achievements (UNESCO, 2024). A curriculum may be developed at the national, state, or institutional level, with considerable overlap often occurring among these tiers; typically, broader curricula at the national or state level significantly influence the development of more localised educational programmes.
differentiation	The modification of instruction and curricula to better suit the learning levels and educational needs of pupils.
empirical (research/data)	Derived from observed evidence, rather than theory or anecdotal evidence.
enrolment	An individual's registration for an educational programme, public, private, or otherwise. The phrase "rate of enrolment" therefore refers to the proportion of a given population that is enrolled in an educational institution (UNESCO, 2011).
foundational learning	Basic literacy, numeracy, and transferable skills such as social-emotional skills which are required for more complex learning to take place (UNICEF, 2022).
foundational literacy	Key fundamental skills that are prerequisites for the ability to comprehend written text, including but not limited to: phonemic awareness, print orientation, oral fluency, etc.

<table>
<tr><td>foundational numeracy</td><td>The ability to perform arithmetic operations and apply them to day-to-day life, including but not limited to: number recognition, addition, subtraction, multiplication, and division, as well as word problems involving these operations (World Bank, 2024; UNESCO, 2024).</td></tr>
<tr><td>heterogeneity</td><td>The state of being diverse in content, characterised by the presence of distinct and varied components.

In the context of this report, the term heterogeneity or heterogenous is used to describe the extent to which dissimilar outcomes exist within a system. For example, if there is "a great deal of heterogeneity in Primary 3 fluency rates in state" that means that fluency rates vary widely among Primary 3 pupils within the state. If there is high “heterogeneity by gender”, this means that outcomes for boys are very different from outcomes for girls.

Determined relative to that of comparable data sets through standard deviations (National Center of Education Statistics, 2024).</td></tr>
<tr><td>high-income country</td><td>This report uses the World Bank’s classification of high-income countries: [Countries] with a gross national income per capita, calculated using the World Bank Atlas method, of $13,846 or more in 2022 (World Bank, 2024).</td></tr>
<tr><td>literacy</td><td>Leading organisations in international education reform offer disparate definitions of literacy:

<table><tr><th colspan="2">External Definitions of Literacy</th></tr><tr><td>World Bank/ UNICEF</td><td>“[The ability to] both read and write with understanding a short simple statement about [an individual’s] everyday life” (UNICEF, 2022b).</td></tr><tr><td>UNESCO/ PIAAC/ OECD</td><td>Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts (UNESCO, 2024).</td></tr><tr><td>IALS & ALL</td><td>Literacy is using printed and written information to function in society to achieve one’s goals and to develop one’s knowledge and potential (National Center for Education Statistics, 2003).</td></tr></table>
Demonstrated by the wide variety of definitions above, literacy is incredibly complex and difficult to define. The goal of the KwaraLEARN programme is for pupils to be able to read and comprehend a grade-level passage, as determined by SUBEB. Unless otherwise noted, the KwaraLEARN programme aligns literacy expectations with the Hasbrouck-Tindal norms.</td></tr>
<tr><td>lesson completion</td><td>Lessons are marked as completed if an educator teaches 80% or more of a scheduled lesson’s content within 80-120% of the allotted time.

The rate of lesson completion is therefore the proportion of lessons a teacher, school, district, etc completes out of all scheduled lessons in a given timeframe.</td></tr>
<tr><td>levelling</td><td>Setting of the difficulty of curricula and lesson content based on pupils’ learning levels and previous levelling decisions.</td></tr>
</table>

<table>
<tr><td>low- and middle-income country/ countries

‘LMIC’</td><td>This report uses the World Bank’s classifications of low- and middle-income countries (World Bank, 2024):

Low-Income: Countries with a gross national income per capita, calculated using the World Bank Atlas method, of $1,135 or less in 2022

Middle-Income: Countries with a gross national income per capita, calculated using the World Bank Atlas method, of $1,135 to $13,846 in 2022</td></tr>
<tr><td>median</td><td>The middle data point in a sequentially ordered data set, or the average of the two middle data points in the set. For example, if the data set [2, 4, 7, 1, 2] is ordered sequentially, it becomes [1, 2, 2, 4, 7], with the middle value being 2. The median of this data set is therefore 2.</td></tr>
<tr><td>non-reader</td><td>A pupil who, when presented with a passage, is unable to correctly read a single word aloud within a minute.</td></tr>
<tr><td>numeracy</td><td>Major organisations offer varying definitions of numeracy:

<table><tr><th colspan="2">External Definitions of Numeracy</th></tr><tr><td>World Bank</td><td>The ability to make simple arithmetic calculations (World Bank, 2024a).</td></tr><tr><td>UNESCO</td><td>The capacity of a person to engage in all those activities in which numeracy is required for effective function of his or her group and community (UNESCO, 2024).</td></tr></table>
Because this report refers to both numeracy and mathematics, it is important to note that researchers often distinguish numeracy from mathematics by associating numeracy with skills involving numbers which are commonly utilised in day-to-day life (as opposed to higher level mathematics such as calculus) to a greater extent than mathematics (Dion, 2014; Ginsburg et al., 2006; HRSDC & Statistics Canada, 2005; Karaali et al., 2016). This report uses the terms numeracy and mathematics synonymously.

Given the existing international definitions, the goal of the KwaraLEARN programme is for pupils to be proficient in grade-level mathematics skills, as determined by SUBEB.</td></tr>
<tr><td>oral reading fluency</td><td>The rate at which a pupil can read a written text aloud (measured in the number of correct words read aloud from a passage within a minute, or ‘cwpm’).</td></tr>
<tr><td>phase</td><td>A portion of a programme’s duration, usually as part of an expansion plan as the programme is rolled out to more schools across a territory, when a group of schools implements the programme on the same timeline.

For example, if a programme is rolled out through a country in two phases, one group of schools will participate during the first phase, then these schools will continue their participation during the second phase as a second group will begin their participation.</td></tr>
<tr><td>phonemic awareness</td><td>The ability to understand that spoken words are made up of individual sounds or phonemes.</td></tr>
<tr><td>phonics</td><td>The process of learning to read an alphabetic language by correlating letters or groups of letters with sounds.</td></tr>
</table>

Primary education	A level of education that occurs after early childhood education and prior to JSS; it provides learning and educational activities typically designed to provide pupils with fundamental skills in literacy and numeracy, and establish a solid foundation for learning and understanding core areas of knowledge and personal development, with little, if any, specialisation (UNESCO, 2011).
primary-model schools	Schools (regardless of grade level) that use a traditional staffing model of one teacher per classroom with class-level groupings.
progressive-model schools	Schools (regardless of grade level) that have fewer than one teacher per grade-level and use a "multi-grade" teaching model, incorporating ability grouping across grades. For a portion of the school day, pupils are grouped by ability rather than by grade level, and receive instruction targeted at their ability level. For the rest of the day, pupils from each grade receive instruction on grade-level concepts in accordance with their syllabus.
public-Primary school	A school that receives public funding and includes Primary grades. A public-Primary pupil is therefore a pupil who attends such a school.
reading comprehension	The ability to derive meaning from written words when they are part of a text (Hoover & Gough, 1990).
standard deviation	A measure of how widely or narrowly scores are dispersed for a particular data set. Specifically, it is the square root of the average squared deviation of scores about their arithmetic mean (National Center of Education Statistics, 2024).
structured pedagogy	A comprehensive educational approach that enhances classroom instruction through a coordinated package, including detailed lesson plans, along with high-quality learning materials and ongoing teacher training. These coordinated inputs create consistency and coherence in educational practices, optimising the teaching and learning experience and facilitating effective instruction (Global Education Evidence Advisory Panel, 2023).
sub-Saharan Africa **'sSA'**	A region consisting of the following countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Republic of Congo, São Tomé and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe (World Bank, 2024).
stratification	Sorting data into strata by one characteristic – such as geographic region – usually for the purpose of sampling or randomisation in a randomised controlled trial, such that each stratum is appropriately represented in the sample and/or to increase statistical power.

Abbreviations

cwpm	Correct Words per Minute
DIBELS	Dynamic Indicators of Basic Early Literacy Skills
ECCDE	Early Childhood Care Development and Education
FLN	Foundational Literacy and Numeracy
GDP	Gross Domestic Product
GPD	Global Proficiency Descriptors
GPF	Global Proficiency Framework
HIC	High-Income Country
ICAN	International Common Assessment of Numeracy
LMIC	Low- and Middle-Income Countries
ORF	Oral Reading Fluency
NERDC	Nigerian Education Research and Development Council
RARA	Nigeria Reading and Access Research Activity
sSA	sub-Saharan Africa
UNESCO	United Nations Educational Scientific Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development

Appendix B: Detailed Programme Description

KwaraLEARN is a **comprehensive education improvement programme** that **combines a set of interconnected, scientifically-proven components that work in tandem** to address key challenges at all levels of the public education system. These components include:

1. Scientifically-based teaching and learning materials, following the principles of structured pedagogy, that align with national curricular standards and prioritise foundational skills
2. Training and ongoing support for teachers, head teachers, regional officers, and ministry staff
3. Integrated technology in classrooms and management systems
4. A strategy for engaging the larger community in education
5. Rigorous methodologies for measuring pupil progress and programme effectiveness, and for identifying areas for continuous improvement

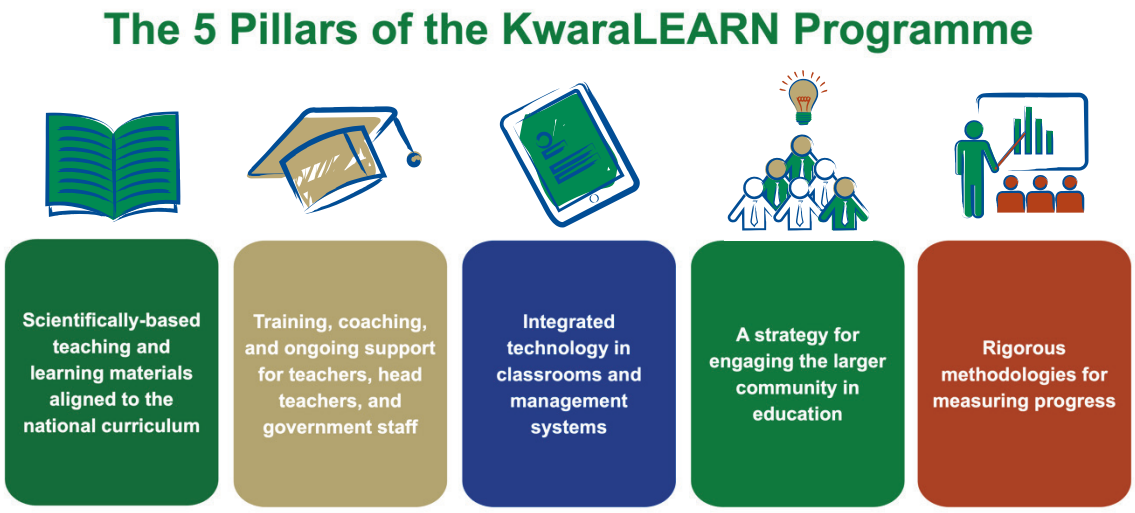


Figure B.1

1. Teaching and learning materials

KwaraLEARN's teaching and learning materials, along with training and ongoing support for teachers (see next section), are the essential elements of **structured pedagogy**, an effective teaching approach that utilises a well-defined framework with clear lesson plans, aligned materials, and consistent teacher training to provide a consistent and organised learning environment for pupils. KwaraLEARN provides teacher guides and pupil materials designed to ensure consistent, high-quality instruction across all classrooms. These resources are designed based on research in the science of learning, and are adapted to the local cultural curriculum as well as to current learning in Kwara State. Importantly, lesson content in the foundational areas is levelled — that is, adjusted to actual learning levels as measured in schools — so that instruction can be aligned with pupils' current learning needs. KwaraLEARN aims to meet pupils where they are, thus more effectively raising learning levels and guiding progress towards grade-level standards.

Detailed teacher guides

KwaraLEARN's teacher guides are comprised of highly detailed lesson plans that offer a clear roadmap for each class, providing educators with comprehensive, step-by-step guidance for delivering engaging and effective lessons. These plans include clear language for explaining concepts, posing questions, and providing feedback to pupils, ensuring consistency in instruction and appropriate pacing across all classrooms. Lesson plans have embedded in-class formative assessment strategies, which enable teachers to monitor pupils' progress in real-time and make necessary adjustments to instruction, ensuring mastery of key concepts and skills.

Lessons are designed with a focus on pupil-centred learning, incorporating a variety of engaging and interactive activities. These include guided practice, independent work, collaborative learning, and open-ended problem-solving exercises. Lessons employ the "model, lead, test" approach, where teachers first demonstrate a skill, then guide pupils in practising it together, before having pupils apply the skill independently.

Pupil materials

Complementing teacher guides are aligned pupil materials, including textbooks and workbooks for some subjects and grade levels. There is an appropriate ratio of materials to pupils, ensuring that each pupil has the opportunity to work independently or take materials home as appropriate.

- **Textbooks.** Textbooks are carefully crafted to be engaging, culturally relevant, and fully aligned with the local curriculum. Structured to follow the scope and sequence of the teacher guides, these durable textbooks ensure seamless integration with daily lessons and are designed for repeated use throughout the school year.
- **Workbooks for each pupil.** Workbooks offer additional practice opportunities to reinforce key skills and concepts, both in class and at home. With activities carefully designed to align with lesson objectives, workbooks provide a gradual "release of responsibility", eventually enabling pupils to perform skills independently.

Assessments

Aligned with teacher guides and pupil books, the comprehensive assessment system is integrated throughout the learning materials. It includes:

- Formative assessments embedded in daily lessons
- Unit assessments administered at the end of each topic of study
- Termly and end-of-year assessments to track long-term progress

Together, these assessments enable the short- and long-term monitoring of pupils' learning progress, and enable stakeholders at all levels – from teachers to policymakers – to take data-informed actions that ultimately enhance learning outcomes.

2. Training and ongoing support for teachers, head teachers, regional officers, and ministry staff

KwaraLEARN establishes a multi-tiered support system that addresses the needs of teachers, head teachers, and ministry staff. This system is designed to create a cohesive, self-reinforcing ecosystem of educational improvement that spans from individual classrooms to the ministerial level.

Teacher training

To ensure that teachers receive consistent, high-quality support throughout their professional journey, KwaraLEARN provides teacher training that is organised to reinforce specific pedagogical skills. The training approach is closely aligned with the teacher guides and pupil materials, ensuring that teachers are well-prepared to implement the programme effectively. At programme launch, teachers undergo induction training, and thereafter receive expert feedback and coaching on an ongoing basis.

Induction training based on the “Big Four” pedagogical framework

Every teacher in KwaraLEARN schools undergoes an intensive induction training programme that serves as the foundation for implementing the structured pedagogy approach. The 80-hour, in-person training, conducted over 10 days, is designed to help train all teachers on the use of the new teaching and learning materials (like the lesson plans) and effective foundational learning methodologies.

The training programme is informed by scientific research on the teaching practices and habits of top decile teachers who have a proven track record of delivering large learning gains, and is centred around KwaraLEARN’s core pedagogical framework, "**The Big Four Teaching Skills**" (see Figure B.2):

- **Motivating pupils to behave and work hard**
- **Providing clear feedback**
- **Checking each pupil's performance**
- **Effectively using the lesson plan**

During induction, teachers not only learn about these skills but also practise them in simulated classroom environments, receiving personalised feedback from training facilitators. By the end of induction training, teachers build mastery over a wide array of critical topics for teacher success such as content delivery and teacher-guide use, effective classroom management, behaviour management techniques, pupil assessment, providing individualised feedback, and building strong pupil and community engagement.

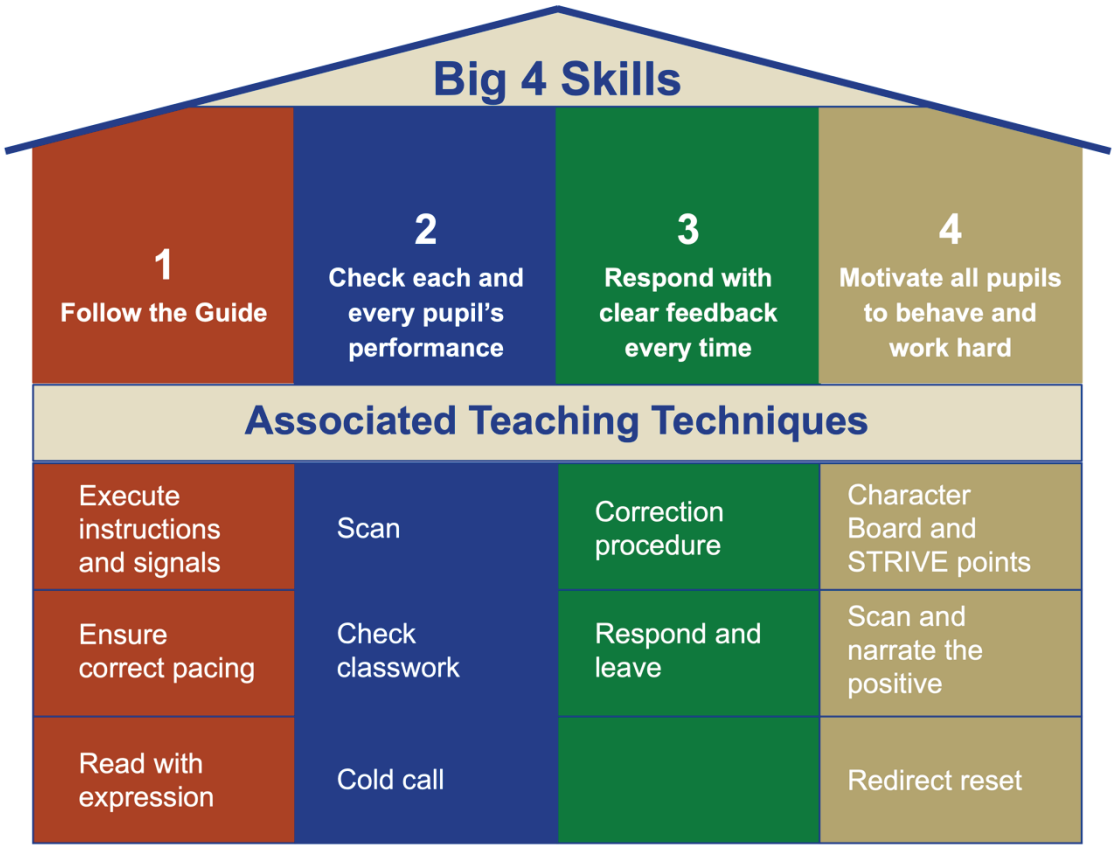


Figure B.2

Ongoing support and coaching for teachers

Recognising that one-time training is insufficient to drive lasting change in teaching practices, KwaraLEARN includes a robust system of continued support and coaching for teachers. After induction, teachers receive ongoing professional development, delivered at the school level by head teachers, which reinforces core skills and trains them in new processes, skills, and tools. Teachers also undergo regular observation by Head teachers and by regional officials, who are themselves trained in KwaraLEARN's pedagogical framework and are provided with tools for effective management (see below). Based on observations, teachers receive feedback in a reflective coaching conversation, which celebrates successes in addition to identifying areas for improvement.

Support for school leaders and regional officials

Head teachers and regional officials are central to KwaraLEARN's ongoing support system, and play a crucial role in ensuring the successful implementation of the programme's structured pedagogy approach.

KwaraLEARN equips Head teachers to lead instructional improvements, conduct short daily classroom observations, provide timely and pupil-centred feedback, focus on pupil outcomes rather than on inputs, and engage productively with the community. To this end, Head teachers are provided with training on KwaraLEARN's pedagogical framework, as well as with digital transparency tools such as Spotlight, which provides them with real-time data on key performance indicators – such as lesson completion rates and pupils' assessment scores – for each teacher. Equipped with these tools, Head teachers check teachers' day-to-day basic implementation of the programme and provide data-informed feedback that is targeted to each teacher's specific needs.

Regional officials receive training and tools that enhance their ability to provide constructive feedback to educators under their supervision. This includes training on utilising digital transparency tools for school monitoring, such as web-based dashboards displaying aggregated data at the school level, as well as tools to aid structured classroom observations,, the "Instructional Leadership" app — a tool for tracking whether teachers are keeping pace with the curriculum and delivering lessons as intended, and a troubleshooting platform through which they can request and receive support for technical issues.

Equipped with these tools, regional officials – jointly with Head teachers – observe entire lessons and provide in-depth coaching to further improve teachers' pedagogical techniques and performance. These longer observations complement the short daily observations described above, and follow a more structured format designed to promote teacher reflection and growth within the structured pedagogy framework. After observing the lesson – using the Big Four Teaching Skills framework as a lens – the regional official or Head teachers engages the teacher in a reflective coaching conversation. Coaching conversations begin with the teacher self-reflecting on the lesson, identifying what went well and areas for improvement. The observer then shares their observations, using specific examples from the lesson to illustrate key points. Together, they identify 1-2 areas for the teacher to focus on improving before the next observation, always linking these areas to the Big Four Skills and the principles of structured pedagogy. Importantly, coaching conversations do not simply address weaknesses; they also celebrate successes and identify best practices that align with the structured pedagogy approach. Over time, these conversations build a collaborative, growth-oriented culture within the school, centred around the consistent implementation of effective teaching practices grounded in the Big Four.

3. Technology integration

KwaraLEARN integrates technology into all aspects of the programme, from the delivery of instructional content into each classroom to system-level management. KwaraLEARN's technology platform includes multiple modules, each dedicated to enhancing a particular aspect of the programme.

In the classroom, teachers use tablets to access the **Learning Management Module**. This includes a digital academic schedule that allocates time for each subject (e.g. Maths) in a manner designed to maximise learning, as well as digital teacher guides with high-quality lesson content, and a digital messaging platform for obtaining academic and operational guidance. The module also enables central planners to track lesson delivery (start and end times, pacing, and completion rates), and includes a central web application for lesson and assessment scheduling, management, and ongoing content adaptation.

In schools, head teachers use the **Accountability & Professionalism Module** to track and validate teacher attendance, track pupil attendance, and manage pupil rosters, as well as to access management resources such as classroom observation tools. The **Pupil Performance Module** enables teachers, head teachers, and central planners to measure and monitor pupil success – through tools that allow for the automatic entering, grading, and management of pupil assessment scores, as well as tools for managing pupil class assignments and grade promotion.

At a system level, several modules ensure transparent and ongoing monitoring of performance and enable data-driven decision-making. The **Reporting & Transparency Module** includes a web-based dashboard that displays aggregated and disaggregated data on pupils, teachers, school leaders, lesson completion, and other indicators of professional accountability and programme operation. The **Back Office & Support Module** provides system-level management and support with functionalities replicated from the Pupil Performance Module, including systems to manage teacher induction training (trainee attendance tracking, training session content delivery, etc.) and to manage digital devices and other assets.

Importantly, the KwaraLEARN technology platform is specifically optimised for low-infrastructure environments – such as those with low and/or infrequent electricity or low-speed/unreliable data access, ensuring effectiveness in even the most marginalised communities.

Beyond system integration, KwaraLEARN builds capacity among school staff and government officials at all levels and ensures that they are equipped with the skills to utilise the programme's full suite of technological tools. Teachers, as part of induction training, learn how to navigate digital lesson plans, monitor real-time class progress indicators to adjust their pace of instruction, quickly record attendance, and analyse class-wide performance patterns over time. Government support teams responsible for classroom observations and teacher/head teacher support receive training on utilising the programme's web-based tools, which provide real-time data on instructional delivery, learning outcomes, attendance, and accountability at both aggregated and disaggregated levels. By providing both the technological tools and the relevant training to leverage them, KwaraLEARN empowers all stakeholders within the education system.

4. Community engagement

Creating and implementing a comprehensive community engagement strategy

Research has shown strong connections between family involvement and pupils' academic achievement. The earlier teachers and head teachers establish robust family engagement with the education system, the more effective they are in raising pupil performance over time. Family partnerships formed during Primary school years build a strong foundation for future pupil success and sustained engagement. When pupils receive more support, classrooms with engaged families perform better overall.

Drawing from these research findings, KwaraLEARN includes a strong component of community engagement aimed at not only improving pupil learning but also enhancing the community's trust in government schools. Community and parent engagement activities are embedded as a core component of the programme, raising collective awareness of the importance of quality education and fostering a greater sense of community ownership and pride in the newly transformed schools. Activities include:

- **Parent & Community Orientations:** Designed to provide information about the government programme to all stakeholders in the community, including parents and local leaders, and explain how it will strengthen each school.
- **Parent-Teacher Conferences:** Vital for fostering positive relationships between parents, teachers, and head teachers, they invite parents to play an active role in their child's education. At the centre of the Parent-Teacher Conference is a review of each pupil's current performance and how to support continued growth. These structured and meaningful interactions bolster the support pupils receive at home and in school.

Additionally, a locally-based communications team for the programme works with existing local initiatives to promote the importance of school enrolment, retention, and educational outcomes. These joint efforts bring together key stakeholders, facilitate the sharing of information and ideas, and enhance the broader community's engagement with the education system.

5. Rigorous methodologies for measuring programme effectiveness and identifying areas for improvement

A key pillar of KwaraLEARN is the systematic and continuous monitoring of educational outcomes to understand the learning gains driven by the programme and, importantly, to continuously identify areas for further improvement. This is achieved through **impact evaluation studies** as well as **ongoing monitoring** of learning levels and other programmatic Key Performance Indicators (KPIs).

Impact evaluation

Impact evaluation studies are conducted at major milestones such as the ends of school years. These studies are rigorous measurements of programme impact, and are designed following the "FACT" principles (for details, see Figure B.3). Per these principles, KwaraLEARN's impact is measured using a formalised evaluation plan that is clearly articulated at the outset and fully aligned with the government's policy goals. Data collection is carried out in a manner that maximises accuracy, and data are analysed using statistical approaches that maximise the validity of the results. Results are then shared in a transparent manner to inform ongoing programmatic decision-making.

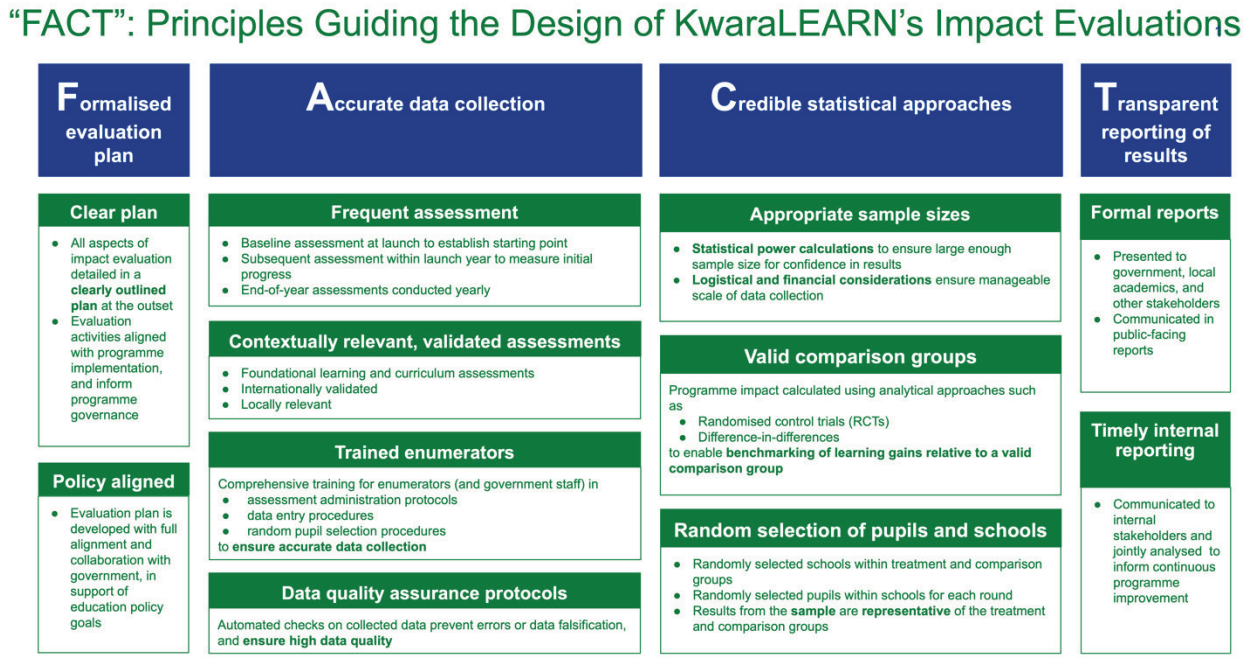


Figure B.3

Ongoing monitoring of programmatic impact and identification of areas for continuous improvement

In addition to formal impact evaluation studies, KwaraLEARN monitors learning outcomes and other indicators of programme performance in an ongoing fashion, so that insights can continuously inform programme implementation.

Ongoing monitoring of learning outcomes

The use of **Let's Mark!**, a phone-based application for automated grading and uploading of pupil- and item-level data to centralised platforms, enables ongoing analysis of performance trends that inform programmatic decision-making, while also saving teacher time and increasing the accuracy of the marking process. "**Termly assessments**" – teacher-led assessments of learning in all subjects, which are standardised across the programme – are conducted at the end of each term, enabling the identification of areas, schools, or teachers that are not performing at expected levels and require additional support. Census-level assessments of numeracy and literacy skills, conducted as part of **Foundational Literacy and Numeracy Day**, further enable the KwaraLEARN team to understand system-wide proficiency levels as well as variations within and between schools.

Ongoing monitoring of other key performance indicators

KwaraLEARN tracks all core operational and performance drivers that contribute to improved teaching and learning – such as **pupil and teacher attendance**, **lesson completion**, **school leader coverage**, and more. Digital tools capture these data automatically and in a decentralised manner, and a **Data Analytics Team** collaborates closely with programme leadership to analyse data trends and leverage insights to inform strategic programme improvements.

Together, the five pillars of KwaraLEARN – Scientifically-based teaching and learning materials, training and ongoing support for teachers and their supervisors, integrated technology, community engagement in education, and rigorous methodologies for measuring progress – work in synergy to drive dramatic improvements in teaching and learning across public Primary schools in Kwara State.

Box 1: Enhancing Learning Outcomes Through Structured Pedagogy

Classroom instruction is one of the most important components of an educational system. Teacher and lesson quality have a greater impact on pupil achievement than any other school-level factor (World Bank, 2018). The absence of effective instructional practices can consequently render education inputs and systems futile. One of the most effective ways to maximise instructional quality at-scale is to incorporate appropriately scaffolded lessons and curricula which enhance retention, employ proven instructional strategies, and are facilitated by educators who possess a comprehensive understanding of subject matter. Unfortunately, classroom instruction in many low- and middle-income countries (LMIC) lack these critical characteristics. Data collected from 2,600 schools over 7 countries in sSA show that approximately 14% of grade 4 language teachers could not spell a simple word like "traffic" or correctly answer questions on a simple grammar exercise. Moreover, even when teachers did possess an adequate amount of subject matter expertise, it did not guarantee their ability to teach effectively. The same study found that less than 31% of teachers were able to independently prepare a lesson plan, develop lesson objectives, formulate questions to check pupils' understanding, or give feedback (Bold et al., 2017). Given the challenges that many teachers face regarding lesson planning, competing time demands, and school understaffing, it is highly probable that educators lack both the time and capacity required to develop comprehensive syllabi.

Structured pedagogy is a package for educational systems that consists of inputs such as lesson plans, learning materials, and ongoing teacher training (World Bank et al., 2023). Structured pedagogy has been classified as a highly cost-effective intervention by an advisory panel made up of international education experts (GEEAP, 2023). This makes pedagogy reform and implementation particularly attractive for countries facing budgetary challenges and inequitable learning outcomes, as it benefits pupils regardless of external factors such as location, income, or background (World Bank et al., 2023). Evidence indicates that structured pedagogy has significantly improved learning outcomes in several LMIC. For instance, Nigeria's RARA (Nigeria Reading and Access Research Activity) programme, focusing on supporting teachers with lesson plans and effective strategies, resulted in substantial gains in language fluency for Primary 2 pupils, equivalent to almost half a year of additional schooling (RTI International, 2016). Similarly, in an RCT conducted by a team led by Nobel Prize-winner Dr. Michael Kremer, pre-Primary and Primary pupils enrolled in Kenyan schools using structured pedagogy for two years experienced average learning gains equivalent to 1.5 and 0.8 additional years of schooling respectively, ranking in the 99th percentile of effect sizes measured in LMIC education studies (Gray-Lobe et al., 2022). A comparable model evaluated in government schools in Rwanda also yielded substantial gains after only 17 weeks of instruction (Rodriguez-Segura et al., 2023). While evidence supports the positive impacts of structured pedagogy, it is important to note that its ability to improve learning outcomes is dependent on the quality.

The efficacy of structured pedagogy relies on well-crafted implementation, comprehensive support, and monitoring. Empirical research indicates that structured pedagogy, when lacking research-supported methodologies and adequately trained educators to implement it, can lead to diminished or negligible effects on learning outcomes. In sSA school systems between 1990 and 2010, despite the provision of new lesson plans and materials, learning outcomes stagnated due to inadequate teacher training (Hassan et al., 2022). Similar studies in Kenya, Uganda, and Malawi found that after implementing reformed pedagogy, teachers who received minimal training exhibited lower levels of effectiveness (Piper et al., 2018). To address this issue, robust monitoring mechanisms are essential. The same studies have shown that incorporating effective teaching aids, prioritising core competencies like literacy and comprehension, and reinforcing prior knowledge positively impacts learning outcomes. Through effective implementation strategies, resources tailored to diverse classroom settings, and comprehensive training, structured pedagogy can improve learning outcomes and empower teachers to facilitate meaningful educational experiences for pupils.

Supporting understaffed schools through a multigrade model

Within the Kwara State public Primary education system, there are schools that have low teacher staffing relative to the number of grades and streams offered. That is, in these schools, there are fewer teachers than streams (groups of pupils in a classroom who would learn from one teacher, typically grouped by grade level). This means they cannot employ the "Primary" staffing model – as is the official state policy – in which one teacher is assigned to a classroom with pupils who are all in the same grade level. Nonetheless, KwaraLEARN supports these schools by implementing the "Progressive" model.

Whereas the "Primary" model follows a more traditional model of one-teacher-one-classroom where pupils in a given classroom are all at the same grade level, the "Progressive" model uses multigrade teaching, in which classrooms can have pupils from two or more grade levels.[4] Multigrade teaching assigns a single teacher or head teacher to two or more grade-level classrooms, thus ensuring that every pupil has a teacher delivering high-quality instruction during every lesson of the day. Multigrade instruction remains a pillar of the Progressive school model, and a central strategy to continue empowering schools with fewer teachers than classrooms to deliver effective instruction for every pupil.

While the Progressive model is employed so that KwaraLEARN can support even those schools that are not in compliance with state policy, this is a temporary solution. In the medium- and long-term, teacher capacity should be redistributed in a thoughtful and data-driven manner so that all children are receiving instruction as intended.

[4] In Kwara State, schools implementing multigrade teaching can have as few as one head teacher assigned to a classroom with pupils from all six grade levels.

Appendix C: Methodological Framework

Through ongoing monitoring, programme leaders can understand how the programme has impacted learning growth thus far, celebrate the milestones that have been reached since the programme's launch, and determine appropriate directions for continued improvement in the future. To that end, this report documents relevant information on the educational outcomes in the state of Kwara prior to and throughout the implementation of the KwaraLEARN programme.

The main findings of this study describe the **cumulative impact of the programme** – i.e. the effect of the programme over the course of two years and one term of implementation – through a longitudinal follow-up. Data were collected as repeated cross sections (representative snapshots at each timepoint) rather than a panel (following the same cohorts of pupils across time). Because of this, and because pupils are expected to grow over the course of a year, it would not be a fair estimation of impact across years to compare learning levels measured at different points in the year. To enable comparisons across years at equivalent points during the year (i.e. end of Term 3), actual baseline measurements taken at launch (beginning of Term 3 of 2022-23) were projected to Term 3 of the previous (2021-22) school year. These projected levels were used as the benchmark against which levels measured at the end of 2023-24 were compared (see Appendix C.3 for details on projections).

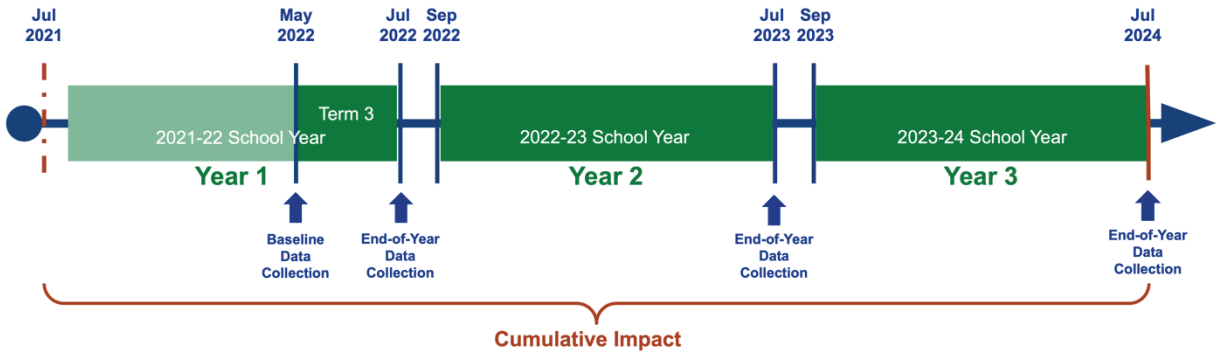


Figure C.1

In addition to describing cumulative impact, this study also aims to understand how the programme, in a relatively mature phase of implementation, is operating year to year. To this end, **year-on-year changes** over the lifetime of the programme is described by comparing learning levels measured at the end of the 2023-24 school year with those at the end of the previous school years.

C.1: Sampling Schools and Pupils

Schools included in the study

In previous impact evaluation studies, the study sample had been composed of a set of 64 public Primary schools across Kwara State. Of these, 32 schools from four LGAs were part of the KwaraLEARN programme ("treatment" schools). The other 32 were non-KwaraLEARN schools ("comparison" schools) from other LGAs. In the four LGAs where KwaraLEARN was initially implemented -— Baruten, Offa, Ilorin East, and Ilorin West — all 32 schools were randomly selected such that each was representative of all other schools in their LGA. Schools in the comparison group had also been randomly selected from three LGAs, such that they were representative of schools in those three LGAs.

After the 2022 launch in four LGAs, the KwaraLEARN programme has undergone large-scale expansion, now operating in all sixteen LGAs. As such, the initial set of 32 non-KwaraLEARN schools can no longer serve as the comparison group. Therefore, the current study sample is composed of a set of 31 schools maintained from the original "treatment" group[5] – i.e. those that were included in the data collection round at baseline and at the end of the launch period (June-July 2024). These schools were randomly selected from the four LGAs where KwaraLEARN was first implemented in May 2022 (Baruten, Offa, Ilorin East, and Ilorin West). Due to this study design, all reported results are representative of the first cohort of schools only.

Pupils assessed for this study

Within the schools that were visited, data were collected from a representative subsample of pupils. The original plan was to assemble a cross-section of 48 pupils per school – 8 pupils from each class. In practice, this was not fully achievable due to small class sizes and some pupil absence. In the end, a total of 1,254 pupils were included in this round of data collection – roughly 40 pupils per school, or 7 per class. As expected, the average number of pupils assessed in each grade decreased with older grades, with an average of 7.1 pupils per grade in Primary 1-3 as compared to 6.4 in Primary 4-6. This sample size is sufficient for accurate conclusions to be drawn about learning levels in public Primary schools across the four LGAs in Kwara State.

[5] Among the 32 schools that have received the KwaraLEARN programme since launch, 31 had data available for both the baseline and end of Year 1 (June-July 2022) and were thus included in the Year 1 evaluation sample. The same 31 schools were included in the Year 3 (June-July 2024) sample.

List of assessed schools

LGA	School Name	Implementation Model
Baruten	BLGEA School, Teme	Progressive
Baruten	Blgea School Sariyankparu	Progressive
Baruten	BLGEA School, Alafiaru	Progressive
Baruten	BLGEA School, Kosomone	Progressive
Baruten	BLGEA School, Tembonu	Progressive
Baruten	BLGWA School, Wodora	Progressive
Baruten	LGA School Gbedebereru	Progressive
Baruten	LGEA School Taberu Central	Progressive
Ilorin East	LGEA Primary School, Alapo	Primary
Ilorin East	Maya LGEA School	Primary
Ilorin East	Olokuta LGEA School Anfeyin Oja	Primary
Ilorin East	Saint Barnabas School 'a'	Primary
Ilorin East	Shamsudeen Local Govt Educ Authority, Ilorin	Primary
Ilorin East	St Johns Catholic LGEA School Adapo	Primary
Ilorin East	LGEA School Aloko Laro Afara	Progressive
Ilorin East	LGEA School Oke Oyi Aregun	Progressive
Ilorin West	Aleniboro LGEA School, Ilorin	Primary
Ilorin West	Anifowoshe LGEA School, Ilorin West Ii	Primary
Ilorin West	Gbemisola Lgubea School, Madi , Ilorin	Primary
Ilorin West	Mount Carmel B LGEA School, Oloje	Primary
Ilorin West	Nawair-Ud-Deen LGEA Primary School	Primary
Ilorin West	Ogundele LGEA Authority School Ilorin	Primary
Ilorin West	Tshangaya Model LGEA School Ilorin West	Primary
Ilorin West	Wesley LGEA School	Primary
Offa	LGEA School, Kanmanu Alayin Offa	Primary
Offa	Nawair-Ud-Deen Model LGEA School, Offa	Primary
Offa	Offa Progressive Women Association LGEA School, Offa	Primary
Offa	Saint Cyprian's '1' Local Government Education Authorit	Primary
Offa	Wesley One Local Government Education Authority School	Primary
Offa	Community LGEA School Kere Aje	Progressive
Offa	Egunkara LGEA School	Progressive
Offa	Onilamu Community LGEA Ikotun Road	Progressive

C.2: Assessments

In order to understand whether the KwaraLEARN programme is producing the desired educational outcomes, changes in pupils' skill levels in English literacy and mathematics were monitored, as well as other metrics that provide a view into the educational landscape in KwaraLEARN schools.

Oral reading fluency

Oral reading fluency describes the ability to read a text aloud quickly and accurately. Previous research has shown that this is one of the components of early literacy that is most correlated with other essential subskills on the path towards reading proficiency. In other words, if a pupil does well in this domain, it is a strong signal that they have also mastered more fundamental subskills (e.g. letter recognition), and that they are capable of completing increasingly advanced tasks, like reading with some degree of comprehension. To quantify this skill, the most common metric used is "correct words per minute" (cwpm).

This study relies on two reading passages to assess oral reading fluency:

1. A **Primary 2-level passage** drawn from Dynamic Indicators of Basic Early Literacy Skills (**DIBELS**), an internationally validated assessment of early literacy development widely used in evaluation studies of educational interventions (University of Oregon, 2018). All pupils read this passage; therefore, performance can be compared across grade levels.
2. A **grade-level passage** selected from Nigerian Educational Research and Development Council (**NERDC**)-approved English textbooks. Evaluating how accurately and quickly a pupil can read one of their class-level textbooks, which are appropriately levelled for each grade and also contextually appropriate for Kwara State, allows for a more accurate assessment of functional fluency – that is, how well a pupil can read a grade-level text like the ones they will encounter in typical lessons.

In total, 7 passages are used: one Primary 2 passage read by all pupils and 6 different grade-level passages (Primary 1–6).[6]

[6] Pupils in Primary 2 received two different passages at the Primary 2 level: one classified as a grade-level passage, and the other being the Primary 2-level passage that is used to assess pupils across Primary 1-6. Utilising two different passages maximises the total data collected and ensures that data are comparable across classes.

Primary 2 Passage (All Pupils)

Fluency Assessment: Oral Reading Fluency
SCORESHEET

End Term Term 1 — Grade 2

DIBELS 8th Edition *Oral Reading Fluency* Benchmark ORF 1.Beginning

Examiner script	Reminders	
Please read this (point to passage) **out loud**.	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Lucky Day

Bobby was on his way home from school one (9)
day. On his walk, he saw something green in the (19)
snow. He stopped and stared. He thought he was (28)
seeing things. Green in the snow? It couldn't be what (38)
it seemed to be, could it? (44)
He bent down in the snow and quickly dug it out. (55)
It was a five - dollar bill. He carefully smoothed it flat. (66)
He wondered if it was real money or just play (76)
money. It looked real. That made him feel good. This (86)
was his lucky day. (90)
But then he felt bad. He knew that if he ever lost (102)
five dollars he would cry and cry. Once, he had (112)
dropped a dime on the floor, and it had rolled into the (124)
heating vent. He never saw that dime again. (132)
What was it like to lose fifty dimes at one time? (143)
Whoever lost the money was having an unlucky day. (152)
But this was Bobby's lucky day. He had no way to (163)
find the owner, so the money was his to keep. (173)

Total words read _____ Total errors _____ Total words correct _____

Primary 1 Passage

Fluency Assessment: Oral Reading Fluency
SCORESHEET

Oral Reading Fluency Progress Monitoring ORF 1.3

Examiner script	Reminders	
Please read this (point to passage) **out loud.**	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Primary 1

Our House

Our house is built on one plot of land in Ijede, Ikorodu. It is a (15)
bungalow. In our house there are four rooms, one living room, (26)
one kitchen, one bathroom and one store. (33)

My parents' room is next to the living room. In their room, they (46)
have a giant-size bed and a reading table. Their wardrobe (56)
is behind the windows. (60)

My room is next to theirs. I have a desk near the window (73)
I keep my laptop on the desk. There are posters of my favourite (86)
singers on the wall. (90)

My sister's room is next to mine. She has her bed in the middle (104)
of the room. On her bed is a giant-size teddy bear which she (117)
uses as a pillow. (121)

The living room is the largest in our house. There is a complete (134)
set of furniture, with a centre table and six stools. There is also a (148)
cabinet where we put a 45-inch television and a DVD player. (159)

The kitchen is on the other side of the living room. In the kitchen, (173)
there is a big freezer and a cabinet where dishes are kept. (185)

Primary 2 Passage

Fluency Assessment: Oral Reading Fluency
SCORESHEET

Oral Reading Fluency Progress Monitoring ORF 1.3

Examiner script	Reminders	
Please read this (point to passage) **out loud.**	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Primary 2

The Ant and the Grasshopper

In a field one summer's day, a grasshopper was hopping, (10)
chirping, and singing to its heart's delight. An ant passed by, (21)
carrying an ear of corn to its nest. (29)

'Why not come and chat with me,' said the grasshopper, (39)
'instead of working and sweating in that way?' (47)

'I am helping to store up food for the winter,' said the ant, (60)
'and I think you should do the same.' (68)

'Why bother about winter?' said the grasshopper. (75)
'We have got plenty of food at present.' (83)

But the ant went on its way and continued its work. When the (96)
winter came, the grasshopper had no food and found itself (106)
dying of hunger, while it saw the ant happily eating corn and grain (119)
every day from the stores it had made in the summer. (130)

Then the grasshopper knew: it is best to prepare for the days (142)
of necessity. (144)

Primary 3 Passage

Fluency Assessment: Oral Reading Fluency
SCORESHEET

Oral Reading Fluency Progress Monitoring ORF 1.3

Examiner script	Reminders	
Please read this (point to passage) **out loud.**	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Primary 3

Jabar and His Tricks

Jabar was a young boy who enjoyed playing pranks on the road. (12)
He would never look at either side of the road before he crossed. (25)
He considered it a waste of time. He was very proud of his habit (39)
because it had never caused an accident once. (47)

One day Jabar saw a cyclist coming very fast at a distance. He (60)
decided to have some fun as usual. He crossed the road when the. (73)
cyclist was close to him. The cyclist could not control his speed and (86)
so hit Jabar. They both fell down. (93)

Although Jabar escaped injury, the cyclist was hurt badly. (102)

The bike had fallen on him and he was wounded in many parts of his (117)
body. A group of people took him to the hospital and Jabar's father (130)
had to pay for his treatment out of his little salary. (141)

For that term, Jabar could not go to school because his father (153)
could not pay his school fees. (159)

He felt very sad for being the reason for all that happened. He (172)
decided that he would never play pranks on the road again but (184)
adhere to road safety rules always. (190)

Primary 4 Passage

Fluency Assessment: Oral Reading Fluency
SCORESHEET

Oral Reading Fluency Progress Monitoring ORF 1.3

Examiner script	Reminders	
Please read this (point to passage) **out loud**.	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Primary 4

Safety at Home

Children learn about their environment by exploring it, that is by watching, touching, and trying things out. They are curious by nature and need careful and gentle guidance from a young age about what danger is and what to stay away from. (11) (21) (32) (42)

Most accidents happen in the home. This is why it is important to ensure that your home is safe for all your family. (55) (65)

There are many measures to take to protect children from injury or accident in the house. In the kitchen, elders should keep all sharp utensils and household cleaning products out of the reach of children. (76) (87) (97) (100)

In the bathroom, never leave water in the tub or sink. It takes very little water to create the danger of drowning. (114) (122)

Do not place furniture near a window that opens onto the balcony. A child could climb onto the furniture and out of the window and fall off the balcony. If you have a bar in the family room, lock away all alcohol. (134) (147) (161) (164)

Always buckle your child into the child safety seat every time your child rides in the car. (176) (180)

Keep all drugs securely locked up in a cabinet. Never keep firearms in a home with little children. If you must keep a firearm, dismantle or unload it, and secure its trigger lock. Then keep it locked in a gun. safe. (192) (205) (220) (221)

Primary 5 Passage

Fluency Assessment: Oral Reading Fluency
SCORESHEET

Oral Reading Fluency Progress Monitoring ORF 1.3

Examiner script	Reminders	
Please read this (point to passage) **out loud.**	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Primary 5

The Stone Cutter

There once was a stone cutter who was dissatisfied with himself and with his position (15)
in life. One day he passed a wealthy trader's house. Through the open gateway, he saw (31)
many fine cars and other possessions. He became very envious and wished he could be (46)
like the wealthy trader. To his great surprise, he suddenly became the trader. He (60)
enjoyed more luxuries and power than he ever imagined. (69)

Soon a high official passed by, accompanied by attendants and escorted by (81)
soldiers. Everyone, no matter how rich, had to bow low to the official. 'I wish I could be a (100)
high official,' he thought. Then he became the high official, carried everywhere, but (113)
was feared and hated by the people all around. (122)

It was a hot summer day, so the official felt very uncomfortable in the sticky sedan (138)
chair. He looked up at the sun. It shone proudly in the sky. 'How powerful the sun is!' (156)
he thought. 'I wish that I could be the sun.' Then he became the sun, shining down on (174)
everyone, burning the fields, cursed by the farmers and labourers. But a big cloud (188)
moved between him and the earth, so that his light could no longer shine on (203)
everything below. 'How powerful that storm cloud is!' he thought. 'I wish that I could (218)
be a cloud!' (221)

Then he became the cloud, flooding the fields and villages, shouted at by everyone. (235)
Soon he found that he was being pushed away by some great force — the wind. He (251)
thought, 'I wish I could be the wind!' (259)

Then he became the wind, blowing tiles off the roofs of houses, and uprooting trees. He (275)
was feared and hated by all below him. But after a while, he ran up against something (292)
that would not move, no matter how powerfully he blew against it – a huge rock. (307)
'How powerful that rock is!' he thought, 'I wish that I could be a rock!' Then he became (325)
the rock, more powerful than anything else on earth. But as he stood there, he heard (341)
the sound of a hammer pounding a chisel into the hard rock and felt himself being (357)
changed. 'What could be more powerful than me, the rock?' he thought. He looked (371)
down and saw far below him the figure of a stone cutter. (383)

It is wise to be contented with one's position in life. Greed kills. (396)

Primary 6 Passage

Fluency Assessment: Oral Reading Fluency
SCORESHEET

Oral Reading Fluency Progress Monitoring ORF 1.3

Examiner script	Reminders	
Please read this (point to passage) **out loud.**	Start timer	When student says first word.
If you get stuck, I will tell you the word, so you can keep reading. When I say 'Stop' I may ask you to tell me about what you read, so do your best reading.	Prompts	Student hesitates: wait 3 seconds; give correct word; mark the missed word as incorrect.
Start here (point to first word of first paragraph of passage). **Ready? Begin.**	Discontinue	Student does not get any words correct within the first line: discontinue ORF.

Primary 6

Chike and the Headmaster

Chike was not easily frightened. In fact, it took a lot to frighten him. (14)
But, standing outside Malam Usman's door, he felt a little scared. (25)
Perhaps it was because he knew that he should have done better in his (39)
mathematics examination. He knocked on the door. (46)

'Come in,' called the Headmaster's voice. The sharpness of it (56)
made Chike shiver, as he opened the door and walked into the room. (69)

'Good morning, sir,' he greeted. 'Good morning, Chike. I shall come (80)
to the point quickly. I received a letter from your father. He told you (94)
that he had written to me?' asked Malam Usman. (103)

'Yes sir,' replied Chike, hanging his head. 'Then you know what it is (116)
about. It is about your mathematics results, which, according to your (127)
father, is not up to your usual standard, although it is a pass mark.' He (142)
turned a stern eye upon the boy standing before him. (152)

'No, sir,' replied Chike. 'Do you know why you did not do as well as (167)
usual, Chike?' 'No, sir,' Chike replied, looking down at his toes. (178)

'Hold your head up, boy,' commanded the Headmaster, 'and have (188)
another try to think of any reason why your result disappointed and (200)
worried your father.' (203)

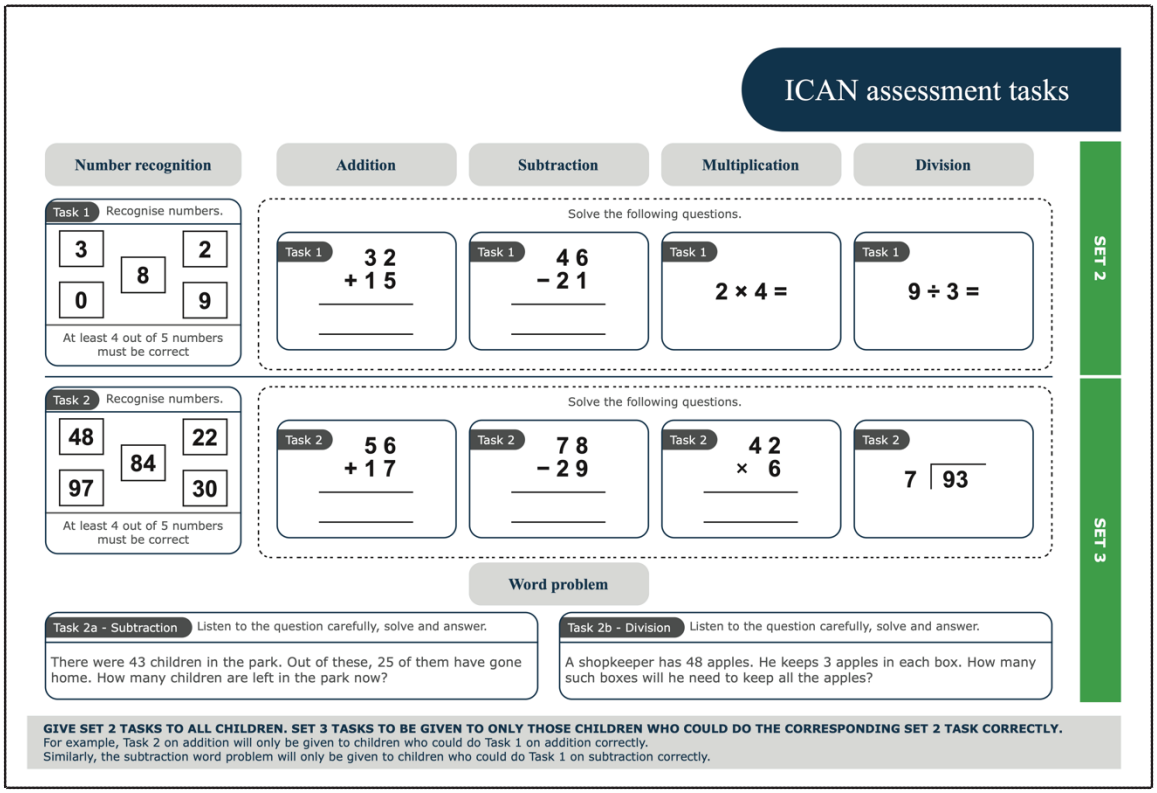
There was a long pause. You could have heard a pin drop in the (217)
headmaster's office. Then Chike spoke. 'Perhaps, sir, it was because (227)
I did not work hard enough,' he said quietly. (236)

Mathematics

Pupils' numeracy skills were assessed using the International Common Assessment of Numeracy (ICAN). The ICAN, developed by the People's Action for Learning (PAL) Network, appropriately targets skills relevant for the age group in this study, in contrast to other global assessments such as PISA and TIMSS which target older pupils and assess more complex mathematical skills, or EGMA which targets only the most foundational skills.

The ICAN is a tool designed to measure performance across five core numeracy competencies: number recognition, addition, subtraction, multiplication, and division. Within each of these domains, there are two sub-tasks; the first requires a simple application of the skill (for example, addition without carrying), and the second requires a more challenging application of the skill (addition with carrying). Two of the domains (subtraction and division) also include a separate word problem as part of sub-task 2. Across several rounds of data collection, enumerators used different versions of the assessment (for example, 2+5 as the simple addition item in one round and 3+4 in another round), so that correct answers would indicate actual mastery rather than familiarity with specific problems. The different versions were carefully designed by the KwaraLEARN Academics team so that the difficulty level and assessed skills remain constant across assessment rounds.

International Common Assessment of Numeracy (ICAN)



Other key indicators of programme implementation

Pupil attendance and enrolment

KwaraLEARN's ecosystem allows the programme team to track metrics on pupil attendance and enrolment in real time. Analysis of these data is completed by comparing average network-wide attendance and enrolment at the beginning of the programme to the same figures observed throughout each school year. This sheds light on whether attendance and enrolment increase over time as the programme matures, and whether improvements in these areas are correlated with learning gains.

Teacher attendance and lesson delivery

Data on teacher attendance and lesson delivery are also collected through the teacher tablets used by all KwaraLEARN teachers. Teachers are required to log their arrival using their tablets prior to their first lesson of the day. If a teacher fails to log their arrival, they are marked as absent. Since lessons are provided through the tablet, the rates of lesson completion are tracked as well. Head teachers and school supervisors have access to these data in order to hold teachers accountable and ensure consistent participation in the KwaraLEARN programme.

Complementing quantitative results with a qualitative study

This study also includes findings from a qualitative follow-up that was conducted during Term 3 of the 2023–24 school year to better understand the mechanisms behind some of the quantitative results. The in-depth interviews comprising the qualitative study touched upon topics of stakeholder satisfaction with the programme, parental and pupil engagement, and areas for improvement, among others. These interviews followed a structured approach (outlined in the protocol in section C.4) and the results were subsequently analysed using conventional coding practices for qualitative data.

C.3: Projecting Data from Baseline to the End of the Previous Year

Differences across grade levels in metrics (specifically oral reading fluency rates and ICAN scores) were calculated in order to estimate typical annual growth rates. For example, in February 2022, if pupils in Primary 1 could read 5 cwpm and those in Primary 2 could read 9 cwpm, the expected annual growth of Primary 1 pupils before the programme was 4 additional cwpm. These differences between grade levels were then divided in two (because baseline data were collected half way through the year) and subtracted from February 2022 levels, resulting in estimated levels by grade in July of 2021. Because these calculations require data for two consecutive grades, Primary 6 is excluded from most of the analyses, as there is no comparable JSS 1 data from an akin set of schools. These projected levels serve as a point of comparison for the actual levels observed at the end of subsequent school years.

C.4: Qualitative Data Collection Protocol In KwaraLEARN

In addition to quantitative data, this study also collected qualitative data. Following a structured protocol (see below), in-depth interviews were conducted in April-May 2024, in which teachers, head teachers, supervisors, parents, and pupils were asked a series of questions on topics including satisfaction with the programme, parental and pupil engagement, and areas for improvement. The responses gathered offer insights into the potential mechanisms behind the quantitative results.

Purpose and framing

The goal of this exercise is to understand what went well during the first months of the KwaraLEARN programme, and what did not.

We understand that there were several operational challenges throughout these initial months. However, as we collect this data, we do not want to prime respondents against any particular issue. Instead, we want to hear their candid opinions and the specific issues that, in their view, were the most significant hindrances to achieving a smoother programme implementation.

The questions below are not intended to be a full script. While interviewers should try to cover as much ground as possible, a key to collecting in-depth data via interviews is making the interviews "flow" by avoiding a feeling of "call-and-response" (i.e. jumping from one question to the next without any follow-ups). In other words, these questions are not meant for you to religiously ask one, and move on to the next. Instead, they serve as a guide about the conversations that you should be bringing up, but also feel free to ask follow-up questions and pursue tangents, if these appear to be fruitful sources of information.

Throughout your conversation, please make sure to take detailed notes. If the interview allows and you feel that this might not bias their responses, feel free to record the conversation. Otherwise, detailed notes, quotes, and any other evidence/opinions that they might produce should be documented.

How to start the interview?

The following paragraph serves as a potential guide on how you may want to frame the conversation from the start. Please **do NOT** read this paragraph verbatim — simply understand the main points, and then relay these to each interviewee at the beginning of each conversation:

"Thank you for your help today. We are working on understanding how the first months of the KwaraLEARN programme went — both the positive things, and the things that still need improvement. None of this conversation is a test, and none of your responses will be used against you in any way! In fact, we are looking for your very honest opinion on how the KwaraLEARN programme could be improved further — what areas you struggled with, and what areas were not working at all. Any questions before we get started? Is it okay if I note your name, classes taught last semester, and the school where you work?"

Questions for teachers:

1. First, what are your general impressions about the KwaraLEARN Programme?
2. Do you think that there are parts of the programme that are a clear improvement relative to before?
3. Were you trained in the methodology for the KwaraLEARN programme? If so, how helpful do you think it is to teach KwaraLEARN-level material?
4. How closely have you been following the methodology that you were trained on? Do you (1) follow the lesson guides closely, do you (2) use them as just some support but you can improvise/go “off script” sometimes, or do you (3) not use it at all?
5. If you have noticed any improvement in how much pupils are learning in class, have these gains been from the pupils who were the lowest performing or the highest performing?
6. What do you do to help low performing pupils learn how to read?
7. What issues, both about the programme or from outside of it (e.g. like in your school) were the most problematic in terms of incorporating the KwaraLEARN methodology into your teaching? Even if you wanted to use this programme as you were trained on, what makes it hard to do so?
8. Did your school leader or your supervisor encourage you to engage with the programme? What do you think their attitudes towards the programme were?
9. If you could ask for 2 or 3 things to ensure that you implement this programme properly, what would they be? What could be improved by next year to make you either use the techniques more, or to ensure that you are more effective in using these techniques?

Questions for head teachers:

1. First, what are your general impressions about the KwaraLEARN Programme?
2. What do you think your teachers’ general impressions about the KwaraLEARN Programme are?
3. During its first year of operations, the KwaraLEARN programme was rolled out in all Primary levels. Did you notice how the teachers taught the programme between the lower-basic class pupils and middle-basic class pupils? Can you speak a little more about how this dynamic played out on a day-to-day basis?
4. In your observations, do you think the programme is better equipped for younger or older pupils?
5. Since implementing the programme, what are some major changes that you have noticed among the teachers, especially in regard to classroom management and teaching behaviours? Were there particular subjects where these changes were more apparent?
6. Think back to your conversations with your teachers throughout the last semester: what do you think their #1 complaint about the programme was?
7. If you could ask for 2 or 3 things to ensure that you implement this programme properly, what would they be? What could be improved by next year to make you either use the techniques more, or that you are more effective in using these techniques?

Questions for supervisors:

1. What are your general impressions of how the KwaraLEARN programme has been going?
2. Do you think that there are parts of the programme that are a clear improvement relative to before?
3. How closely do you think that teachers have been following the methodology that they were trained on? Do they (1) follow the lesson guides closely, do they (2) use them as just some support but they can improvise/go "off script" sometimes, or do they (3) not use it at all?
4. In your observations, what areas of the programme were the most problematic in terms of incorporating the KwaraLEARN methodology into the classroom?
5. During its first year of operations, the KwaraLEARN programme was rolled out in all Primary levels. Did you notice how the teachers taught the programme between the lower-basic class pupils and middle-basic class pupils? Can you speak a little more about how this dynamic played out on a day-to-day basis?
6. In your observations, do you think the programme is better equipped for younger or older pupils?
7. Since implementing the programme, what are some major changes that you have noticed among the teachers, especially in regard to classroom management and teaching behaviours? Were there particular subjects where these changes were more apparent?
8. Since implementing the programme, do you think teachers have been teaching differently for the lowest performing pupils? What about for the highest performing pupils?
9. Think back to your conversations with your teachers throughout the last semester: what do you think their #1 complaint about the programme was?
10. When you provide teachers with feedback, how receptive have they been to this feedback?
11. If you could ask for 2 or 3 things to ensure that you implement this programme properly, what would they be? What could be improved by next year to make you either use the techniques more, or that you are more effective in using these techniques?

Questions for parents:

1. In the past six months, have you noticed any changes in how your child's teacher teaches the class? If so, what are those changes?
2. In the past six months, have you noticed any attitude changes from your child's teacher? Do they seem more or less motivated? Are they coming to class more or less often? Any changes of this type?
3. What challenges do you think your child encounters at school every day to keep learning?

Questions for pupils:

1. In the past six months, have you noticed any changes in how your teacher teaches the class? If so, what are those changes?
2. In the past six months, have you noticed any attitude changes from your teacher? Do they seem more or less motivated? Are they coming to class more or less often? Any changes of this type?
3. What makes you excited about coming to school? [this question is to positively prime them for the following question, so it's not such a negative transition]
4. What makes learning at school hard? What challenges do you encounter at school every day to keep learning?

Sample data collection

For teachers

Question	Respondent 1 Name: (if available) School: (if available) Grades taught last year: (if available)	Respondent 2 Name: (if available) School: (if available) Grades taught last year: (if available)	Respondent 3 Name: (if available) School: (if available) Grades taught last year: (if available)
Question 1	Response	Response	Response
Question 2	Response	[Not discussed]	Response
Question 3	Response	Response	[Not discussed]
Question 4	[Not discussed]	Response	Response
Questions 5	Response	[Not discussed]	Response
Questions 6	Response	[Not discussed]	Response
Question 7	[Not discussed]	Response	Response
Other comments	[Add here additional comments from the respondent]	[Add here additional comments from the respondent]	[Add here additional comments from the respondent]
Interviewer observations	[Add here any observations from the interviewer — what was the tone of the conversation? Hostile? Did they seem to really dislike the programme? Were they frustrated with certain aspects of the educational system, either within or outside of the programme? Did they seem sincere/insincere in their dislike/praise of the programme?]	[Add here any observations from the interviewer — what was the tone of the conversation? Hostile? Did they seem to really dislike the programme? Were they frustrated with certain aspects of the educational system, either within or outside of the programme? Did they seem sincere/insincere in their dislike/praise of the programme?]	[Add here any observations from the interviewer — what was the tone of the conversation? Hostile? Did they seem to really dislike the programme? Were they frustrated with certain aspects of the educational system, either within or outside of the programme? Did they seem sincere/insincere in their dislike/praise of the programme?]

Ideally, after each interview, we suggest that the interviewer either takes a few minutes to add all their notes to a new column, or at the very least, that they process their notes either on paper or in the spreadsheet, in such a way that they can come back to the spreadsheet later on, and have a clear memory of everything that was discussed so they can finish filling out the spreadsheet. As shown in the example above, we do not need an answer for every question from every participant. Although we want to cover a lot of ground with each response, we also do not want to sacrifice candour and in-depth discussions for a more superficial coverage of all questions.

Finally, the interviewer should also take a few minutes to meditate about the subjective feel of the interview and of the respondent's attitudes towards the programme. Any "vibe" that was not able to be transmitted through the other (more concrete) questions, should be incorporated into this section. Then, interviewers will include this information in the last row of the spreadsheet, for as many interviewees as possible.

Appendix D: Hasbrouck-Tindal Oral Reading Fluency Norms

Hasbrouck & Tindal **Oral Reading Fluency Data** 2017

This table shows the oral reading fluency rates of students in grades 1 through 6, based on an extensive study by Jan Hasbrouck and Gerald Tindal that was completed in 2017. The results of their study are published in a technical report entitled, "An update to compiled ORF norms," which is available on these websites:

- **ERIC website:** eric.ed.gov/?id=ED594994
- **BRT website:** www.brtprojects.org/publications/technical-reports

This table can help you assess the oral reading fluency of your students relative to their peers. Students scoring 10 or more words below the 50th percentile using the average score of two unpracticed readings from grade-level materials need a fluency-building program. Teachers can also use the table to set long-term fluency goals for struggling readers.

Related information:

- **Essential Components of Reading:** readnaturally.com/components
- **Correlation Between Oral Reading Fluency and Overall Reading Achievement:** readnaturally.com/correlation
- **Read Naturally Tools for Assessing Fluency:** readnaturally.com/assessment-tools
- **Read Naturally Intervention Programs That Develop Fluency:** readnaturally.com/fluency-interventions

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Grade	Percentile	Fall WCPM*	Winter WCPM*	Spring WCPM*	Avg. Weekly Improvement**
1	90		97	116	1.2
	75		59	91	2.0
	50		29	60	1.9
	25		16	34	1.1
	10		9	18	0.5
2	90	111	131	148	1.2
	75	84	109	124	1.3
	50	50	84	100	1.6
	25	36	59	72	1.1
	10	23	35	43	0.6
3	90	134	161	166	1.0
	75	104	137	139	1.1
	50	83	97	112	0.9
	25	59	79	91	1.0
	10	40	62	63	0.7
4	90	153	168	184	1.0
	75	125	143	160	1.1
	50	94	120	133	1.2
	25	75	95	105	0.9
	10	60	71	83	0.7
5	90	179	183	195	0.5
	75	153	160	169	0.5
	50	121	133	146	0.8
	25	87	109	119	1.0
	10	64	84	102	1.9
6	90	185	195	204	0.6
	75	159	166	173	0.4
	50	132	145	146	0.3
	25	112	116	122	0.3
	10	89	91	91	0.1

*WCPM = Words Correct Per Minute **Average words per week growth

Appendix E: Mapping ICAN results onto Global Performance Standards

Mastery of numeracy skills in the early grades plays a crucial role in a pupil's ability to form a strong academic foundation, which then contributes to the individual's opportunities for economic, social, and personal prosperity. Yet, despite its importance, it is often the case that pupils are performing far below expectations in mathematics. In fact, a third of the global population of pupils will complete their Primary school education without mastery of foundational numeracy (Sitabkhan and Platas, 2018). Therefore, it is important for policymakers to have visibility into pupil numeracy progress and to understand the amount of growth needed for pupils to achieve mastery of grade-appropriate skills before the end of their schooling careers. For this, researchers need an international performance standard which aggregates data on pupil competencies from a broad array of contexts so that pupil numeracy levels can be benchmarked against globally representative expectations and the actual performance of other contexts.

The Global Proficiency Framework (GPF) is a context-agnostic compilation of numeracy proficiency descriptors developed by the UNESCO Institute for Statistics and myriad contributing organisations. The "Global Proficiency Descriptors" (GPD) included in it leverage mathematics performance data collated from fifty countries to form a standardised definition of grade-appropriate numeracy skills. Mathematical competencies that may be demonstrated by pupils at a particular grade level, but exceed expectations for that grade level, are categorised as such, and underperformance is likewise attributed accordingly (UNESCO Institute for Statistics et al., 2023). As such, policymakers are granted the comprehensive insight necessary to manage expectations and implement a gradational approach to elevating pupil success in their particular education system. Furthermore, the GPF is recognised as the source material for tracking learning progression in alignment with Sustainable Development Goal 4, which underpins its utility for translating within-system mathematical proficiency analysis to effective policy decisions (UNESCO Institute for Statistics et al., 2023).

Given the prominence of the GPF to understand global numeracy standards, this study has created a crosswalk between each skill assessed via the International Common Assessment of Numeracy (ICAN), described in this report, and the grade in which children are expected to master that skill according to the GPF. The study team carefully identified the mathematical benchmarks in the GPF that most closely correspond with assessment items, based on both the exact problem and the skill that is assessed by each problem. The grade level at which assessed pupils should be reaching these benchmarks was then determined by referencing the grade level(s) described under the framework's "Meets Global Minimum Proficiency"[7] threshold. In the following table, the precise alignment between each assessed ICAN skill and the grade-level expectation, per the GPF, for sufficient ability to demonstrate this skill can be found:

[7] By design, this threshold is formed from a lenient definition of the level of proficiency pupils need to demonstrate the skill. Therefore, if an ICAN skill is assessed by a problem that is marginally more advanced than the corresponding GPD on the GPF, it is still reasonable to state that pupils would achieve this skill by the grade level designated by the GPD. Since the GPD describes the minimum level of skill a pupil can demonstrate that is still considered sufficient, it is likely that a significant proportion of pupils at this grade level would have stronger proficiency.

ICAN Skill	Sample Problem	GPF Grade-Level Expectation	NERDC Grade-Level Expectation	Rationale[8]
Simple number recognition: One-digit number recognition	3, 0, 8, 2, 9	KG	P1	G1: N1.1.1_M Count in whole numbers up to 30.
Complex number recognition: Two-digit number recognition	48, 97, 84, 22, 30	G1–2	P1	G1: N1.1.1_M Count in whole numbers up to 30. G2: N1.1.1_M Count in whole numbers up to 100.
Simple addition: Two-digit addition without carrying	32 + 15 = ____	G2-3	P2	G2: N1.3.1_M Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols. G3: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols (e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).
Complex addition: Two-digit addition with carrying	56 + 17 = ____	G3	P2	G3: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols (e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).
Simple subtraction: Two-digit subtraction without borrowing	46 - 21 =____	G2	P2	G2: N1.3.1_M Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols.

[8] The Global Proficiency Descriptors for each grade level are coded in accordance with which domain and where in the GPF they are located ("N" stands for "Number Operations" and "A" stands for "Algebra"). The "M" at the end of each descriptor's label indicates that this is the expectation for the "Meets Minimum Proficiency" level.

Complex subtraction: Two-digit subtraction with borrowing	78 - 29 = ____	G3	P2	G3: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols.
Simple multiplication: One-digit multiplication without regrouping (exact multiplication)	2 x 4 = ____	G3	P3	G3: N1.3.2_M Multiply and divide within 100 (i.e., up to 10 x 10 and 100 ÷ 10, without a remainder), and represent these operations with objects, pictures, or symbols.
Complex multiplication: Two-digit multiplication with regrouping	42 x 6 = ____	G5	P4	G5: N1.3.2_M Multiply, with and without regrouping, and divide, with no remainder, any number by a one-digit number and multiply two, 2-digit numbers, with and without regrouping (e.g., 342 x 4 = __; 42 x 34 = __; 1380 ÷ 5 = __).
Simple division: Exact, one-digit short division with no remnant	9 ÷ 3 = ____	G3	P3	G3: N1.3.2_M Multiply and divide within 100 (i.e., up to 10 x 10 and 100 ÷ 10, without a remainder), and represent these operations with objects, pictures, or symbols.
Complex division: Short division of a two-digit dividend by a one-digit divisor with a remnant	93 ÷ 7 = ____	G6	P4	G6: N1.3.2_M Multiply any number by a 2-digit number, with and without regrouping, and divide any number by a 1-digit number, with and without a remainder (e.g., 3427 x 68; 1380 ÷ 6 = __).
Subtraction word problem	There were 43 children in the park. Out of these, 25 of them have gone home. How many children are in the park now?	G4	P2	G4: N1.4.1_M Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with and without regrouping, including problems involving measurement and currency units.
Division word problem	A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?	G5	P3	G5: N1.4.2_M Solve simple real-world problems involving the multiplication of two whole numbers to 10, and associated division facts.

Appendix F: An Overview of the Data Quality Assurance Protocol

The context surrounding the quality assurance protocol

Foundational **literacy** and **numeracy** (FLN) skills amongst children in any given education system are integral to their success, both within their academic careers and in their everyday lives. Proficiency in these two fundamental skills can be used as a measure of overall education quality, but it is something that is often lacking in pupils attending schools in low- and middle-income countries (LMIC). Transforming this distressing reality is a direct focus of NewGlobe's government-partnered education reform strategies. However, raising pupils' competencies in these core skills up to ideal levels necessitates that those competencies be properly assessed and measured before, during, and after our programmatic interventions.

To achieve this, we use internationally validated assessments that contextualise where pupil learning levels are within the broader scope of where they need to be. Pupils are scored based on the number of correct responses they provide, and the number of incorrect responses is also recorded. For literacy, we use two assessment passages provided by **Dynamic Indicators of Basic Early Literacy Skills** (DIBELS), which is widely regarded by researchers as an effective literacy measurement procedure. These passages work in tandem to provide insight into **oral reading fluency** (ORF), the subskill most strongly correlated with others on the path towards reading proficiency, and **reading comprehension**, the ultimate goal of literacy skills. The first assessment is a Primary 2 passage, which all pupils (regardless of grade level) read, and the second is a grade-level passage tailored specifically to each pupil's respective class. For both, pupils are scored based on the number of **correct words per minute** (cwpm), and incorrectly read words are also recorded. In order to assess pupils' numeracy skills, we use the **International Common Assessment of Numeracy** (ICAN), which aligns with global standards for monitoring learning progress in LMIC, and tests pupils on the core skills of number recognition, addition, subtraction, multiplication, and division. With these tools, we can benchmark pupils' learning levels based on their assessment scores, and thus precisely target our efforts to help them improve.

Furthermore, given that these assessments are what underpin some of the major policy decisions needed to benefit pupils to the greatest extent possible, it is vital that the data gathered from them be current and reliable. Therefore, to ensure efficient turnaround and accuracy of assessment scores, NewGlobe dispatches trained enumerators to administer the assessments in the schools it serves. Enumerators are responsible for recording and reporting assessment scores with the utmost precision. In turn, NewGlobe is responsible for effectively monitoring these enumerators' output, to ensure that there are no observances permitted that may compromise the reliability of the data. To execute this, NewGlobe's Research, Measurement and Evaluation (RME) team has developed a **quality assurance protocol**.

The goal of the protocol

The quality assurance protocol is embedded within our larger data cleaning process — which is employed to correct erroneous, incomplete, or duplicate information from our data sets — and certifies that the data collection completed by enumerators is of the expected calibre. This is the primary function of the protocol, and what allows it to reach its primary goal of supporting validated data that reflects actual pupil performance in the assessed skills.

In the interest of transparency and greater visibility into data-gathering performance patterns, the RME team also produces **quality assurance reports,** which detail our work in identifying problematic enumerator observations, thus allowing for targeted interventions to improve data quality. This documentation also serves as an internal guide to the quality assurance protocol for anyone in our organisation who is interested in understanding how we ensure data quality control.

Defining quality assurance indicators

To examine the quality of our data, the RME team has implemented an automated approach, built with standardised code created in Stata — a statistical software platform — which allows us to identify certain indicators within the data that point to inaccuracies. These indicators reveal that some reported assessment scores may reflect an issue with enumeration, rather than a true measure of pupil ability. To further streamline this process, we've identified **seven indicators** that may be flagged for the possibility of potential issues that need to be investigated:

- **Indicator 1:** The proportion of observations showing that pupils are non-readers
- **Indicator 2:** The proportion of observations containing ORF scores of extreme values for a given grade
- **Indicator 3:** The proportion of observations containing ORF scores that surpass the maximum achievable score
- **Indicator 4:** The proportion of observations containing discrepant ORF scores
- **Indicator 5:** The proportion of observations containing identical ORF scores
- **Indicator 6:** The proportion of observations containing ORF scores that are multiples of 5, or similar grouping patterns
- **Indicator 7:** The correlation of scores among ORF, reading comprehension, and numeracy skills

While it is worth noting that not all of these indicators are, by themselves, a clear indication of inaccurate data, if the data cleaning process leads to the discovery of several of these indicators, this may indicate a pattern of malpractice among certain enumerators. Therefore, a thorough investigation into the specific cases flagged by these indicators is necessary to determine if there is an issue that compromises data quality.

Putting guidelines in place for each indicator

In order for these indicators to support our goal of consistent data quality assurance, the RME team must have frameworks in place for analysing them. Therefore, we have defined a **reasonable range** that we would expect assessment scores to fall within. Scores that are within two standard deviations (SDs) from the mean are considered reasonable, while scores that are outside of that are more closely examined as outliers requiring further verification. As such, some of the indicators described below revolve around identifying scores that exist above or below a reasonable range.

In addition to this, we have established a **frequency threshold** for how often indicators signifying potential errors in the data collection process should occur. That is, if more than 10% of a given enumerator's observations contain these indicators, the RME team will investigate the reliability of their findings accordingly.

Indicator 1: The proportion of observations showing that pupils are non-readers

The key question to answer for this indicator is whether the proportion of non-readers (those scoring zero correct words per minute) identified by enumerators is within the established reasonable range for a given territory. Observations outside of this range are considered to be an overestimation or underestimation of non-readers. Additionally, we investigate any discrepancies in the proportion of non-readers identified between the two passages used as assessments. We expect that enumerators who identify many pupils as non-readers using the class-level ORF passage will also identify many non-readers using the standard-class ORF passage, and vice versa.

Other parameters also determine whether this indicator suggests unreliable data. For instance, if most enumerators report a high proportion of non-readers in a given territory, it would not necessarily be viewed as a data quality issue. However, if only a few enumerators report a high proportion of non-readers, we will closely scrutinise the results from those enumerators to identify potential data quality issues. It is important to consider that some schools may genuinely have a higher proportion of non-readers, but we conduct a thorough evaluation of the data to confirm whether an actual trend exists in the territory, or whether it is an indication of errors in the data set.

Indicator 2: The proportion of observations containing ORF scores of extreme values for a given class

Just as we expect there to be a reasonable range of non-readers, there should also be a realistic distribution of high-performers. For this reason, we also monitor enumerator observations for scores that would be considered outliers when viewed in conjunction with the other scores reported for pupils in a given class. These scores would fall well outside of the reasonable range — clearly above or below what is expected of pupils — based on the typical scores seen in the rest of the sample. They would therefore be flagged as indicative of a potential data quality issue. Moreover, if the proportion of an enumerator's observations that are outside this range surpass the predetermined frequency threshold, then we would investigate the accuracy of the data based on how regularly these extreme values are occurring.

Indicator 3: The proportion of observations containing ORF scores that surpass the maximum achievable score

Since the assessment passages used to measure oral reading fluency contain a fixed number of words, it is impossible for a pupil to read a greater number of correct words than the total count in the passage. Even if they did not make any errors, the maximum achievable score would be equal to the total number of words in the passage. Consequently, enumerator observations showing ORF scores that exceed this number are considered an indicator of a potential data quality issue. However, it is important to clarify that the word limit can be adjusted during different data collection rounds to reflect the current passage, and this may be the source of the discrepancy.

Hence, we apply the same reasoning for this indicator as for the first indicator. If only a few enumerators report a disproportionately high proportion of unlikely ORF scores when evaluating pupils in a given territory, while the majority of enumerators do not indicate such a trend, then there could be potential issues with the accuracy of their data collection worthy of closer examination. Similarly, the RME team would also scrutinise the output of an enumerator who records many excessively high scores for one of the assessment passages, but not for the other.

Indicator 4: The proportion of observations containing discrepant ORF scores

In addition to scores that surpass the total number of words read in a passage, we examine whether enumerator observations contain discrepant scores. A discrepant score is defined as a total number of words read that does not match the sum of correctly read words and incorrectly read words. It is unusual for an enumerator to produce a significant proportion of discrepant scores. However, we closely monitor their observations to ensure that enumerators do not include these errors in either or both of the two passages used for assessment.

Indicator 5: The proportion of observations containing identical ORF scores

Because it is typical for assessment scores to show variation, it is unlikely that enumerators would report a large proportion of observations containing exactly the same ORF score. Therefore, an enumerator reporting a proportion of identical scores that is above the established threshold would prompt further examination to ensure the accuracy of the data. Likewise, we expect individual pupils to score differently on the different passages used for assessment. It is hence an indication of a potential data quality issue if enumerators report the exact same score for one pupil across both passages.

Indicator 6: The proportion of observations containing ORF scores that are multiples of 5, or similar grouping patterns

This indicator is focused on examining whether enumerators are reporting an excessive number of ORF scores that are multiples of five. Based on the typical range of reading fluency scores, we would expect only around 20% of scores to be multiples of five. Therefore, significant clusters or groupings of scores that are multiples of five, such as 100 cwpm, for example, would raise concerns about potential round number bias, rather than reflecting genuine variations in performance. In cases of high-quality data collection, we anticipate observing scores that are uniformly distributed across a range of values, including those that are multiples of five.

Furthermore, it is more probable for enumerators to report a score that is a multiple of five for one assessment passage than for both passages. Therefore, reporting a score that is a multiple of 5 for one passage is less concerning, but if an enumerator reports scores that are multiples of five for both assessment passages, it would be considered a flag and require further scrutiny.

Indicator 7: The correlation of scores among ORF, reading comprehension, and numeracy skills

Reading fluency, reading comprehension, and numeracy assessment scores tend to correlate with one another. Given this relationship, we assess whether the correlations among these skills reported by specific enumerators differ significantly from those observed across the rest of the sample.

Correlations that are disproportionately higher or lower than others could indicate a serious data quality concern. Correlative deviations may signify inattentive and imprecise observations completed by enumerators — especially in the case of lower correlations — and they can also point to inaccurate assumptions being made about pupils' competencies in one or more of these skills, based on their performance in other skills, which would mean an inaccurate reading of their learning levels.

Understanding how the RME team interacts with quality assurance indicators to maximise data quality

Part 1: Creating flags for each indicator across observations

If the observations completed by enumerators contain these indicators, and the number of indicators exceeds the frequency threshold or contain scores that are outside the reasonable range, flags will be raised to signify the need for review of the data. To standardise this process, the RME team has created code to flag the issues defined by each indicator, for each of the observations in a data set. The specifics of this code ensure that these flags identify the individual enumerator who completed the observations, thereby establishing accountability norms and governance over performance patterns.

Part 2: Aggregating data for each indicator, by enumerator

After the indicator flags for each observation have populated, the next step involves aggregating the data embedded in each indicator, per enumerator. This allows us to quantify the number of flags per indicator that are occurring as a result of a given enumerator's data collection process, which provides further insights into the consistency with which they report accurate data.

Part 3: Investigating enumerator alert rates based on indicators

These tools, used for identifying potential errors within enumerators' observations, provide us with an **alert rate**, which serves as part of the basis for determining which enumerators' data collection processes require further investigation. An alert rate is a metric that measures the severity of potential errors in an enumerator's work. It is calculated by dividing the number of flagged indicators for an enumerator by the total number of indicators present. A higher alert rate indicates a higher likelihood of errors, and potentially reduced reliability in an enumerator's data collection. We pinpoint enumerators with comparatively high alert rates and rigorously examine the data they collected to determine whether the improbabilities found in their data are genuine, or if they are indicative of unreliable data collection.

Part 4: Reporting enumeration performance to the data collection team

By implementing these measures, our organisation can conduct a thorough evaluation of enumeration performance aligning with our mission to uphold data integrity. Once we have followed these steps, which ensure a sound evaluation of each enumerator's data collection process, we share our results with the data collection team. At this stage, the team carries out independent investigations and takes proactive measures to address any identified issues. Via this iterative process, we foster a collective effort to promote transparency and accountability, and reinforce our commitment to deliver accurate and trustworthy data.

Appendix G: The State of Learning in Kwara State Before the Start of the Programme

Average literacy levels were low across all classes

Data collected before the programme's launch revealed that Kwaran pupils had very weak literacy skills. For example, the average pupil in a Primary 2 classroom could not read a single word of a class-level passage. Literacy outcomes did not improve significantly year-on-year, with the average Primary 5 pupil reading less than 15 cwpm. Even by Primary 6, the average pupil could only read 34 cwpm. To contextualise these scores within the broader data on global pupil performance, the average Primary 6 pupil in this sample performed at roughly the level of a Primary 1 pupil in high-income, English-speaking countries. Further, pupils in a typical Primary 1 classroom performed at approximately one-tenth the level of their peers in other low- and middle-income countries (LMIC), and only one-twentieth of the level of their peers in high-income countries (Figure G.1). By the end of Primary school, pupils were, on average, more than four classes behind where they should be.

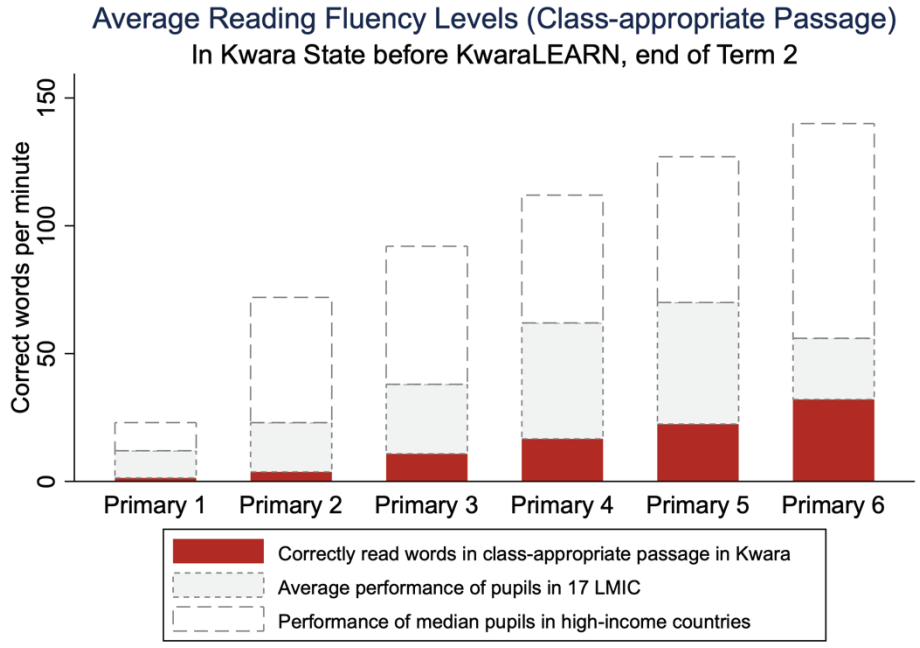


Figure G.1

These low average reading fluency outcomes were driven, in part, by the large number of pupils who could not read at all – more than one-third of the sample could not read a single word from a class-level passage before the start of the KwaraLEARN programme. These poor outcomes persisted even in higher classes, such as Primary 5 and 6, where 15–20% of pupils were unable to read a single word of a class-level passage (Figure G.2). These low literacy levels had negative implications for pupils' capacity to access learning across other subjects, as they did not possess the minimum levels of literacy needed to read or understand class-level content. Further, these findings indicated that a significant proportion of pupils were leaving Primary school without acquiring the necessary foundational literacy skills needed to meaningfully engage with secondary–school-level curricula, placing them progressively further behind as they struggled to tackle more challenging concepts (See Box 2 for information regarding the importance of acquiring foundational skills).

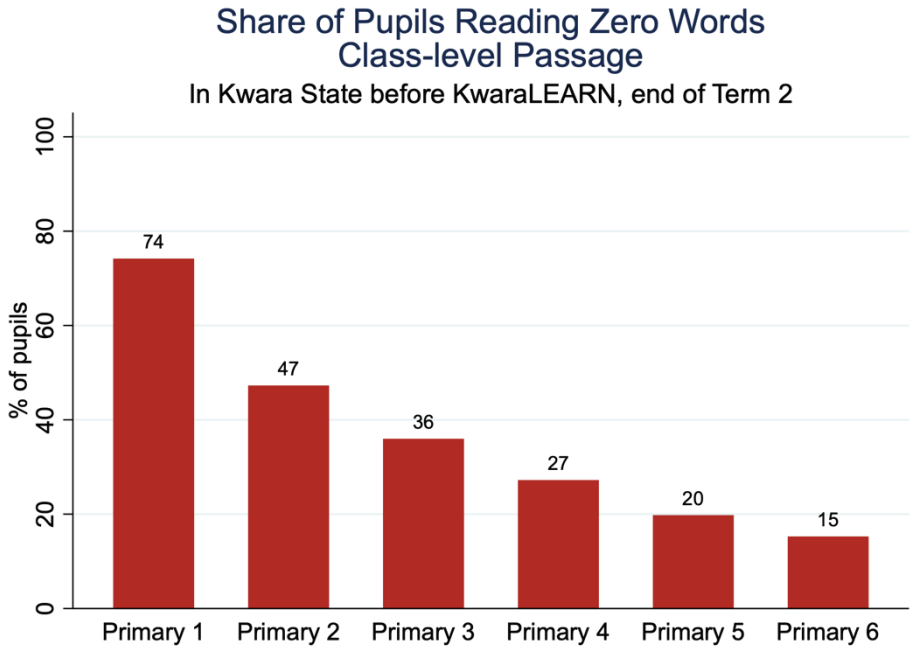


Figure G.2

Box 2: The Value of Universal, Early, Conceptual, and Procedural Mastery of Foundational Skills

Over the last few decades, educational enrolment in low- or middle-income countries (LMIC) has been catching up with the enrolment rates in high-income countries (HIC). However, international standards of literacy and numeracy indicate that the average pupil in LMIC performs worse than 95% of the pupils in HIC (World Bank, 2018) — that is, despite these global enrolment increases, learning levels remain low because children are not mastering foundational skills like literacy and numeracy. For instance, a 2021 study conducted across 32 countries highlighted that on average, only 30% of Grade 3 pupils possessed foundational literacy skills, with only 18% possessing foundational numeracy skills (UNICEF, 2022).

Foundational skills are necessary to effectively advance learning, comprehension, and problem solving skills in children's future academic careers and personal lives. Lacking foundational skills in the early grades creates even larger gaps in learning in later grades, as pupils who did not master the foundations will have a harder time advancing through higher order concepts. This can have a negative impact on further skill development, career opportunities, and social mobility later in adulthood (Belafi et al., 2020).

To increase overall learning levels, education systems must prioritise universal, early, conceptual, and procedural mastery of foundational skills (Belafi et al., 2020). Universality ensures that learning progress is being made and measured for all children, regardless of socioeconomic status, gender, race or ethnicity, or whether the child is in school. It's also important that foundational skills are mastered in early grades, as learning gaps emerge early and widen throughout grade progression (Belafi et al., 2020). Additionally, developing both conceptual and procedural knowledge helps pupils cultivate a well-rounded understanding of foundational skills, which contributes to mastering the skill and being able to apply it in other contexts (Kilburn, 2020). Implementing all these components in conjunction is necessary for a more comprehensive and equitable approach to teaching and learning.

Prioritising universal, early, conceptual, and procedural mastery of foundational skills may require government intervention, curriculum reform, additional instructional support, and/or targeted remediation efforts for pupils falling behind (Belafi et al., 2020). To successfully implement this, reform should aim to specifically target learning outcomes instead of inputs that may influence learning, such as technology, textbooks, or teachers. For example, in 2015 Tanzania enacted the "3Rs" reform, which consisted of major curriculum reforms in Grades 1 and 2 that aimed to focus 80% of instructional time on foundational literacy and numeracy. The reform had a positive effect on both literacy and numeracy; the likelihood of a pupil reaching Grade 2 maths proficiency increased by 50%, and the likelihood of reaching Grade 2 Kiswahili proficiency increased by 71% (Rodriguez-Segura & Mbiti, 2022). In this sense, realigning curricular expectations for teachers such that they would focus more heavily on foundational skills led to meaningful learning gains in the earlier grades, and will allow these pupils to be better prepared to learn new subjects later on.

Insufficient mastery of foundational skills has a detrimental effect on overall levels of learning, thus perpetuating an ineffective education system. To make the system more effective, governments and schools can prioritise universal, early, conceptual, and procedural mastery of foundational skills in schools' curriculum, with the goal to increase learning for a wider range of children. A system-wide commitment to prioritising foundational skills mastery in schools is a necessary step that not only lays the groundwork for future learning, but also effectively bridges nationwide and global equity gaps with more impactful educational investments.

Most pupils could not solve maths problems using age-appropriate subskills

Similar to literacy, pupils displayed low achievement levels in numeracy. When examining specific subskills, pupils' learning outcomes were extremely weak compared to NERDC standards for each class. For example, before the start of the KwaraLEARN programme, fewer than 4 in 10 pupils in a typical Primary 4 classroom could solve a two-digit addition problem in the form of 56+17 (Figure G.3), even though this is a skill which should have been mastered by Primary 2, according to national standards.

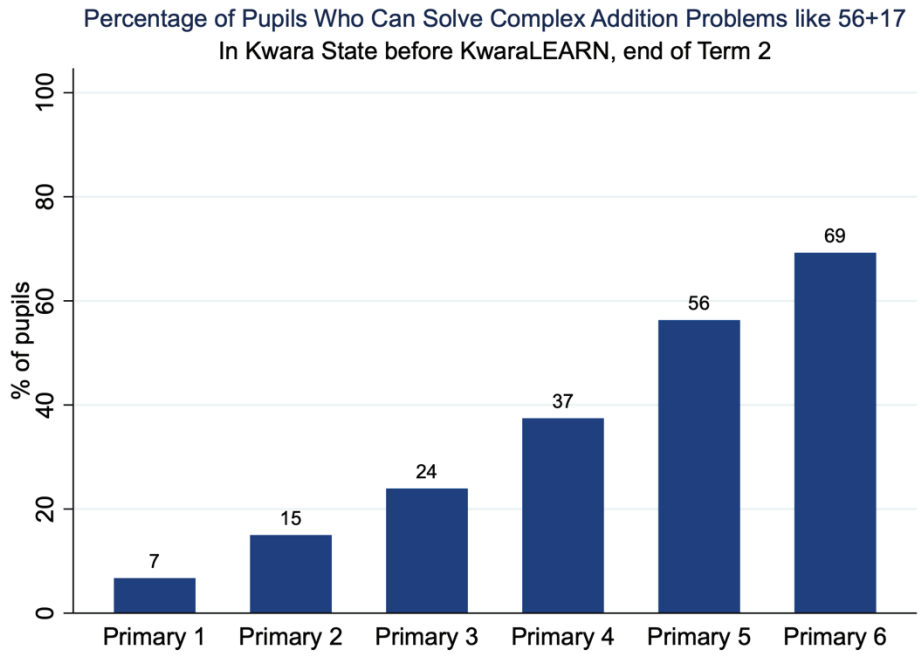


Figure G.3

These outcomes persisted in higher classes as well. For instance, one-quarter of Primary 6 pupils could not perform two-digit subtraction in the form of 46–21 (Figure G.4), even though national standards suggest that this skill should have also been mastered by Primary 2.

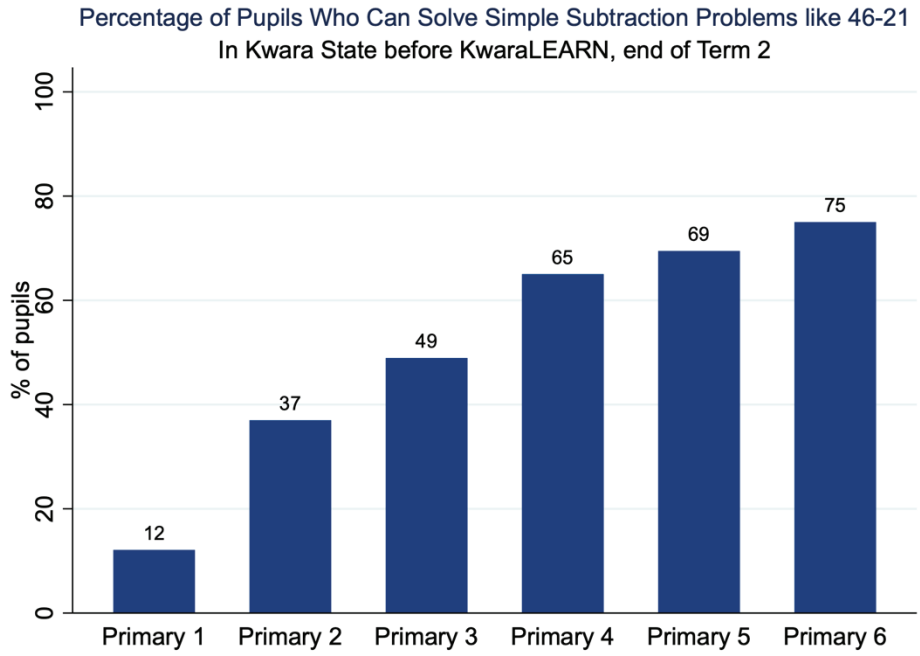


Figure G.4

Even when pupils knew how to perform mathematical operations, they struggled to translate their knowledge into real-life situations

Pupils' numeracy and literacy skills further translated into low performance levels on word problems. For example, only 1 in 4 Primary 5 pupils could solve a word problem involving subtraction, and only 1 in 10 could solve a word problem involving division (Figure G.5). Even the few pupils who could solve complex subtraction and division problems in operational form struggled to translate these skills into real-world situations. For instance, only half of all children who could perform the subtraction problem 78–29 could also correctly answer this word problem involving subtraction: "There were 43 children in the park. Out of these, 25 of them have gone home. How many children are left in the park now?" For division, less than 40% of pupils who could solve division in the form of 93÷7 could also answer this question: "A shopkeeper has 48 apples. He keeps 3 apples in each box. How many boxes will he need to keep all the apples?" These low performance levels on word problems are, in part, also a reflection of pupils' low levels of reading fluency and comprehension.

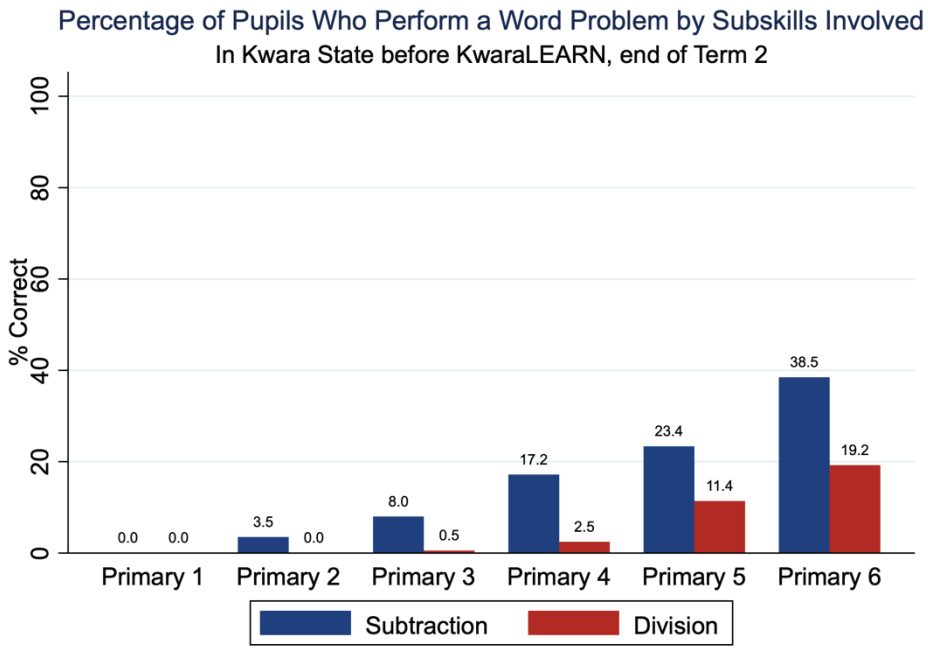


Figure G.5

Overall, there were low levels of mastery of more advanced numeracy subskills among pupils in schools in Kwara State. Even among the pupils who had mastered these skills in a computational sense, the translation of these skills to real-life situations was not automatic. In other words, the state of learning in these schools prior to KwaraLEARN was such that, even when pupils mastered certain foundational numeracy skills, they were not equipped with the tools to apply that same knowledge to their daily lives, and hence were unable to fully reap the benefits of numeracy outside of school.

Constraints in staffing and instructional practices

Prior to the KwaraLEARN programme, the instructional environment in Kwara State was not conducive to fostering robust learning. Strong pedagogical practices were not as prevalent as they could have been, ultimately falling short of meeting the full extent of pupils' needs in the classroom. When analysing the pedagogical practices in Kwara State's public schools before the programme, the data highlighted that only 1 in 6 teachers clarified misunderstandings or responded to their pupils' needs in the classroom, and only 1 in 5 teachers explained the lesson content clearly. As a result, pupils in Kwara State often found themselves receiving lessons that were not very clear, with teachers who rarely clarified any misunderstandings that may have arisen from weak explanations of the content. Additionally, there was a lack of standardisation in both the development and adherence to lesson plans. This greatly impacted the extent to which curriculum was covered across schools and classes, consequently affecting pupils' learning outcomes.

In addition to weak pedagogical practices, lack of standardisation in the curriculum, and lack of support from head teachers, Kwara State schools also struggled with low staffing. Approximately 25% of schools in the four LGAs where KwaraLEARN was initially implemented had either no teachers or only one teacher, and consequently, each teacher was expected to cover a large number of classes (See Box 3 for more about the implications of teacher absenteeism).

Box 3: Teacher Absenteeism in Low- and Middle-Income Countries: Challenges, Implications, and Effective Solutions

Teacher absenteeism is a deep and widespread challenge that jeopardises returns on substantial investments in student learning outcomes and enrolment outreach (World Bank, 2018). Teacher salaries in low- and middle-income countries (LMIC) often represent a significant portion of the public education budget. For instance, in Uganda, Tanzania, Nepal, and Namibia, 60–95% of the government budget that is earmarked for education is invested in teacher salaries. Yet, high rates of teacher absenteeism have been consistently recorded across many LMIC: In a global study, teachers were not in school 16% of the time in Bangladesh, 18% of the time in Togo and Senegal, and 45% of the time in Mozambique (Chaudhury et al., 2006). Even among the teachers that were present in school across 8 sub-Saharan African countries, less than half of them were found to be in their assigned classrooms during instructional time when measured by the World Bank via drop-in visits (World Bank, 2018). Hence, the large shares of fiscal resources spent on teacher salaries, coupled with the ingrained prevalence of teacher absenteeism, indicates that the fiscal and educational repercussions of this issue are a serious policy concern that deserve immediate governmental action.

From a fiscal standpoint, one study in India found that an unauthorised teacher absence rate of 23.6% cost the government an estimated 1.5 billion INR in 2017 alone (Muralidharan et al., 2017). The World Bank has estimated that teacher absences also cost Senegal, Mozambique, and Tanzania over 300 million USD each in 2013 (World Bank, 2018). This financial loss not only correlates with diminished learning gains due to inadequate instruction time and quality, but also with the payment of salaries using limited government funds in contexts where public budgets are particularly constrained.

For the students in the system, the most direct consequence of teacher absenteeism is significantly reduced instructional time, which, in turn, translates into weaker learning outcomes. According to The World Bank's Service Delivery Indicators, out of the 8 LMIC that were surveyed in sub-Saharan Africa, including Nigeria, Kenya, Uganda, and Togo, an average of 2 hours and 46 minutes of instructional time was lost daily due to teacher absenteeism (World Bank, 2018). Teacher absenteeism not only detracts from total learning time, but also negatively impacts the quality of learning that takes place in school (Méndez Vargas, 2016). When classes are combined to compensate for inconsistent teacher attendance, students experience disruptions in their lessons. Furthermore, chronically absent teachers were found to be less productive in school when compared to their peers (Utami & Vioreza, 2021). This lack of consistency and quality contributes to parents' and students' poor perceptions of the public education system, which leads to lower rates of enrolment and attendance among students, therefore permanently stunting their positive educational trajectories (World Bank, 2018).

High rates of teacher absenteeism are symptomatic of inadequate management systems and data tracking, which fail to facilitate accountability and motivation. Investment in increased teacher attendance can lead to efficient national education systems that yield greater learning outcomes. By not targeting educational management systems and data collection, national governments are continually funnelling funds into an ineffective education system which produces increasingly diminished returns.

Fortunately, cost-effective, evidence-based solutions have been shown to yield high-impact results that mitigate the harmful consequences of this systemic issue. Studies done by the World Bank and UNICEF suggest that funds should be directed towards improving accountability systems and to the oversight of teachers rather than other applications, such as blindly increasing teacher staffing rates or implementing unconditional salary increases. For example, one study in Chile found that increasing teacher salaries by 4–30% decreased instructional time per student by an average of 1 hour a week, and another study in Indonesia found that the unconditional doubling of teacher salaries did not lead to better self-reported attendance or, most importantly, improved student learning outcomes (Méndez Vargas, 2016; Utami & Vioreza, 2021). Conversely, cost-effective interventions that have been shown to significantly decrease teacher absenteeism include in-person or technological accountability systems, supportive and competent management, and increased data tracking. When studied in India, attendance tracking systems that relied solely on self-reporting among teachers were found to be ineffective. Instead, randomised, unannounced drop-in visits and daily check-ins to monitor both attendance and curriculum progression were found to produce substantial improvement, and ultimately increased the productivity of the existing workforce (Muralidharan et al., 2017). Therefore, investing in these systems that improve visibility of stakeholder behaviour and allow policymakers to better support teachers on a national level yields increased teacher attendance, performance, and, consequently, greater returns in student learning outcomes.

Appendix H: Additional Figures and Tables

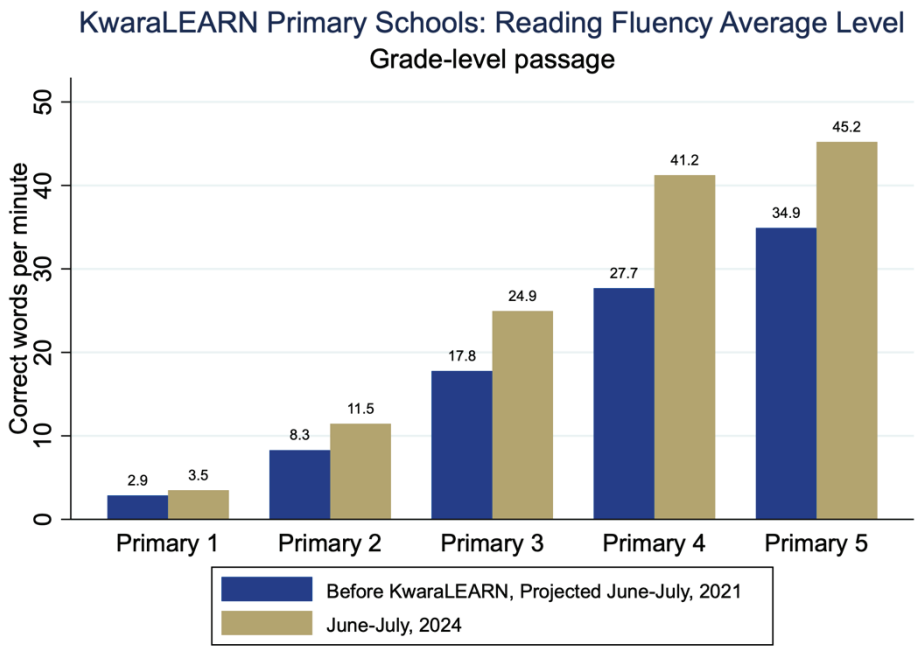


Figure H.1

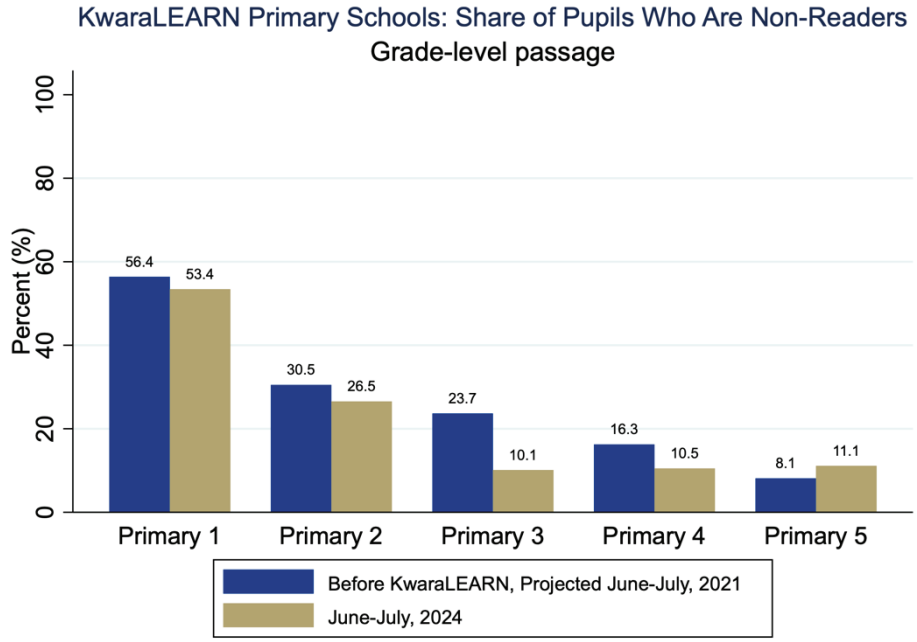


Figure H.2

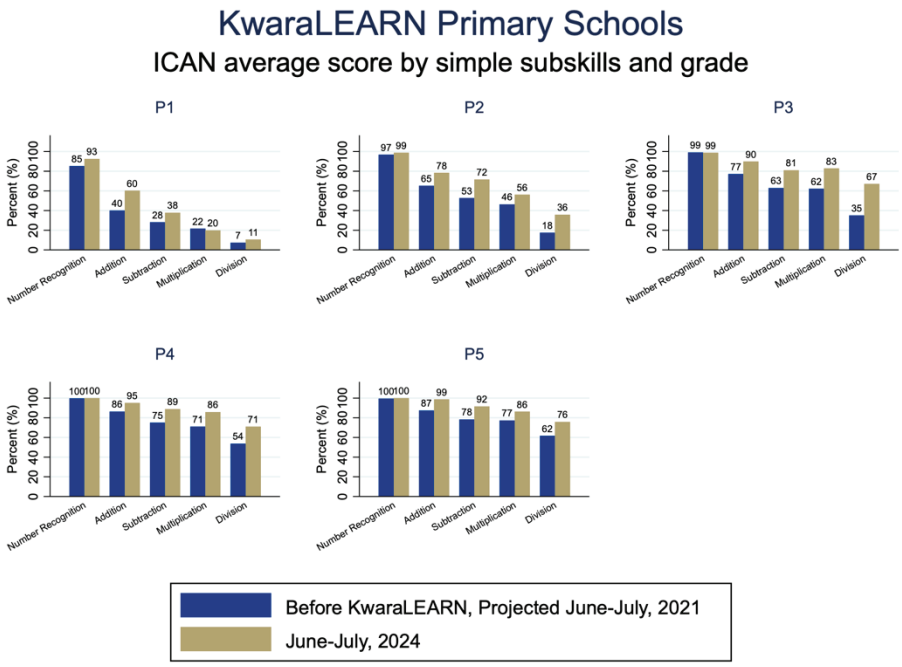


Figure H.3

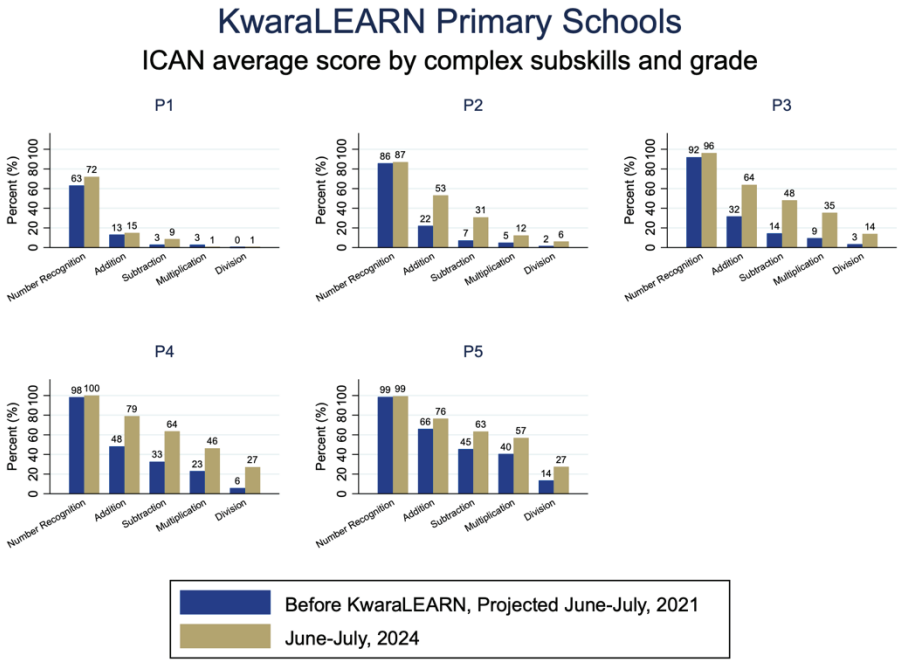


Figure H.4

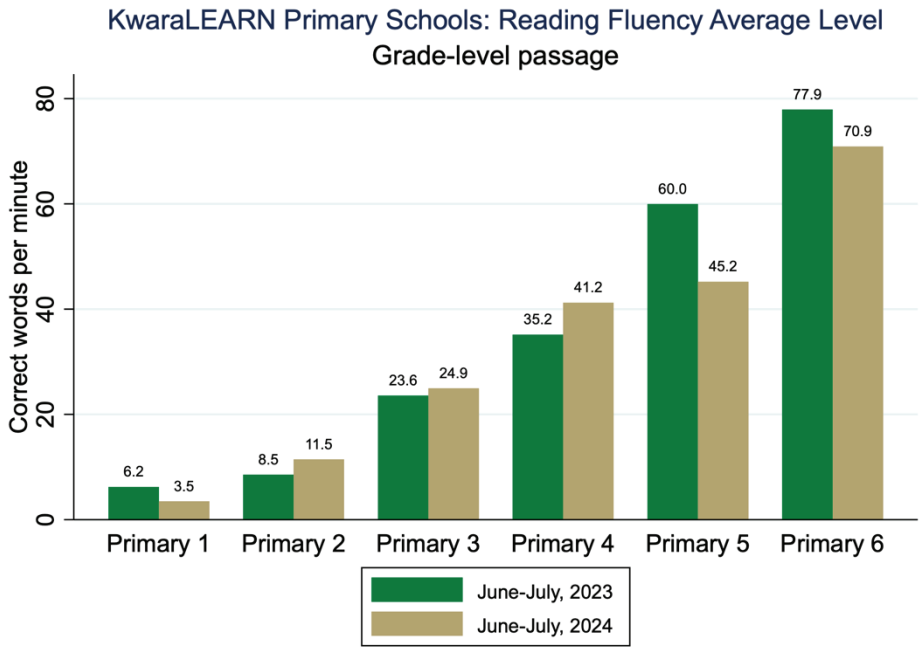

KwaraLEARN Primary Schools: Reading Fluency Average Level
Grade-level passage
Correct words per minute
0
20
40
60
80
6.2
3.5
8.5
11.5
23.6
24.9
35.2
41.2
60.0
45.2
77.9
70.9
Primary 1
Primary 2
Primary 3
Primary 4
Primary 5
Primary 6
June-July, 2023
June-July, 2024

Figure H.5

Table H.6: Changes in grade-level averages from June/July 2021 to 2024 for Primary-model schools, by region

Subskill		Grade	Ilorin East	Ilorin West	Offa
Reading Fluency (Correct words per minute)	Primary 2 passage	All	8	8	8
		P1	0	0	0
		P2	8	4	3
		P3	14	8	8
		P4	11	19	17
		P5	6	9	10
	Grade-level passage	All	4	10	8
		P1	1	1	0
		P2	6	3	1
		P3	10	7	6
		P4	9	21	12
		P5	-5	15	22
Non-Readers (Percentage points)	Primary 2 passage	All	-7	-10	-7
		P1	-5	4	-1
		P2	12	-7	-19
		P3	-9	-21	-16
		P4	-20	-23	0
		P5	-13	-4	1
	Grade-level passage	All	1	-10	-6
		P1	-1	-11	0
		P2	7	-6	-13
		P3	-7	-17	-15
		P4	-5	-15	0
		P5	10	2	-3
Average ICAN Score (Percentage points)		All	12	17	10
		P1	7	13	-4
		P2	8	14	14
		P3	19	16	21
		P4	18	24	10
		P5	10	18	8

Table H.7: Changes in grade-level averages from June/July 2021 to 2024 for Progressive-model schools, by region

Subskill		Grade	Baruten	Ilorin East	Offa
Reading Fluency (Correct words per minute)	Primary 2 passage	All	1.9	-0.4	3.3
		P1	1.2	0.0	1.8
		P2	1.2	-0.7	4.4
		P3	1.4	-0.3	3.8
		P4	0.7		
		P5	4.9	-0.6	
	Grade-level passage	All	1.8	-0.5	3.3
		P1	2.0	-0.6	2.0
		P2	1.2	-0.6	4.6
		P3	1.5	-0.8	3.4
		P4	0.8		
		P5	3.5	-0.1	
Non-Readers (Percentage points)	Primary 2 passage	All	-28.5	22.6	-98.9
		P1	-11.8	3.2	-96.8
		P2	-23.1	39.0	-100.0
		P3	-35.2	19.5	-100.0
		P4	-13.9		
		P5	-58.6	28.8	
	Grade-level passage	All	-24.7	19.9	-99.7
		P1	-14.0	16.4	-99.0
		P2	-23.1	26.0	-100.0
		P3	-22.7	20.4	-100.0
		P4	-13.9		
		P5	-49.9	16.8	
Average ICAN Score (Percentage points)		All	11.6	-5.9	31.9
		P1	9.2	-7.2	32.6
		P2	9.1	-20.0	38.0
		P3	20.7	-4.4	25.1
		P4	13.3		
		P5	5.7	8.1	

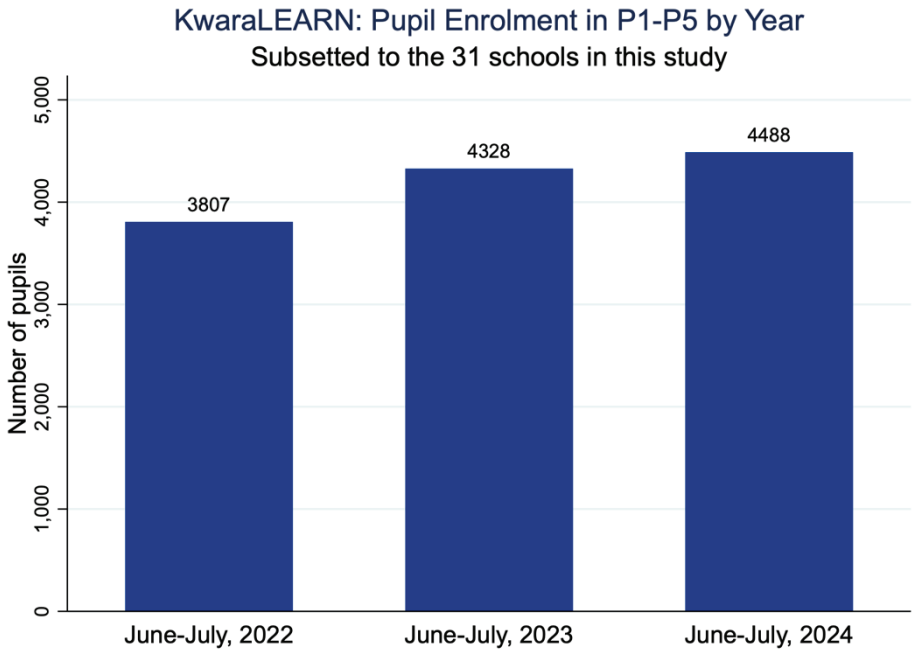


Figure H.8

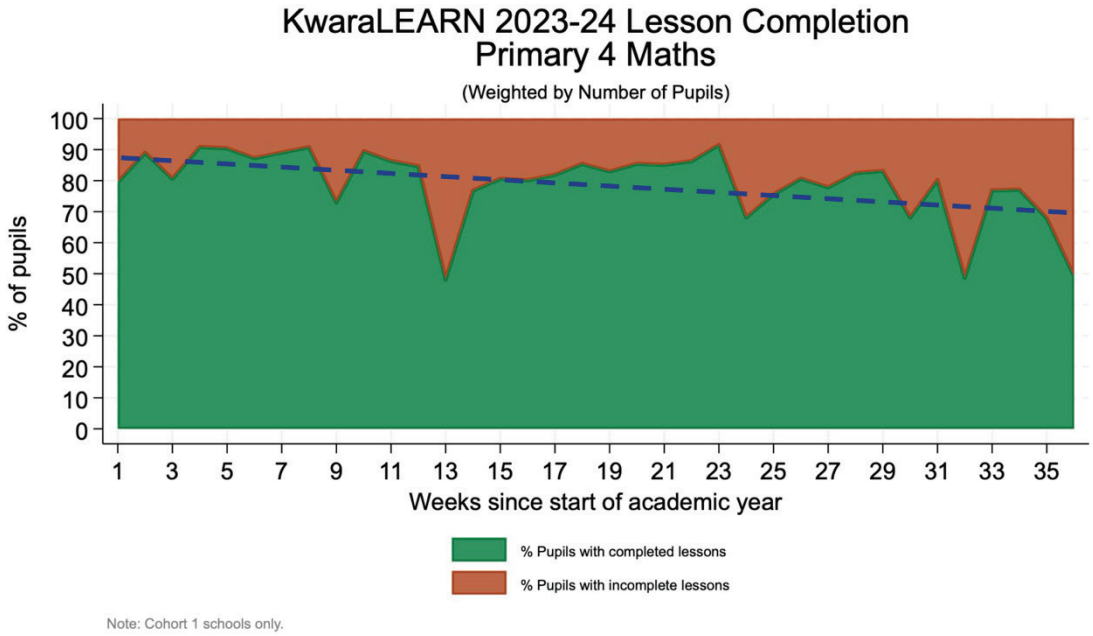


Figure H.9

Table H.10: Changes in Pupil Enrolment by Grade, from 2022 to 2024

Grade	Number of pupils in Progressive schools at the end of **2021-22**	Number of pupils in Progressive schools at the end of **2022-23**	Number of pupils in Progressive schools at the end of **2023-24**
Primary 1	4,133	4,077	3,470
Primary 2	2,245	4,228	4,154
Primary 3	1,852	2,418	3,901
Primary 4	1,495	1,868	2,259
Primary 5	1,404	1,514	1,787

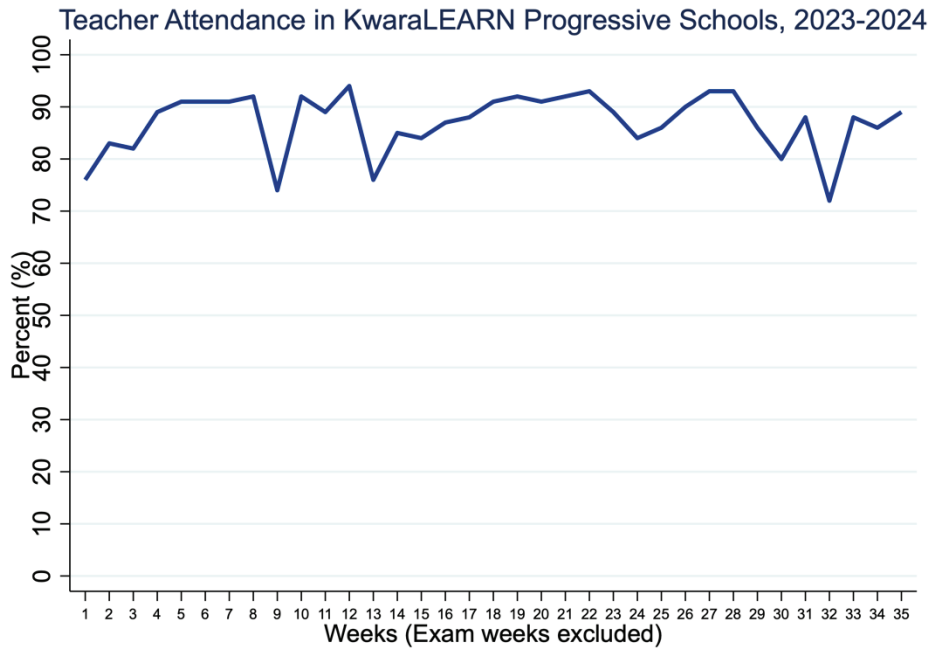


Figure H.11

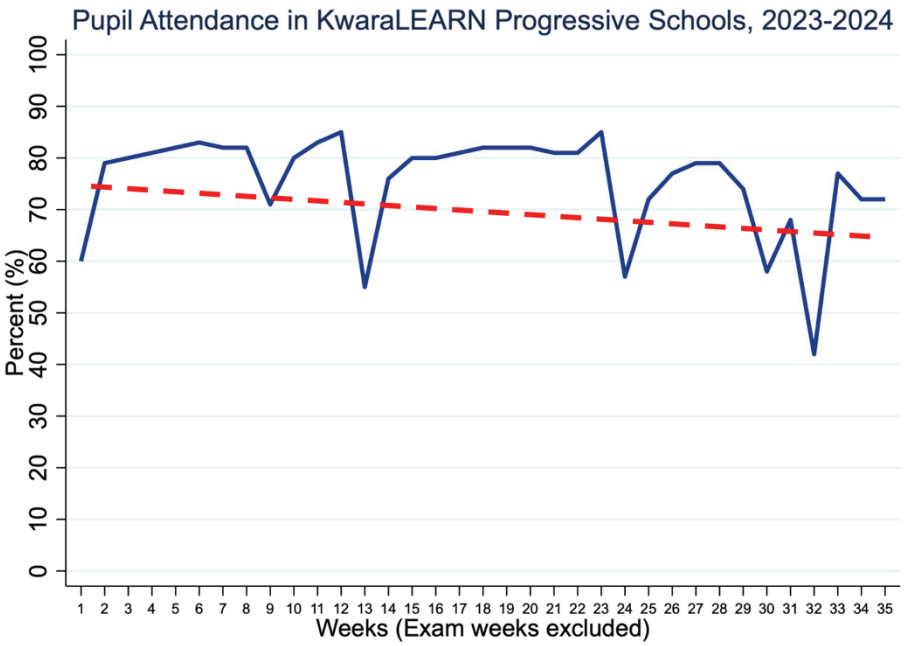

Pupil Attendance in KwaraLEARN Progressive Schools, 2023-2024
Percent (%)
0 10 20 30 40 50 60 70 80 90 100
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
Weeks (Exam weeks excluded)

Figure H.12

Appendix I: External Research on the KwaraLEARN Programme

The KwaraLEARN programme monitors programme impact through rigorous internal impact evaluation studies such as is detailed in this report. In addition, researchers external to the programme have conducted their own research. One such study, “Digitization of Primary schools through computer managed instruction programme in the teaching of science in Ilorin metropolis” by Abdulazeez et al. was recently released (Abdulazeez et al., 2024), in which the researchers examined how the use of digital devices influenced the teaching and learning of science in KwaraLEARN schools in Ilorin metropolis.

In this study, the authors utilised a teacher survey that includes questions about respondents’ perceptions of the influence of KwaraLEARN’s digital materials on teaching and learning in their classrooms, as well as questions about respondents’ backgrounds and the availability of digital materials for instructional delivery. The survey was administered to a sample of 448 public Primary school teachers, randomly selected from among a total of roughly 4,300 in the city of Ilorin.

As intended by the KwaraLEARN programme, the researchers found near-universal availability of KwaraLEARN tablets. They also found that teachers felt more comfortable teaching science with the KwaraLEARN tablets. Importantly, teachers reported that their content knowledge of science had improved since they had started using the tablets, and that their pupils’ learning outcomes had greatly improved since they started using the tablets.

The KwaraLEARN initiative has received praise from teachers, who report that the tablets have decreased their job stress by eliminating the need for lesson notes through the provision of well-crafted lesson plans, as well as through an easier method for recording pupil attendance. While this research also identified areas for future improvement – for example, with some teachers pointing to occasional issues with connectivity – the overall findings indicate a positive influence of KwaraLEARN’s digital tools on science instruction in Ilorin’s public Primary schools. The study also identified potential areas for future research using KwaraLEARN's rich data, such as investigating how the pre-set timing dictated by the tablets affects instruction.

Appendix J: The Learning Crisis: Causes, Contributors, and Consequences

Enrolment and literacy rates around the world have increased at record speed in recent decades

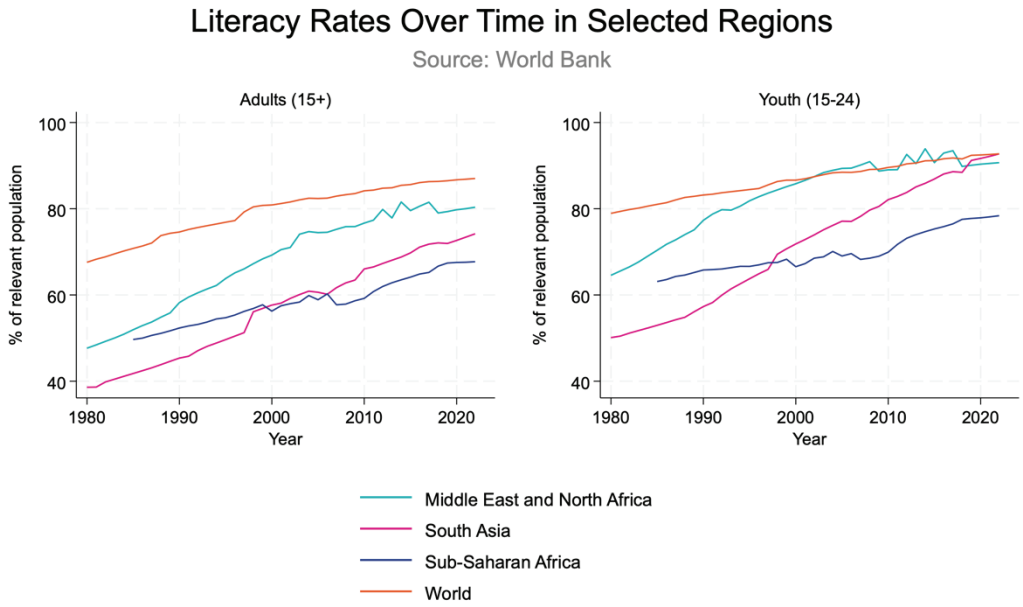
Growing global focus on broadening access to schools has led to significantly improved enrolment rates

Over the last 75 years, there has been a significant global shift towards expanding schooling infrastructure and enrolment outreach in an effort to achieve universal education. As a result, more children are in school today than at any other time in history — both in absolute and relative numbers (World Bank, 2018). Of the nearly 2 billion children under 14 years of age worldwide, 80% are now enrolled in school, with the majority living in low- or middle-income countries (LMIC). In LMIC in particular, nominal enrolment rates have increased at unprecedented speeds, now reaching near-universal levels (Pritchett, 2013).

For example, it took Bangladesh only 20 years to achieve nearly universal gross enrolment, growing by 33 percentage points between 1987 and 2007, starting from 65%. Similarly, Pakistan reduced the proportion of out-of-school children from 1 in 3 to 1 in 6 over the 2001-2021 period (World Bank, 2024). Morocco saw an impressive 54% increase in girls' enrolment over 11 years — a feat that took the United States 40 years to accomplish. More broadly, between 1970 and 2010, the gross Primary enrolment rate in sub-Saharan Africa and South Asia surged from 68% and 47%, respectively, to over 100% in both regions (World Bank, 2018). These remarkable gains illustrate the successful efforts of countries worldwide to match enrolment rates in high-income nations, reflecting a global commitment to the importance of education.

Increased enrolment has been accompanied by growth in literacy rates

With ever-larger shares of the population being exposed to formal schooling, officially reported literacy rates have increased dramatically. Globally, literacy rates more than doubled, from 42% in 1960 to 86% in 2015 (Roser & Ortiz-Ospina, 2013). Along with expanded access, this represents a remarkable achievement in expanding educational access.



Despite successes in expanding enrolment and raising literacy rates, more progress is needed

Barriers to enrolment still persist

Access to schooling is a crucial prerequisite to learning, and the rapid, worldwide increases in enrolment in recent history are cause for hope. However, enrolment is still not universal; in 2018, 1 in every 6 Primary and Secondary school-aged children still remained out of school, which accounts for a total of 258 million children worldwide (UNESCO, 2023b). The COVID-19 pandemic further exacerbated this situation, with school closures keeping out almost 1.6 billion children (Azevedo, 2020), and even after schools reopened, many pupils never returned (UNICEF, 2023; Mighati, 2022).

Several barriers to enrolment persist. In some contexts, particularly in rural areas, there are ‘education deserts’, where large shares of the population do not live within a reasonable distance from the closest school, or are barred by impassable terrain or issues of travel safety. In other contexts, even government-led schooling is not free and/or compulsory, or comes with associated fees for school uniforms, meals, or textbooks – the cost of which can be prohibitive for many prospective pupils and their families (Abdul Latif Jameel Poverty Action Lab, 2019; Oyekan et al., 2023).

Beyond physical, financial, and infrastructural barriers, the quality of education offered by school systems is a crucial factor for ensuring that children not only enter school, but also remain in and advance to the next levels of school. There is a significantly stronger likelihood that pupils will drop out of school or will not transition to higher grades or levels of education if they are not academically thriving (Pritchett, 2013), and the responsibility of ensuring the scholastic achievement of all pupils falls on the education system, to a far greater degree than it is dependent on pupils’ backgrounds or characteristics (OECD, 2012; Eble & Escueta, 2022). Ultimately, failure to ensure adequate pupil

retention and attainment has negative implications for both the education system and for pupils. It is more costly for education systems to devote educational resources to pupils who must repeat grades or who ultimately withdraw from formal education, and high rates of dropout are equated with lower levels of productivity in the labour force, which is detrimental for individuals and whole societies alike (OECD, 2012; Patrinos & Psacharopoulos, 2018).

Access to education must start with early childhood

While great progress has been made in recent decades towards enrolling larger numbers of school-aged children, children in many contexts enter school later than the intended age, which can profoundly impact the rate at which they master skills during their academic careers and how well they develop into adulthood. For example, in Guinea-Bissau, more than three quarters of children in Primary school are over-age (UNESCO, 2023a), and this is largely due to late enrolment, with only 30% of children beginning school at the specified age of six (Borgen Project, 2021). In Nigeria, 1.8 million children were attending Primary school after the age of 11 during the 2018-2019 school year (Sasu, 2022). A 2017 study conducted in Uganda found that pupil ages in the final year of Primary school ranged from 12 to 22 years, with most pupils being 16 years old (Nath et al., 2017). In some contexts, late entry is a result of positive systemic changes that have broadened access to education (World Bank, 2020b) by making schooling available to children who were previously barred from it. However, in the long term, it is more advantageous for pupils to be equipped with school readiness by entering a learner-centred environment as early as possible — ideally through early childhood development education (Sosu & Pimenta, 2023). This plays a critical role in ensuring that pupils keep pace with curricular expectations, thereby maximising their potential throughout their academic careers and beyond.

Despite the value of investing early in children's lives, 250 million children in low- and middle-income countries (LMIC) were found to be developmentally at risk in 2016, partly due to a lack of early learning programmes — a figure alarmingly similar to that of children out of school entirely in 2019 (Black et al., 2017; UNESCO, 2019). Similarly, UNICEF (n.d.) reports that developmental delay affects 43% of the population under the age of 5. This highlights a pervasive, systemic issue that has seen little improvement over the last decade — an issue that begins with pre-Primary programmes and continues to hinder retention in later years of schooling across education systems. Low enrolment in early childhood education remains widespread: Over 4 in 10 age-appropriate children worldwide were not enrolled in pre-Primary school in 2020, and the vast majority of countries do not include it in free and compulsory education (UNESCO, 2022a). For children to succeed academically, it is imperative that they start with a strong foundation. At this formative stage of cognitive development, children benefit greatly from a learning environment that places them on the appropriate path towards essential skill-building (Sosu & Pimenta, 2023; UNESCO, 2022b). Education systems are further incentivised to make pre-Primary school access more equitable as it yields the highest return on investment compared to all other stages of schooling and contributes to a smoother-running Primary education system by preparing pupils to participate meaningfully (UNICEF, 2019).

Pupils should have the opportunity to enter school at the earliest possible stage to begin their path to becoming lifelong learners, and education systems must be ready to provide them with high-quality education through strong teacher professionalism and accountability — starting with early childhood programmes, appropriately levelled curricula, and environments dedicated to learning. While evidence suggests that most LMIC are nearing their goals of universal access to Primary schooling, this is not the case for early childhood programmes. Ensuring a strong foundation from before Primary school, at the developmentally appropriate age, is a crucial next step for education systems to maintain their current progress and transition from merely increasing schooling to enhancing learning.

Enrolment is necessary but not sufficient

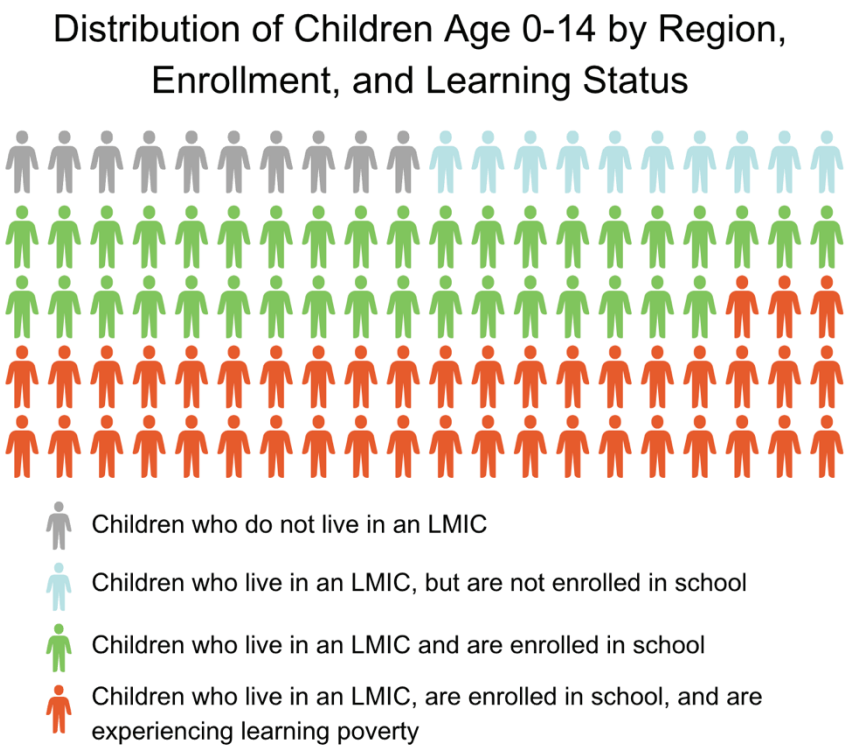
Focusing solely on enrolment is not sufficient to ensure that children are actually learning. The goal of universal education is not merely about superficially exposing children to educational institutions; it also requires that these institutions effectively equip pupils with the foundational skills necessary to function as members of a knowledge-based economy and to lead fulfilling lives (Pritchett, 2013). The alarming reality is that, despite the unprecedented number of children attending school for longer periods, many are still not mastering the skills they need to excel. This lack of learning, despite many children being enrolled in school, is the defining characteristic of the current learning crisis – and affects most countries around the world.

"This lack of learning, despite many children being enrolled in school, is the defining characteristic of the current learning crisis – and affects most countries around the world."

The rapid increase in enrolment in recent years, coupled with the learning crisis, presents both a policy opportunity and a serious risk. On the one hand, inaction means that more resources will need to be spent on maintaining underperforming education systems that do not yield the returns in human capital that will fuel economic growth and innovation. On the other hand, the greatly expanded access to schooling also provides an opportunity for positive impact on an unprecedented scale. Capitalising on the progress made in bringing children into schools as a crucial first step, policymakers can now implement interventions aimed at improving education quality, so that children in schools actually learn.

Progress is needed on true measures of literacy

As mentioned before, a notable success in recent decades is the doubling of global literacy rates between 1960 and 2015 (Roser & Ortiz-Ospina, 2013). That said, while literacy rates are often used as a measure of education quality, they provide an incomplete — and often overly optimistic — picture of learning outcomes globally. In particular, official literacy rates in LMIC can be misleading due to variations in measurement methods — including self-reporting of literacy levels, which often inflate actual proficiency levels and reflect a level of optimism that does not match the levels of actual reading proficiency. For instance, in sub-Saharan Africa, the illiteracy rate is said to be 24%, but 87% of children are in learning poverty (World Bank, 2018). In Pakistan, the youth illiteracy rate for people aged 15-24 was 73% in 2019, while only 23% of children could read with comprehension (World Bank, 2023).



In this context, it is crucial to examine what exactly defines “literacy.” Some definitions — including, implicitly, most official ones — describe it simply as a single, often low, threshold to cross, rather than as a framework within which pupils should develop the skills to navigate and grow. From an academic perspective, this type of benchmark for achievement may be set too low to ensure substantial returns on subsequent investments on education. Therefore, even if official literacy statistics suggest that a significant portion of a population is nominally literate, it is important to recognise that, in most cases, the majority of youth worldwide remains far from achieving the ultimate goal of literacy: reading comprehension. This skill, which involves extracting meaning from and applying the purpose of a text, is what enables pupils to progress from learning to read to reading to learn.

In the global effort to address the learning crisis, progress is needed on true measures of literacy. Pupils must be able to understand written class materials in school if they are to gain subject-specific content knowledge and develop more advanced skills. Citizens must be able to comprehend what they read if they are to be civically and economically engaged. Thus, education systems – particularly those that are faced with the opportunity to impact large numbers of new pupils – must go beyond merely raising literacy rates by superficial measures, and teach pupils how to read to learn.

Learning outcomes are weak and urgently require transformative interventions

Foundational literacy and numeracy skills are severely lacking among pupils in all levels of schooling, but especially in Primary grades

Ensuring that children have access to school, start school at a developmentally appropriate age, and remain in school for the expected duration is a substantial undertaking. However, success in these areas alone does not guarantee that pupils are receiving an education that will adequately equip them for their future careers and daily lives. Learning, especially when it is not measured for efficacy, is not the natural by-product of school attendance (World Bank, 2018; Pritchett, 2013). In fact, persistently low learning levels are prevalent in all low- and middle-income countries (LMIC), where over half of all children experience “learning poverty” according to the World Bank, despite the fact that most of them are attending school. Moreover, this regional average conceals the severity of the problem in specific areas, such as sub-Saharan Africa, where learning poverty is estimated at approximately 90%, and in the Middle East, North Africa, and South Asia, where more than 6 in 10 children do not meet the minimum expected proficiency levels. These shortfalls in learning outcomes among enrolled pupils indicate insufficient education quality, which prevents them from mastering increasingly complex curricular expectations and may lead to their eventual withdrawal from school.

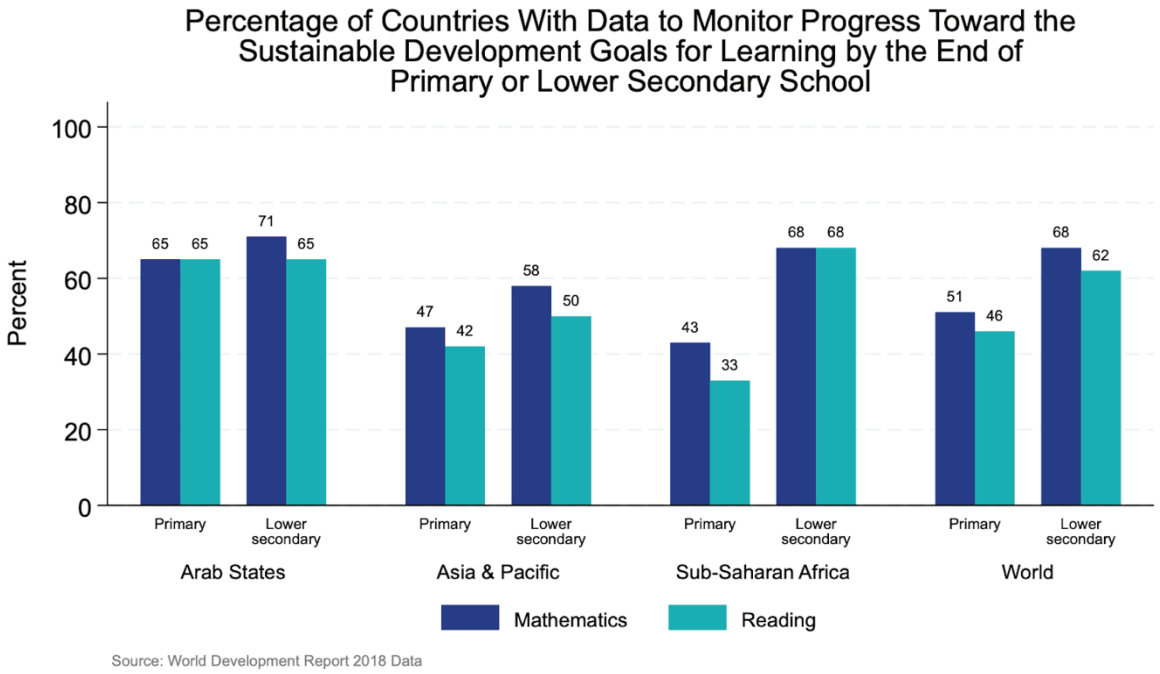
Literacy, the most extensively studied foundational skill, can also be examined among pupils in LMIC. Competency in this domain is essential for pupils to follow written instructions, engage with learning materials, participate in assessments, and gain knowledge in every core subject. However, evidence indicates a widespread lack of proficiency in many early-grade subskills that are fundamental to literacy. For example, in Pakistan in 2023, half of Grade 5 pupils were unable to read a story in Urdu considered appropriate for a Grade 2 curriculum (ASER Pakistan, 2024). Similarly, 80% of Grade 2 pupils in Ghana and Malawi were unable to read a single familiar word, such as “the” or “cat,” during assessments conducted at the end of the school year. When assessing literacy using a three-sentence passage and lowering the threshold, 75% of pupils in Nigeria, Uganda, and Bangladesh did not qualify as literate by the end of Primary school (World Bank, 2018). Despite widespread recognition of the benefits of literacy and the negative consequences of illiteracy, there remains a pervasive lack of proficiency in this essential skill among pupils within and across education systems.

Problematic literacy rates are mirrored by numeracy rates, which could also significantly hinder pupils' ability to function in their daily lives. For instance, 50% of all third graders in Uganda cannot solve simple subtraction problems. In rural India, 54% of third graders cannot complete double-digit subtraction, and by Grade 5, half of these pupils still cannot solve the same operations (World Bank, 2018). Similarly, only 60% of pupils in urban Pakistan could correctly perform double-digit subtraction by Grade 3, a figure that drops to 40% for the same grade level in rural areas. The lack of numeracy proficiency seen in these contexts extends to broader regions as well. For example, across sub-Saharan Africa, the Middle East, and North Africa, the average percentage of pupils who score above the minimum proficiency level on a mathematics assessment is between 18% and 42% (World Bank, 2018). While the specific interventions needed to elevate foundational numeracy learning will vary based on the context of each education system, the urgent need to address low learning levels
is clear.

Moreover, without the implementation of effective policy solutions to improve learning outcomes, vast amounts of educational resources will continue to be expended without a meaningful return on investment. Globally, for instance, 125 million pupils who have completed four years of schooling still lack functional literacy or numeracy skills, demonstrating a widespread failure to achieve desired educational outcomes — through no fault of their own — despite the investment in them. This
calls for targeted, transformative approaches to address the ongoing learning crisis and to ensure that education funding yields its expected benefits — especially crucial in the aftermath of the economic downturn triggered by COVID-19 (United Nations, 2020).

"Without the implementation of effective policy solutions to improve learning outcomes, vast amounts of educational resources will continue to be expended without a meaningful return on investment."

Finally, to complicate the matter further, one-third of 121 countries have also been found to lack the data assessing reading and mathematics proficiency levels among children (World Bank, 2018). Therefore, it is pivotal that educational interventions operate with a data-driven core, not only to certify and track their efficacy within education systems, but also to benchmark pupil progress against international standards, thereby ensuring that pupils are prepared to become globally competitive adults.



Source: World Development Report 2018 Data

Year-on-year improvement is too slow for pupils to keep pace with their high-performing peers

Compounding the problem of non-universal enrolment, late enrolment, and low levels of foundational literacy and numeracy, pupils in LMIC are not making yearly progress at a pace that puts them on track to meet curricular expectations in their own countries, or to catch up with their peers in HIC. Currently, high-performing pupils in middle-income countries would be ranked in the bottom quarter in wealthier countries, while for many education systems in LMIC, the current rate of pupil learning would not result in globally comparable content mastery in a reasonable number of decades (World Bank, 2018; Pritchett, 2013). According to a simulation by the World Bank, it would take an estimated 50 years just for LMIC to halve current levels of learning poverty (Azevedo, 2020).

The evidence clearly indicates that generations of pupils are at risk of continuing to lag behind expected learning levels. However, rapid improvement on a large scale is attainable. If every LMIC in the world were to produce learning gains at a rate that doubles or triples their historical progress, learning poverty would be reduced by almost half by 2030 (Azevedo et al., 2021), which would be an 82% reduction in the counterfactual projection of time needed to meet this goal. Given this, the critical dual objective of education systems in LMIC is to not only achieve large learning gains, but also augment the pace at which they are achieved.

The COVID-19 pandemic led to significant setbacks in learning progress

The onset of COVID-19 has drastically increased the prevalence of weak learning outcomes across the globe. Not only did existing deficits in learning worsen in the years during and following the pandemic, but the resultant need for specialised systems that will reverse learning losses from this global event also presents another obstacle to advancement for education systems that are susceptible to low performance. According to the most recent reports provided by UNICEF and the World Bank, the average pupil in a low-to-middle-income country spent close to two school years (236 days) out of school (World Bank, 2023), and learning poverty in LMIC was estimated to have increased beyond original estimates of 53% to as much as 70% — an increase that would signify three years of pandemic-related learning loss (Azevedo et al., 2022).

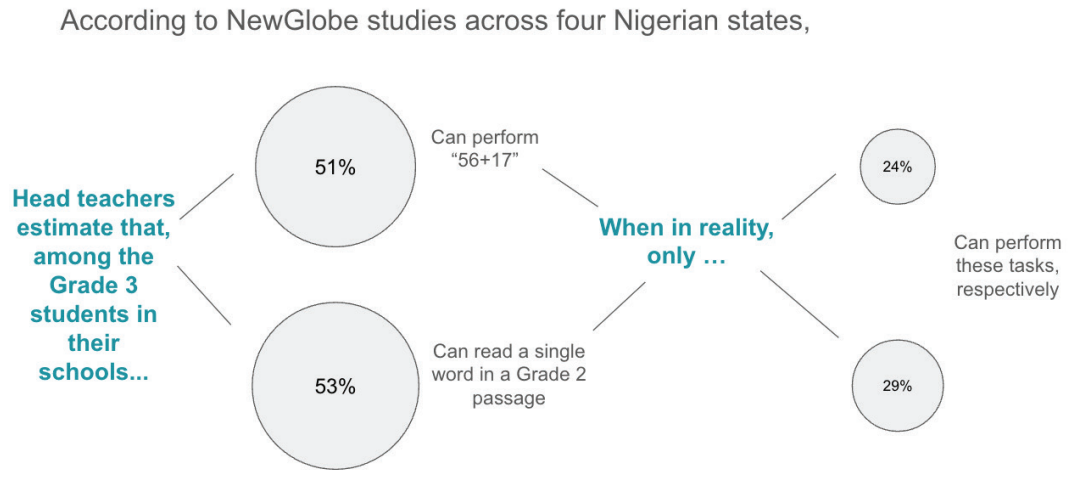
While longer school closures are correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in pupils' ability to keep pace with academic expectations. However, in nearly all low-income countries, more than half of the population does not have access to the internet at home (World Bank, 2023). While other at-home learning models were employed by most LMIC that did not require internet connectivity — such as radio lessons, televised lessons, or take-home packages — these did not allow teachers to verify pupil engagement with lessons via observation, nor did they enable teachers to track pupil understanding of the subject matter while instructing (World Bank, 2023). In this sense, the tradeoff education systems faced when innovating distance-learning approaches to reach a greater number of pupils was the inability to manage these pupils' mastery of lesson content in real-time.

As a result, many pupils across LMIC learned much less than they would have if participating in conventional, in-person instruction, and therefore, more pupils demonstrated lower learning levels from 2020 onward. In Brazil, for example, some pupils participating in at-home learning absorbed only 28% of the content they would typically learn in school (World Bank, 2023), and thus scored over 50 percentage points lower than projected in maths and nearly 40 percentage points lower in language on state exams administered in Sao Paolo in 2021. A similar scenario is observable in South Africa, where second- and fourth-grade pupils learned only an average of 25–41% of a year's worth of instruction during the pandemic. In India, more than half of second-grade pupils were already reading fewer than 10 correct words per minute (cwpm) prior to the onset of COVID-19, and this share increased by 42% in 2020 (UNESCO et al., 2021). This disruption to education interrupted the academic trajectory of pupils on a worldwide scale (United Nations, 2020), with the most significant consequences for pupils in early grades needing to master foundational skills and for those who were already struggling in their learning. In response, researchers and policymakers have offered and tested a number of solutions involving structured pedagogy, edtech-based solutions, targeted instruction, among others, that aspire to reclaim a positive learning trajectory on an accelerated timeline (UNESCO et al., 2021).

In this sense, teachers need the support of impactful tools and resources, and the motivation of effective leadership, in order to implement systemic changes to education systems in their classrooms, which pupils will require to overturn the severe learning losses incurred in recent years. Education systems in LMIC, which already faced a learning crisis prior to the advent of COVID-19, are now further incentivised to unite key stakeholders in introducing transformative interventions that will standardise high-quality learning opportunities for all pupils.

Policymakers often underestimate the extent of the learning crisis

Given the limitations of officially reported literacy rates as metrics for education quality, the lack of reliable learning data at both macro and micro levels in many education systems, and the prevalence of large class sizes, it is not surprising that many policymakers and school officials around the world significantly underestimate the scale of learning gaps in their own contexts. For example, a study involving 931 interviews with officials in sub-Saharan Africa and the Asia-Pacific regions revealed a widespread overestimation of pupil proficiency in foundational skills by policymakers. This study found that, on average, policymakers believed that twice the actual proportion of pupils had attained foundational literacy compared to the figures determined using the World Bank's Learning Poverty indicator (Crawfurd et al., 2021). Similarly, several large-scale studies led by NewGlobe across four Nigerian states (Anambra, Enugu, Jigawa, and Oyo) confirmed the gross overestimation of learning levels even by head teachers regarding their own pupils. For example, while head teachers estimated that 51% of their Grade 3 pupils could solve "56 + 17", a Grade 2 skill in the Nigerian curriculum, only 24% could actually do so. Moreover, consistently across the four states, the gaps between head teachers' estimates and actual pupil performance were significantly larger among the lowest-performing schools.



The mismatch between the beliefs of different stakeholders within education systems worldwide and the actual performance of the pupils they serve is concerning for at least two reasons. First, it highlights the systematic lack of reliable large-scale assessment data on learning outcomes, as well as the absence of best practices in formative assessments to diagnose critical areas of improvement at both macro and micro levels within systems. Secondly, the overestimation of pupils' actual skills by policymakers, head teachers, and teachers likely contributes to the slow progress towards implementing concrete programmes aimed at improving learning outcomes. For example, Crawfurd et al. (2021) found that while four in five interviewed officials (79%) acknowledged that the learning crisis affected both their own country and the globe, only 2% considered foundational reading or literacy programmes as the most significant recent educational reform in their context. Moreover, overly positive perceptions of pupils' skills in foundational literacy and numeracy were strongly correlated with a reduced motivation to focus on reform in these areas. Consequently, the relative lack of policy focus aimed at strengthening core pupil competencies may stem from an overly optimistic view of the state of learning, driven by inadequate visibility into accurate measurements of educational outcomes.

"The overestimation of pupils' actual skills by policymakers, head teachers and teachers likely contributes to the slow progress towards implementing concrete programmes aimed at improving learning outcomes."

Increased heterogeneity in learning levels poses a new challenge

Recent successes in raising enrolment rates have brought many children into classrooms who would otherwise not have enrolled in school. This has created a new challenge for education systems: how to educate larger and more heterogeneous groups of pupils. Multiple levels of heterogeneity exist, and have distinct implications. Heterogeneity within classrooms requires teachers to tailor their instruction to a wider range of proficiency levels within their classrooms (Ganimian & Djaker, 2023). Additionally, heterogeneity between classrooms or between schools – where learning levels vary widely across classrooms or schools within an education system (Rodriguez-Segura & Tierney, 2024) – poses challenges for central planners who must set appropriate curricular levels system-wide, and/or establish guidelines for schools to diverge from the central policy prescription.

Heterogeneity in pupils' preparation within a classroom makes teaching more challenging, especially in contexts of low teacher capacity, where teachers may already be taking on larger class sizes or have less systemic support. Education systems have adopted a variety of strategies that can reduce heterogeneity, and some have been more effective than others (Ganimian & Djaker, 2023). Expanding access to high-quality early childhood education – with the idea that it can foster a stronger foundation for Primary school – has been successful in improving learning outcomes in upper-middle-income countries (Berlinski et al., 2009), though less so in lower-middle- and low-income countries (Bouguen et al., 2018; Blimpo et al., 2019). Similarly, providing reports for principals and school leaders on their pupils' performance in maths and language – either as standalone information or in combination with other interventions such as training to design improvement plans based on the data – have proven effective in UMIC and less so in LMIC (Muralidharan & Singh, 2022; de Hoyos et al., 2022).

Providing the lowest-performing pupils with opportunities to catch up with their higher-performing peers can reduce the need for teachers to cater to a wide range of preparation levels within a classroom (Banerjee et al., 2007; Álvarez Marinelli et al., 2019), as has remediation before or after school (Saavedra et al., 2017). Using technology to differentiate instruction – by presenting different material to pupils at different preparation levels – has had limited success; providing pupils with hardware, either by itself or pre-loaded with educational software intended for use in independent self-paced learning, has typically failed to improve learning outcomes (Cristia et al., 2017). What has been effective, however, is combining technology-based solutions with pedagogy that is responsive to pupils' current levels. Software that dynamically adjusts the content and difficulty of the material based on pupils' performance – as contrasted with pre-loaded, static content – had moderate to large impacts on achievement (Muralidharan et al., 2019).

Just as within-class heterogeneity can create challenges for teachers in delivering effective instruction to every pupil, heterogeneity across schools can pose similar challenges for central planners in setting curricular levels for entire education systems. On the one hand, a one-size-fits-all approach to curriculum setting, even if moderately well-calibrated to learning levels within an education system, risks leaving behind many children on both ends of the distribution. One recent study examines the extent of between-school heterogeneity in six education systems (Rodriguez-Segura & Tierney, 2024) – and finds that learning levels, though low overall, can show considerable variation by school. It also finds that the degree of heterogeneity increases with grade, and varies by subject. In systems with a high degree of between-school heterogeneity, customising the instructional level of the curriculum for the needs of different schools given their baseline levels of performance could enable the education system to reach a significantly higher share of children through appropriate instruction. Yet, such an intervention would require an agile system of assessment and material distribution that does not exist in many countries, and that current governance systems may not be equipped to deliver.

The causes of weak learning outcomes are many

Visible, input-based policies are heavily relied on, but their effectiveness is dubious

The most visible manifestations of government efforts to enhance educational opportunities for the growing number of pupils in their systems have often focused on input-based solutions, particularly as a perceived alternative to improving quality when education systems fail to meet established standards. A lack of tangible resources – such as paper, textbooks, or technological hardware – in some schools has been regarded as a significant barrier to improving learning. In some cases, this concern is valid; for instance, one study found that less than half of all pupils in Niger and Nigeria had paper to write on, while there was only one maths textbook for every 66 pupils in Togo (World Bank, 2010–2014). Such deficiencies can hinder the learning process, especially when instructional efficiency is limited. In this sense, inputs are necessary to a degree, but they are not sufficient as a standalone improvement effort.

Despite the shortage of certain materials that may act as prerequisites for strong learning outcomes in many education systems worldwide, the mere injection of resources into classrooms and schools has not been shown to result in higher levels of academic achievement and may even act as a detractor. In other words, if the specific factors inhibiting learning gains in a school have not been identified, indiscriminate expenditures may have little effect, while existing problems persist. For example, in 2008, textbooks distributed to schools in Sierra Leone were discovered unused in a cupboard during a follow-up inspection. Speculation suggests that teachers were hesitant to risk damaging these rare resources (World Bank, 2018), but their lack of use represents a missed opportunity for pupil learning and signifies non–cost-effective spending on education improvement. Another, more far-reaching example is the One Laptop per Child (OLPC) initiative, which was an ambitious effort to enhance learning via technology access in over 42 countries (Yanguas, 2020). However, one year after successful distribution, nearly half of the teachers reported rarely or never using the laptops in the classroom (World Bank, 2018). Various studies across parts of the developing world have shown neutral or negative effects on academic outcomes stemming from OLPC. In some cases, pupils spent more time on their computers but less time on independent study or other learning-based activities (Meza-Cordero, 2017). Further evidence aligns with these findings, indicating that the introduction of educational technology hardware only has a 6% positive effect on pupil learning, while the remaining 94% of the effect is either neutral or negative.

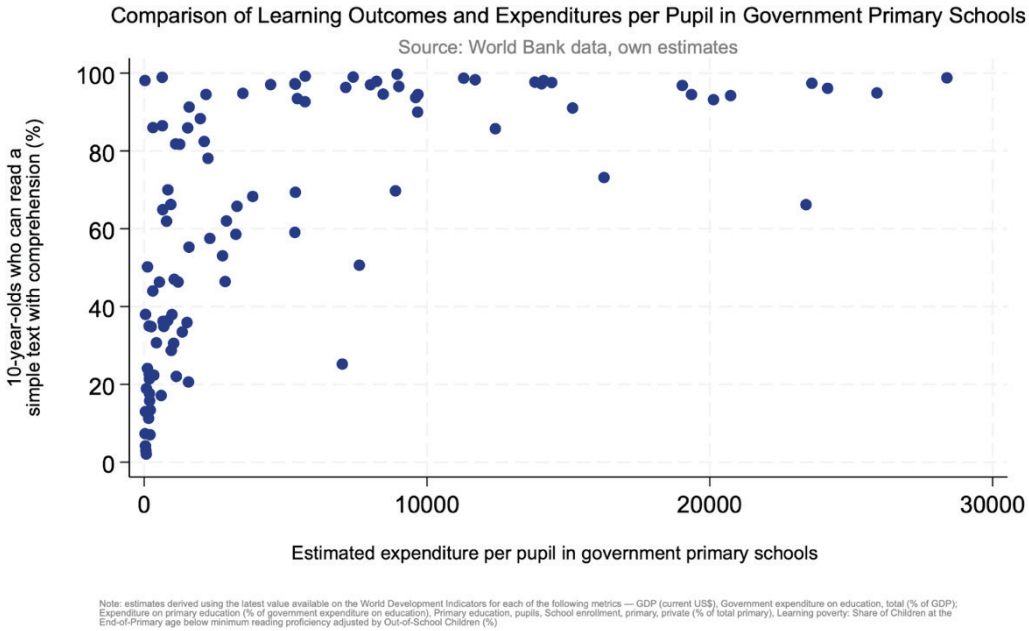
In response, it is imperative for education systems in LMIC to maintain momentum with holistic and proven-effective approaches, so that gaps in educational achievement do not widen during misdirected pursuits. Furthermore, curricular design should justify how and why material or technological inputs are used. These resources must fortify pre-existing teacher-learner relationships as complementary tools, not substitutes (World Bank, 2018). In this sense, while targeted, scaled investments in education are needed to improve learning outcomes, misguided efforts to enhance schooling through simple increases in inputs like books or computers will at best lead to wasted resources, and at worst, exacerbate already-problematic learning levels.

In countries where overall educational spending is relatively low by global standards, how resources are used is more important than how much is spent.

Governments worldwide have dedicated significant resources to their education systems, especially in response to the rapid increases in enrolment over recent decades. For instance, while the number of Primary school children globally rose from 502 million in 1978 to 732 million in 2018, the pupil-teacher ratio decreased from 29 to 23 over the same 50-year period, demonstrating countries' commitment to matching "inputs", in this case teachers, with enrolment growth. Given the considerable investment and the potentially high opportunity cost for other development initiatives, it is crucial that these resources be used effectively to ensure that any level of government spending translates into improved learning outcomes.

In general, there is a positive correlation between higher investment in education and improved educational outcomes. For example, a 1% increase in the share of GDP spent on education correlates with a 5.6 percentage point reduction in learning poverty. More tangibly, each additional USD 100 spent on Primary pupils in government schools reduces nationwide learning poverty by approximately 0.3 percentage points.

However, this relationship between educational investment and learning outcomes is not linear. For instance, among countries spending less than USD 5,000 per pupil annually in public Primary schools, there is considerable variation in learning outcomes, even with similar spending levels. For instance, Tunisia and Georgia both spend between USD 600 and 700 per pupil, yet their learning poverty rates differ greatly: while the learning poverty rate in Georgia is only 14%, the learning poverty rate in Tunisia is nearly 5 times that at 66%. This variation among lower-spending countries underscores the importance of prudent financial allocations towards initiatives that can genuinely enhance education quality without incurring excessive costs.



Achieving efficient use of educational investments requires ensuring that resources in LMIC are directed towards evidence-based interventions that have demonstrated impact on learning gains, making the investments, in turn, cost-effective. In other words, how allocated resources are used is more critical than how much is allocated, up to a certain threshold. For effective decision-making that maximises cost-effectiveness, educational resource allocation should prioritise strategies that yield measurable results rather than those with high visibility. Approaches that build a solid foundation in literacy and numeracy before focusing on other more visible academic inputs have produced positive results in many contexts, and hold the potential for large returns on investments in LMIC. By focusing on effective, proven interventions, increased investments in education by currently low-spending countries can lead to improved learning outcomes for future generations who will fuel their countries' economic growth.

“Achieving efficient use of educational investment requires ensuring that resources in LMIC are directed towards evidence-based interventions that have demonstrated impact on learning gains, making the investments, in turn, cost-effective.”

Importantly, policymakers and education personnel alike should be prepared to recognise that reforms targeting pedagogical improvement and increased accountability are not always as visible as input-based policy changes such as the building of new schools or efforts to increase enrolment and attendance. Nonetheless, the appropriate interventions have the potential to drive unprecedented gains in learning, which is the strongest indicator of a policy’s effectiveness. As Rukmini Banerji succinctly summarises it, “Discussions focused on learning are neither easy nor automatic” (Mbiti, 2016). Furthermore, while policies may be adapted for a given education system based on their replicated success in other contexts, it is imperative that education leaders investigate the nuances of the selected education system, in order to ensure that policy implementation is scalable, cost-effective, and aligned with the most urgent learning needs.

Low teacher content knowledge can translate into poorly executed pedagogy

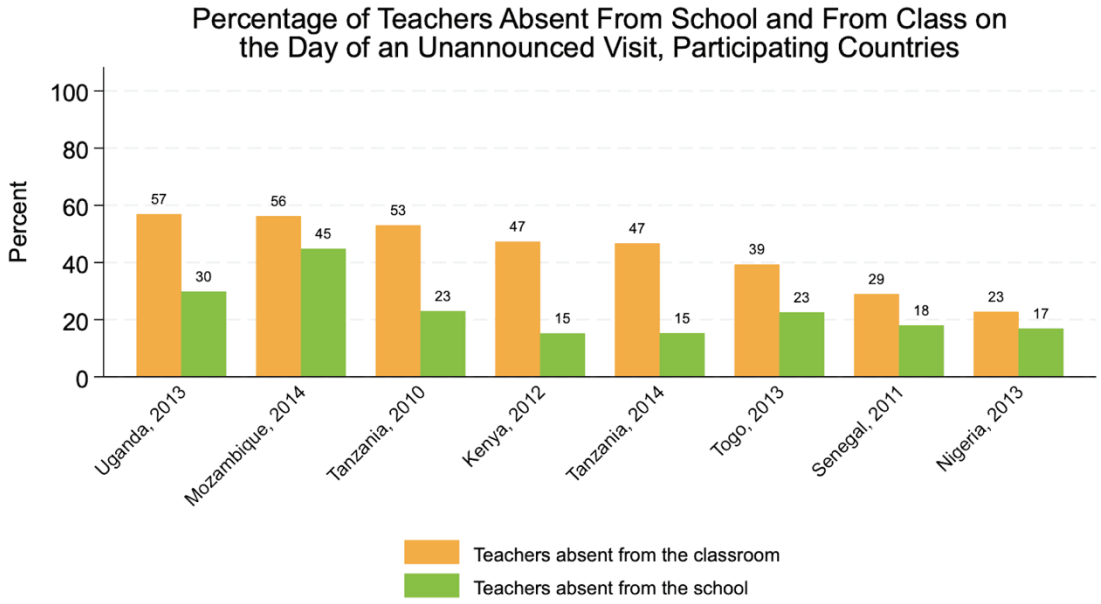
Teachers are central to what can be achieved in any classroom and are the most influential factor across all education systems (Vegas, 2020). Their professional competence and the rapport they build with pupils enables them to assess learning levels and help pupils reach their academic potential. However, in some LMIC, teachers may lack the content knowledge needed to effectively support struggling pupils. For instance, in 14 sub-Saharan African countries, teachers performed at the same level on reading tests as their highest-performing Grade 6 pupils (World Bank, 2018). Similarly, in India, two-thirds of teachers (66%) could not correctly solve a Grade 5 maths problem. Studies suggest that these deficiencies in teachers' subject knowledge can negatively impact pupil achievement. In some cases, as much as 30% of pupils' failure to meet curricular expectations was attributed to a lack of teacher content knowledge. Supporting this, evidence shows that large proportions of teachers in Kenya and Togo could not accurately correct at least 80% of pupil answers on a fourth-grade mathematics test, revealing an inability to evaluate pupil learning or guide them towards improvement (Brunetti et al., 2021).

Even when teachers have mastered the content, central instructional design decisions or differing teacher incentives may lead them to focus on higher-performing pupils. For example, teachers may prioritise maintaining instructional flow over supporting struggling pupils, or they may push through the curriculum without addressing areas where pupils need more help. Such approaches are often at odds with the strategies pupils need for success, and can contribute to pupil dropout (World Bank, 2018). To explore this issue further, various studies have assessed teachers' pedagogical skills. The World Bank's Service Delivery Indicators report found that the average teacher in Indonesia scored only 25% on a pedagogy assessment in 2019 (World Bank, 2020a), while in Madagascar in 2014, the average teacher scored just 23% (Wane & Rakotoarivony, 2017). In Pakistan, Primary school teachers assessed on several pedagogical skills, including lesson facilitation, checks for understanding, and fostering critical thinking using the TEACH tool, saw nearly two-thirds (63%) of teachers score between two and three out of five. The lowest scores were in the areas of fostering critical thinking, providing feedback, and promoting social and collaborative skills (Molina et al., 2020).

The consequential link between poor content knowledge and unsatisfactory pedagogical performance provides policymakers with the opportunity to address both shortfalls simultaneously. Solutions like structured pedagogy can provide teachers with expertly researched lesson content that will not suffer from low levels of teacher expertise in subject matter, and include essential techniques, like scaffolding, that ensure the teacher properly paces delivery of the lesson with pupils' ability to achieve mastery of foundational concepts.

Strong governance is essential for encouraging teacher professionalism and accountability

Regardless of whether teachers possess ideal levels of content knowledge and pedagogical skills, it is essential that they uphold professionalism and accountability if they are to be effective. For this to occur, they must be supported by effective governance administered by informed policymakers. However, evaluative reports suggest that these vital elements are not always in place. Across eight African nations studied between 2010 and 2014, for instance, teachers were frequently absent from their classrooms or the school itself. In Mozambique, Uganda, and Tanzania, teacher absenteeism rates were close to or exceeded 50% (World Bank, 2018). Absenteeism on this scale reduces actual instructional time from that of a typical school day to approximately two to three hours per day, on average. Instructional time is further compromised when present teachers interrupt their classes to check on other classrooms left unsupervised due to absenteeism and a lack of substitute coverage (Bashir et al., 2018; World Bank, 2018). Teachers who are required to integrate these unattended pupils into their own class are forced to dilute the benefits of ability-grouping and disrupt the appropriate scope and sequence of academic content by delivering it to pupils for whom it was not intended.



Source: World Development Report 2018 Data

Effective school-monitoring practices are essential to address high rates of absenteeism across LMIC, but they are not always utilised to ensure consistent teacher attendance. In Tanzania, for instance, only 30% of schools reported that recent visits from Ministry of Education officials were related to teaching and learning. In a sample of public schools in India, no teachers with high absenteeism rates were dismissed by principals during their tenure (Mbiti, 2016). Additionally, UNICEF's Time to Teach study found that in several West and Central African countries, school leaders refrained from sanctioning frequent absenteeism due to uncertainty about the education system's hierarchy or doubts that corrective action would follow (Karamperidou et al., 2020).

Regular observation by school leaders and the introduction of programmes that tie professional benefits for teachers directly to academically constructive behaviours can lead to reduced absenteeism and improved classroom engagement, which naturally benefits pupils. For instance, a study of public schools in India showed a 25% reduction in overall absences and a 40% reduction in unauthorised absences when regular school inspections were conducted (Muralidharan et al., 2017). In another case, financial incentives that required teachers in India to take time-stamped photos with their class at the beginning and end of the school day led to better teacher attendance and, consequently, improved learning outcomes (Mbiti, 2016). Such initiatives not only enhance pupil learning gains but also establish professional expectations that can positively influence future generations of teachers.

However, the issue of teacher shortages extends beyond absenteeism, particularly in regions with daunting pupil-teacher ratios, such as South Asia, the Middle East, and Africa, where these ratios range from 35:1 to 90:1 (World Bank, 2018). This imbalance often forces teachers to focus more on classroom management than instruction, detracting from pupil achievement (Molina et al., 2020). Yet, efforts to reduce class sizes by hiring more teachers do not always lead to better outcomes. In western Kenya, for example, increasing the number of teachers did not improve performance. Instead, the additional staff reduced teachers' sense of urgency and responsibility, leading to a diffusion of accountability and a shift in focus to personal priorities, such as securing jobs for relatives (Mbiti, 2016). This example highlights the need for regular teacher observation and constructive coaching to accompany staffing increases, ensuring that expanded capacity translates into better instructional quality.

To optimise pupil learning, it is crucial that teachers be adequately supported by their education systems, and this support should include relevant, consistent in-service training. However, this vital support for professional performance is often lacking (World Bank, 2018). According to UNESCO's 2017 data, between one-third and over half of Primary school teachers in 21 countries are not adequately trained, and the quality of training varies across these nations (Montoya, 2019). Additionally, many teachers face heavy workloads that include administrative tasks unrelated to instruction, as well as a shortage of teaching and learning materials. Professional development for non-teaching education personnel is also essential, enabling them to better manage school-wide responsibilities and provide coaching to teachers. The use of structured pedagogy can further alleviate the burden on teachers who lack the time or resources to design effective lesson plans. Through increased training and support, teachers can be better positioned to meet professional standards.

Effective policymaking starts with reliable data

The coordinated, effective action of all stakeholders in an education system is essential for fostering pupil success – and lack thereof can undermine that success. The latter is especially a risk when policymakers' decisions do not properly leverage all components of the education system towards achieving a clear objective of enhanced pupil learning. Yet, policymakers seeking to enact change for learning-deprived schools can be inhibited or misled by an absence of data. Without accurate information about the state of learning across their education systems, policymakers lack the context with which to make viable recommendations. This insufficiency of actionable data is most common in the parts of the world where such data are needed most. World Bank research has demonstrated that LMIC, which represent the majority of the global population, have historically lacked assessment results that reliably compare learning outcomes on an international scale – and it is these countries that have the most room for growth in terms of education quality (Angrist et al., 2021). Therefore, it is essential that the decision-making process for improving education quality begin with the system-wide collection of robust, regular measurements on the state of learning.

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Importantly, a single assessment or statistic does not paint the full picture; in order to accurately gauge the health of an education system, policymakers must have access to multiple cuts of data, and be equipped to consider data from multiple angles. For example, if pupils who struggled on one assessment withdrew from school in higher proportions than mid- to high-performing pupils, subsequent assessments would present a seemingly more favourable picture on average, even though learning levels will not in fact have improved (World Bank, 2018). Without additional data focusing on the participation and performance of these struggling pupils, policymakers would be misled – even when lack of measurement is not an issue.

Just as policymakers can benefit from reliable data on learning levels, education systems can benefit from fostering a culture of data usage at all levels. Teachers who regularly conduct formative assessments in the classroom will be able to identify pupils needing extra support, and provide differentiated instruction based on individual pupils' levels of preparation. School leaders and regional officials who access data from state or national assessments – and view breakdowns by classroom, school, or regional subdivision – will be able to identify teachers needing additional coaching and schools needing extra support. Nations participating in international large-scale assessments (ILSAs), which evaluate the effectiveness of education systems across countries and over time (World Bank, 2018; Rocher & Hastedt, 2020), will be able to gauge their own progress against that of their peers. The integrated information from these multiple layers of data sources will inform the broad reforms implemented by education leaders, which will in turn guide the day-to-day instruction in classrooms.

The case for solving the learning crisis through targeted investment in foundational skills and beyond

There is potential for substantial economic gains from thoughtful, increased investment in education

Pupils with strong learning outcomes are more likely to achieve higher educational attainment and are subsequently more productive and fulfilled in the labour market. For instance, research by the World Bank in 2018, based on observations in 139 countries, found a 9% average increase in wages for every additional year of schooling (Patrinos and Psacharopoulos, 2018). The converse also holds true; pupils currently deprived of learning stand to lose a collective $10 trillion in potential labour earnings over their working lives, which will have broader detrimental effects on the economies where these former pupils live and work. These foregone earnings are equivalent to one-tenth of global GDP and are twice the global annual public expenditure on Primary and Secondary education (Azevedo, 2020). Moreover, comprehensive research shows that deficits in pupil performance could lead to a loss of $700 trillion from the global economy by 2100 (Gust et al., 2022). The failure of education systems to meet the needs of the global population could lead to large financial losses, not only by impeding individual pupils' chances for personal prosperity but also by reducing potential future investments in education for subsequent generations.

Still, it should be recognised that the current amount of funding being devoted to education quality improvement is significant. On average, 14% of worldwide government expenditures are devoted to education, according to USAID (2018), and an average of USD 5 trillion is spent on education every year across the globe. A UNESCO report calls for an additional USD 500 billion of yearly education funding from low- and middle-income countries, specifically, to reach SDG 4 by 2030 (2022a). While these amounts pale in comparison to what is forecast to be lost if low learning levels and resultant high rates of school dropout continue, it is possible to achieve higher returns on these investments by ensuring that they are strategically allocated to reforms that have been proven effective in elevating pupil performance, which will in turn contribute to pupil retention. Therefore, concerted effort towards solving the learning crisis is the foremost proposed action to ensure the cost-effectiveness of education funding and increased opportunity for sustaining these investments over time.

Supporting cognitive development in childhood is crucial for ensuring a solid knowledge base in adulthood and enhancing pedagogy in classrooms

Missed learning opportunities early in life can have a stunting effect on pupils' learning trajectories as they advance through their education. Although the brain continues to adapt and foster learning throughout life, it operates most effectively when provided with a strong foundation during childhood upon which to build increasingly complex skills. In other words, pupils who lack mastery of fundamental content from the early grades are at greater risk of slower progress due to the cumulative nature of learning, which is particularly significant in a finite formal education period (World Bank, 2018; Eble & Escueta, 2022). The negative impact of early learning deficits is compounded by the fact that the synapses responsible for sensory pathways, language comprehension, and higher cognitive functions gradually plateau as children approach early adulthood. Therefore, a robust skills base is essential for pursuing an increasingly comprehensive education that adequately prepares graduates for societal participation (World Bank, 2018).

Further evidence supports the notion that foundational skills are pivotal for academic success. Observations conducted by researchers in high-performing classrooms reveal that foundational skills should be viewed as stepping stones to more advanced knowledge (Hwa & Duong, 2021). Mastery of fundamental concepts enables teachers to connect new ideas to previously learned material, moving beyond rote memorisation to more meaningful practice. This approach enhances pupils' ability to acquire and retain a broader scope of knowledge throughout their education. However, many curricula in LMIC still do not prioritise mastery of foundational literacy and numeracy, which ultimately hinders pupils' progress in subsequent stages of instruction.

Conversely, pupils who engage with and apply foundational skills are better equipped to develop metacognitive thinking from an early age. Those encouraged by their teachers to analyse their own learning processes tend to exhibit better performance and greater interest in learning (Hwa & Duong, 2021). Thus, fostering cognitive development through a learning-centric environment has cumulative benefits, enhancing both teaching practices and pupil agency. This, in turn, leads to more effective classrooms and improved educational outcomes.

Elevating education quality standards drastically improves educational equity

It is often the case, across LMIC, that pupils from relatively disadvantaged socioeconomic backgrounds display lower performance in foundational literacy and numeracy competencies, in addition to being less likely to remain in school for the duration of or following their Primary school careers. These disparities increase over time, which highlights the necessity of early interventions that create equitable learning opportunities and foster gains for pupils from all wealth groups (DHS, 2014, 2015; Spaull & Kotze, 2015). Research indicates that improving pupil mastery of foundational skills in an education system, regardless of the variety of socioeconomic backgrounds of the pupils comprising it, narrows gaps in academic performance — the very gaps that have been attributable to differences in pupil background — by providing the appropriate substructure pupils need before becoming exposed to more advanced concepts (Crouch et al., 2021; Asim, 2020). The implication of a narrowing learning divide, furthermore, is that a greater number of pupils become important contributors to a knowledge-based economy from which they otherwise would have been excluded.

Further evidence suggests that even in instances of severe socioeconomic disadvantage, pupils' demand-side characteristics are neither a determinant nor a deterrent of their level of educational achievement to the extent that the supply-side characteristic — the level of education quality — is. Put plainly, children who are motivated and supported by their households to learn still do not develop crucial foundational literacy and numeracy skills after years of schooling when education quality is poor, while the converse is not true — that is, a lack of fortifying inputs in the households of these children does not detract from their ability to learn at a sufficient pace and to a commendable degree when the quality of education available to them is improved (Eble & Escueta, 2022). In this sense, devoting education resources towards achievement of foundational skills raises performance standards for all pupils, and therefore promotes the upward mobility of all citizens in a society.

Education systems must be improved holistically

Optimising investments in education requires aligning entire education systems towards the common goal of enhancing learning in foundational skills and beyond. Education systems consist of many components — such as teachers, pupils, school infrastructure, and school leaders — and reform initiatives often target improving the quality or performance of individual components to mirror the characteristics of high-functioning education systems (Pritchett, 2013; Spivack, 2021). However, such approaches frequently overlook a crucial aspect: the interactions among these components. These relationships not only define but also reinforce the objectives of the entire education system (Spivack, 2021).

When the goals of one component are misaligned with the overall objectives of the system or when no clear objective is present, the quality of education and learning outcomes are compromised (Kaffenberger, 2021). It is not enough to adjust individual components; the processes through which they support or hinder each other must also be evaluated and refined to enhance their effectiveness in promoting meaningful learning.

In recent decades, global education systems have successfully focused on making schooling more accessible, thereby increasing enrolment and attendance (Spivack, 2021). To address the pressing need to improve pupil learning levels — essential for maintaining high enrolment and attainment rates and for enabling pupils to translate academic benefits into their future lives — education systems must be similarly aligned with comprehensive accountability and unified coherence. Therefore, any new intervention that countries may consider, particularly large investments, must ensure that all components, including both new and existing resources, work cohesively towards the ultimate goal of stronger learning outcomes that enable pupils to lead fulfilling and productive lives in the future.

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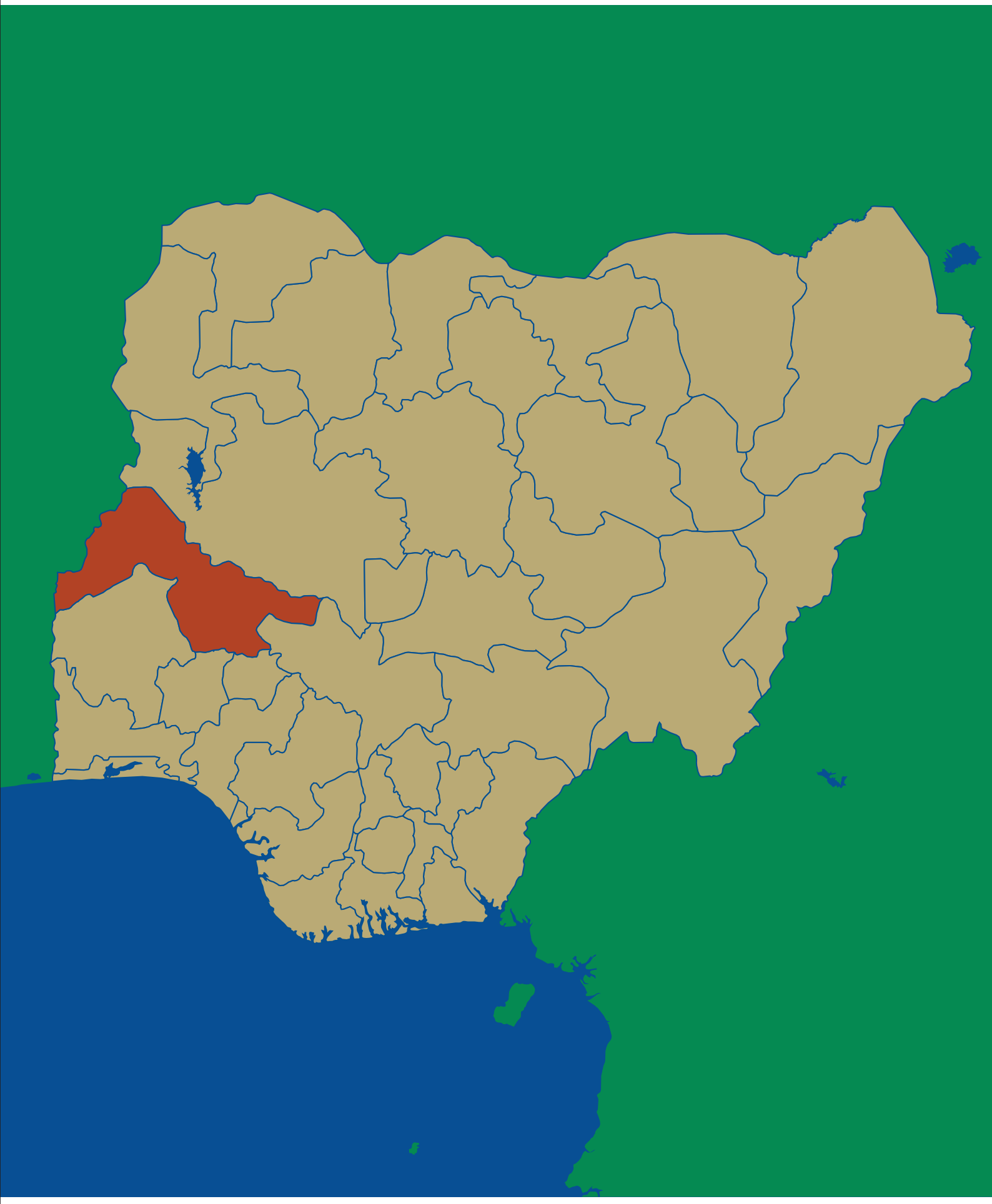

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