KWARA LEARN
LEADING EDUCATION ACHIEVEMENT & REFORM NOW

Can Data-Informed Management and Structured Pedagogy Improve Learning?

Evidence from government schools in Kwara State by the end of the 2022-23 school year after 43 weeks of programme implementation

Professor Henry Owolabi, Sylvester Mchihi, Daniel Rodriguez-Segura, Keuna Cho, Priscilla Lu, and Savannah Tierney

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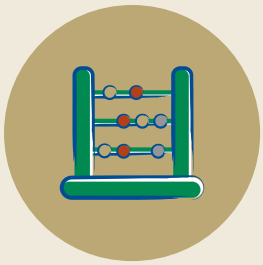
Executive Summary

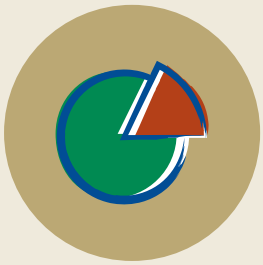
To elevate learning outcomes across the state, the Government of Kwara launched the KwaraLEARN programme in May 2022 as a holistic model of educational transformation.

By the end of the 2022–23 school year, the programme has expanded to serve 125,000 pupils from 872 schools across 10 LGAs.



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

55% of Primary 1–6 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.



After 10 instructional weeks, positive leading indicators emerged, signalling greater progress to come as the KwaraLEARN programme matured.

The percentage of pupils who could not read in a typical classroom was **reduced by one-third,** and there were significant improvements in the quality and quantity of instruction — teachers were **creating more supportive learning environments and employing more effective pedagogical strategies.**

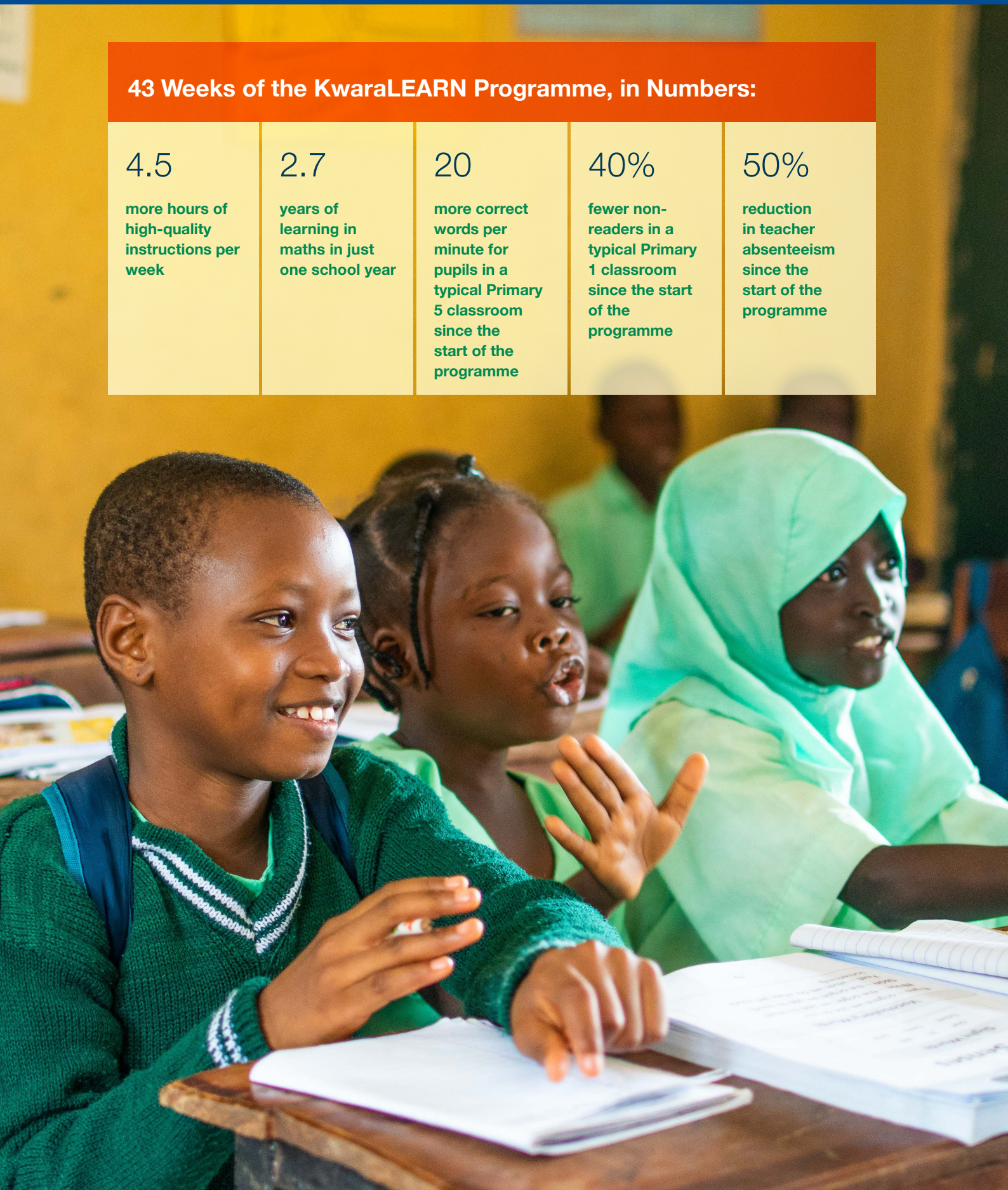
After 43 weeks of programme implementation, pupils experienced dramatic gains in foundational learning.

Pupils' English literacy skills have significantly improved. Across all 872 KwaraLEARN schools, **an estimated 29,000 children have learned to read.**

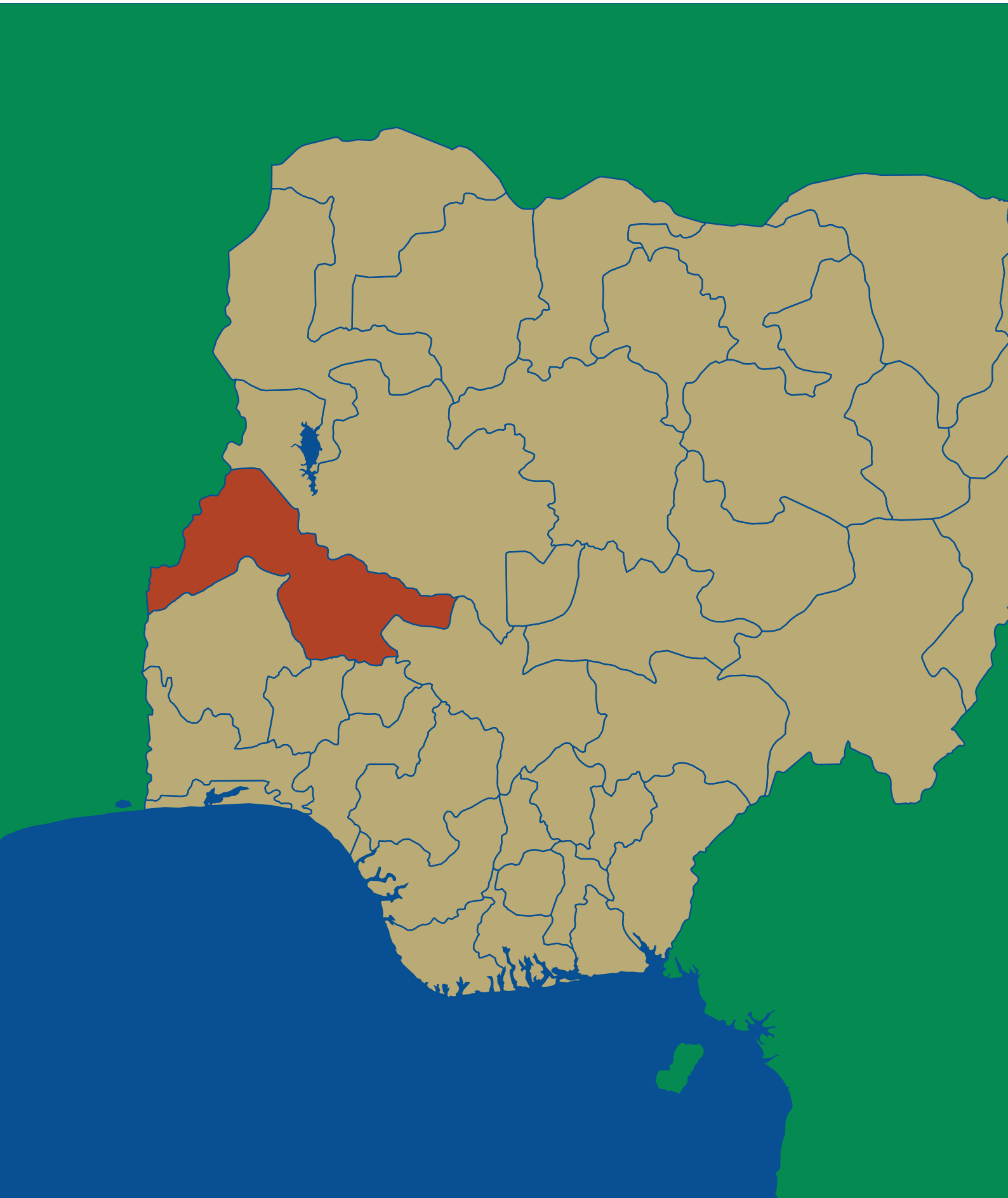
The observed improvements in maths performance represent **gains equivalent to an additional 1.7 years of schooling** — indicating that one year of participation in the KwaraLEARN programme is as effective as receiving 2.7 years of public education without the programme in maths.

43 Weeks of the KwaraLEARN Programme, in Numbers:

4.5	2.7	20	40%	50%
more hours of high-quality instructions per week	years of learning in maths in just one school year	more correct words per minute for pupils in a typical Primary 5 classroom since the start of the programme	fewer non-readers in a typical Primary 1 classroom since the start of the programme	reduction in teacher absenteeism since the start of the programme



I. Preamble



Foreword from Governor AbdulRahman AbdulRazaq

OFFICE OF THE GOVERNOR
KWARA STATE

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KwaraLEARN 2022-23 Report

Effective education is the bedrock of a successful society; it drives economic prosperity, reduces inequality, and empowers individuals to lead healthier, choice-filled lives. Therefore, our administration has prioritised and invested in transforming education to lay the foundation for prosperous development in Kwara State. Through these dedicated investments, we expect to provide thousands of children in Kwara State — both now and in the coming years — the opportunity to acquire the knowledge, skills, attitudes, and values necessary to shape a sustainable future and to become contributing members of their communities.

In pursuit of global standing for the state's basic education system, our administration launched the Kwara Leading Education Achievements Reform Now (KwaraLEARN) programme in March 2022. KwaraLEARN leverages the transformative power of technology to deliver exceptional learning outcomes to public primary school students and better support their teachers. The programme initially spanned 365 public primary schools across four LGAs. Now, after over four school terms of implementing KwaraLEARN, 872 schools are enrolled in the programme across 10 LGAs in the state, while at least 4,100 teachers have received robust training and are now equipped with the tools and skills to facilitate a unique learning experience for children. The swiftness with which programmatic uptake occurred speaks to the commitment of educators and our administration to address critical gaps in public education in Nigeria and, particularly, in Kwara State.

Our sole motivation for an investment of this magnitude is to bolster public education in service of Kwara State's youth. The global shift towards a knowledge-based economy requires that we equip our children to competently and competitively engage with their peers worldwide. Without a strong educational foundation, our children will not be able to navigate a digital era, in which knowledge is crucial for socioeconomic growth and sustainability. Therefore, the KwaraLEARN programme is a tangible manifestation of our administration's resolve to strategically rescue public primary education and secure the future of children in the state.

After four terms of implementation, the programme has demonstrated its potential to transform Kwara's basic education system with profound achievements in literacy and numeracy. The findings of this report are both exciting and encouraging. They provide detailed insight into the tremendous strides that have already been made, equipping teachers and pupils with the necessary skills and tools to participate in our transformative education system meaningfully. They show that students in KwaraLEARN schools are now performing meaningfully better than before the programme, even after a small number of instructional weeks. Even children from every corner of the state who, in the

past, could not read a single word, are now taking off in their learning journey thanks to the KwaraLEARN programme. We must not become complacent, for this is just the beginning. There is still much work ahead to ensure that every child in Kwara has the opportunity to learn through this laudable education transformation.

For the great achievements of this programme so far, I must commend the enthusiasm and commitment of the leadership of our education sector, particularly the Ministry of Education and Human Capital Development and the Kwara State Universal Basic Education Board (SUBEB). They have shown a great determination to undertake all that is required to bring about the most profound changes to the Kwara 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 without any bias or prejudice to transform the public education sector in our state.

Our profound gratitude goes to NewGlobe Educational Services International, our technical partners, who have availed Kwara State of their renowned technology-enabled methods.

In conclusion, this report serves as a testament to the remarkable strides achieved in the first calendar year of our major investment to reshape the educational trajectory in our dear state. We recognise that these early accomplishments must serve as a solid foundation for the ongoing growth and sustainability of our education system as we continue to gain valuable insights and look toward the future. The report also highlights the benefits and importance of continuous partnership between Kwara SUBEB and our technical partners to strengthen individual schools, as well as our entire public education system. I hope that you will find the report useful in your assessment of the progress that the Government of Kwara State is making to deliver high-quality, competitive, and accessible education which gives all our children a head start in life.

AbdulRahman AbdulRazaq
Governor, Kwara State

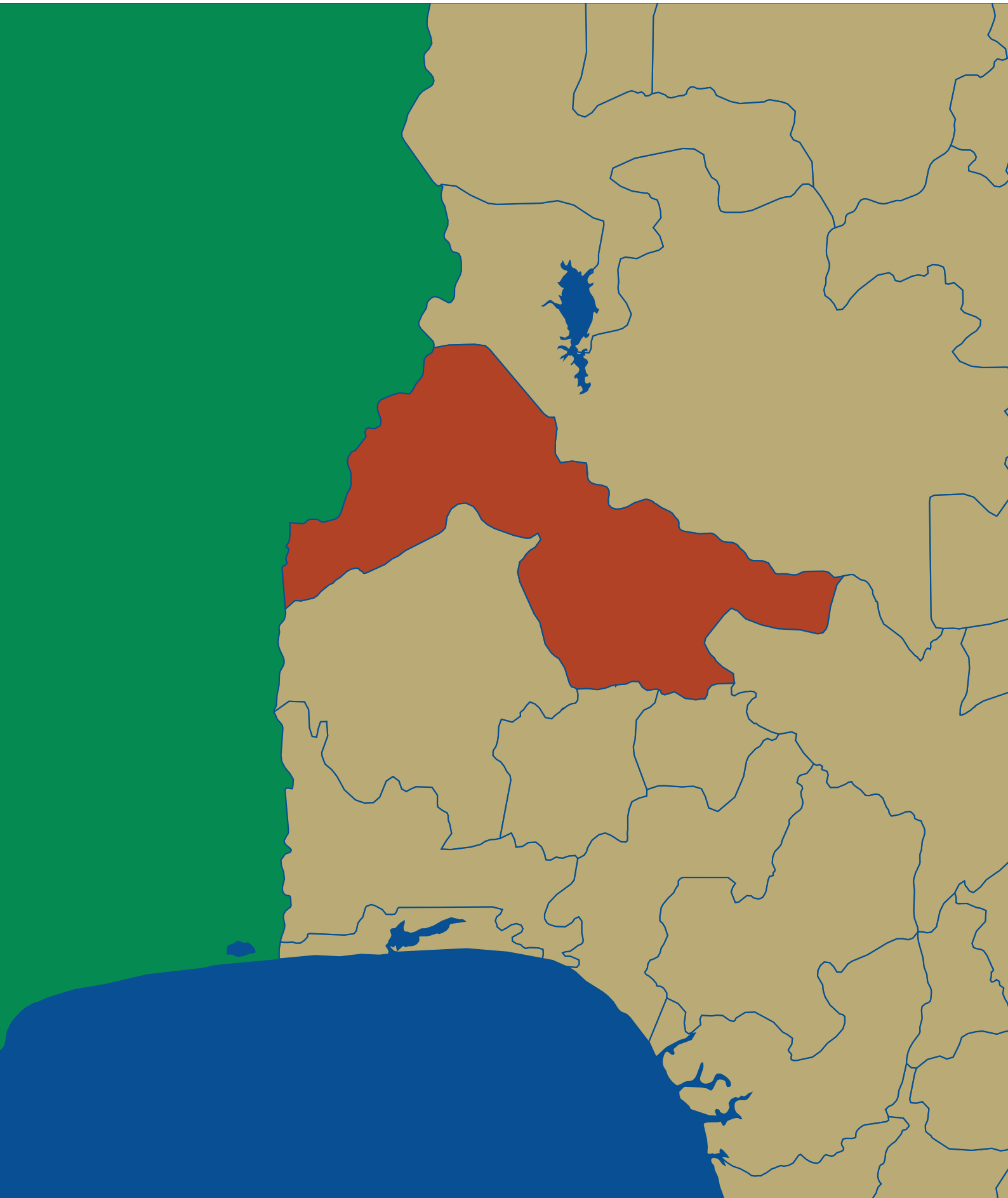
Acknowledgements

The successful completion of this study is due to the support and instrumentality 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 Education Board (SUBEB) 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 of Planning, Research and Statistics for Kwara SUBEB Alhaji Abdulkadir Zakariyau and the Kwara SUBEB desk officer for KwaraLEARN Mrs Aliyu 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, Demi Chen, Anchal Khandelwal, Alya Shaiful Bahari, Marlee Mullane, Melanie Gaudet, Tobias Mitchell, and the entire KwaraLEARN team including Femi Oyinloye, Segun Sanusi, and Gbenga Oyebajo.

Finally, we owe our deepest gratitude to the field team, the backbone of this project: Oladayo Olaluwoya, 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, Akinsola Fisola, Adeyemi Omobola, Aminu Munirat, Boluwatife Beautrice, Olaoye Priscilla, Bilkis Raheem, Oluwabunmi Fahuwa, Okafor Uchenna and Adulsemiu Zuliyat.

II. The KwaraLEARN Programme



Overview of the Programme

The Kwara State Government put forth a bold vision to transform the quality of public education across the state in order to ensure that all pupils reach their full potential. In March 2022, it launched the Kwara Leading Education Achievements Reform Now (KwaraLEARN) programme. KwaraLEARN is a holistic, 360-degree programme strengthening all aspects of the public Primary education system. Through KwaraLEARN, school leaders and teachers are empowered to deliver transformative education to each child. The programme is dedicated to accelerating learning in all subjects and equipping all pupils with mastery in foundational skills encompassing reading, language, and mathematics.

KwaraLEARN is anchored in five core pillars:

1. Scientifically-based learning materials aligned to the Kwara State curriculum
2. A technology-enabled instructional model
3. Data-driven training, coaching, and ongoing professional development
4. 360-degree support teams
5. Technology-driven monitoring and reporting

The programme has five central goals:

- Support the Kwara State Government to better utilise the existing human and material resources allocated to the public education system
- To build capacity among school leaders and teachers, training them in the use of effective and scientifically-based instructional practices that create learning-centric classrooms
- To establish management structures that enable effective governance and ultimately increases the quantity and quality of instructional time that each pupil receives
- To provide materials that enhance the quality of teaching and learning within each classroom
- To raise learning levels in both foundational skills and in subjects covered by the state and national curricula

KwaraLEARN: A Holistic Programme With Integrated Features

Academic planning and lesson mapping

KwaraLEARN drives pupil learning by providing school leaders and teachers with the tools and support they need to deliver life-changing education to each and every child. Moreover, KwaraLEARN also offers government and programme leaders visibility into the minute-by-minute experience of pupils, teachers, and schools. This digital and operational transparency ensures that leaders can work in close collaboration and make strategic, data-driven decisions to improve the quality of education on a system-wide scale. Importantly, KwaraLEARN schools remain under the purview of the Kwara State Ministry of Education. As such, they receive the same level of scrutiny and monitoring as do other public schools in Kwara outside of the programme. The key difference is that public schools in the KwaraLEARN programme receive the additional support provided by the programme.

Below, we highlight the core pillars that enable KwaraLEARN to ensure high-quality learning in each and every classroom:

1. Scientifically-Based Learning Materials Aligned with State Curriculum

One key pillar of KwaraLEARN is the materials that teachers use to ensure that all pupils master the curriculum and build the necessary foundational literacy and numeracy skills to excel in their studies. KwaraLEARN designs thousands of high-quality, syllabus-aligned teacher guides. Each teacher guide is based on thousands of hours of research and development on what works best to drive learning gains. These scientifically-based lessons provide the necessary structure and pedagogical support to lead a world-class lesson. This includes key lesson objectives, procedures for teaching new concepts, impactful and rigorous independent practice opportunities, and mechanisms for assessing learning. Each lesson is then observed in the classroom to ensure that there is a continuous cycle of improvement.

KwaraLEARN enables the teaching of the national curriculum, while also building foundational skills that serve as the building blocks that allow access to all curricular content. KwaraLEARN's lesson materials cover all curriculum-mandated subjects, and include lessons that strengthen the core foundational literacy and numeracy skills necessary for pupils to meaningfully engage with and master the content in the national curriculum. 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 toward class-level standards.

The quality of instructional materials is constantly evaluated through several mechanisms. First, continuous and comprehensive assessments of pupils' learning are administered termly, and the data are automatically captured from these assessments, providing ongoing visibility into pupils' progress across the entire system. Second, KwaraLEARN programme officers observe lessons each day, evaluating the quality of the design and opportunities for improvement. This continuous cycle of observation and iteration ensures that each and every lesson drives effective classroom instruction and contributes to optimised learning outcomes (For more information regarding structured pedagogy, see Box 1).

2. Technology-Enabled Instructional Model

KwaraLEARN's instructional model is made possible by technology. Teacher guides are shared digitally with teachers through a teacher tablet. These digital teacher guides not only deliver high-quality academic content, but also enable the consistent implementation of pedagogical strategies to ensure that teachers are engaging all pupils. For example, teachers are provided with prompts to pause for pupil questions or to facilitate small-group sessions, and they can track which pupils they have called on, so that they can be sure to call on others. Technology also enables the efficient allocation of time, ensuring that every minute of the school day maximises learning. Lessons are organised by a digital timetable, and the teacher tablet automatically tracks the amount of time spent on each page of a lesson, providing insights into time-on-task. When teachers assess learning outcomes, they do so using an application on their teacher tablet, called Let's Mark, which allows fast and automated marking of exams. The tablet, in turn, provides the teacher with the data and

insights necessary to adjust their instruction based on the actual learning outcomes and patterns in their classroom. From the delivery of lesson content to supporting strong pedagogical practices to enabling time management, technology enables KwaraLEARN's instructional model.

3. Data-Driven Training, Coaching, and Ongoing Professional Development

High-quality instructional materials are necessary but not sufficient to transform teaching and learning in the classroom; in addition, teachers need professional development, as well as ongoing support from school leaders. Another key component of KwaraLEARN is data-driven professional development programmes. Additional induction training sessions are scheduled at each expansion phase of the programme.

KwaraLEARN induction training has three core objectives:

- To ensure that every teacher has the **skills and knowledge** to deliver lessons, manage a classroom, assess learning, and motivate pupils.
- To develop the **mindset** that every pupil can be successful, that high-quality instruction is possible and leads to improved learning outcomes, and that positive reinforcement is the most effective tool to motivate pupils.
- To strengthen the **communication strategies** needed to engage with the school community and beyond.

A teacher's support does not end with induction training. KwaraLEARN also provides continuous professional development for teachers. This professional development, delivered at the school level by a Schools Supervisor, reinforces core skills from induction training. It delivers training on new processes, skills, and tools in the KwaraLEARN programme.

Importantly, KwaraLEARN empowers school leaders to provide powerful coaching for their teachers. School leaders receive frequent visits from supervisors, during which they conduct joint lesson observations and hone their skills in providing improved feedback to teachers. Thus equipped with the tools and training to monitor performance and observe teachers, school leaders can observe teachers and deliver coaching sessions that celebrate areas of strength and target areas of growth. Coaching, alongside continuous professional development, ensures that every single teacher receives constant feedback and reinforcement of the skills that help them to become a stronger teacher.

> *"[The KwaraLEARN programme] provides good class control and facilitates teaching and learning."*
>
> **-Teacher E, Baruten**

4. 360-Degree Support Teams

KwaraLEARN knows that to be successful, systems must be put in place to ensure that all members of the school ecosystem deliver the programme with fidelity. A 360-degree support team ensures that at every school, all of the conditions are in place for learning. This includes operational factors (Is there a teacher assigned to every classroom? Does every teacher have a tablet?). It also includes performance indicators (What percentage of lessons are teachers delivering each day? Are teachers taking attendance for their classrooms?). A team of Schools Supervisors checks in with schools daily, and visits in person every other week to ensure that these conditions are met. When issues surface, a support team responds in order to resolve these issues. This includes IT support, operational support, and other departments in place to ensure optimal conditions for learning.

5. Technology-Driven Monitoring and Reporting

The identification and resolution of school-based issues does not only occur during in-person visits. KwaraLEARN tracks all core operational and performance drivers that contribute to learning outcomes, such as pupil and teacher attendance, lesson completion, school leader coverage, and more. Digital tools capture these data automatically and in a decentralised manner; for example, teachers do not need to manually log lesson completion, and school leaders do not need to take teacher attendance. Technology then transforms these data into usable insights for school leaders, which, in turn, enables more effective school management and teacher coaching. These data are also used by KwaraLEARN's 360-degree support team to identify challenges, resolve issues, support school leaders, and drive improvement at the school level. These data are also available for government and KwaraLEARN leadership. These insights inform strategic decisions at the programme level and ensure that all key programme decisions are responsive to the reality of the school system as a whole.

Box 1. Enhancing Learning Outcomes Through Structured Pedagogy

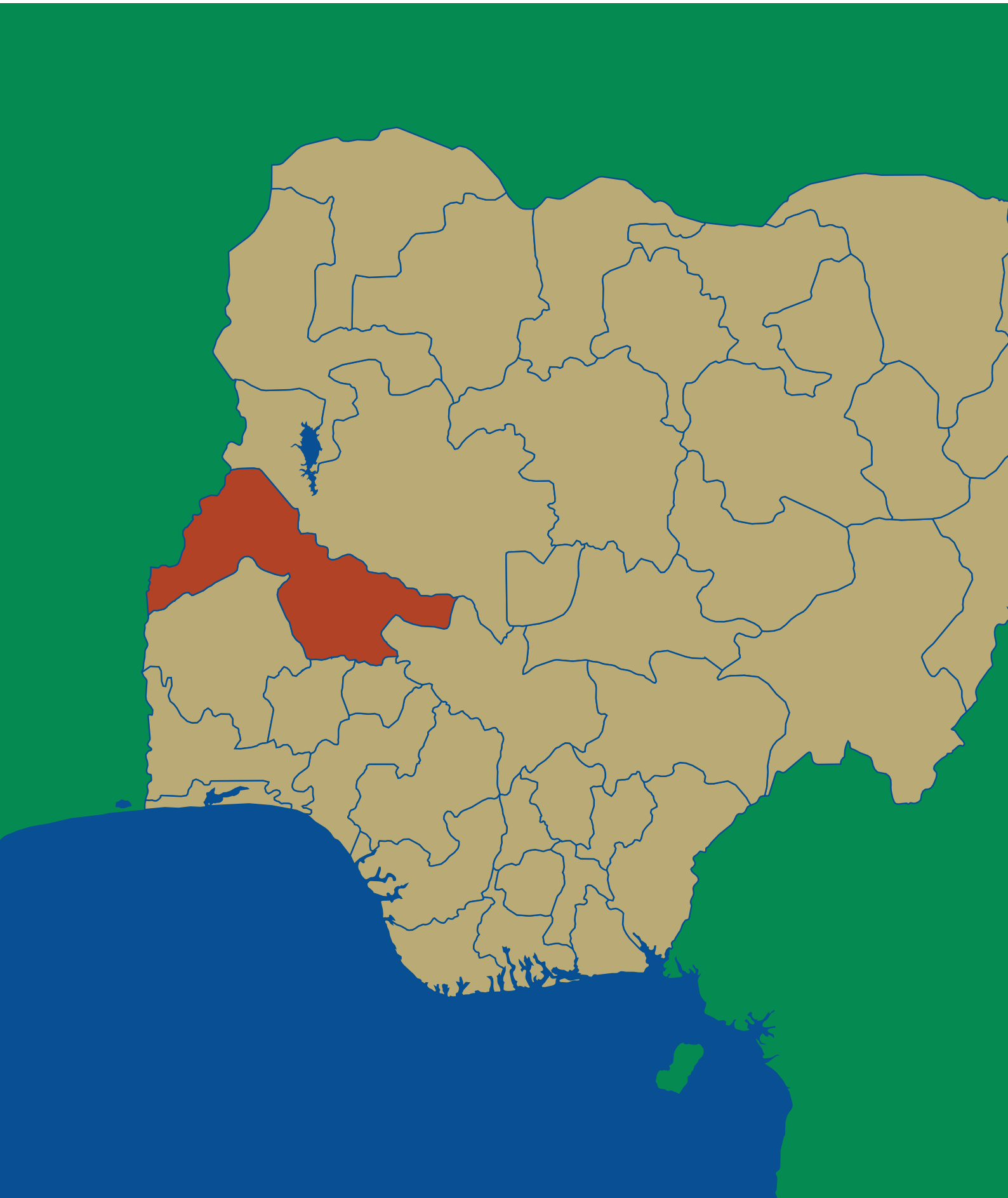
Classroom instruction is one of the most critical components of an education system. No other school-level factors have an impact on pupil achievement as large as teacher and lesson quality (World Bank Group, 2017). The absence of effective instructional practices can consequently render education inputs and systems futile. One of the most effective ways to maximise instructional quality on a broad scale is to incorporate appropriately scaffolded lessons and curricula which enhance retention, employ proven instructional strategies, and are facilitated by educators possessing a comprehensive understanding of subject matter. Unfortunately, classroom instruction in many low- and middle-income countries lack these critical characteristics. Data collected from 2,600 schools over 7 countries in sub-Saharan Africa show that about 14% of Grade 4 language teachers can not spell a simple word like “traffic”, and a similar share can not correctly answer questions on a simple grammar exercise. Moreover, even when teachers do possess an adequate amount of subject matter expertise, it does not guarantee their ability to communicate knowledge to pupils. The same study found that only 31% of teachers are able to prepare a lesson plan, and an even smaller share of teachers can develop lesson objectives, formulate questions to check pupils’ understanding, and give feedback (Bold et al., 2017). Given the challenges many teachers face regarding lesson planning, competing time demands, school understaffing, and absenteeism rates, it is highly probable that educators lack both the time and capacity required to develop comprehensive course syllabi.

According to the World Bank, structured pedagogy is a package for educational systems that consists of inputs such as lesson plans, learning materials, and ongoing teacher training. Carefully cultivated, evidence-based, policy recommendations classify structured pedagogy as a highly cost-effective measure to enhance educational systems in LMIC (The World Bank et al., 2023). Comprehensive and high-quality structured pedagogy equips teachers with expertly developed and coherent materials, benefiting pupils regardless of external factors such as location, income, or background. Evidence indicates that structured pedagogy has significantly improved learning outcomes in several LMIC. For instance, the RARA (Nigeria Reading and Access Research Activity) program 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, 2015). Similar patterns were observed in a 2018 study by Research Triangle International (RTI), which highlighted the contribution of structured lesson plans to improved learning outcomes across 19 education programs in 13 countries (Piper et al., 2018). In a recent randomised control trial, conducted by an international group of education experts 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 this intervention is not monolithic in its ability to improve learning outcomes.

The effectiveness of structured pedagogy on a broad scale relies on well-crafted implementation and necessitates comprehensive support as well as monitoring to sustain its impact over time. 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 sub-Saharan African 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 expressed a desire for additional training on the use of lesson plans and materials; those who received more consistent training exhibited higher levels of effectiveness (Piper et al., 2018). To address this issue, robust monitoring mechanisms are essential to facilitate the effective utilisation of materials across the region. The same 2018 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, tailored resources to diverse classroom settings, and comprehensive training, structured pedagogy can lead to improved learning outcomes and empower teachers to facilitate meaningful educational experiences for pupils.

III. Methodology

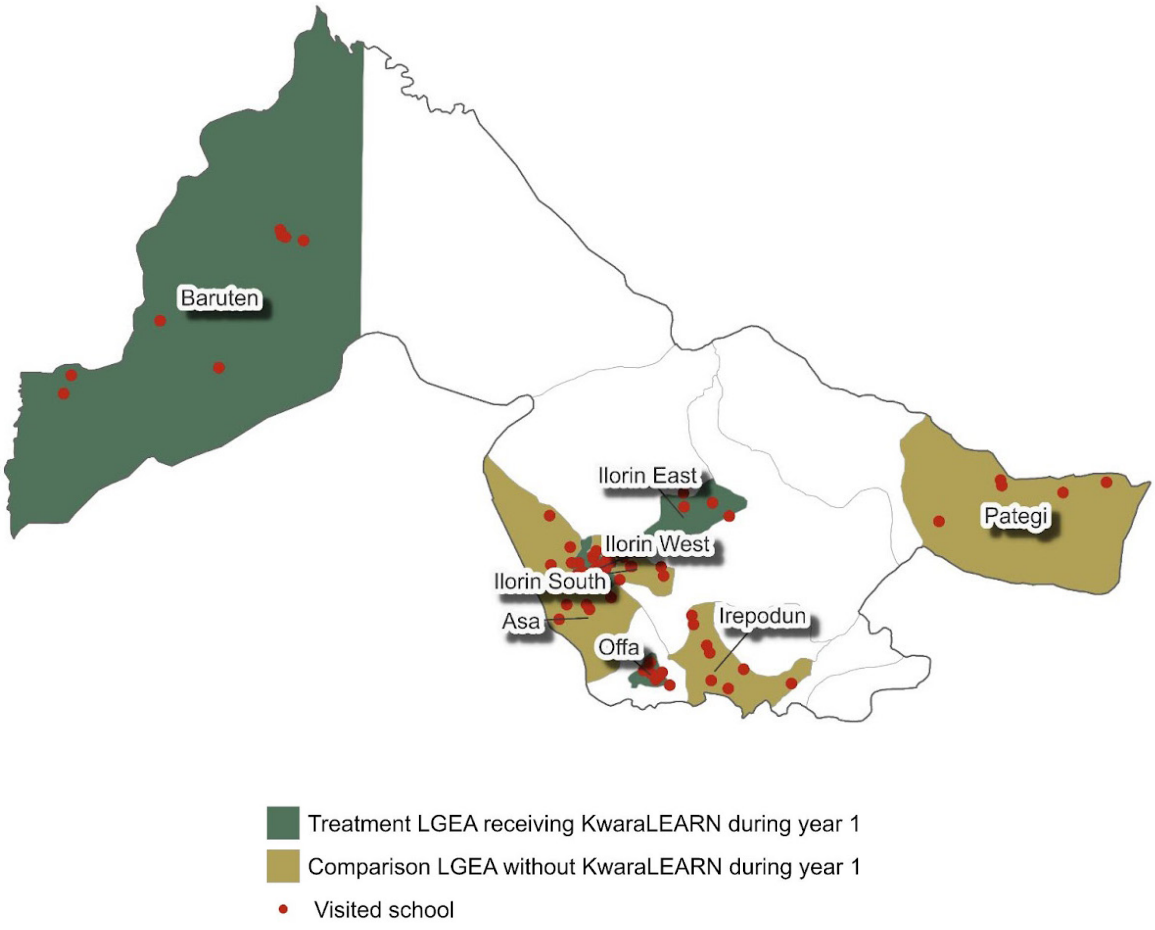


Sampling Schools and Pupils

Schools included in the study

The study sample was composed of a set of 64 public Primary schools across Kwara State. Of these schools, 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. Of the 32 comparison schools, 24 were randomly selected from three respective LGAs — Ilorin South, Irepodun, and Pategi. In a fourth LGA, Asa, data were collected from 8 manually-selected schools about which the government had a particular interest to learn (See Appendix D for the full list of sampled schools). The schools that comprised the treatment group were selected such that each was representative of all other schools in their LGA. For the comparison group, the 24 schools that were randomly selected from the three LGAs constitute a representative subsample of all schools in those three LGAs. The broad representativeness of these schools allows us to ensure that the data collected also reflects the larger educational landscape in the state.

Figure 3.1 Geographic Distribution of Schools Included in This Study



Pupils assessed for this study

Within the schools that were visited, data were collected from a representative subsample of pupils. Across the 64 schools, the original plan was to assemble a cross-section of 3,072 randomly selected pupils during each round of data collection, composed of 48 pupils per school – roughly 8 pupils from each class. In practice, this was not fully achievable due to small class sizes and some pupil absence. Therefore, after three rounds of data collection, an average of 2,500 pupils had been assessed per round – roughly 40 pupils per school. As expected, the average number of pupils assessed in each class decreased with older cohorts: for Primary 1–2, an average of 7.4 pupils per school were assessed, an average of 6.6 pupils were assessed for Primary 3–4, and an average of 6 pupils were assessed for Primary 5–6. Fortunately, this sample size is still large enough for accurate conclusions to be drawn about the state of learning in public Primary schools across eight LGAs in Kwara State.

Data Collected

Assessments of learning outcomes

This report documents relevant information on the status of learning outcomes in the state of Kwara prior to and throughout the implementation of the KwaraLEARN programme. For the state's programme to be effective — and any educational intervention targeting foundational learning, for that matter — understanding pupils' baseline literacy and numeracy levels is crucial. This information ensures that the programme can meet the needs of all learners through appropriately levelled instructional materials.

Oral Reading Fluency

Oral reading fluency is the skill of reading quickly, accurately, and with expression. The most common metric to assess oral reading fluency is correct words per minute (cwpm) — in other words, how quickly and accurately a pupil can read a passage aloud in one minute.

This evaluation relies on two assessments of oral reading fluency: a Primary 2 passage that all pupils read and a selection of class-level passages specific to each pupil's class (See Appendix A for the passages used). The Primary 2 passage was selected from Dynamic Indicators of Basic Early Literacy Skills (DIBELS), a reliable and valid assessment of early literacy development widely used in evaluation studies of educational interventions (University of Oregon, 2018). It enables a comparison of performance levels across all Primary classes and the measurement of growth throughout classes on the same passage. In addition, the use of DIBELS allows for comparison of the fluency results from Kwara State's schools with performance in comparable educational systems.

The class-level passages (Primary 2–6) were selected from Nigerian Educational Research and Development Council (NERDC)-approved English textbooks. For Primary 2–6, evaluating how accurately and quickly a pupil can read one of their class-level textbooks, which are appropriately levelled for each class and also contextually appropriate for Kwara State, allows for a more accurate assessment of functional fluency; in other words, how well can a pupil

read a class-level text like the ones they will encounter in typical lessons? The only exception to this is the Primary 1 "passage", which consisted of a word list, in keeping with expectations of KwaraLEARN and DIBELS that pupils do not need to be reading a fully connected text by this class level. In total, 7 passages are used: one Primary 2 passage read by all pupils and 6 different class-level passages (Primary 1–6).[1]

Numeracy

Pupils' numeracy skills were assessed using the International Common Assessment of Numeracy (ICAN). ICAN, developed by the People's Action for Learning (PAL) Network, is a tool designed to measure performance across a range of core numeracy competencies, all of which are relevant for the age group of pupils in this study. Global assessments like PISA and TIMSS target older pupils and assess more complex mathematical topics. Popular assessments like EGMA assess foundational numeracy in lower classes, but are not designed to assess numeracy among pupils older than Primary 3. ICAN targets constructs that overlap with the more basic constructs in EGMA (e.g. number recognition) while also allowing pupils to demonstrate higher levels of performance through questions like word problems involving division. Similarly, ICAN is a shorter assessment than the other alternatives discussed here, allowing enumerators to reach a larger sample size within the same amount of allotted time for pupil assessments. By using ICAN across all classes, reports emerging from this plan will be able to illustrate how different classes perform on the same assessment, and thus, how pupils progress class-on-class.

More specifically, ICAN assesses five sub-skills: number recognition, addition, subtraction, multiplication, and division. Within each domain, there are two tasks. Task 1 is a simple application of the concept (for example, addition without carrying). If the pupil answers Task 1 correctly, they attempt Task 2, which is a more challenging application of the concept (for example, addition with carrying). Two of the domains, subtraction and division, also include a separate word problem as part of Task 2 (See Appendix A for a version of the full ICAN). This provides clearer insight into the extent to which pupils can apply their knowledge of arithmetic operations in real-world situations.

ICAN also allows for extensive international comparison, situating results within the broader global context. In 2019, ICAN was used to assess foundational numeracy among 20,000 pupils across 13 different countries (including Nigeria). With such a rich data source, the outcomes of KwaraLEARN schools can be reasonably compared with performance across these 13 other countries after different rounds of data collection — with the caveat that the external ICAN data also include out-of-school pupils, likely biassing down each territory's performance relative to the sample in Kwara, which is exclusively composed of pupils enrolled in school.

Finally, since there are several rounds of data collection, enumerators will use different versions of this assessment over time to avoid pupils answering correctly due to their familiarity with specific questions, and not due to their actual mastery of the content. However, these different versions were all carefully crafted by the KwaraLEARN Academics team so that the difficulty level and assessed skills remain constant across assessments.

[1] 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.

Collection of other data

Teaching Practices

During the earliest stages of the programme after its initial rollout in May 2022 — when learning outcomes were beginning to improve — it was important to monitor changes in pedagogical practices, as these changes would prefigure improvements in learning outcomes. To do so, this study uses an adapted version of the TEACH observation tool. The TEACH tool was originally developed by the World Bank (2022) for use in classrooms in low- and middle-income countries. The tool is designed to measure teaching practices that are pedagogically sound and empirically proven to be effective. With the TEACH Tool, we are able to measure the frequency at which KwaraLEARN teachers within our sample use these effective practices at the beginning and end of the initial 10 weeks of instruction (Term 3 of the 2021–22 school year) compared to teachers in comparison schools. The results from these data serve as leading indicators as to how the quality of teaching changed in the short term with the implementation of the KwaraLEARN programme.

Longitudinal Metrics on Pupil Attendance and Enrolment in KwaraLEARN Schools

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. One major limitation of these metrics is that they are not available for comparison schools, since they are collected through the KwaraLEARN teacher tablets.

Teacher Attendance and Lesson Delivery in KwaraLEARN Schools

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.

Evaluating the Impact of the Programme

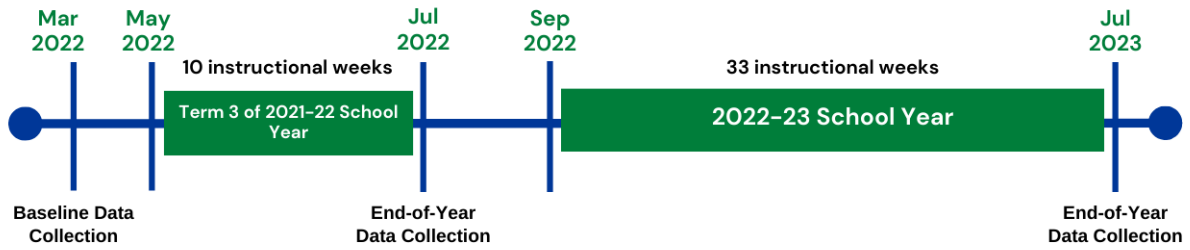
The empirical strategy for measuring learning growth in KwaraLEARN

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. Doing so allows programme leaders to understand how the programme has impacted learning growth thus far, highlight the milestones that have been reached since the programme's launch, and determine appropriate directions for continued improvement in the future.

To benchmark the learning gains achieved by the KwaraLEARN programme, the study outlined in this report was conducted in two parts: First, the effect of the KwaraLEARN programme on learning outcomes during the first 10 weeks was calculated using a statistical method called "difference-in-differences". This method utilised two rounds of data collection — conducted at the beginning and end of the instructional period — in KwaraLEARN ("treatment") schools and non-KwaraLEARN ("comparison") schools, enabling the measurement of pupils' academic progress from the beginning to the end of the instructional period. The gradual expansion of the programme allowed LGAs that had not yet joined the programme to serve as a valid and reliable comparison group for the initial 10 weeks of programme implementation.

Following the initial period of implementation, the KwaraLEARN programme expanded to include additional LGAs, effectively reaching more schools and pupils across the state. As such, schools within the four LGAs in the comparison group joined the KwaraLEARN programme during the 2022–23 school year, and therefore, were no longer suitable as a comparison group. To continue monitoring the progress of KwaraLEARN schools, a longitudinal follow-up was conducted at the end of the 2022–23 school year in the 32 schools that comprised the treatment group (See Figure 3.2 for a more comprehensive programme timeline). Given the programme's expansion, these 32 schools are no longer fully representative of all schools participating in the KwaraLEARN programme — only of the first cohort to join the programme. However, maintaining this group enabled the longitudinal comparison of the progress made by pupils who have received the programme since its inception (See Appendix D for an overview of the data quality assurance protocol). In addition, it should be noted that while Primary 6 pupils were included in baseline data collection and projections prior to the programme, Primary 6 classes did not participate in the KwaraLEARN programme during its first 10 weeks of implementation. Therefore, the longitudinal data presented in this report do not include outcomes for Primary 6 pupils.

Figure 3.2 The Timeline of This Study



After the initial 10 weeks of implementation, the progress seen in comparison schools established the growth trajectory expected in schools that adhered to the status quo, and allowed for inference about how pupils in treatment schools would have progressed in the absence of the KwaraLEARN programme. Calculating the difference between the actual performance of pupils in treatment schools and their expected performance following a status quo trajectory yielded a quantitative measure of the "KwaraLEARN effect". In other words, this analysis highlighted the additional growth made by KwaraLEARN pupils beyond what was expected under status quo education, and served as an important indicator of pupils' anticipated progress as the programme entered its first full school year. Refer to Box 2 below for a more detailed description of the difference-in-differences method used during the 2021–22 school year.

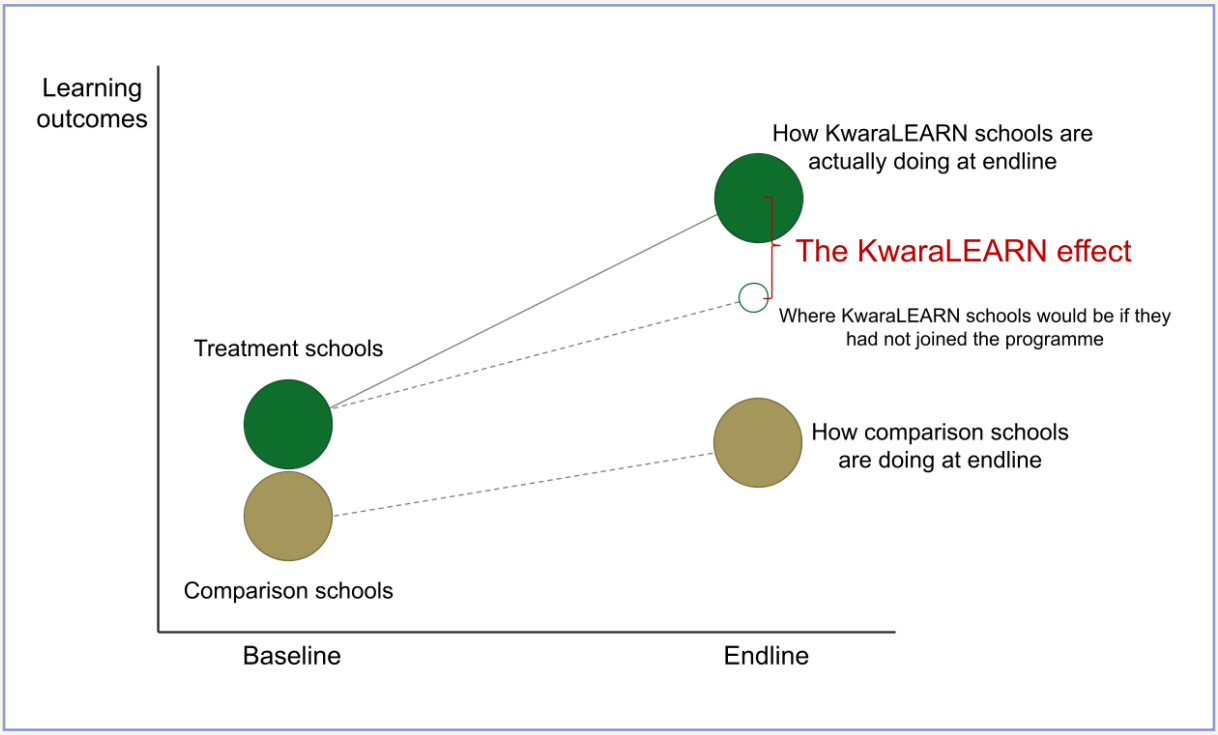
Box 2. The Difference-in-Differences Method

To understand the impact of a programme, the gains observed among participants of the programme must be compared to the gains that would have been observed for the same participants over the same period of time in the absence of the programme. Comparing the learning levels at KwaraLEARN ("treatment") schools and non-KwaraLEARN ("comparison") schools at a single point in time would not allow meaningful interpretation, as this could mask differences between the groups that would have existed regardless of their participation in the programme. Similarly, following the changes in the learning levels at KwaraLEARN schools over time, without reference to what these changes would have looked like without the programme, would not yield meaningful conclusions about the impact of the programme. Therefore, impact is calculated using a statistical methodology called "difference-in-differences".

The difference-in-differences method relies on two rounds of data collection: one before the start of an intervention (such as the rollout of KwaraLEARN), and one at the end of an instructional period (such as a school year), for both treatment and comparison schools. Using these data, a status-quo growth trajectory can be established based on how comparison schools progressed over the course of the instructional period; in other words, the first "difference" calculated is the difference between end-of-period and start-of-period learning levels at comparison schools. This growth trajectory at comparison schools serves as a reference for how current KwaraLEARN schools would have progressed had they not taken part in the programme, and it is added to the start-of-period learning level at treatment schools to calculate the expected learning level at the end of the instructional period. Then, the actual learning level at the end of the instructional

period is compared to the expected learning level; i.e., the difference in differences is calculated, yielding a quantitative measure of the "KwaraLEARN effect" — the amount of growth beyond expected levels made by KwaraLEARN pupils. The full analytical setup of the study is illustrated with a graphic below (Figure 3.3).

Figure 3.3 Analysing the "KwaraLEARN Effect" Using a Difference-in-Differences Approach



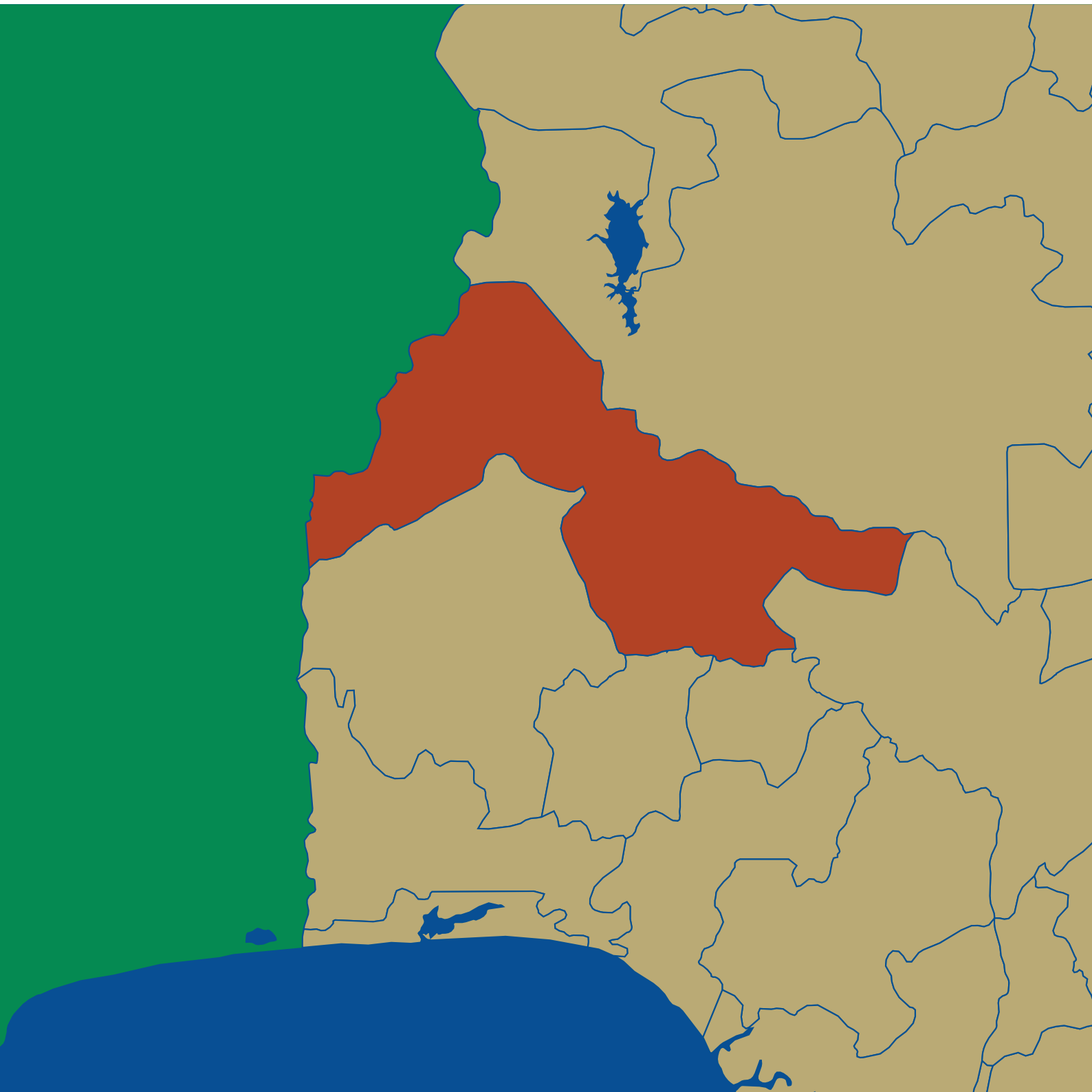
To build on the results of the difference-in-differences approach, the longitudinal follow-up provides an additional point of comparison for measuring pupils' learning outcomes. These results can be compared to those observed at the end of the first 10 weeks of instruction and to the projections of what their outcomes would have been at the end of the previous year. These comparisons provide a comprehensive picture of KwaraLEARN pupils' progress over time. Not only do the results stemming from the 2022–23 school year provide insight into how pupils have demonstrated further growth in foundational skill-building the longer they are exposed to the programme, but they also facilitate understanding of the programme's continued effects on learning for these cohorts compared to the learning growth that would be expected absent the programme. In addition to the ongoing tracking of pupil progress, performing the longitudinal follow-up allows further visibility into aspects of KwaraLEARN schools that have influenced programme implementation and the extent to which they continue to do so. In turn, this supports KwaraLEARN leaders to optimise the delivery of the programme.

To summarise, the first term of the KwaraLEARN programme (Term 3 of the 2021–22 school year) consisted of 10 weeks of instruction for the 363 schools where the programme was initially implemented. The following school year consisted of 33 weeks of programme implementation for 872 schools. Therefore, over the 43 total weeks of programme implementation, those pupils in the initial set of 363 schools received 43 weeks of instruction, while those in the schools that joined at the start of the 2022–23 school year received 33 weeks of instruction. However, it is important to note that, by the end of the 2022-23 school year, 23% of all enrolled pupils in the first cohort of schools in P2-P6 —those who would have been in P1-P5 in 2021-22— had not participated in KwaraLEARN during the programme's first 10 weeks of implementation. Thus, these new pupils likely received a lower dosage of instruction compared to those in the same class who joined the programme when it commenced, potentially underestimating the programme's effect on learning.

Complementing quantitative results with a qualitative study

This evaluation also conducted a qualitative follow-up at the start of the 2022–23 school year (October 2022), 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. In total, 186 interviews were carried out with 54 teachers, 14 head teachers, 8 supervisors, 40 parents, and 70 pupils from different schools across the state. These interviews followed a structured approach (using the protocol outlined in Appendix G) and the results were subsequently analysed using conventional coding practices for qualitative data.

IV. The State of Learning in Kwara State Before the Start of the Programme

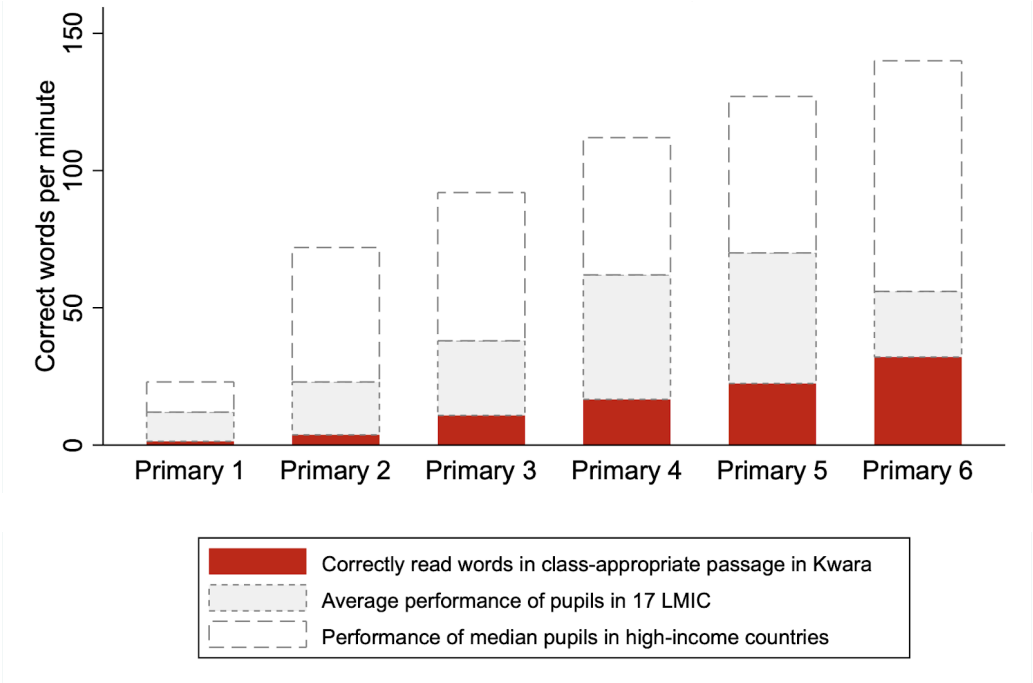


Limited Proficiency in Foundational Skills

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 4.1). By the end of Primary school, pupils were, on average, more than four classes behind where they should be.

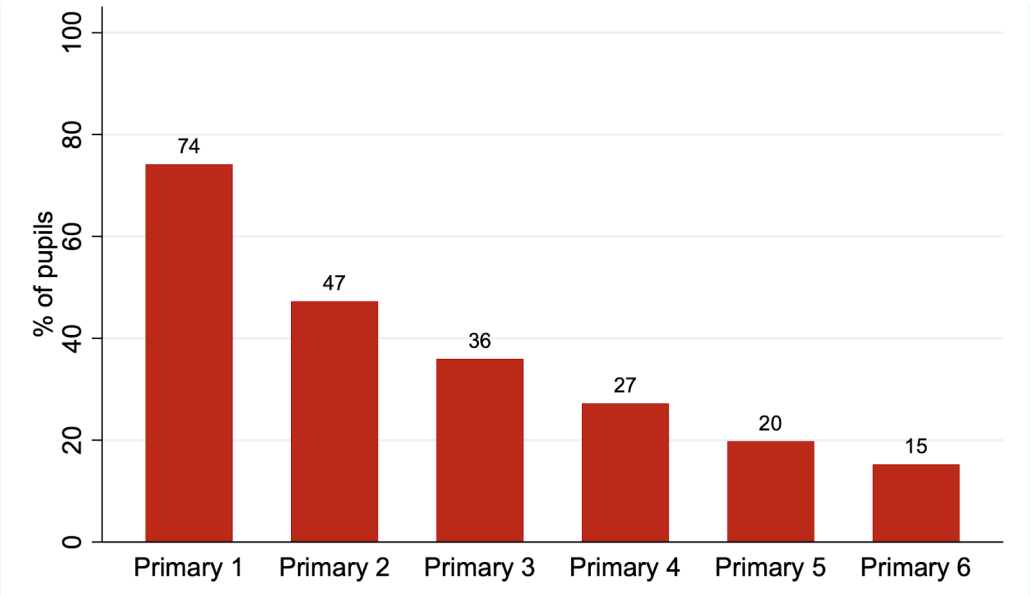
Figure 4.1 Average Reading Fluency Levels (Class-appropriate Passage)
In Kwara State before KwaraLEARN, end of Term 2



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 4.2). 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 3 for information regarding the importance of acquiring foundational skills).

Figure 4.2 Share of Pupils Reading Zero Words (Class-level Passage)
In Kwara State before KwaraLEARN, end of Term 2




I will do anything to protect my
Cause I love

Box 3. The Value of Universal, Early, Conceptual, and Procedural Mastery of Foundational Skills

Over the last few decades, educational enrolment in 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 Group, 2017) — 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 (United Nations Children's Fund, 2022).

Foundational skills are necessary to effectively advance learning, comprehension, and problem solving skills in their future academic careers and personal lives. Lacking foundational skills in the early class 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 ethnic group, or whether the child is in school. It is 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-

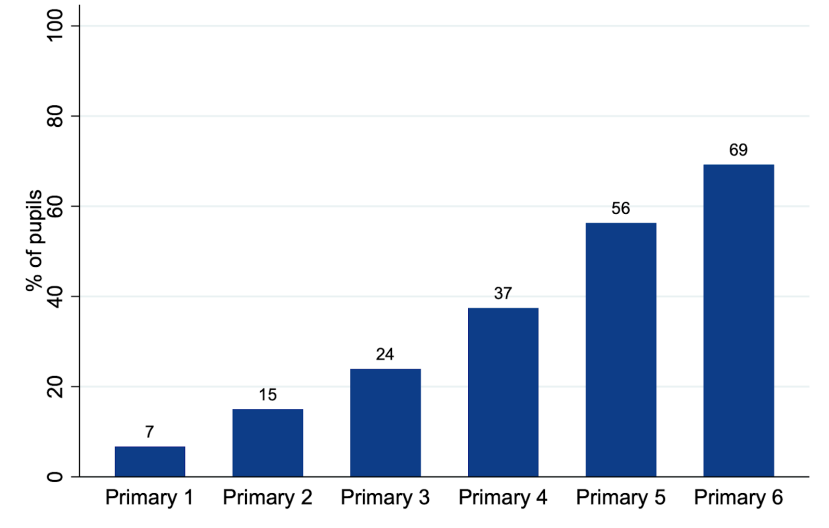
Segura & Mbiti, 2022). In this sense, realigning curricular expectations for teachers such that they would focus more heavily on foundational skills led to significant learning gains in the earlier grades, and will allow these pupils to be better prepared to learn new subjects later on.

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 sub-skills

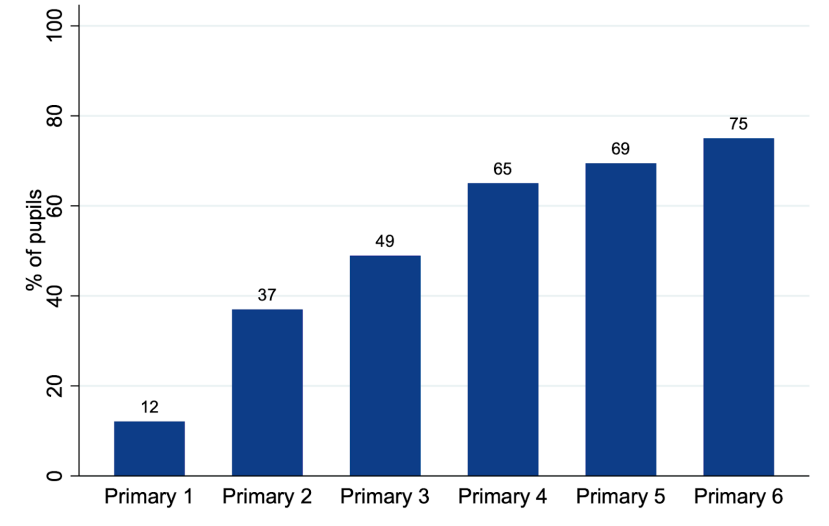
Similarly to literacy, pupils displayed low achievement levels in numeracy. When examining specific sub-skills, pupils' learning outcomes were extremely weak compared to NERDC standards for each class. For example, before the start of the KwaraLEARN programme, fewer than 4 in 10 pupils in a typical Primary 4 classroom could solve a two-digit addition problem in the form of 56+17 (Figure 4.3), even though this is a skill which should have been mastered by Primary 2, according to national standards.

Figure 4.3 Percentage of Pupils Who Can Solve Complex Addition Problems like 56+17
In Kwara State before KwaraLEARN, end of Term 2



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 4.4), even though national standards suggest that this skill should have also been mastered by Primary 2.

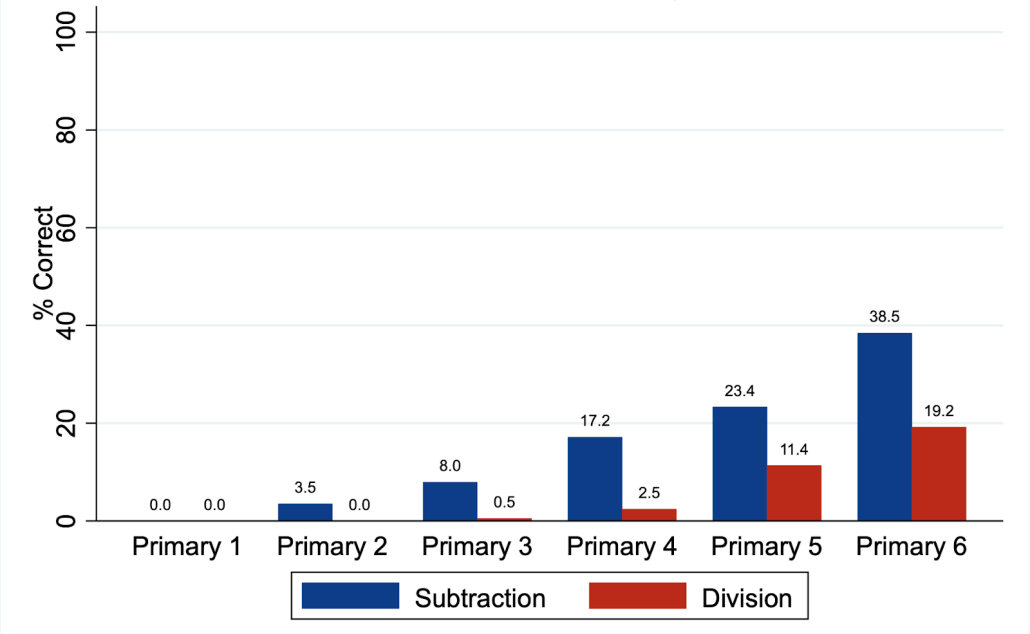
Figure 4.4 Percentage of Pupils Who Can Solve Simple Subtraction Problems like 46-21
In Kwara State before KwaraLEARN, end of Term 2



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 4.5). 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 4.5 Percentage of Pupils Who Can Perform a Word Problem by Sub-Skill Involved
In Kwara State before KwaraLEARN, end of Term 2



Overall, there were low levels of mastery of more advanced numeracy sub-skills among pupils in schools in Kwara. 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 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 4 for more about the implications of teacher absenteeism).

Implementing the KwaraLEARN programme using "Primary" vs. "Progressive" staffing models

Given the challenges in many schools due to low staffing and/or low pupil enrolment, the KwaraLEARN programme was implemented in two different modalities: the "Primary" model and the "Progressive" model. The Primary model follows a more traditional model of one-teacher-one-classroom with class-level grouping of pupils. The Progressive model, implemented in schools with fewer than one teacher per classroom, uses a "multi-grade" teaching model and incorporates ability grouping across class levels. Specifically, for the first half of the school day, pupils are grouped by ability rather than by class level, and receive instruction targeted at their shared level in order to most effectively grow their competencies in these skills. During the second half of the day, pupils from each class receive instruction on class-level concepts in accordance with the syllabus. Employing this model ensures that all pupils can receive high-quality instruction from teachers in their school, even if the school is significantly short-staffed. In this report, unless otherwise stated, results are weighted by pupil enrolment in each modality, for the first cohort of schools that joined the programme.


Level
A
Literacy
Katie Cella, Kurt Schwartz
Volume 2
I have fun
reading.
KWARA
LEARN

Box 4. 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 Group, 2017). 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 Group, 2017). 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 Group, 2017). 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.

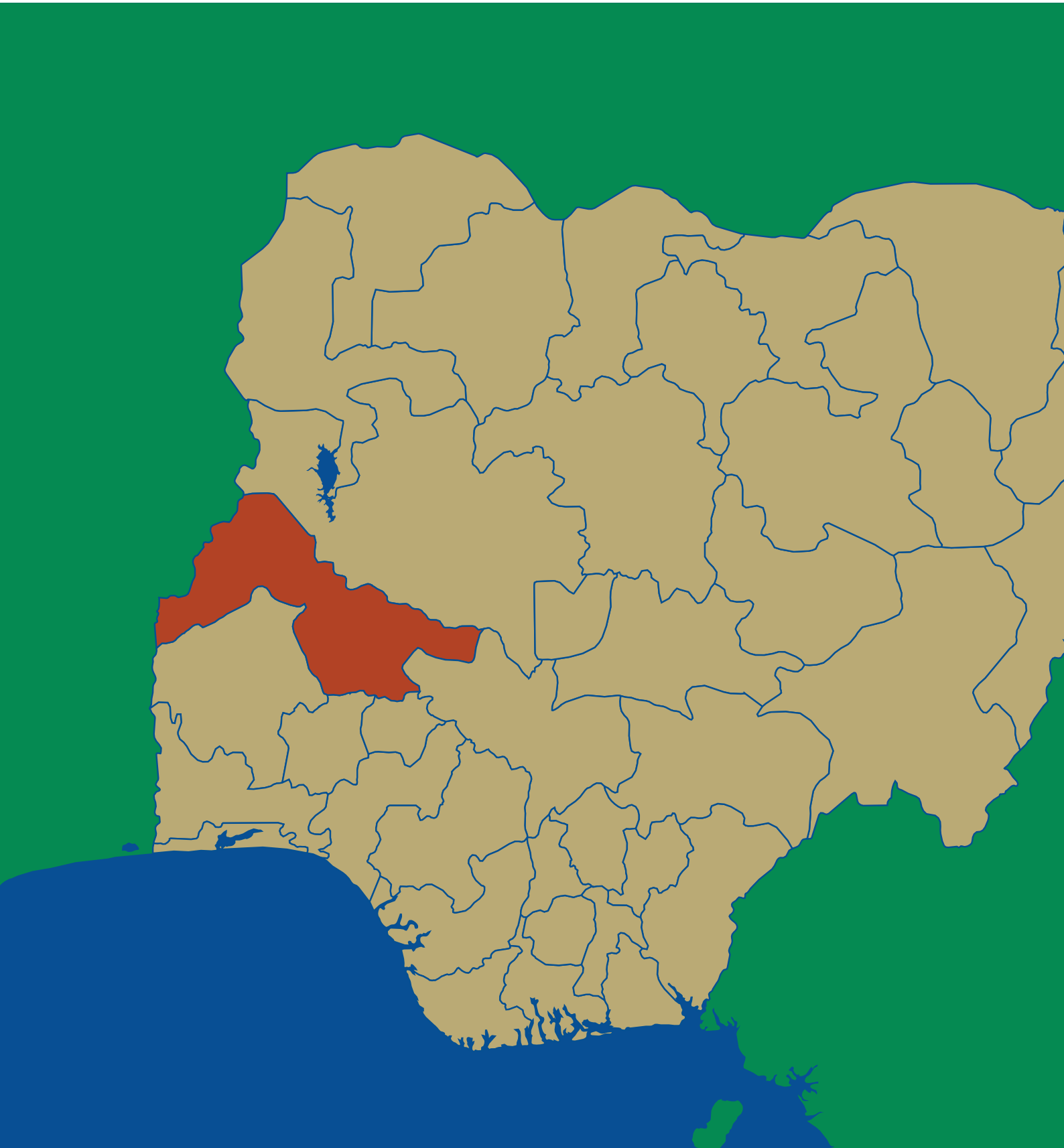
From an academic perspective, for the students in the system, the most direct consequence of teacher absenteeism is significantly reduced instructional time, which, in turn, translates into weaker learning outcomes. According to The World Bank's Service Delivery Indicators, out of the 8 LMIC that were 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 Group, 2017). 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 Group, 2017).

High rates of teacher absenteeism are symptomatic of inadequate management systems and data tracking, which fails to facilitate accountability and motivation. Investment in increased teacher attendance can lead to more 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 system that produces increasingly diminished returns.

Despite the severity of the challenges around teacher absenteeism, cost-effective, evidence-based solutions have been shown to yield high-impact results that mitigate this systemic issue. Studies done by entities like the World Bank and UNICEF suggest that funds should be directed towards improving accountability systems and to the oversight of teachers, rather than towards other applications, such as increasing staffing where shortages are not prevalent, or 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.

V. Achievements During the First 10 Weeks of the Programme



Early Positive Outcomes for Pupils and Teachers

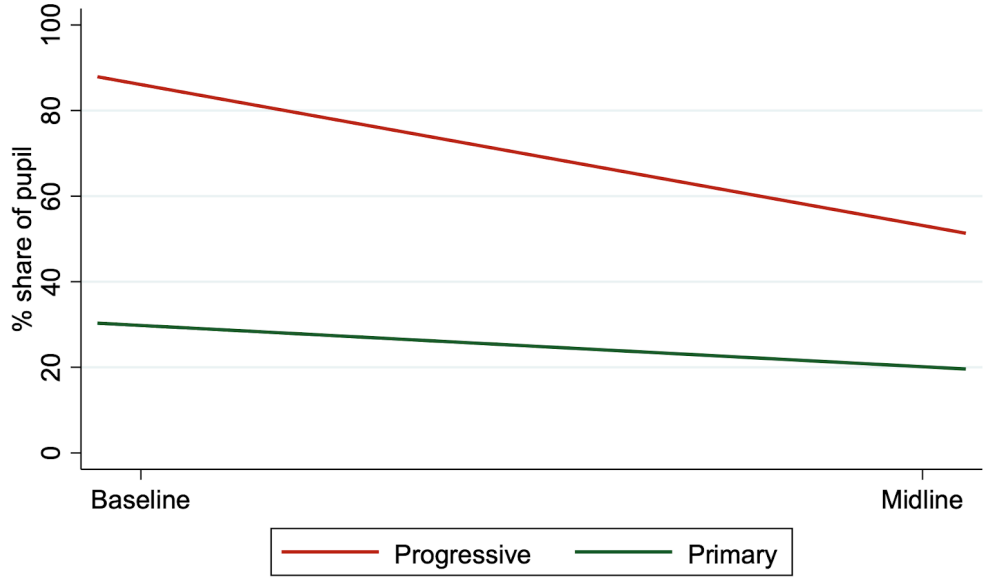
The KwaraLEARN programme, launched in May 2022, was initially implemented for 10 weeks over the course of the third term of the 2021–22 school year. After the conclusion of this term, pupils had achieved modest improvements in foundational learning outcomes. The observed gains suggested that pupils and teachers were starting to see the positive impact of the programme. However, these findings also indicated that sustained participation was necessary in order to drive larger gains in learning in the coming years of the programme. Importantly, this first term of implementation provided many key insights into the programme's initial successes, areas for improvement, and strategic considerations as the programme moved forward. In this sense, the first 10 weeks of instruction played an important role in laying the foundation for the KwaraLEARN programme to enter its first full academic year.

The first 10 instructional weeks strengthened pupils' literacy skills, leading to a decrease in the share of non-readers in a typical classroom

Within its first 10 weeks of implementation, the KwaraLEARN programme led to a decrease in the share of non-readers across all class levels, indicating that it could reach even the lowest-performing groups of pupils. Across all classes, the proportion of non-readers was effectively reduced by one-third (See Appendix B, Table 1). Importantly, KwaraLEARN schools displayed significantly higher outcomes than comparison schools. In a typical Primary 2–5 classroom, the reduction in non-readership after just 10 weeks of programme participation was equivalent to a year's worth of progress in Primary schools, and two years' worth of progress in Progressive schools (See Figures 1–4 in Appendix C for additional figures regarding expected outcomes from the first 10 weeks). In other words, there were fewer non-readers in Primary 2–5 classes in KwaraLEARN schools compared to pupils who were one to two classes ahead in non-KwaraLEARN schools.

Figure 5.1 Improvement in Non-readers in KwaraLEARN Schools at Baseline and Midline

Primary 2 passage



Additionally, after 10 weeks of instruction, the difference in the share of non-readers in Progressive and Primary schools was reduced by half. This was largely driven by the significant decline in non-readers in Progressive schools; as shown in Figure 5.1, pupils in Progressive schools were beginning to perform at a more similar level to their peers in Primary schools. In minimising the learning gaps between these schools, the programme effectively began to raise the floor in terms of reading proficiency. This has positive implications for pupils and teachers. Through elevation of the lowest performers, the median level of performance of all pupils increases, and the programme is able to reach a wider range of pupils with more appropriately targeted instruction. Therefore, the fact that the gap in non-readers was substantially reduced after 10 weeks of instruction provided early indications of the programme's ability to foster more equitable learning outcomes for all pupils.

Improvements in teaching behaviours and pupil motivation were positive early indicators of programme implementation

In the first 10 weeks of the KwaraLEARN programme, there were significant improvements in the quality and quantity of instruction that was delivered by teachers. Pupils were spending statistically significantly more time learning than they had been before the programme and, as shown in some qualitative interviews, some teachers and head teachers noted that pupils were more motivated to attend school, more attentive, and more engaged in learning. Teachers were creating supportive learning environments through positive behavioural expectations, and were employing more effective pedagogical strategies, including checking for understanding, following the lesson plan, and responding to pupils (see Appendix B, Table 3). Importantly, the average lesson completion rate increased over the 10-week period in both Primary and Progressive schools, which served as a positive indication of fidelity to programme implementation and acceptance by teachers.

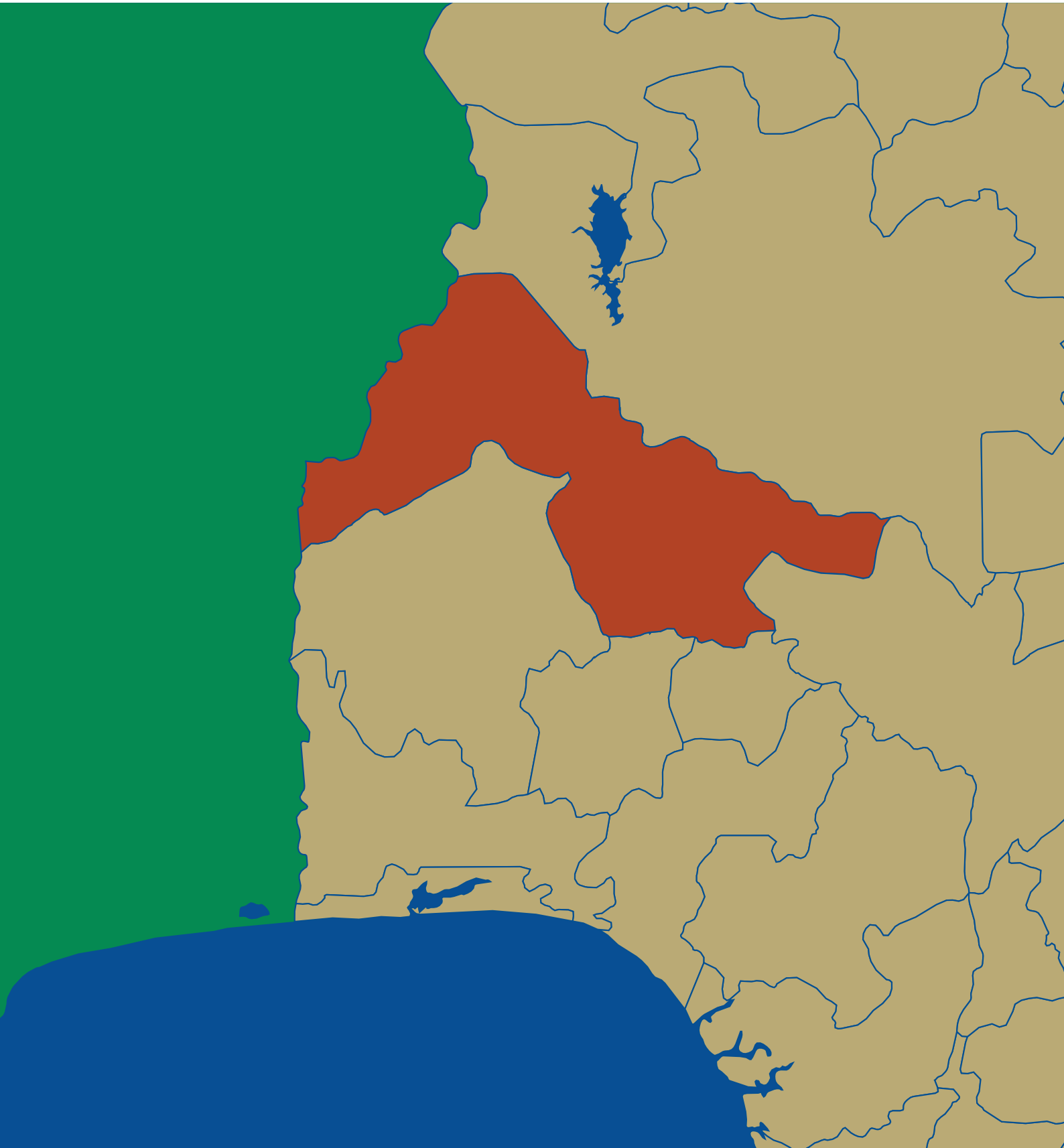
> *"I feel excited to come to school because our teacher motivate us and makes learning easy for us."*
>
> **-Pupil S, Ilorin West**

> *“Most of [the teachers] have internalised the vision of KwaraLEARN at large and it shows in the pupils’ performance.”*
>
> **-Supervisor A, Ilorin West**

Leading Indicators Signalled Greater Progress to Come

After KwaraLEARN’s first 10 instructional weeks, pupils, staff, and parents were already seeing the positive impact that KwaraLEARN had on learning outcomes. Thorough classroom observations showed that teachers in the KwaraLEARN programme were displaying stronger pedagogical skills than teachers outside of the programme, which, in turn, fostered a more supportive learning environment for pupils. As a result of enhanced pedagogy in classrooms, the programme yielded positive changes in some learning outcomes. For example, the proportion of non-readers decreased at a much faster rate than in non-KwaraLEARN schools over the same period, resulting in a one-third reduction in the number of non-readers. Such an improvement is important not only due to its benefits for the children who are no longer non-readers, but also because it reduces the disparities in reading levels among children in the same classroom, allowing for more efficient and better-targeted instruction. Ultimately, the progress seen in the first 10 weeks of the programme was suggestive of even larger learning gains to come in future terms given prolonged, consistent programme participation. The next section of this report explores whether, with more time and iteration, KwaraLEARN pupils experienced more meaningful learning gains. As such, the remainder of the report details results over the full 43-week period, allowing for a deeper, more comprehensive analysis of the impact of the KwaraLEARN programme thus far.

VI. Achievements After 43 Weeks of Programme Implementation



Major Improvements in KwaraLEARN Schools After 43 Weeks of Implementation

At the conclusion of the 2022–23 school year, after 43 weeks of instruction for the first cohort of schools that joined the KwaraLEARN programme, pupils have demonstrated remarkable gains in learning. In addition to the significant advancements in foundational learning outcomes among pupils, teacher attendance and rates of lesson completion greatly improved. Importantly, the KwaraLEARN programme is strengthening pupils' standing in the competitive global skills market, bringing them progressively closer to reaching class-level benchmarks. The ongoing success of the programme emphasises KwaraLEARN's ability to improve the return on education investment in Kwara State through continuous support for teachers and pupils, high-quality instructional materials, and the programme's transformative approach to learning.

> *"[The programme] is impressive and pupils learn in a better way and teacher and pupil are punctual to school now."*
>
> **-Head Teacher B, Offa**

Large Gains in Foundational Literacy and Numeracy Skills

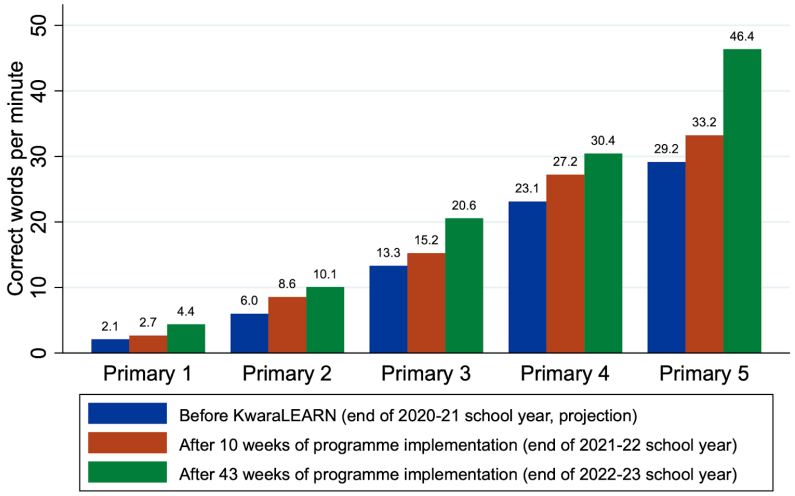
Average reading fluency rates have increased across all classes

After 43 weeks of programme implementation, pupils have made significant progress in the rate at which they can read a Primary 2-level passage with accuracy. On average, pupils in a typical Primary 1–5 classroom are reading 8 more cwpm at the end of 43 weeks of programme implementation than they were prior to the start of the programme, improving their reading fluency by 50% (see Appendix B, Table 4 for a more comprehensive look at the changes in learning outcomes after 43 weeks of programme implementation).[2] **Pupils in a typical Primary 5 classroom experienced the largest growth in reading fluency, with an average improvement of 17 cwpm after 43 weeks** (Figure 6.1). These effects extend into lower classes as well – Primary 1 pupils who joined the KwaraLEARN programme at the start of the 2022–23 school year are now reading at twice the rate of their peers in this class prior to the programme.

[2] At the end of the 2022-23 school year, 23% of P2-P6 pupils enrolled in the first cohort of KwaraLEARN schools had not participated in the programme during its first 10 weeks of implementation. Therefore, these new pupils likely received a lower dosage of instruction compared to those in the same class who joined the programme in Term 3 of the 2021-22 school year, potentially underestimating the results displayed after 43 weeks of implementation compared to those observed after 10 weeks of implementation.

Figure 6.1[3] KwaraLEARN: Reading Fluency Average Level

Primary 2 passage



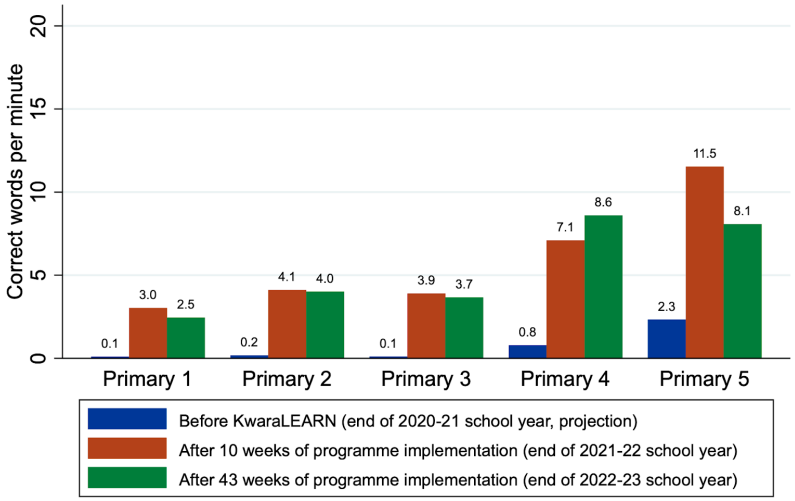
Among the fluency gains observed across all KwaraLEARN schools, pupils in Primary-model schools significantly improved their average reading fluency levels; in these schools, pupils in a typical Primary 1–5 classroom now read an average of 10 cwpm (0.37 SD) more fluently than before the programme. Notably, pupils in a typical Primary 5 classroom in Primary-model schools can now read an average of 60 cwpm, improving their fluency by more than 21 cwpm in 43 weeks. **This effect size (0.61 SD) is greater than that observed in 96% of all studied education interventions in low- and middle-income countries**, which demonstrates the large gains that the KwaraLEARN programme has fostered among its schools thus far.

The improvements in reading fluency were also sizable in Progressive schools. On average, pupils in these schools improved their fluency by 5 additional cwpm — more than a sixfold increase from their average fluency level before the programme. Impressively, pupils in a typical Primary 1–3 classroom in these schools now read more fluently than their peers several classes ahead could prior to the start of the programme; Primary 1 pupils in Progressive schools are reading, on average, more correct words per minute of a Primary 2-level passage than Primary 5 pupils were before the programme (Figure 6.2).

[3] The baseline data were collected from a different point in the academic year than the subsequent rounds of data collection. To avoid overstating the effects of the programme, and to further enhance the comparability of the results, the results from the baseline round of data collection were projected back to the end of the 2020-21 school year, which serves as a more suitable metric for longitudinal comparisons. To make the projection, we first estimated the difference in pupils' scores over one term by dividing the average difference in scores by grade, by three, to account for the three terms of the school year. Additionally, we use the baseline data collected at the start of Term 3 of the 2021-22 school year as an estimation of pupil performance at the start of Term 3 in the 2020-21 school year, with the assumption that pupils' performance would have followed a similar trajectory, given the absence of the programme. Finally, we add the termly growth to the estimated starting point of Term 3 in 2020-21 to get the projected data for the end of Term 3 in 2020-21.

Figure 6.2 KwaraLEARN Progressive: Reading Fluency Average Level

Primary 2 passage



The KwaraLEARN programme has led to a substantial decrease in the proportion of non-readers in a typical classroom

The number of non-readers in KwaraLEARN schools significantly declined across all classes, with the largest effects occurring in lower classes. Prior to the implementation of the programme, approximately 95% of pupils in a typical Primary 1 classroom in Progressive-model schools, and 58% in Primary-model schools, could not read a single word from a Primary 2-level passage after nearly two terms of schooling (Figures 6.3 & 6.4). **After 43 weeks of programme implementation, the share of non-readers in a typical Primary 1 classroom has decreased by approximately 43 percentage points in Progressive schools, and by more than 21 percentage points in Primary schools.** Such a sizable decrease in non-readers in Primary 1 is a positive indication that pupils are becoming better equipped to master class-appropriate concepts.

Figure 6.3 KwaraLEARN Progressive: Share of Pupils Who Are Non-readers

Primary 2 passage

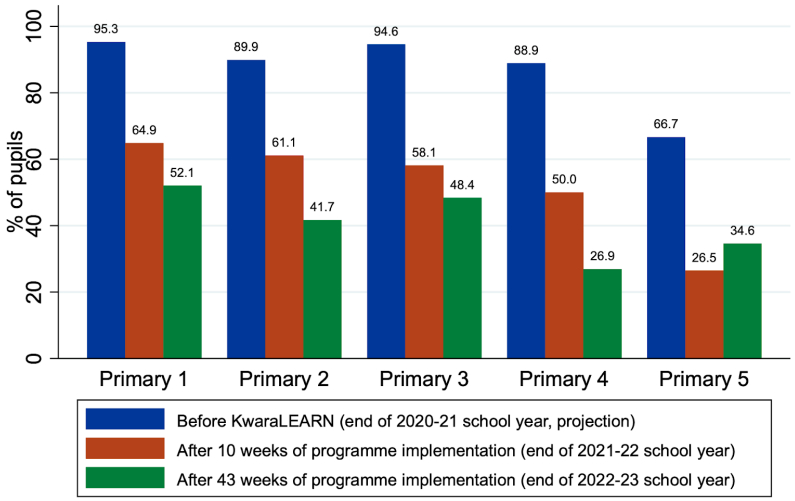
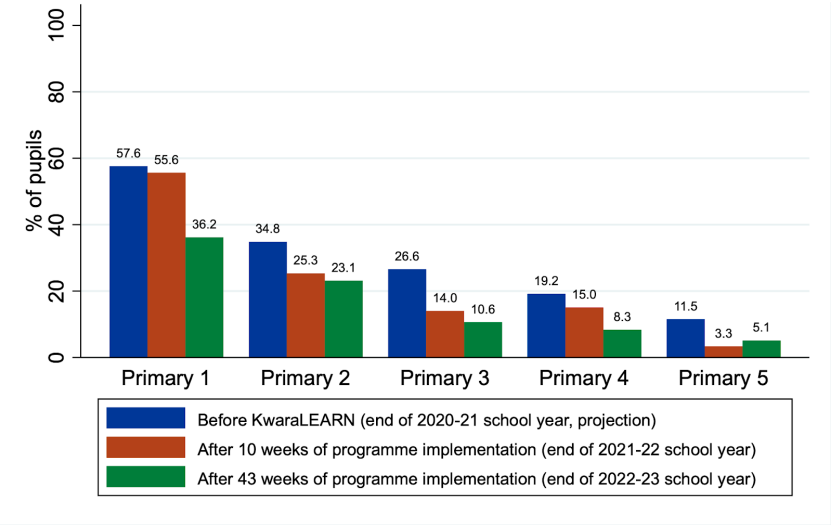


Figure 6.4 KwaraLEARN Primary: Share of Pupils Who Are Non-readers

Primary 2 passage



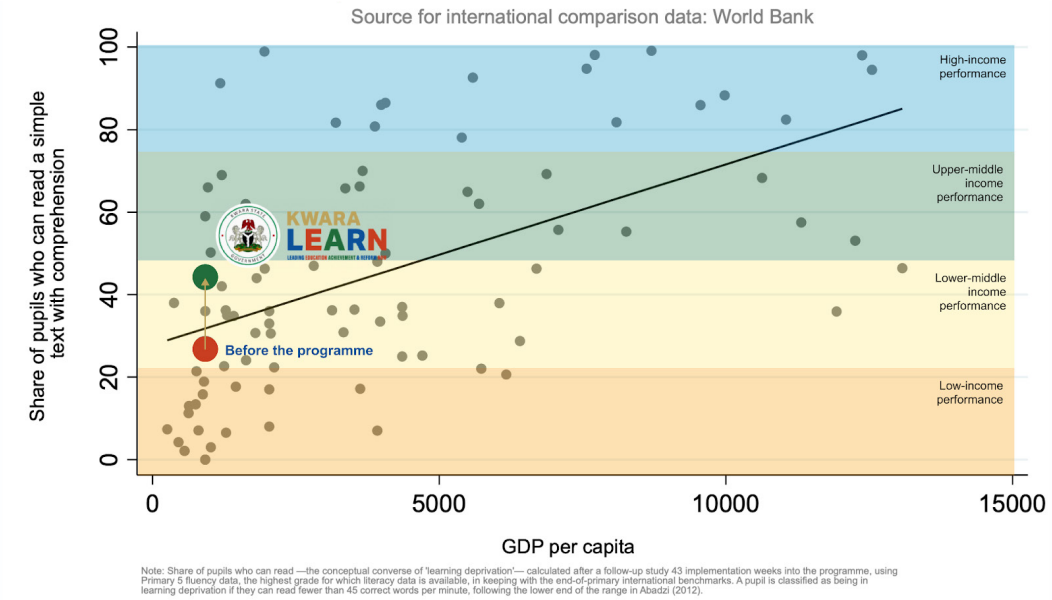
The observed progress in reducing non-readership also extends into middle-basic classes (Primary 4–6), showing that pupils were able to learn key foundational skills they missed in earlier classes. **In Progressive schools, the share of non-readers in a typical Primary 4 classroom dropped from 89% prior to the programme to 27% by the end of Year 2 — a 62 percentage-point reduction achieved after 43 weeks of programme implementation.** In Primary schools, there were similar effects; the proportion of non-readers was reduced by more than half across the average Primary 3–5 classroom, decreasing from an average of 19% to just 8% over the course of the KwaraLEARN programme. In order for the programme to positively impact learning on a system-wide scale, it must equally support all learners, including the lowest performers. In this sense, the progress made in Primary 3–5 classes indicates that KwaraLEARN is effectively positioning pupils on a promising trajectory towards achieving advanced levels of literacy proficiency, which, in turn, is expected to have a significant bearing on their performance across various core subjects.

Learning deprivation in Kwara State has significantly decreased

The learning gains in foundational literacy achieved through the KwaraLEARN programme are substantial, both in terms of absolute effects and relative to other interventions in similar contexts. Importantly, these gains also translate into meaningful and tangible effects on policy-relevant metrics, such as "learning deprivation." Learning deprivation is defined as the proportion of children who fall below a minimum proficiency level, as outlined by the Global Alliance to Monitor Learning (Azevedo, 2021). By aligning learning deprivation metrics with Sustainable Development Goal (SDG) 4.1.1.b, which measures the proportion of children unable to read a simple passage with comprehension by the end of Primary school, one can further contextualise these gains. **Using this metric, schools in the KwaraLEARN programme experienced a reduction in learning deprivation from 73% to 56% after just 43 weeks of programme implementation — effectively reducing this metric by a quarter** (Figure 6.5).

This change means that these schools' performance now approaches that of upper-middle-income countries, such as Gabon and Libya, and moves away from lower-middle-income countries like Benin or Comoros.

Figure 6.5 Reading Skills in KwaraLEARN After 43 Weeks of Programme Implementation Compared to Other Low- and Middle-Income Countries



Pupils' foundational numeracy proficiency has substantially improved

After 43 weeks of programme implementation, pupils across all classes have experienced dramatic growth in their foundational numeracy capabilities. To best illustrate these gains, the growth observed after 43 weeks can be compared to pupils' expected growth trajectory had they not participated in the programme. Before the KwaraLEARN programme was introduced, the average year-on-year growth on total ICAN scores was 9 percentage points. By the end of the 2022–23 school year, pupils demonstrated an average improvement of 15 additional percentage points beyond this expected year-on-year growth (see Appendix B, Table 4). This improvement translates to gains equivalent to an additional 1.7 years of schooling. **In other words, one year of participation in the KwaraLEARN programme has been as effective as receiving 2.7 years of public education without the programme.**

Figure 6.6 KwaraLEARN Progressive: ICAN Average Score

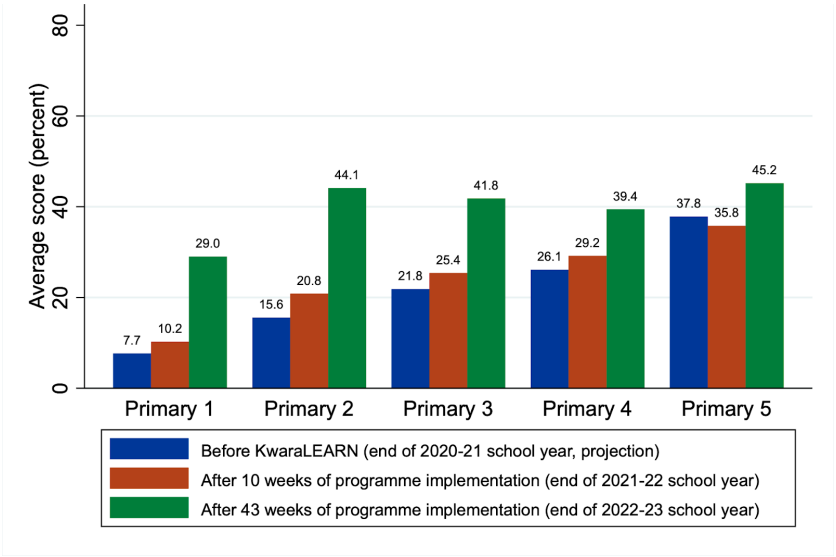
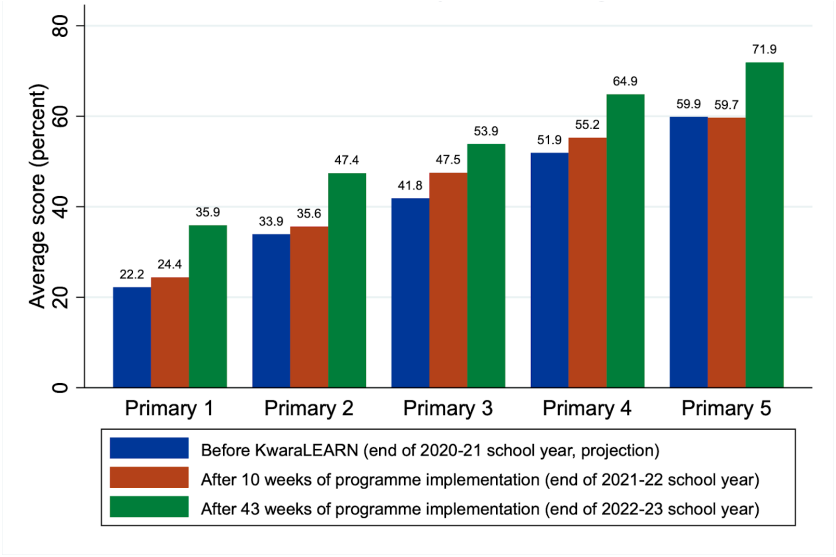


Figure 6.7 KwaraLEARN Primary: ICAN Average Score



Notably, pupils in Progressive schools demonstrated exceptional rates of improvement in foundational numeracy. On average across all classes and sub-skills, pupils experienced a fivefold improvement in their maths proficiency (See Figures 5–8 in Appendix C for performance across all classes and sub-skills). **For example, the proportion of pupils in a typical Primary 2 classroom who can solve a two-digit subtraction problem (i.e. 46–21) increased by 56 percentage points, surpassing the proportion of pupils in a typical Primary 5 class who were proficient in this sub-skill before the KwaraLEARN programme**. Similarly, in exact short division (i.e. division without a remnant, such as 9÷3), the proportion of pupils in a typical Primary 1 classroom who could perform the sub-skill improved from 1% before KwaraLEARN to 23% after 43 weeks of programme implementation. Given that global benchmarks (UNESCO, 2020) and Nigerian curricular standards consider exact short division to be a skill which should be mastered by Primary 3, nearly one-quarter of Primary 1 pupils in Progressive schools are now performing at least two classes ahead in division.

Primary 4 and 5 pupils made considerable improvements in their ability to solve word problems

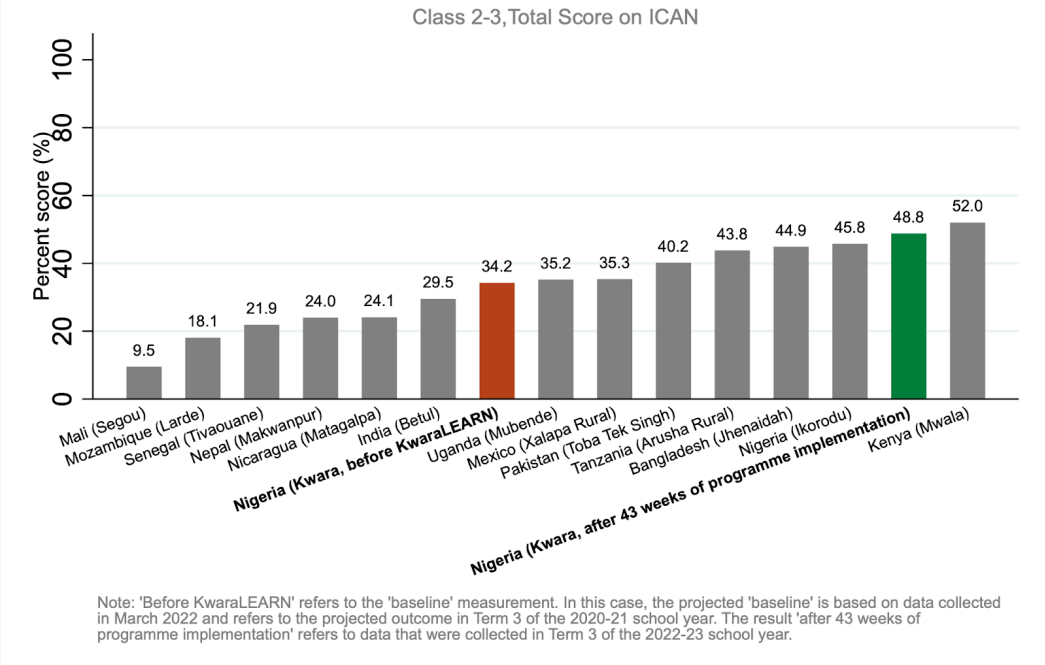
Pupils' proficiency in correctly solving maths problems in the computational sense is a leading indicator of their ability to solve problems that mirror real-life situations, which they are likely to encounter both in and out of school. Throughout the programme's instructional period, the KwaraLEARN team has continued to support pupils in correctly solving word problems that require the use of the same skills these pupils have been working to master in operational form. In Primary-model schools, middle-basic pupils saw substantial improvement in their ability to answer subtraction word problems (For example: "There were 43 children in the park. Out of these, 25 of them have gone home. How many children are in the park now?"). In a typical Primary 4–5 classroom, pupils improved their performance by 19 percentage points, from an average of 28% to 47% after 43 weeks (See Figures 9–10 in Appendix C for word problem proficiency in all classes). Pupils' ability to solve word problems not only evidences improvements in numerical proficiency, but it also supports the gains observed in fluency as well, as pupils must possess a certain level of fluency to be able to understand the contents of a word problem. Therefore, the observed improvements in word-problem solving are evidence that more time spent receiving the programme's instruction translates into compounding positive results across multiple subjects for KwaraLEARN pupils in a typical classroom.

KwaraLEARN pupils are becoming increasingly more competitive on a global scale

One advantage of utilising the ICAN for this evaluation is its extensive use as a standardised assessment across numerous countries. As such, publicly available datasets enable us to contextualise pupils' numeracy outcomes relative to regions in other LMIC. Before the KwaraLEARN programme, the numeracy proficiency of pupils in Primary 2–3 ranked in the bottom half of the distribution, compared to 13 other regions (Figure 6.8). **After 43 weeks of programme implementation, pupils in a typical Primary 2–3 classroom in KwaraLEARN schools now rank near the very top amongst these regions in terms of maths performance.** Considering that more than 1 in 5 pupils in the set of schools that these data represent joined these classes between the end of the 2021-22 school year and the end of the

2022-23 school year, these results are likely understated in terms of the programme's effect on learning had all pupils been in the programme since the start. Therefore, these results not only demonstrate the immense growth in foundational knowledge that pupils are experiencing due to their participation in the KwaraLEARN programme, but they also speak to the swiftness with which these large gains are occurring.

Figure 6.8 Numeracy Levels in Kwara State Before and After the KwaraLEARN Programme, Compared to Publicly Available ICAN Data



Note: 'Before KwaraLEARN' refers to the 'baseline' measurement. In this case, the projected 'baseline' is based on data collected in March 2022 and refers to the projected outcome in Term 3 of the 2020-21 school year. The result 'after 43 weeks of programme implementation' refers to data that were collected in Term 3 of the 2022-23 school year.

Significant Improvements in Programme Implementation, Such as Teacher Attendance and Lesson Delivery

Teachers spent more time in the classroom, delivering high-quality instruction

The ecosystem of the KwaraLEARN programme enables the tracking of certain teacher behaviours, including attendance and lesson completion. These metrics are tracked automatically through the teacher tablets, which allows for the monitoring of programme implementation in KwaraLEARN schools and classrooms. As such, these data provide insights into the degree to which teachers are adopting the programme and delivering it as intended, and are not measures of programme effect as compared to teacher behaviours in non-KwaraLEARN schools. Observed improvements in teacher attendance and lesson completion over the course of the programme thus far serve as positive indicators that the programme is continuing to gain more buy-in and support among teachers, which is further reinforced by the observed learning gains among pupils.

> *"We have seen dramatic improvement in how lessons are delivered, how pupils are actively participating in lessons and eagerness of teachers to want to teach lessons."*
>
> **-Supervisor B, Ilorin West**

Data indicate that the increased teacher accountability enabled by the KwaraLEARN ecosystem was accompanied by a marked decrease in teacher absenteeism across the system. **Since the start of the programme, the proportion of pupils without a teacher in KwaraLEARN schools due to teacher absenteeism has been cut in half,** dropping from 13% to 6% on average across KwaraLEARN schools. Ensuring that teachers are consistently on time and present in their schools and classrooms plays a vital role in driving programmatic implementation and supporting system-wide coherence across the KwaraLEARN network of schools. These factors, in turn, are crucial for facilitating learning outcomes among pupils by ensuring that they receive sufficient exposure to high-quality instruction.

In addition to being present in the classroom, teachers must also be actively engaged in teaching. The KwaraLEARN programme therefore continuously monitors the rate at which teachers deliver their lessons in entirety. In Term 3 of the 2021–22 school year, only 51% of lessons had been completed, on average, in KwaraLEARN schools. Given that the average schedule in Kwara schools includes 4.4 hours of instruction per day (22 hours per week), this amounted to approximately 11.2 hours of instruction being delivered each week. In Term 3 of the following (2022–23) school year, 71% of lessons were completed in KwaraLEARN schools, translating to roughly 15.7 hours of high-quality instruction delivered per week to the average pupil in the programme. **Therefore, the average KwaraLEARN pupil is now experiencing 40% more high-quality instruction compared to the first term of the programme.**

Figure 6.9 KwaraLEARN Progressive: Average Lesson Completion Rate

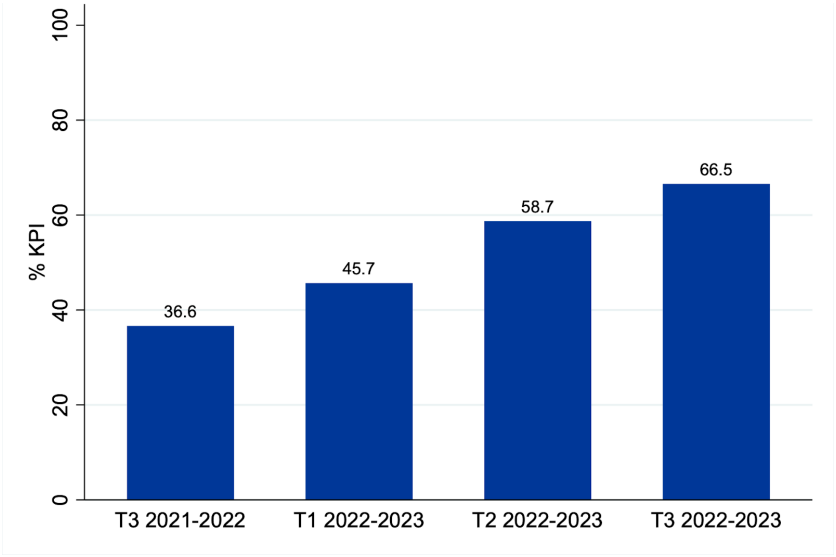
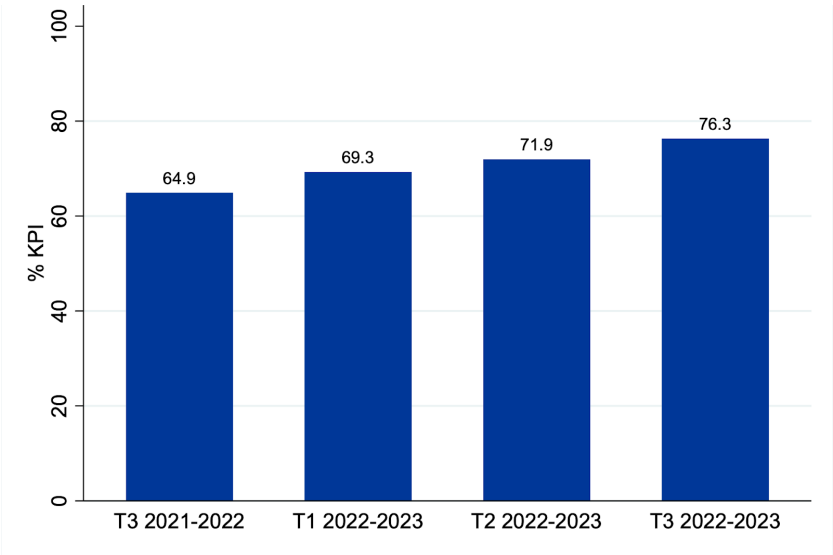


Figure 6.10 KwaraLEARN Primary: Average Lesson Completion Rate



In light of these findings, the previously discussed learning gains in foundational literacy and numeracy outcomes are unsurprising. As teachers and pupils spend more time in their classrooms, the opportunities for pupils to learn are now much higher, both in terms of quantity and quality. Additionally, the provision of teacher guides and training have streamlined the lesson planning process, enabling teachers to dedicate more attention to delivering high-quality instruction rather than to exhaustive preparation. In summary, the overall improvements in attendance, lesson delivery, and instructional quality observed over the duration of the programme thus far, combined with the stronger accountability mechanisms and quality of the support that teachers have received, continue to improve learning outcomes while also enhancing the overall return on the Kwara State Government's existing investment in the educational system.

Box 5. Strengthening the Measurement & Evaluation Capacities of Policymakers and Evaluators

As a government programme, KwaraLEARN not only delivers improved educational experiences for pupils, but also builds the data monitoring and evaluation capacity of individuals and organisations within the education system by promoting knowledge exchange, coordination, and collaboration among partners. Given the current demand for measurement and evaluation (M&E) capacity-building on the part of multiple stakeholders, the KwaraLEARN team has developed, implemented, and supported a broad range of trainings, workshops, and other professional development opportunities to encourage growth of M&E capacities in the Kwara State education sector.

KwaraLEARN reached a key milestone in its M&E capacity building efforts on January 26, 2023 by conducting its first technical training workshop aimed at building participants' knowledge of how M&E is leveraged in KwaraLEARN. The full-day, technical workshop described the importance of measuring learning constructs such as foundational literacy and numeracy, then detailed the types of data collected, the data collection process including sampling methodologies, and the rigorous statistical techniques used to analyse the data and quantify the impact of the KwaraLEARN programme.

About 40 participants from Kwara SUBEB and the MOE attended the technical training workshop, including the KwaraLEARN Desk Officer for Kwara SUBEB, the Director of Research, Planning and Statistics for Kwara SUBEB, the Director of Research, Planning, and Statistics for the MOE, the Head of the M&E Unit for MOE, the Head of the School Inspection Team for Kwara SUBEB, and the Education Secretary for the Baruten LGA. The workshop had received positive feedback from SUBEB and MOE officers, many of whom had shared their appreciation of the KwaraLEARN team for using relatable explanations and hands-on activities to facilitate conceptual understanding of the M&E process. Furthermore, both SUBEB and MOE officers have stated their interest in continuing to receive robust capacity building from the KwaraLEARN team on outcomes and methodologies for future M&E studies so that they can lead presentations on such studies to the government and better communicate these results to the general public.

Through continuous engagement with stakeholders in the Kwara State education ecosystem, KwaraLEARN and its partners actively learn from one another in order to develop better solutions for the pupils, teachers, and leaders in Kwara State.

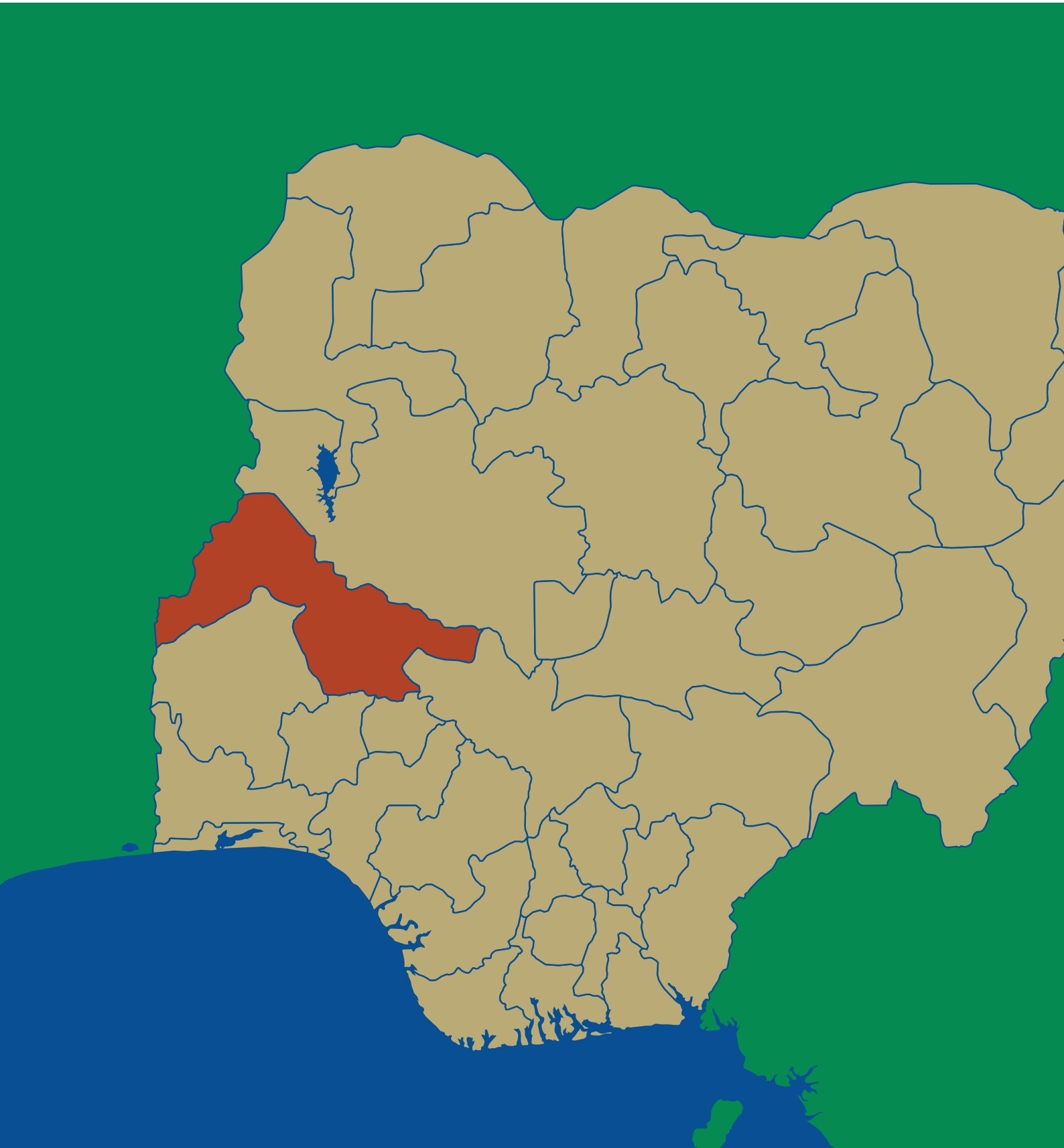
Corporal punishment is being replaced by positive classroom management strategies

The KwaraLEARN programme is also supporting the State Government in enforcing its zero-tolerance policy for corporal punishment in schools. Unfortunately, this disciplinary method has traditionally been seen as a tactic for teachers to manage their classrooms and ensure that pupils remain on task. However, the Kwara State Government recognises that this approach can have the opposite effect by demotivating pupils from participating in class, distracting them from the concepts they need to learn during the day's lesson, and in the long term, leading them to consistently underperform compared to their peers and curricular expectations. For these reasons, among others, Kwara State passed the Child's Rights Law in 2006, which bans the use of corporal punishment. To support the shift away from corporal punishment as a classroom management strategy, the KwaraLEARN programme has trained teachers and school leaders to use more healthy and positive classroom management practices, which include verbal correction, energetic refocusing, highlighting positive behaviour, and positive reinforcement. Qualitative data collected suggests that there have been positive overall changes in teachers' behaviours, with more teachers favouring alternative classroom management strategies instead of corporal punishment. Further, some pupils shared that they are now excited to come to school because of the shift in behaviours.

> *"[The teachers] have stopped giving punishment and corporal beating has been stopped."*
>
> **-Pupil A, Ilorin East**

> *"[The teachers] not using cane as part of teaching is making a huge change in the classroom management."*
>
> **-Supervisor A, Ilorin West**

VII. Looking Ahead to the 2023–24 School Year and Beyond



After 43 weeks of programme implementation, the KwaraLEARN programme has gained momentum in transforming the educational landscape within the state, effectively adapting its approach to meet the specific needs of both pupils and school staff. In turn, the quality of instruction and pupil learning outcomes continue to improve year-on-year. During the 2022–23 school year, the first full year of the KwaraLEARN programme, teachers spent more time in the classroom and used pedagogically-sound teaching methods to deliver lessons, thereby increasing the quantity and quality of instruction pupils received. As a result, pupils have made tremendous strides in foundational literacy and numeracy. **In maths, the average KwaraLEARN pupil gained an additional 1.7 years of schooling.** In English, the share of non-readers drastically declined from 30% to 17% in Primary schools, and from 87% to 41% in Progressive schools over the course of the programme thus far. **This means that across all 872 KwaraLEARN schools, an estimated 29,000 children have learned to read because of their participation in the programme.** These findings, among other improvements, demonstrate the positive impact of the continued educational investments made by the Kwara State Government.

Despite the improvements observed by the end of the 2022-23 school year, more work is required in order to sustain these positive trends — and build upon them — in the coming years of the programme. For instance, there still exist considerable gaps between Primary and Progressive schools, as well as considerable variation across class levels in the amount of improvement made. In absolute terms, learning levels are still short of national curricular benchmarks, despite large gains. Therefore, for the 2023–24 school year and beyond, the KwaraLEARN programme is working to address differences in learning levels between Primary and Progressive schools, utilise a data-driven approach for even better targeting of instructional levels, support the development of foundational skills through the instruction of content knowledge in other core subjects, and ensure consistent classroom coverage and pupil attendance.

Leveraging content knowledge in other subjects will further drive improvements in foundational skills

Although large learning gains were observed after 43 weeks of programme implementation, many KwaraLEARN pupils are still not meeting benchmarks in key foundational skills, especially in English. As of the end of the 2022–23 school year, the average KwaraLEARN pupil in a typical Primary 4 classroom can read approximately 31 words of a Primary 2-level passage within one minute, which is still below even the most lenient international standards (≥45 cwpm) to be considered a proficient reader (Abadzi, 2012). Moreover, this rate of fluency is only half the average fluency of Primary 4 pupils across 17 other LMIC (Abadzi, 2011), and less than one-quarter that of Primary 4 pupils in high-income contexts (Hasbrouck & Tindal, 2017). Given that KwaraLEARN is a holistic programme that supports learning across all subjects, successfully fostering foundational skills is essential for overall programme success given that they are essential for learning in other subjects, such as Science or Social Studies.

English lessons, which are the most important pathway to strengthening foundational English literacy skills, occupy roughly one-third of the school day. This is significantly more than most education systems, which is reflective of the fact that foundational learning is a core priority of the programme. At the same time, the need for intensive English instruction also points to the existence of persistent learning gaps in Primary school classes. Yet, as a standalone approach, this reliance solely on English courses to improve literacy is insufficient to close the significant gaps that exist between current literacy levels and class-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".

Next year, the key area where this investment will take form is in Science for lower-basic classes. Specifically, Science will adopt a new course structure, supplemented by new, high-quality, levelled textbooks. This new course structure 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 fundamental not only for syllabus mastery, but also for reading proficiency. Second, the new Science course structure 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 structure will also deploy evidence-based instructional strategies like "duet readings" and the use of rich imagery to support language and vocabulary development. In this way, KwaraLEARN will create 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.

More precise, data-driven targeting of instructional levels will support pupils across all classes

While pupils across classes have made significant progress narrowing the gap between learning levels and class-level standards, those gaps still exist for many pupils, and especially pupils in middle-basic classes. In order to create learning environments that are optimised to foster learning outcomes, instruction must continue to be delivered at the right level for pupils. The first and most important way to achieve this is to ensure that the level of English and Maths instructional materials — including teacher guides and textbooks — is precisely aligned to the median pupils' learning levels, rather than simply to the class level of the pupil, which is not necessarily an accurate predictor of where they are in their learning. For instance, Nigeria's curriculum expects pupils to master division word problems by Primary 3; yet, in actuality, only 20% of pupils in a typical Primary 5 classroom in Primary-model schools can solve this type of problem, and no Primary 5 pupils in Progressive schools can solve such problems. For the coming year, KwaraLEARN will use item-level data on English and Maths performance for every pupil across the system in order to identify the appropriate level of instruction for each class level, and to subsequently inform the instructional materials that are provided to each teacher. In this way, the programme can dynamically respond to changes in learning levels over time as well as across class levels, maximising the relevance of instruction for pupils.

In lower-basic classes, where most pupils across schools have similar learning levels (i.e. almost all pupils in Primary 1 are reading and doing Maths at a Primary 1 level), a single instructional level — informed by robust assessment data — can be provided to all teachers across the programme. But, based on insights from the current evaluation and from other, similar data collection exercises, it is clear that in middle-basic classes, within the same class, there is significant variation in learning levels across schools. For instance, the average pupil in a Primary 4–5 classroom in Ilorin South can read 45 cwpm of a Primary 2 passage, while the average pupil in a Primary 4–5 classroom in Pategi can read just 13 cwpm of the same passage. In order to meet the learning needs of pupils across differently-performing schools, KwaraLEARN will employ strategies to provide even more precise and responsive differentiated instruction across the system. Specifically, performance data will be used to ensure that each school and class across the programme receives its own customised learning programme with instructional levels that precisely match the unique learning profile of its pupils. This will ensure that classrooms in higher-achieving schools are provided with more challenging content, while classrooms in lower-achieving schools receive more foundational-aligned instruction that meets the needs of their pupils.

Sustaining high rates of pupil attendance is necessary to improve learning outcomes

The KwaraLEARN programme must also continue to ensure high levels of pupil attendance as it progresses into the 2023–24 school year and beyond. As KwaraLEARN pupils are key stakeholders in the programme, the quantity of effective education they receive is influenced not only by the consistent quality performance of school staff, but also by the extent to which they regularly engage with their own schooling (see Box 6 for more information regarding issues surrounding out-of-school children). The average rate of pupil attendance in Term 3 of the 2021–22 school year was 75% in Primary schools and 87% in Progressive schools, and the data show that the attendance rate has gradually decreased over subsequent school terms, with an average attendance rate of 69% in Primary schools and 83% in Progressive schools during the 2022–23 school year (Figures 7.1 & 7.2). This pattern could reflect actual attendance, or it could be caused by changes in the degree of completeness and representativeness of the attendance data that are entered by teachers. Nevertheless, low pupil attendance, if true, would signal an important detractor from pupil learning. Moving forward, sustaining high levels of pupil attendance will remain a priority in the ongoing implementation of the KwaraLEARN programme in order to maximise the programme's potential to enhance learning. To do this, continuous participation and buy-in from all stakeholders — including teachers, parents, and pupils — are necessary, so that pupils in Kwara State can continue to build stronger foundational skills and achieve greater learning outcomes.

Figure 7.1 KwaraLEARN Progressive: Average Pupil Attendance Rate

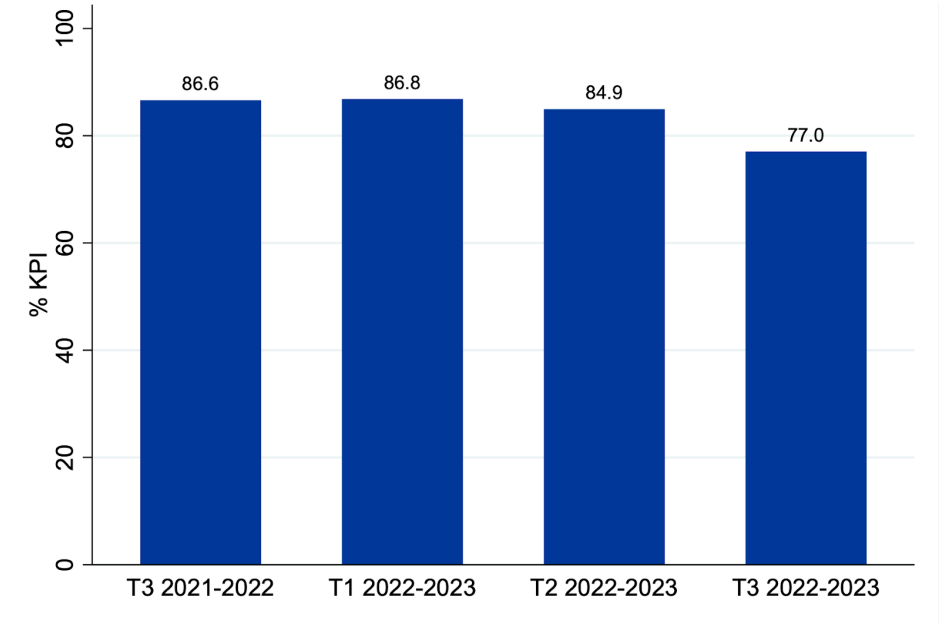
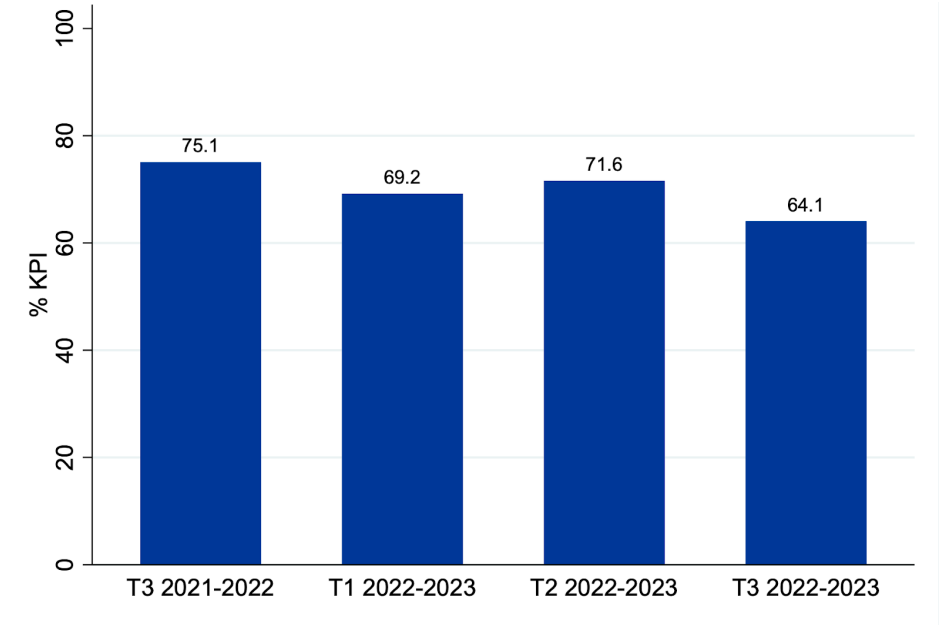


Figure 7.2 KwaraLEARN Primary: Average Pupil Attendance Rate



Box 6. The Problem of Out-of-School Children Worldwide

The world has made great strides towards increasing educational access, with currently nine out of every ten children enrolled in Primary school (UNICEF, 2022). Yet, achieving the Fourth Sustainable Development Goal (SDG4), which aims for universal enrolment by 2030, remains distant, with 244 million children still out of school worldwide (UNICEF, 2022). The situation is particularly acute in low- and middle-income countries (LMIC), where one in every six children is out of school (UNICEF, 2019). This group likely represents children living in extreme poverty and/or remote areas with poor access to schools. Therefore, enrolling them is the first step towards guaranteeing learning outcomes for some of the most marginalised children in society, bringing them a multitude of benefits such as improved health and lower poverty rates (UNICEF, 2023).

The consequences for out-of-school children are severe. Although it is common across LMIC for children who regularly attend school to still be subject to low learning outcomes, those children who are missing from school and not learning at all, and will quickly fall even further behind their peers (Bau, 2021). Moreover, the gaps between those participating in formal education and those excluded from it grow year over year, further decreasing the likelihood that out-of-school children will ever be in alignment with the performance standards set by the education system.

Traditionally, poverty and violence have been viewed as the two of the most significant barriers preventing a child's participation in education. The poorest Primary school age children are 4 times more likely to be out of school compared to their peers from the richest households (UNICEF, 2018), as they are often not able to meet costs associated with education, such as school fees, uniforms and textbooks (Global Citizen, 2019). Violence can destroy school infrastructure as well as displacing populations, making accessing school more difficult (World Bank 2022). Efforts towards eliminating poverty and violence remain crucial, and progress in this area will go a long way to increasing enrolment worldwide. There exists however a third, and often overlooked, factor keeping children out of school that must be addressed if the world is going to achieve the promise of universal enrolment: the 'learning crisis'.

The learning crisis refers to the chronically weak learning outcomes still present across global education, with a particular concentration in low- and middle-income countries. If the perceived value of education is low, parents will be less likely to enrol and send their children to school. This is an expected response, as in a context of limited resources, parents have to make difficult decisions on where to allocate their scarce resources (Rivken, 2005), and will be more likely to put these towards education if they believe this investment will indeed reap

rewards. While there are a variety of ways through which to improve parents' perception of an education system, increasing learning outcomes has been consistently cited as the most effective (Alderman, 2001), and therefore represents an effective route through which to increase enrolment worldwide. For each year of learning a child receives, their future earnings will increase (World Bank 2017), helping those newly enrolled students, who typically come from marginalised communities, to lead healthier, wealthier, more productive lives. This in turn will reduce poverty, another factor suppressing enrolment, creating a positive cycle of educational enfranchisement uplifting the world's most vulnerable learners.

Addressing the problem of out-of-school children requires tackling its root causes. Though progress has been made in the global fight against poverty and violence, these are incredibly complex issues, and remain difficult to solve. Addressing low learning outcomes on the other hand, through smart investments in educational quality (GEEAP, 2023), represents an achievable step that visionary governments can take towards increasing enrolment in education, and make progress towards solving the problem of out-of-school children worldwide.

Ensuring consistent teacher coverage will be crucial to sustain learning gains

Schools must also ensure adequate teacher coverage to support pupil learning and development. By the end of the 2022–23 school year, KwaraLEARN teachers were attending school more often and delivering more lessons to completion compared to the start of the programme. As previously discussed, the rate of teacher absenteeism was reduced by half in 43 weeks, dropping from 13% to 6% on average. This reduction was accompanied by a significant increase in lesson completion across all schools; notably, the rate of lesson completion in Progressive schools improved by an average of 30 percentage points. These improvements serve as a strong indication of the continued implementation and acceptance of the programme among teachers and school leaders, which further supports the programme's ability to drive learning gains, given its proper implementation.

Ensuring that teachers are in classrooms and delivering lessons as intended is an important factor in fostering strong learning outcomes. However, such efforts would be greatly undermined if a school is understaffed. 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 more hiring is by far the most impactful policy alternative in the medium-term, there are other policy actions that the Government of Kwara can take in the short-term to improve the utilisation of existing human resources in the system. For example, the Kwara State Government 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. Geographical school location data, combined with staffing data, indicate that in Kwara State, there are schools with teacher surpluses in close proximity to schools with teacher shortages. Through KwaraLEARN's technical partner, analytical tools are available which can identify potential transfers of teachers from schools with teacher surpluses to nearby schools with teacher shortages. Under a certain set of analytical assumptions, thoughtful implementation of the potential transfers identified by this tool could potentially fill up multiple empty streams without increasing expenditures on teacher salaries. Therefore, KwaraLEARN will continue to strive for more complete teacher coverage across the state, and will recommend teacher transfers that will significantly enhance the Kwara State Government's return on its educational investments.

Progressive schools will continue to receive targeted support

Multi-grade 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. Multi-grade teaching assigns a single teacher to two or more classrooms. This ensures that in schools with fewer teachers than classrooms, every pupil has a teacher delivering high-quality instruction during every lesson of the day. While both Primary and Progressive pupils in KwaraLEARN demonstrated improvements in foundational learning during the 2022–23 school year, there are still significant differences between these groups in terms of pupils' learning levels. For example, the average pupil in a Primary 3 classroom in Primary-model schools can read approximately 27 cwpm of a Primary 2 passage, while the average Primary 3 pupil in Progressive-model schools can only read 4 cwpm of the same passage. Similarly, pupils in a typical Primary 5 classroom in Primary-model schools can read approximately 52 more cwpm of a Primary 2 passage than their counterparts in Progressive-model schools. Such findings indicate that pupils at Progressive schools are not progressing at the same rate, on average, as their peers in Primary-model schools in certain areas of foundational learning. This is further supported by the observed rates of lesson completion in Primary and Progressive schools; on average, 73% of lessons were completed in Primary schools during the 2022-23 school year, while 57% were completed in Progressive schools.

At the start of the KwaraLEARN programme, pupils in Progressive schools displayed significantly lower learning levels compared to those in Primary schools. Given the lower initial starting point of Progressive pupils, it is to be somewhat expected that their learning did not progress at the same rate as their peers in Primary schools. In this sense, the differences between these groups after 43 weeks may be partly attributed to the fact that Progressive pupils simply need more time and participation in the programme in order to elevate their current learning levels and begin to mirror the learning outcomes observed in Primary schools. While there are myriad other factors which may have contributed to these differences, the KwaraLEARN team is continuing to work towards reducing the achievement gap between pupils in Progressive and Primary schools by providing continued support and aptly targeted instruction.

In order to continue supporting these schools, KwaraLEARN will use 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). This ensures that schools continue to receive the right level of support (multi-grade vs single-grade) based on their unique staffing realities and in response to any recent changes to teacher arrivals and/or departures. In addition, the instructional programme at Progressive schools will continue to be 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 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 will be updated within each given grade-pair in order to ensure that no pupil repeats the same instructional programme for two consecutive years and that all pupils master the comprehensive syllabus over the course of their primary school career.

Learning from experience and setting intentions for the future

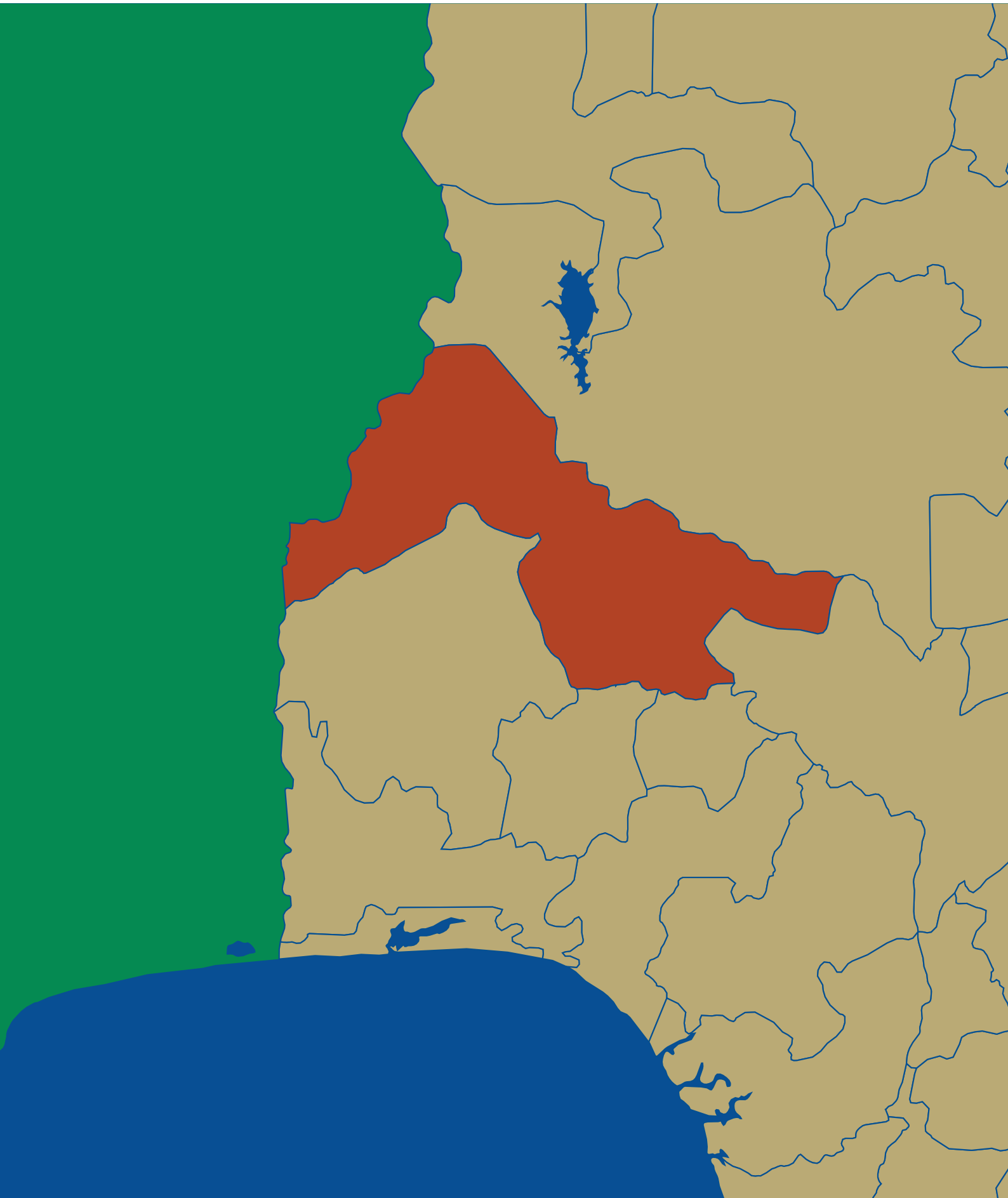
The KwaraLEARN programme is a bold initiative from the Government of Kwara. During its 43 weeks of operations, it has enabled pupils to be on faster, higher learning trajectories than what they could have expected from non-KwaraLEARN education. The large impact on foundational literacy and numeracy outcomes — 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.

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.


HAPPY VALENTINE DAY TO YOU
I LOVE YOU
TUESDAY 3 OCTOBER, 20
ENGLISH STUDIES
OBJECTIVE:- To complete grammar
Pronouns- Pronouns replace a noun
Direction:- Identify the pronouns in
If they are personal,
is a great dance
where did she go?
Indefinite:- Anybody can be a bull
Demonstrative: That is my favourit
one.
Reflexive: I can drive myself.
S = SIT TALL
the teacher with
and body
Respond to question
success

VIII. Appendix



Appendix A: Learning Assessments Used

A.1: Oral reading fluency assessments

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)

Total words read _____ Total errors _____ Total words correct _____

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)

Total words read _____ Total errors _____ Total words correct _____

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)

Total words read _____ Total errors _____ Total words correct _____

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)

Total words read _____ Total errors _____ Total words correct _____

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

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

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

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

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

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

Total words read _____ Total errors _____ Total words correct _____

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)

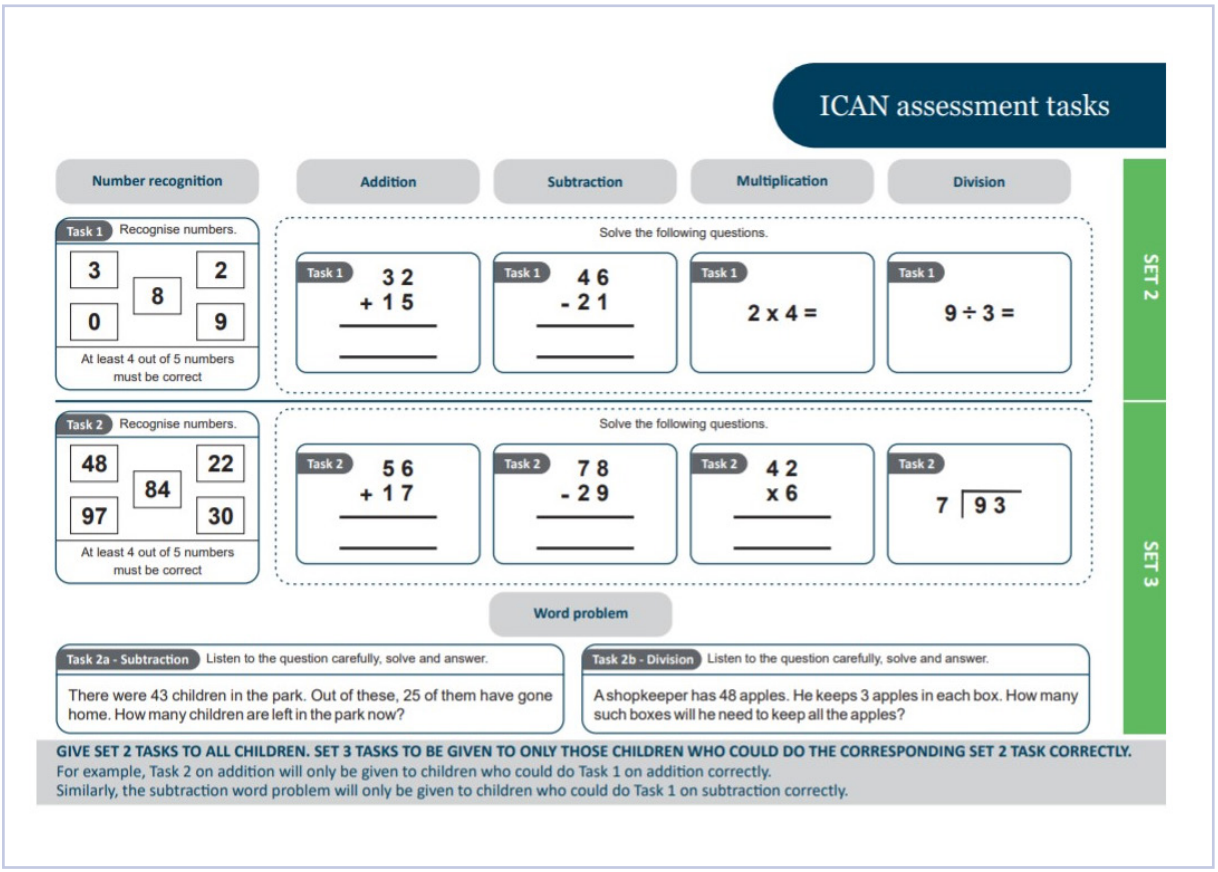
'No, sir,' replied Chike. 'Do you know why you did not do as well as (167)
usual, Chike?' 'No, sir,' Chike replied, looking down at his toes. (178)

'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)

Total words read _____ Total errors _____ Total words correct _____

A.2: Mathematical problems included in the ICAN



Appendix B: Tables

Table 1: Reading Fluency: Treatment Effect Over Expectation During the First 10 Weeks of KwaraLEARN

		Primary 1-3		Primary 4-5	
Sub-skill		**Progressive**	**Primary**	**Progressive**	**Primary**
Reading fluency (cwpm)	Primary 2 passage	1.34	1.64	4.01	-0.62
		(1.92)	(1.25)	(4.18)	(3.57)
	Class-level passage	1.57	0.28	3.27	-2.07
		(1.8)	(1.24)	(3.27)	(3.44)
Accuracy	Primary 2 passage	0.11	0.05	0.23*	0.02
		(0.09)	(0.04)	(0.11)	(0.04)
	Class-level passage	0.13	0.00	0.18**	0.02
		(0.08)	(0.04)	(0.07)	(0.04)
Non-readers	Primary 2 passage	-0.22*	-0.14**	-0.41*	-0.11
		(0.11)	(0.06)	(0.2)	(0.07)
	Class-level passage	-0.31**	-0.09	-0.41**	-0.08
		(0.14)	(0.07)	(0.18)	(0.07)

Notes: Significance levels: *p<0.10, **p<0.05, ***p<0.01
The first row for every outcome is the treatment effect in absolute units, and the second row (number in parentheses) is the treatment effect in SD units.

Table 2: Numeracy: Treatment Effect Over Expectation During the First 10 Weeks of KwaraLEARN

		Primary 1-3		Primary 4-5	
Sub-skill		Progressive	Primary	Progressive	Primary
Simple	Number recognition	0.00	0.02	0.07	0.00
		(0.09)	(0.03)	(0.08)	(0.01)
	Addition	0.04	0.06	0.16	0.08**
		(0.08)	(0.06)	(0.15)	(0.04)
	Subtraction	0.03	0.02	0.17	0.05
		(0.08)	(0.05)	(0.1)	(0.06)
	Multiplication	-0.19**	0.04	-0.24*	0.04
		(0.08)	(0.07)	(0.12)	(0.08)
	Subtraction	-0.27***	0.10	-0.06	0.01
		(0.07)	(0.06)	(0.11)	(0.09)
	Word problem involving subtraction	-0.02	0.01	0.07	-0.09
		(0.03)	(0.04)	(0.08)	(0.07)
Complex	Number recognition	-0.03	0.01	0.12	-0.04*
		(0.08)	(0.05)	(0.11)	(0.02)
	Addition	-0.12	0.00	-0.09	-0.03
		(0.08)	(0.05)	(0.13)	(0.07)
	Subtraction	-0.05	0.01	-0.16**	-0.06
		(0.04)	(0.03)	(0.07)	(0.06)
	Multiplication	-0.06	0.02	-0.28***	-0.02
		(0.05)	(0.02)	(0.09)	(0.06)
	Subtraction	0.03	0.01	-0.15	-0.02
		(0.05)	(0.02)	(0.1)	(0.05)
	Word problem involving subtraction	-0.06	0.02	-0.14	0.03
		(0.06)	(0.01)	(0.11)	(0.05)
	Foundational numeracy	-8.89*	1.12	5.49	7.15
		(4.79)	(6.75)	(10.56)	(6.35)

Notes: Significance levels: *p<0.10, **p<0.05, ***p<0.01
The first row for every outcome is the treatment effect in absolute units, and the second row (number in parentheses) is the treatment effect in SD units.

Table 3: TEACH Outcome: Treatment Effect Over Expectation in the First 10 Weeks of KwaraLEARN					
Sub-skill	All	Lower Primary	Upper Primary	Language Subjects	Math Subjects
Q1: time on learning	0.15**	0.17	0.61	0.32*	0.26**
	(0.06)	(0.11)	(0.37)	(0.19)	(0.12)
Q2: supportive learning environment	0.26**	0.07	0.62*	0.13	0.09
	(0.13)	(0.15)	(0.36)	(0.15)	(0.15)
Q3: positive behavioural expectation	0.09	0.22	0***	0.24	0.22
	(0.11)	(0.13)	(0)	(0.15)	(0.16)
Q4: lesson facilitation	0.21**	0.07	0.09	0.07	0.05
	(0.1)	(0.15)	(0.09)	(0.14)	(0.16)
Q5: checks for understanding	0.20	0.13	0.24	0.08	0.14
	(0.12)	(0.13)	(0.17)	(0.17)	(0.15)
Q6: feedback	0.24	0.04	0.20	0.18	-0.03
	(0.18)	(0.16)	(0.14)	(0.18)	(0.16)
Q7: critical thinking	0.26**	-0.11	0.24*	0.01	-0.11
	(0.13)	(0.13)	(0.13)	(0.17)	(0.2)
Q8: autonomy	0.09	0.04	0.3*	0.22	-0.17
	(0.13)	(0.12)	(0.17)	(0.14)	(0.17)
Q9: perseverance	0.28**	0.23*	0.27	0.21	0.13
	(0.14)	(0.12)	(0.21)	(0.19)	(0.14)
Q10: social and collaborative skills	0.17	0.04	0.28*	-0.06	0.10
	(0.13)	(0.15)	(0.16)	(0.18)	(0.21)
Q11: teacher actively leading	-0.03	0.32**	0.05	-0.01	0.00
	(0.1)	(0.16)	(0.17)	(0.14)	(0.03)
Q12: pupils' materials	0.02	0.21	0.29*	0.25*	-0.02
	(0.14)	(0.13)	(0.17)	(0.15)	(0.13)
Q13: motivate pupils	0.08	0.10	0.38**	0.24	-0.30
	(0.14)	(0.15)	(0.17)	(0.16)	(0.49)
Q14: accurate lesson plan	0.13	-0.02	0.02	0.37**	0.20
	(0.13)	(0.03)	(0.14)	(0.17)	(0.58)
Q15: check pupil performance	0.37**	0.06	0.08	0.17	0.20
	(0.15)	(0.11)	(0.17)	(0.16)	(0.53)
Q16: respond pupil	0.10	0.21	0.07	0.08	-0.04
	(0.13)	(0.31)	(0.18)	(0.19)	(0.56)
Q17: teacher help pupil	0.24**	0.9*	0.07	-0.05	0***
	(0.11)	(0.5)	(0.15)	(0.05)	(0)

Notes: Significance levels: *p<0.10, **p<0.05, ***p<0.01
The first row for every outcome is the treatment effect in absolute units, and the second row (number in parentheses) is the treatment effect in SD units.

Table 4: Change in Literacy and Numeracy Scores From Before the Start of the Programme to the End of the 2022-23 School Year

	Primary Schools						
Outcome	Primary 1	Primary 2	Primary 3	Primary 4	Primary 5	All Classes	
Correct words per minute (Primary 2 passage) (cwpm)	2.26	4.16	8.57	7.16	21.33	9.56	
	(0.72)	(0.48)	(0.52)	(0.24)	(0.61)	(0.37)	
Share of non-readers (Primary 2 passage) (Percentage)	-21.40	-11.71	-15.95	-10.82	-6.44	-13.97	
	(-0.46)	(-0.24)	(-0.35)	(-0.26)	(-0.18)	(-0.3)	
Correct words per minute (Class-level passage) (cwpm)	3.36	0.25	5.80	7.46	25.06	9.13	
	(0.99)	(0.03)	(0.33)	(0.24)	(0.84)	(0.38)	
Share of non-readers (Class-level passage) (Percentage)	-19.57	-12.41	-16.77	-4.72	-4.28	-12.32	
	(-0.42)	(-0.26)	(-0.38)	(-0.12)	(-0.14)	(-0.27)	
Simple Addition (Percentage)	29.71	21.09	14.08	7.27	10.63	17.30	
	(0.65)	(0.43)	(0.31)	(0.22)	(0.29)	(0.38)	
Simple Multiplication (Percentage)	27.64	20.51	17.81	14.26	16.29	20.16	
	(0.84)	(0.42)	(0.36)	(0.31)	(0.37)	(0.41)	
ICAN Total Score (Percentage)	13.71	13.49	12.00	12.94	12.01	13.43	
	(0.89)	(0.82)	(0.66)	(0.66)	(0.5)	(0.58)	
Foundational Numeracy (Percentage)	31.33	17.11	11.86	6.79	4.26	15.12	
	(0.67)	(0.39)	(0.3)	(0.25)	(0.17)	(0.36)	

Notes: The first row for every outcome is the treatment effect in absolute units, and the second row (number in parentheses) is the treatment effect in SD units.

	Progressive Schools					
	Primary 1	Primary 2	Primary 3	Primary 4	Primary 5	All Classes
	2.35	3.83	3.55	7.81	5.75	4.23
	(4.9)	(6.49)	(5.92)	()	(1.05)	(1.91)
	-43.28	-48.22	-46.20	-61.97	-32.05	-46.63
	(-3.59)	(-1.52)	(-1.67)	()	(-0.67)	(-1.62)
	2.66	3.56	3.68	6.68	6.63	4.15
	(4.36)	(5.31)	(4)	()	(1.51)	(2.26)
	-45.31	-52.98	-43.17	-58.12	-35.75	-47.39
	(-2.21)	(-2)	(-1.88)	()	(-0.75)	(-1.69)
	48.51	46.62	40.46	35.39	26.73	42.48
	(1.86)	(1.24)	(0.84)	(0.79)	(0.56)	(1.01)
	17.69	37.01	17.47	-2.19	-15.43	17.46
	(0.58)	(1.09)	(0.38)	(-0.04)	(-0.32)	(0.4)
	21.34	28.52	19.96	13.32	7.35	20.61
	(2.37)	(2.7)	(1.35)	(1.07)	(0.34)	(1.25)
	46.91	47.24	27.24	24.44	13.65	37.14
	(1.38)	(1.13)	(0.54)	(0.48)	(0.3)	(0.79)

Appendix C: Additional Figures

Figure 1 Expected vs. Actual Performance in Reading Fluency in Year 1 (P1-3)

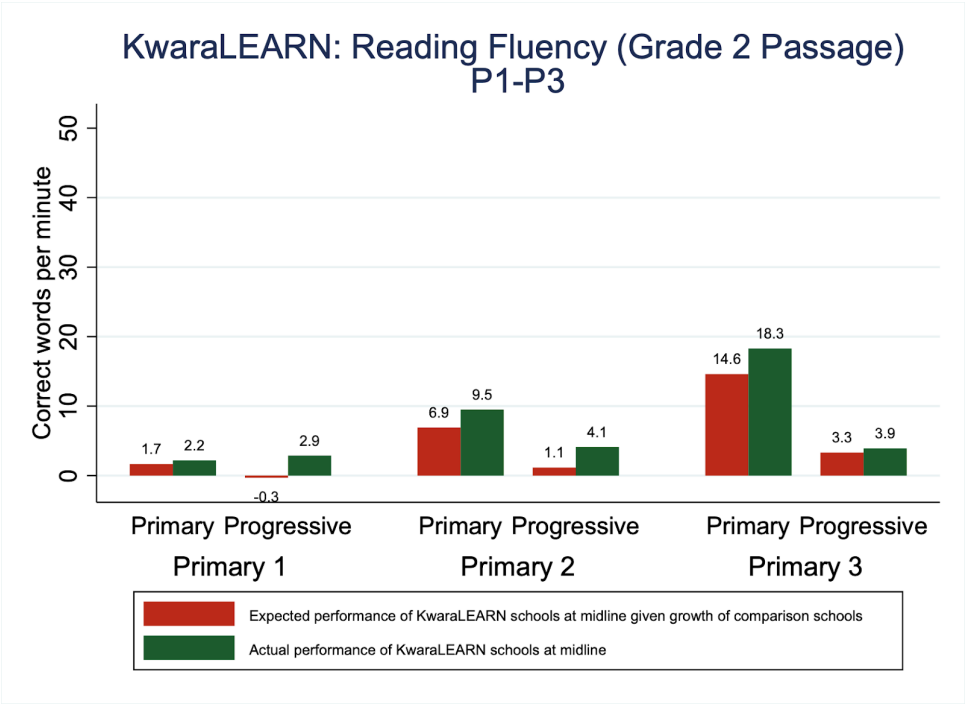


Figure 2 Expected vs. Actual Performance in Reading Fluency in Year 1 (P4-5)

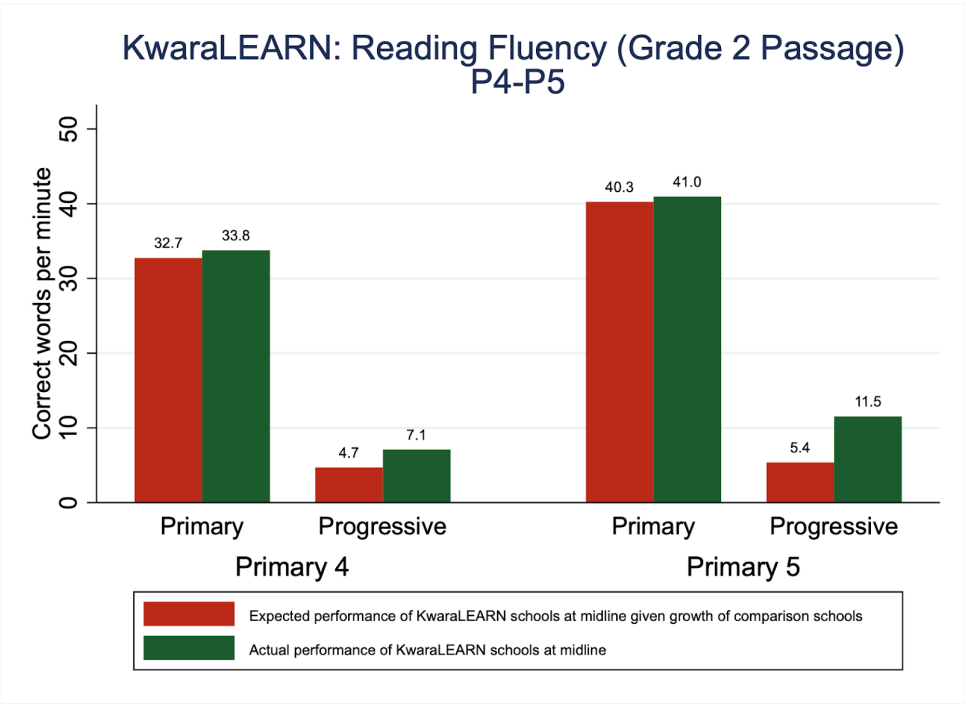


Figure 3 Expected vs. Actual Performance in Reading Proficiency in Year 1 (P1-3)

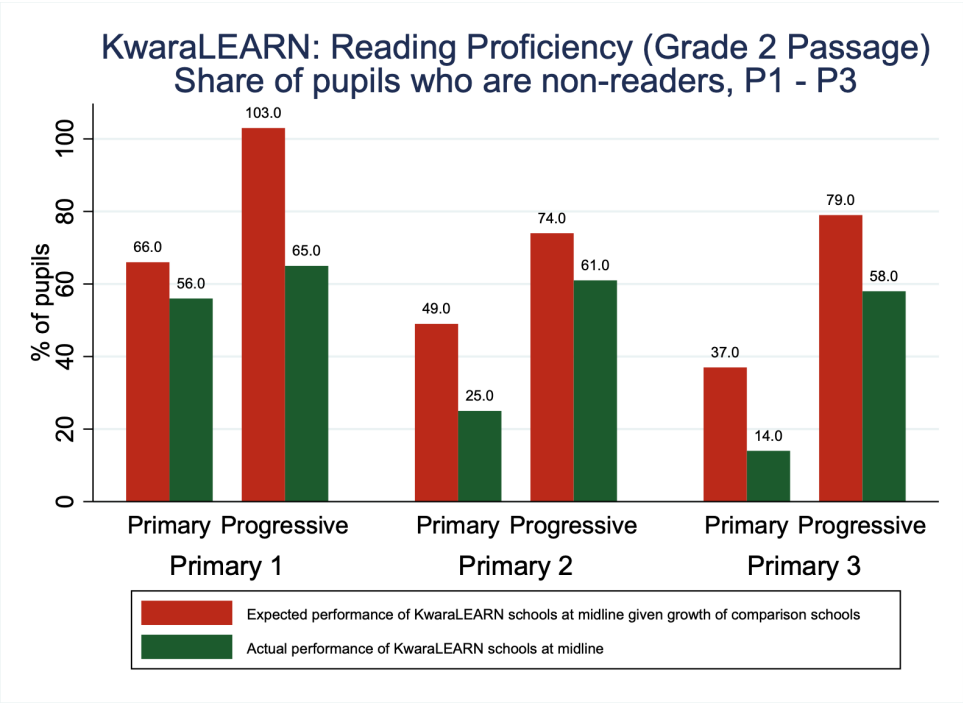


Figure 4 Expected vs. Actual Performance in Reading Proficiency in Year 1 (P4-5)

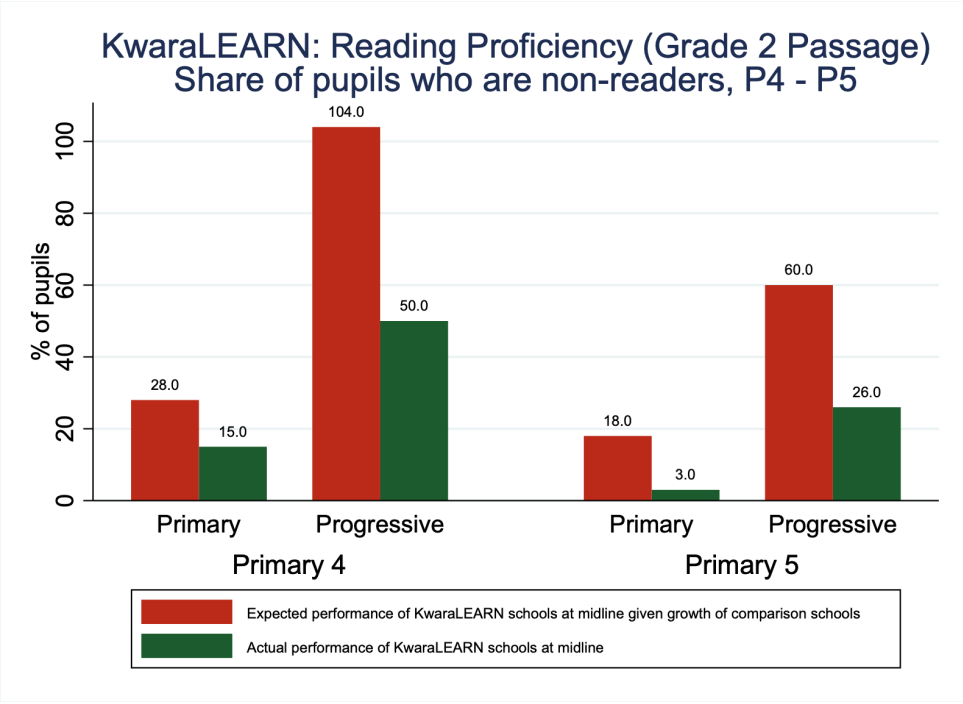


Figure 5 Performance on "Simple" ICAN Sub-skills in Year 2 (Progressive)

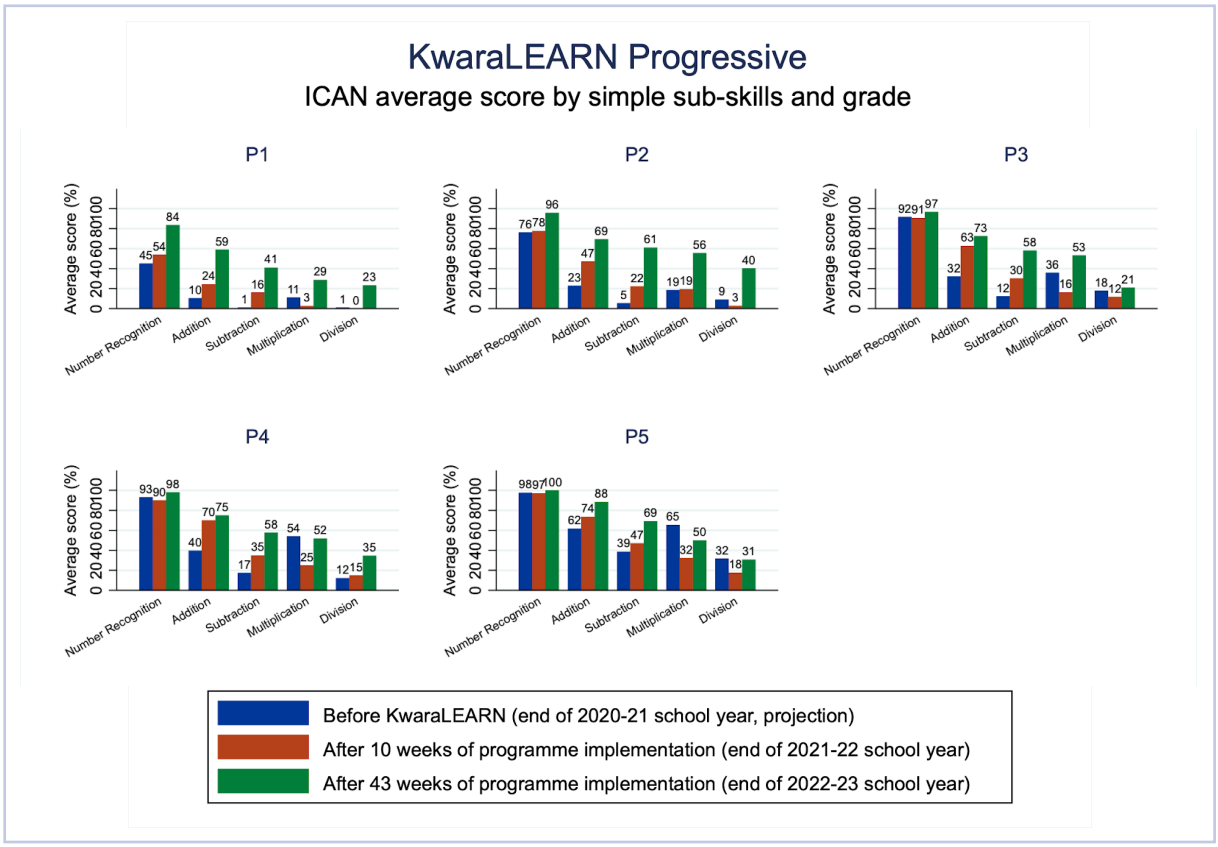


Figure 6 Performance on "Simple" ICAN Sub-skills in Year 2 (Primary)

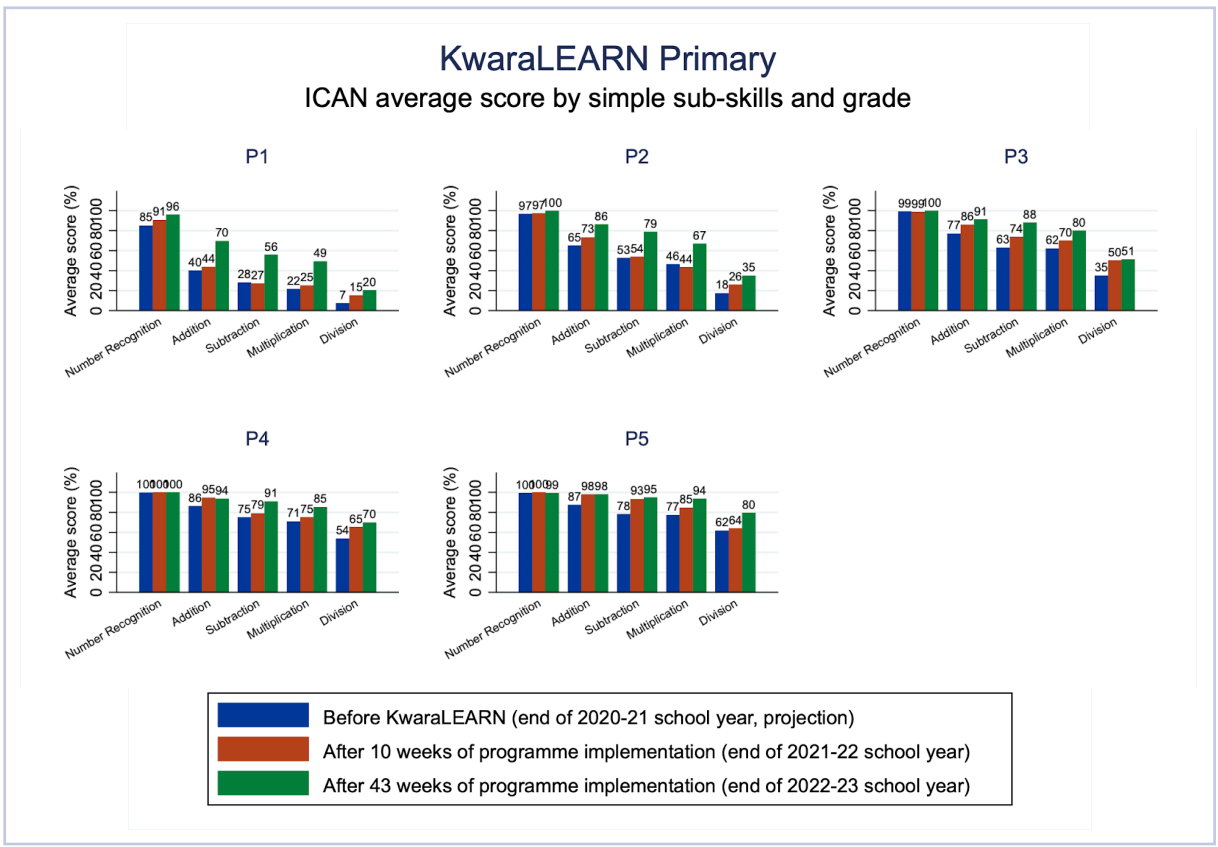


Figure 7 Performance on "Complex" ICAN Sub-skills in Year 2 (Progressive)

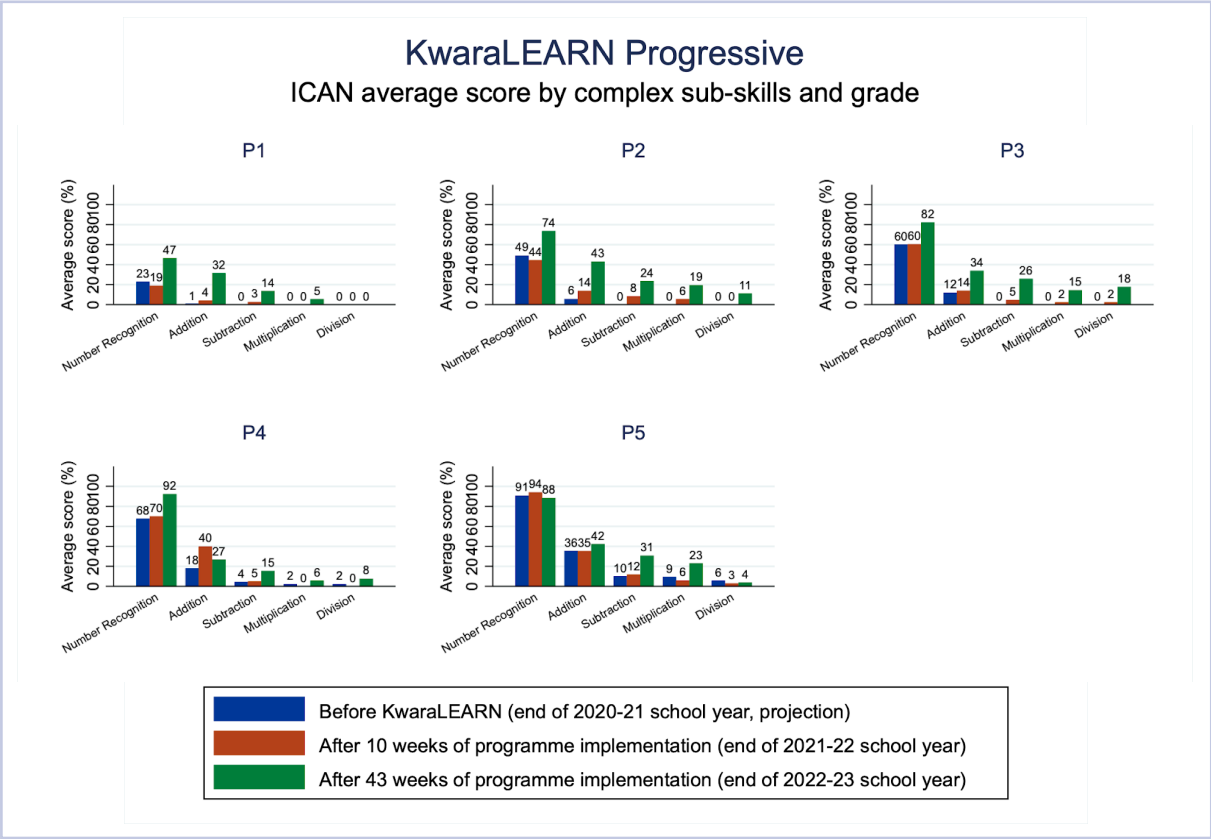


Figure 8 Performance on "Complex" ICAN Sub-skills in Year 2 (Primary)

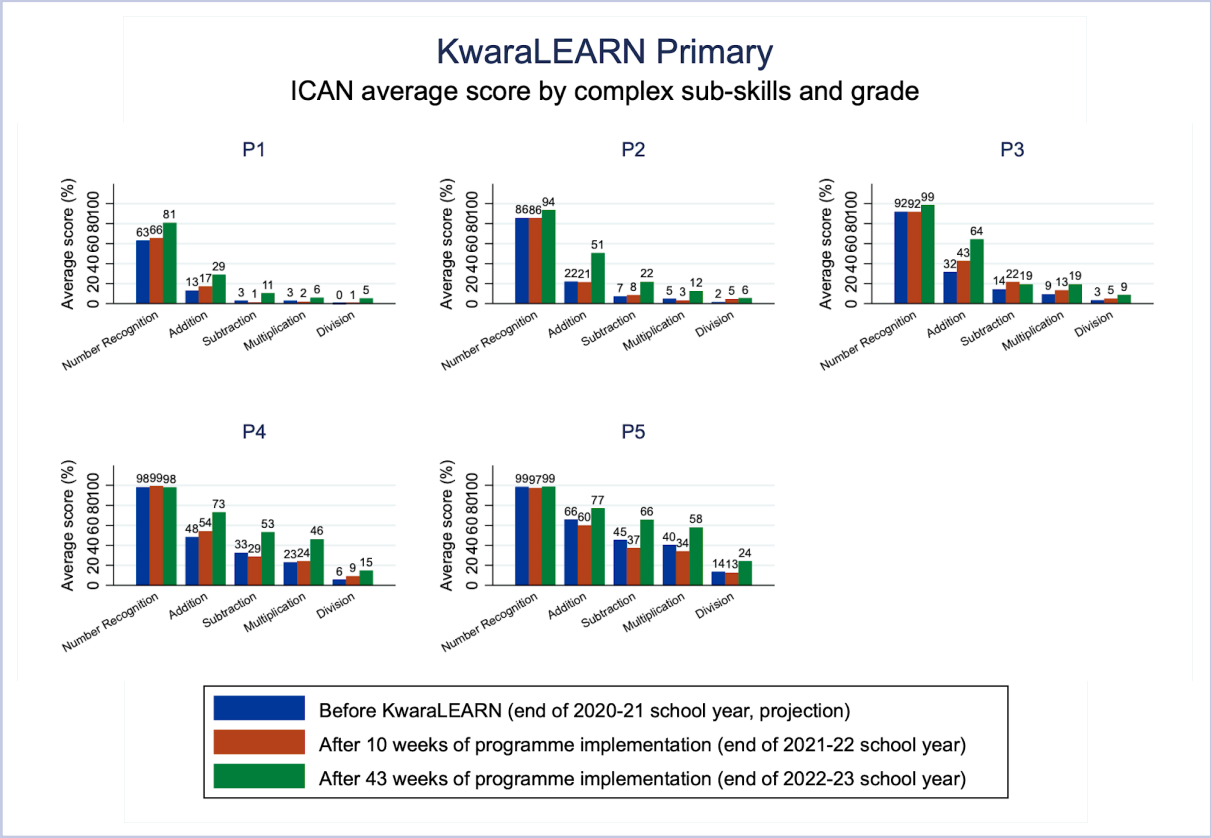


Figure 9 Performance on Word Problems in Year 2 (Progressive)

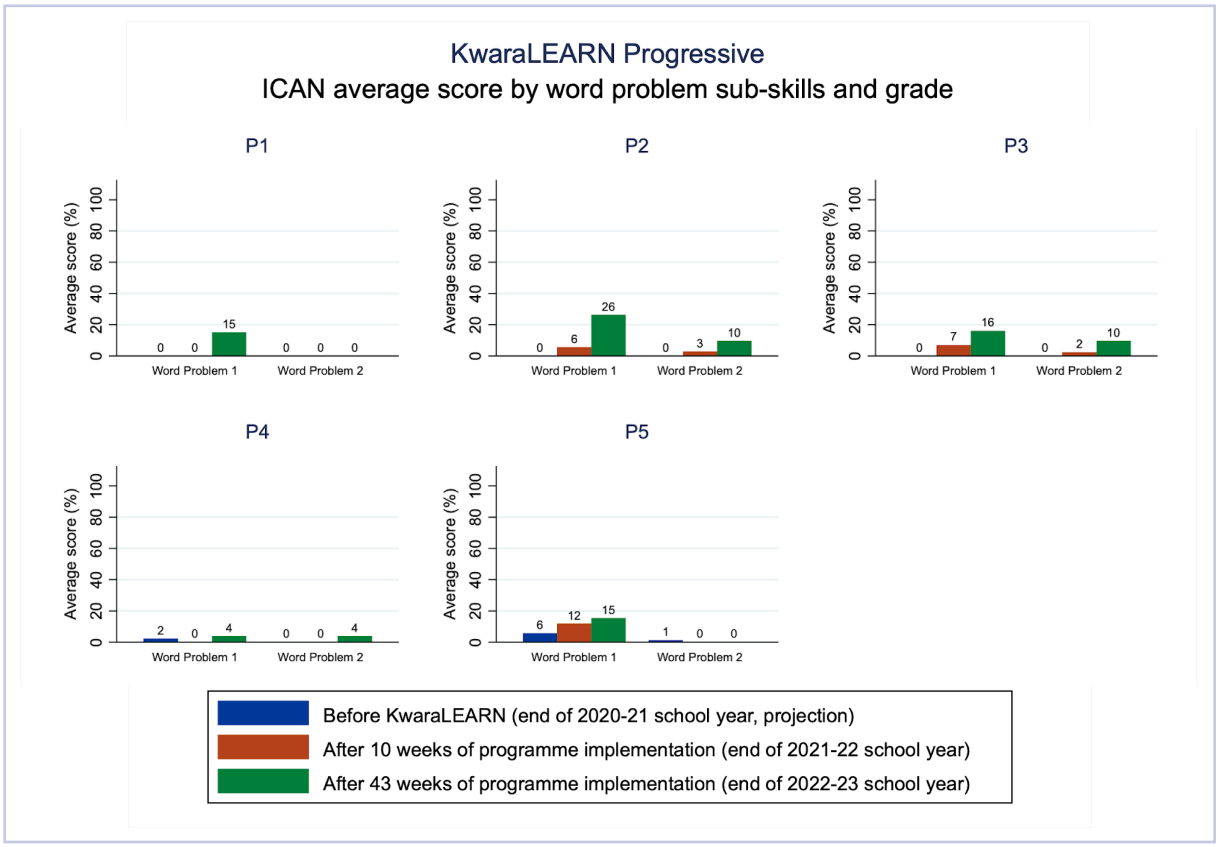
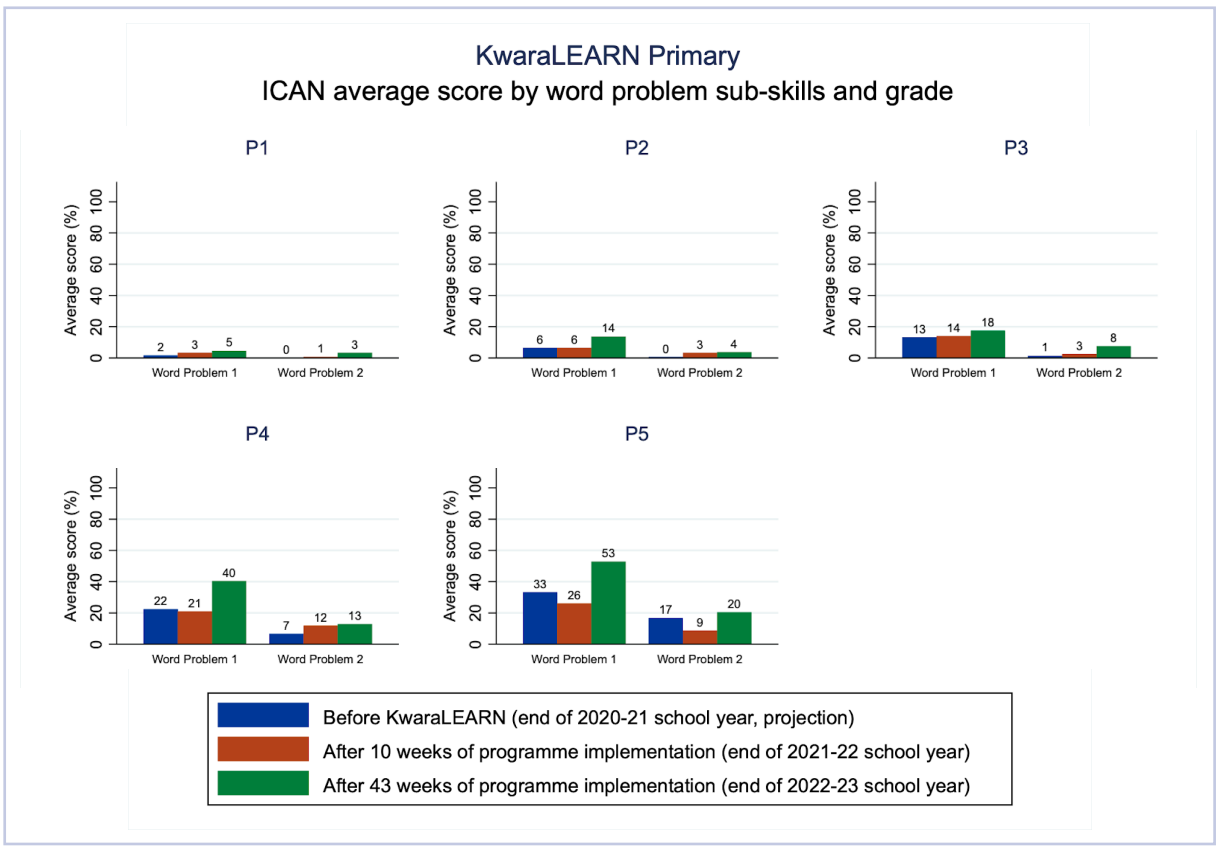


Figure 10 Performance on Word Problems in Year 2 (Primary)




Time Box
12:15
Striving
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Respect
Smart

Appendix D: List of Assessed Schools

LGA	School Name	Programme	Treatment Group
Asa	Alapa LGEA School	Primary	Non-KwaraLEARN
Asa	Ballah LGEA School	Primary	Non-KwaraLEARN
Asa	Laduba LGEA School	Primary	Non-KwaraLEARN
Asa	Ogele LGEA School	Primary	Non-KwaraLEARN
Asa	Owode Oja LGEA School,	Primary	Non-KwaraLEARN
Asa	St. Kevis LGEA School	Primary	Non-KwaraLEARN
Asa	Eleminla LGEA School	Progressive	Non-KwaraLEARN
Asa	Ogbondoroko LGEA School	Progressive	Non-KwaraLEARN
Baruten	BLGEA School, Teme	Progressive	KwaraLEARN
Baruten	Blgea School Sariyankparu	Progressive	KwaraLEARN
Baruten	BLGEA School, Alafiaru	Progressive	KwaraLEARN
Baruten	BLGEA School, Kosomone	Progressive	KwaraLEARN
Baruten	BLGEA School, Tembonu	Progressive	KwaraLEARN
Baruten	BLGWA School, Wodora	Progressive	KwaraLEARN
Baruten	LGA School Gbedebereru	Progressive	KwaraLEARN
Baruten	LGEA School Taberu Central	Progressive	KwaraLEARN
Ilorin East	LGEA Primary School, Alapo	Primary	KwaraLEARN
Ilorin East	Maya LGEA School	Primary	KwaraLEARN
Ilorin East	Olokuta LGEA School Anfeyin Oja	Primary	KwaraLEARN
Ilorin East	Saint Barnabas School 'a'	Primary	KwaraLEARN
Ilorin East	Shamsudeen Local Govt Educ Authority, Ilorin	Primary	KwaraLEARN
Ilorin East	St Johns Catholic LGEA School Adapo	Primary	KwaraLEARN
Ilorin East	LGEA School Aloko Laro Afara	Progressive	KwaraLEARN
Ilorin East	LGEA School Oke Oyi Aregun	Progressive	KwaraLEARN
Ilorin South	Alagbede LGEA Primary School, Ilorin	Primary	Non-KwaraLEARN
Ilorin South	Jalala/Gago L.G.E.A School Ilorin South	Primary	Non-KwaraLEARN
Ilorin South	LGEA Primary School Fufu	Primary	Non-KwaraLEARN
Ilorin South	Okealuko LGEA School'b', Ilorin	Primary	Non-KwaraLEARN
Ilorin South	Olunlade LGEA Primary School	Primary	Non-KwaraLEARN
Ilorin South	Saint Williams 'rcm' L.G.E.A School Ii Ilorin	Primary	Non-KwaraLEARN
Ilorin South	Ita Aisha LGEA	Progressive	Non-KwaraLEARN
Ilorin South	Oke Aluko LGEA School 'a' Ilorin	Progressive	Non-KwaraLEARN

LGA	School Name	Programme	Treatment Group
Ilorin West	Aleniboro LGEA School, Ilorin	Primary	KwaraLEARN
Ilorin West	Anifowoshe LGEA School, Ilorin West Ii	Primary	KwaraLEARN
Ilorin West	Gbemisola Lgubea School, Madi , Ilorin	Primary	KwaraLEARN
Ilorin West	Mount Carmel B LGEA School, Oloje	Primary	KwaraLEARN
Ilorin West	Nawair-Ud-Deen LGEA Primary School	Primary	KwaraLEARN
Ilorin West	Ogundele LGEA Authority School Ilorin	Primary	KwaraLEARN
Ilorin West	Tshangaya Model LGEA School Ilorin West	Primary	KwaraLEARN
Ilorin West	Wesley LGEA School	Primary	KwaraLEARN
Irepodun	Community LGEA School, Agbeola-Oro	Primary	Non-KwaraLEARN
Irepodun	Ecwa Demonstration LGEA School, Oko	Primary	Non-KwaraLEARN
Irepodun	Muslim Community LGEA School, Ajase-Ipo	Primary	Non-KwaraLEARN
Irepodun	Muslim Community LGEA School, Oro	Primary	Non-KwaraLEARN
Irepodun	St. James Anglican LGEA School, Iludun Oro	Primary	Non-KwaraLEARN
Irepodun	United Anglican LGEA School Arandun-Omido	Primary	Non-KwaraLEARN
Irepodun	Nomadic Primary School Gaa Ajengbe	Progressive	Non-KwaraLEARN
Irepodun	Nomadic Primary School Gaa Federal, Omu-Aran	Progressive	Non-KwaraLEARN
Offa	LGEA School, Kanmanu Alayin Offa	Primary	KwaraLEARN
Offa	Nawair-Ud-Deen Model LGEA School, Offa	Primary	KwaraLEARN
Offa	Offa Progressive Women Association LGEA School, Offa	Primary	KwaraLEARN
Offa	Saint Cyprian's '1' Local Government Education Authorit	Primary	KwaraLEARN
Offa	Wesley One Local Government Education Authority School Offa	Primary	KwaraLEARN
Offa	Community LGEA School Kere Aje	Progressive	KwaraLEARN
Offa	Egunkara LGEA School	Progressive	KwaraLEARN
Offa	Onilamu Community LGEA Ikotun Road	Progressive	KwaraLEARN
Pategi	LGEA Sudan Interior Mission School Patigi	Primary	Non-KwaraLEARN
Pategi	Local Government Education Authority Nurul Islam, Patigi	Primary	Non-KwaraLEARN
Pategi	LGEA Normadic School Latayi	Progressive	Non-KwaraLEARN
Pategi	LGEA Primary School Gbodonji	Progressive	Non-KwaraLEARN
Pategi	LGEA Primary School Lile	Progressive	Non-KwaraLEARN
Pategi	LGEA School Guluka	Progressive	Non-KwaraLEARN
Pategi	LGEA School Yagbagi	Progressive	Non-KwaraLEARN
Pategi	Nomadic LGEA School, Rogun	Progressive	Non-KwaraLEARN

Appendix E: 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 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 sub-skill 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 class level) read, and the second is a class-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 our organisation 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 class
- **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 insight 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: Qualitative Data Collection Protocol In KwaraLEARN — Post-Midline (October 2022)

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 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

We suggest that the collection of the data happens in an orderly and systematic manner. To do so, Demi Chen can support in the set up of a spreadsheet with the following structure (where there is one tab for teachers, one for head teachers, one for supervisors, etc.):

For Teachers			
Question	Respondent 1 Name: (if available) School: (if available) Classes taught last year: (if available)	Respondent 2 Name: (if available) School: (if available) Classes taught last year: (if available)	Respondent 3 Name: (if available) School: (if available) Classes 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 H: The Learning Crisis in Low- and Middle-Income Countries: An Overview of Causes, Contributors, and Consequences

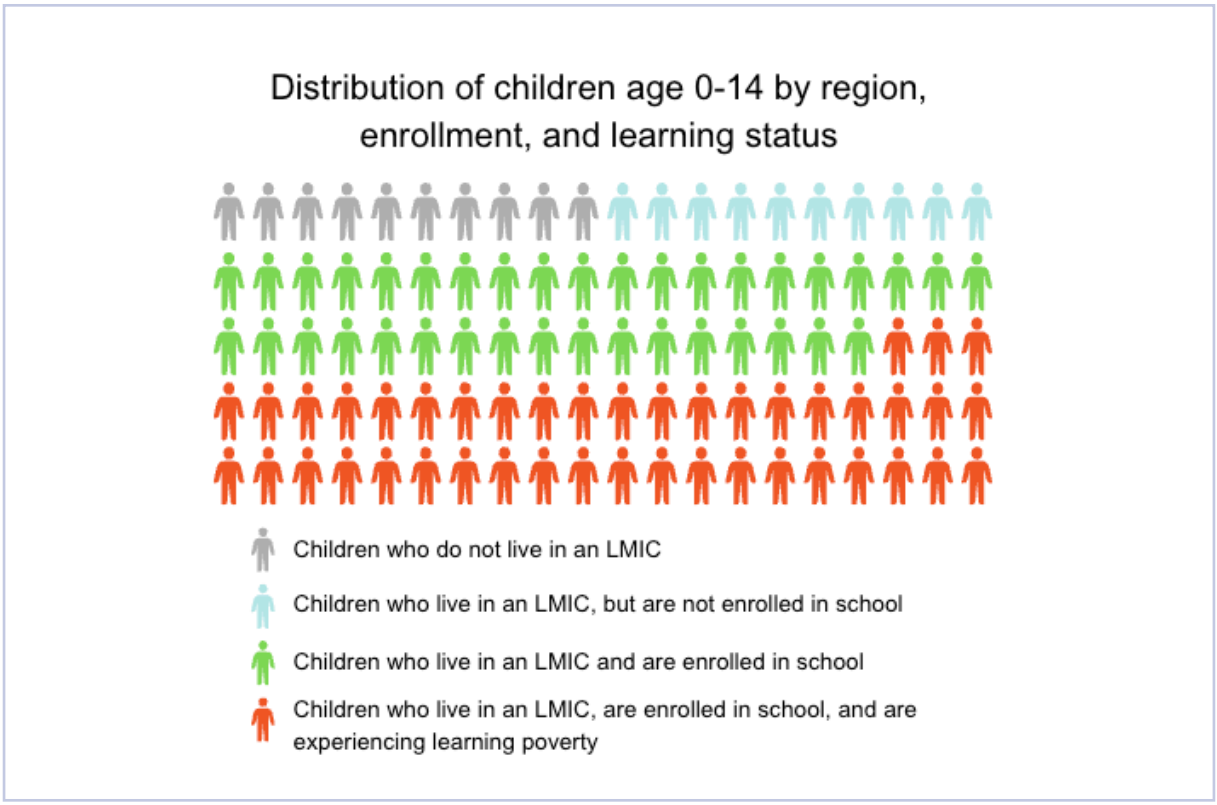
1. Enrolment and literacy rates in low- and middle-income countries have increased at record speed in recent decades

a. The growing global focus on broadening access to schools has led to significantly improved enrolment rates

Over the last 75 years, there has been a massive global shift toward the expansion of schooling infrastructure and enrolment outreach in an effort to reach a goal of universal education. As such, there are more children presently in school than at any other time in history (World Bank, 2018). Of them, 80% go through an education system in a low- to middle-income country, and in low- and middle-income countries (LMIC), in particular, enrolment rates have increased to unprecedented levels (Pritchett, 2013) as a result of groundbreaking achievements in schooling equity that deserve to be recognised. Morocco, for example, saw an impressive increase in girls' enrolment, equivalent to 54%, over the course of 11 years. By comparison, it took the United States 40 years to accomplish a similar feat. Meanwhile, in the 40-year interval between 1970 and 2010, the gross Primary enrolment rate skyrocketed from 68% in all of sub-Saharan Africa and 47% in South Asia to over 100% for both regions[4] (World Bank, 2018).

[4] A gross enrolment rate over 100% indicates that some children have enrolled in a grade who are over the official age of entry for that grade.

Remarkable gains such as these demonstrate a successful push from LMIC to match enrolment rates in high-income countries, which further demonstrates a universal emphasis on the importance of education. However, designated focus alone is not equivalent to improved rates of learning. The goal of universal education is not limited to the single criterion that all children within a given population are exposed to an educational institution; it also requires that the education provided by that institution is adept at equipping students with the necessary foundational skills for them to function as key members of a knowledge-based economy and lead fulfilling lives (Pritchett, 2013). This is what defines the current learning crisis — that an unprecedented number of children are attending school for longer periods, but are still not mastering the skills they need to excel. In this regard, nearly all education systems across LMIC have areas in which they must progress.



b. Barriers to enrolment still persist nonetheless

Unconditional access to schooling is a crucial prerequisite for supporting global policy attention on improving education quality and efficacy. However, while rapid, worldwide increases in enrolment in recent history are cause for hope, global universal enrolment has not yet been reached, and there are myriad factors inhibiting its realisation. To better conceptualise the gravity of the situation, it may be considered that 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, 2023). The advent of the COVID-19 pandemic further exacerbated this situation: almost 1.6 billion children in more than 180 countries were kept out of school due to closures (Azevedo, 2020). Even after the prolonged period of sweeping closures ended, many students never returned to school. In some nations, dropout rates soared, with as many as

400,000–500,000 children in South Africa, 2 million children in Ethiopia, and 6 million children in India permanently leaving the education system between 2020 and 2021 (UNICEF, 2023; Mighati, 2022). Among them, the students who were disproportionately affected were those who had already been struggling academically, or whose families were facing severe financial hardships during this period (Kidman et al., 2022; UNICEF, 2023).

In this sense, quantifying the share of children who are not enrolled in school not only underscores the urgency of improving enrolment outreach as a necessary condition for improving education systems in LMIC, but it also asks the question of why this problem persists. In some contexts, access is a central obstacle. Across the globe, and 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 in order to be able to reach school. Additional factors, like impassable terrain or issues of travel safety, may exacerbate problems with physically accessing schools beyond distance alone. Furthermore, school construction meant to mitigate instances like these has not always been optimally efficient, in the sense that fewer schools would need to be built in a given area if they were more advantageously located relative to the locations of prospective students, though other constraints do not always allow for this.

Another restricting factor to equitable access is the financial burden to households. In contexts in which schooling is not free and/or compulsory, and even in those instances in which it is, school fees — even the relatively smaller ones associated with school uniforms, meals, or textbooks — presented barriers to entry for many prospective students and their families (Abdul Lateef Jamil Poverty Action Lab, 2019). In a current report, it was shown that an average of one-fifth of students in Nigeria — which has the highest absolute rate of out-of-school children in the world — gave their top reasons for inability to attend school as competing financial responsibilities/untenable cost and the too-far distance to school (Oyekan, 2023). Further evidence indicates that the issue is widespread. Across an array of LMIC studied in a 2021–2022 report by UNESCO, individual financial contributions to schooling costs accounted for a large share of each economy. On average, household spending on education amounted to 2.3% of countries' GDP (Global Education Monitoring Report Team, 2021–2). The implications of these findings are that hindrances to educational equity are prevalent, but there are actionable incentives — such as conditional cash transfers and merit-based scholarships — that governments can use to encourage enrolment among previously excluded students (Abdul Lateef Jamil Poverty Action Lab, 2019). In doing so, a greater number of children will have the opportunity to fulfil their potential via the benefits of education.

Often, however, the issue with enrolment is that the last mile is the hardest. 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 students will drop out of school or will not transition to higher grades or levels of education if they are not academically thriving (Pritchett, 2013). However, the responsibility of ensuring the scholastic achievement of all students falls on the education system, to a far greater degree than it is dependent on

students' backgrounds or characteristics (OECD, 2012; Eble and Escueta, 2022). Ultimately, failure to ensure adequate student retention and attainment has negative implications for both parties. It is more costly for education systems to devote educational resources to students who must repeat grades or who ultimately withdraw from formal education, and, namely, 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 and Psacharopoulos, 2018).

c. Access to education must be prioritised from the beginning of children's academic careers

It is often also the case that children enter school later than the intended age, which can have a profound negative impact on the rate at which they master skills during their academic careers, and, thus, how well they develop into adulthood. According to 2019 data, for example, 1.8 million Nigerian children were attending Primary school after the age of 11 years old (Sasu, 2022), while in the Democratic Republic of the Congo, nearly half of students (44%) begin school later than the intended age (USAID, 2018.; Global Education Monitoring Team, 2022). In a study conducted in Uganda in 2017, student ages in the last year of Primary school ranged from 12 to 22 years, and most students were 16 years old (Nath et al., 2017). In some contexts, late entry is the product of positive systemic changes that have broadened an education system's access (World Bank, 2020). While it is an undeniable step in the right direction to make schooling available to children who were previously barred from it, it is more advantageous, in the long term, for students to be equipped with school readiness by matriculating into a learner-centred environment as soon as possible — ideally via early childhood development education (Sosu and Pimenta, 2023) — which plays a critical role in ensuring that students are able to keep pace with curricular expectations, therefore maximising their potential throughout their academic careers and beyond.

Yet, two-hundred fifty million children in LMIC were found to be developmentally at-risk, due in part to a lack of early learning programmes, in 2016, which is a number alarmingly similar to that of children found to be out of school entirely in 2019 (Black et al., 2017; UNESCO, 2019). Similarly, UNICEF (n.d.) states that developmental stunting of this kind affects 43% of the population under the age of 5. This indicates a prevalent, systemic issue that has not been improved upon at least in the last decade — an issue that starts with pre-Primary programmes and continues to hinder retention in later years of schooling across education systems. Still, low enrolment in early childhood education is a widespread phenomenon: Over 4 in 10 age-appropriate children, worldwide, were not enrolled in pre-Primary school in 2020, but the vast majority of countries do not include it in free and compulsory education (UNESCO, 2022). In order for children to succeed in their academic careers, it is imperative that they start with a strong foundation. Children at this formative stage of their cognitive development greatly benefit from a learning environment that places them on the appropriate path toward essential skill-building (Sosu and Pimenta, 2023; UNESCO, 2022). Education systems are further incentivised to make pre-Primary school access more equitable by the fact that it yields the highest return on investment compared to all other schooling stages, in addition to contributing to a more smoothly running Primary education system by preparing students to meaningfully participate in it (UNICEF, 2019).

While students should have the opportunity to enter school at the earliest possible stage in order to fortify their path to becoming lifelong learners, education systems must be ready to provide them with high-quality education via strong teacher professionalism and accountability, appropriately levelled curricula, and environments dedicated to learning. Evidence suggests that most LMIC are nearing their goals of universal access to schooling, but they must anticipate the influx of a greater number of students into their education systems and have strategies in place to accommodate them. Keeping enrolled students in school requires ensuring that they achieve expected levels of learning proficiency, and this is the most crucial next step for education systems in order to maintain their current progress and move from increasing schooling to increasing learning (Pritchett, 2013).

d. Literacy rates are used as a measure of education quality, but they fail to present a comprehensive picture of learning outcomes

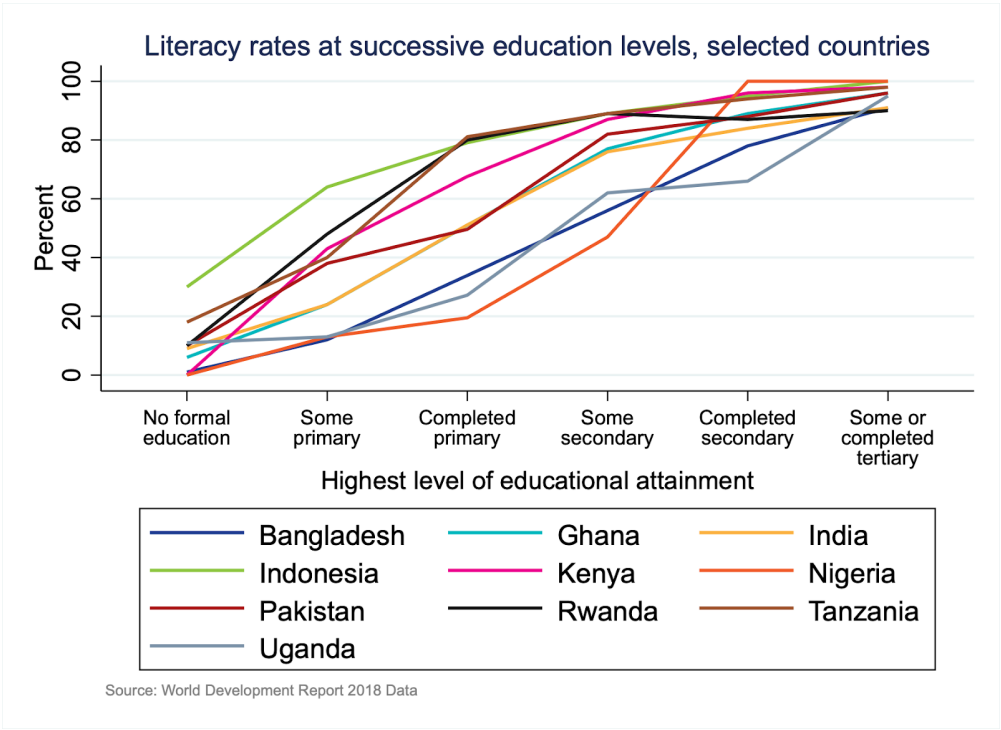
Literacy, like enrolment, is often used as a measure of education access. Because this foundational skill underpins the student's ability to master content in all subjects and to properly function in everyday life, it is also highly studied as a barometer of the actual learning taking place in schools. On a global scale, literacy rates have dramatically increased — from 42% in 1960 to 86% in 2015. However, there are sizable disparities in the percentages of the literate population within and across countries (Roser and Ortiz-Ospina, 2013), signalling that there is more work to do towards achieving universal competency in this regard. Furthermore, when using literacy as a model, research suggests that insufficient attention has been allocated to education quality in favour of efforts to expand education access (Pritchett, 2013; Nestour et al., 2022).

To provide a comprehensive understanding of the trajectory of education systems in LMIC, researchers (Nestour et al., 2022) conducted a study that included 86 countries, 39 of which were concentrated in sub-Saharan Africa. They isolated the growth of education quality from increases in access and measured this growth, using the likelihood that individuals would become literate after five years of Primary-level schooling as a proxy. Ultimately, researchers found that education quality had not improved in any of the evaluated LMIC in the last 50 years. For some, education quality had in fact declined over time, all while the drive for mass enrolment saw higher numbers of students entering formal education systems. Findings also indicated notable gaps in education quality not only among comparatively high-performing and low-performing countries, but within each of the countries as well (Nestour et. al., 2022).

The level of heterogeneity in literacy proficiency to this extent suggests that educational inequities exist in various magnitudes within and across the developing world. It is therefore clear that there is a need for implementation of standardised practices — tailored to the individual needs of each education system's context — in order to ensure broad and effective delivery of high-quality education. If the appropriate measures towards improvement are taken, literacy rates among all shares of the population will continue to rise.

e. Literacy rates in LMIC are often inaccurately inflated by variation in measurement methods

Differences in literacy rates can indicate varying levels of commitment to effectively implementing the necessary characteristics of well-functioning education systems. Taken together, these individual variations point to a large-scale deterioration of academic standards that then diminishes millions of students' opportunities for upward mobility. It is therefore important to consistently collect evidence on contextual literacy proficiency and use this evidence as a basis for applying learning-centric approaches. However, it is equally important to recognise that there are often significant disparities between reported literacy rates and the actual levels of learning achieved in schools.



It is worth examining, then, what exactly constitutes literacy. Some definitions present it simply as a singular threshold to cross, rather than a heuristic model within which students should have the skills to navigate and grow. In this sense, the benchmark aligning with achievement may be too low. In certain cases, observing that students cannot meet or surpass a relatively lenient threshold in literacy can provide beneficial visibility into the extent to which these students require intervening instruction. Conversely, the evaluations may show that students are nominally literate, though they are far from achieving the ultimate goal of literacy: reading comprehension, which incorporates a variety of emergent sub-skills commonly featured on assessments, such as phonemic awareness and automatic decoding. Combining these contributing sub-skills into the ability to draw meaning from and apply the purpose of a text, however, is what elevates them from *learning to read* to *reading to learn.*

Before the need for improvement in this particular area of learning can be addressed, its rampancy must first be properly assessed. Currently, self-reported literacy rates across a number of nations reflect a level of optimism that does not match the levels of learning poverty. 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 India, data compiled by UNESCO from individual and household reports concluded that the youth literacy rate was 92% in 2018, though India's National Statistical Office surveyed the average overall literacy rate to be approximately 74%. Meanwhile, more than half of children in India were estimated to be in learning poverty in 2019 (World Bank, 2019). From these examples, a clear pattern of dubious accuracy emerges, which will continue to impede educational improvements as long as it remains unremediated.

Moreover, the decision to make foundational literacy and numeracy skills the focal point of education improvement initiatives may be largely predicated on the extent to which policymakers across LMIC understand acute student deficiencies in these domains and the significance of remediation. To assess this, 931 interviews were conducted with officials in the sub-Saharan Africa and Asia-Pacific regions, which revealed a widespread overestimation of student proficiency in foundational skills. On average, policymakers estimated that double the share of students had attained foundational literacy than the actual proportion, which was determined by using the World Bank's Learning Poverty indicator (Crawfurd et al., 2021).

Additionally, the findings of this study have shown that there is an absence of urgency among policymakers to prioritise building foundational skills as the cornerstone of education quality programmes. While as many as four in five interviewed officials (79%) recognised that the learning crisis affected both their own country and the entire globe, only 2% regarded a foundational reading or literacy programme as the most significant, recent educational reform in their context. Further evidence showed that a positive official perception of student skills in foundational literacy and numeracy strongly correlated with reduced motivation to focus on this area of improvement. Therefore, the disparaging response to programmes strengthening core pupil competencies may be due to a falsely optimistic outlook on the state of learning that is, in turn, produced by a lack of visibility into consistent, accurate measurements of learning (Crawfurd et al., 2021). However, it is necessary that students in these contexts have verifiably mastered the most fundamental concepts before policymakers can address other goals in order to preserve education quality.

2. Learning outcomes are weak and urgently require transformative interventions

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

While ensuring that children have access to school, start school at a developmentally appropriate age, and stay in school for the expected duration is a massive undertaking, succeeding in any or all of these areas does not guarantee that students are receiving an education that will properly 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, myriad examples of persistently low learning levels exist in all LMIC, where over half of all children (53%) experience learning poverty according to the World Bank[5], even while 40% of them are attending school. Furthermore, this regional average masks the extent to which learning poverty rates are especially dire, such as in sub-Saharan Africa, where it is estimated to be approximately 90%, and in the Middle East, North Africa, and South Asia, where 6 in 10 children do not approach expected minimum proficiency levels. These shortfalls in learning outcomes among enrolled students speak to insufficient education quality that will inhibit them from mastering increasingly complex curricular expectations, and may lead to their eventual withdrawal from school.

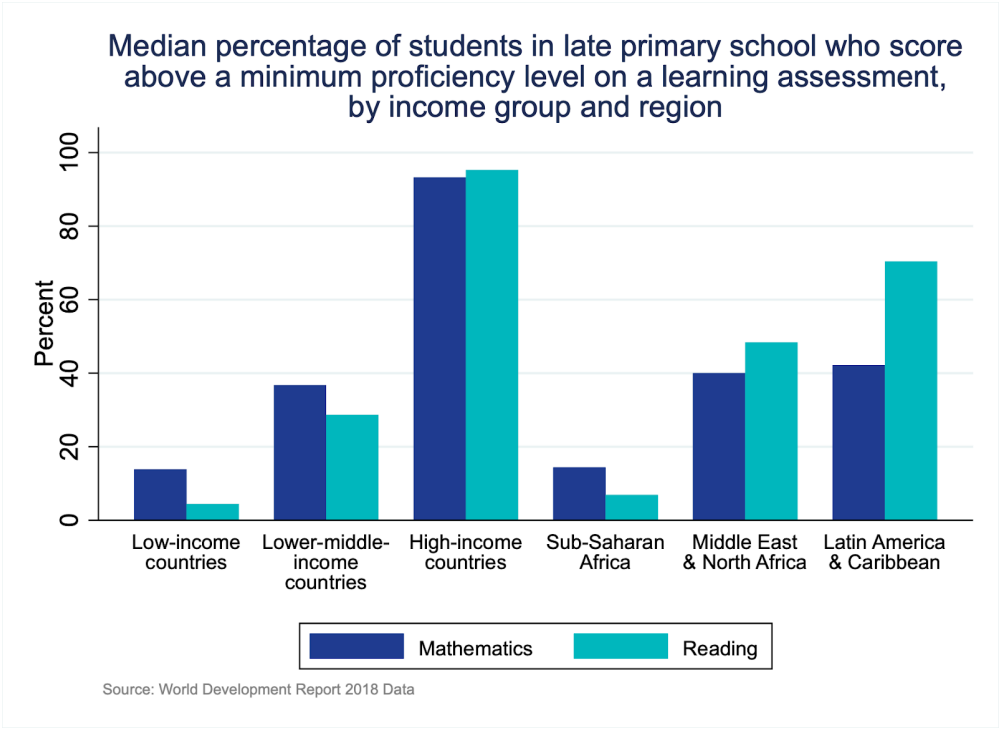
Literacy, the most extensively studied foundational skill, can also be examined among students in LMIC. Competency in this domain is essential for students to follow written directions, engage with learning materials, participate in assessments, and become knowledgeable in every core subject in school. However, evidence points to a widespread lack of proficiency in many of the fundamental, early-grade sub-skills that ultimately inform literacy. In rural India in 2016, for example, half of the students were unable to read sentences in their local languages that were considered appropriate for a grade 2 curriculum. In another scenario, 80% of grade 2 students 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 using a three-sentence passage for assessment and reducing the defining characteristics of literacy to a relatively lower threshold[6], 75% of students in Nigeria, Uganda, and Bangladesh did not qualify to be considered literate by the end of Primary school (World Bank, 2018). Therefore, despite the inherent understanding of the extensive advantages of literacy and the detrimental consequences of illiteracy, there is still a pervasive absence of proficiency in this foundational skill among students within and across education systems.

Problematic literacy rates are mirrored by numeracy rates that could also significantly inhibit students’ abilities to function in their daily lives. For example, 50% of all third graders in Uganda cannot solve simple subtraction operations. An even higher percentage, 69% of third graders cannot complete double-digit subtraction in rural India. By grade 5, half of those third graders still cannot solve the same operations (World Bank, 2018). Similarly, only 60% of students in urban Pakistan could correctly perform double-digit subtraction by grade 3, and this percentage

[5] “Learning poverty” is defined as the inability to read and comprehend a simple text by the age of 10.

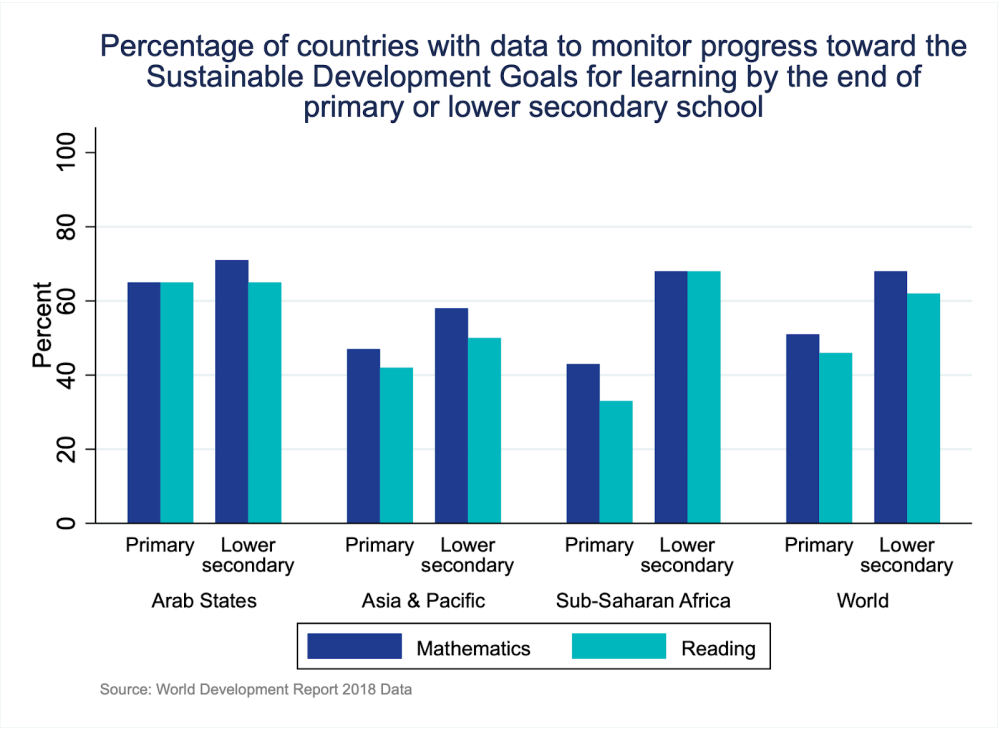
[6] “Literacy” was defined in this context as the ability to read either “fluently without help”, or “well but with a little help”.

dropped to 40% for the same grade level in rural areas. The dearth of numeracy proficiency seen in these contexts extends to broader regions, as well. Across sub-Saharan Africa, the Middle East, and North Africa, for instance, the average share of students who score above the minimum proficiency level on a mathematics learning assessment is between 18 and 42% (World Bank, 2018). Therefore, while the specific interventions that must be implemented to elevate learning in foundational numeracy will vary based on an education system's independent context, the necessity to disrupt stagnating learning gains is clear.



Furthermore, without the implementation of effective policy solutions that drive improved learning outcomes, massive amounts of educational resources will continue to be expended without a meaningful return on the investment. On a global scale, for instance, 125 million students who have successfully completed 4 years of schooling do not have functional literacy or numeracy skills, demonstrating a widespread lack of recompense for schooling efforts. This will require targeted, transformative approaches to prevent the ongoing scarcity of learning, and to preserve the expected output of education funding — which has little room for deviation following the economic downturn incited by COVID-19 (United Nations, 2020).

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



b. Year-on-year improvement is too slow for students to keep pace with their better-positioned peers

As the evidence pointing to low worldwide learning levels implies, there is a profound need to determine the extent of under-education in foundational skills and target them from Primary grades upward. In addition to measuring the student learning gains that result from this educational reform, however, stakeholders must also measure the pace at which these learning gains are achieved in order to gain insight into their education system's global competitiveness and thus improve their rate of progress. Currently, data show that high-performing students 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 student learning will not result in globally comparable content mastery in a reasonable number of decades (World Bank, 2018; Pritchett, 2013). For example, a comprehensive number for the developing world estimates 50 years just to halve current learning poverty levels (Azevedo, 2020).

The implications of these findings are that there is a considerable risk of generations of students continuing to lag behind desired learning levels, but that essential rapid improvement on a large scale is attainable through interventions that positively overhaul learning outcomes. For example, if every LMIC in the world were to produce learning gains at a rate that doubles or triples their historical progress, it is possible to reduce learning poverty by almost half by 2030 (Azevedo et al., 2021), which is an 82% reduction in the counterfactual projection of time needed to meet this goal. Therefore, the critical dual objective of education systems in LMIC is to not only set precedents in learning gains achieved, but also in the pace at which they achieve them.

c. 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 overturn deteriorating learning 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 student in a low-to-middle-income country spent close to two academic years (236 days) out of school (World Bank, 2023), and learning poverty in LMIC was estimated to increase 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 were correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in students' 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 (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 student engagement with lessons via observation, nor did they enable teachers to track student 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 students was the inability to manage these students' mastery of lesson content in real-time.

As a result, many students across LMIC learned much less than they would have if participating in conventional, in-person instruction, and therefore, more students demonstrated lower learning levels from 2020 onward. In Brazil, for example, some students 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 students 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 students 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 students on a worldwide scale (United Nations, 2020), with the most significant consequences for students 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 curriculum restructuring and small-group tutoring, among others, that aspire to reclaim a positive learning trajectory on an accelerated timeline (UNESCO et al., 2021).

To ensure the effectiveness of these solutions, however, it is worth examining how the COVID-19 pandemic hampered the performance of teachers and school leaders, who also experienced significant disorder to the typical execution of their roles. Many teachers did not have access to in-service training relevant to the hard pivot to remote-learning modalities, which would be exacerbated by a pre-existing lack of professional development in regions like sub-Saharan Africa, where more than a third of teachers (36%) had not received training (United Nations, 2020). Across all studied LMIC, two out of three teachers did not receive any special training (68%) in the first seven months of school closures, while nearly half of teachers (48%) had not been trained in the specific use of online platforms for instruction during the initial three months of school closures (UNESCO, 2020). Beyond training in this regard, an outright lack of technological devices and internet connectivity in LMIC impeded teacher participation in remote learning to a similar extent that it affected student participation in these countries, as only 19% of teachers were provided with ICT tools or internet connectivity (UNESCO, 2020).

Furthermore, UNESCO data (2020) show that the school personnel required to continue working was commensurate with the proportion of teachers required to continue teaching in LMIC. However, the evidence (UNESCO, 2020; Vegas, 2020) showing a general lack of support for teachers in these contexts calls into question the extent to which class-time observations by school monitors and teacher performance evaluations were severely limited, if not altogether impossible, during the pandemic, especially depending on the distance-learning methods employed by education systems. This, coupled with the financial hardships endured by many teachers, could have contributed to higher rates of absenteeism — which was already pervasive in LMIC — and a greater number of teachers leaving the profession altogether during and following the pandemic (United Nations, 2020).

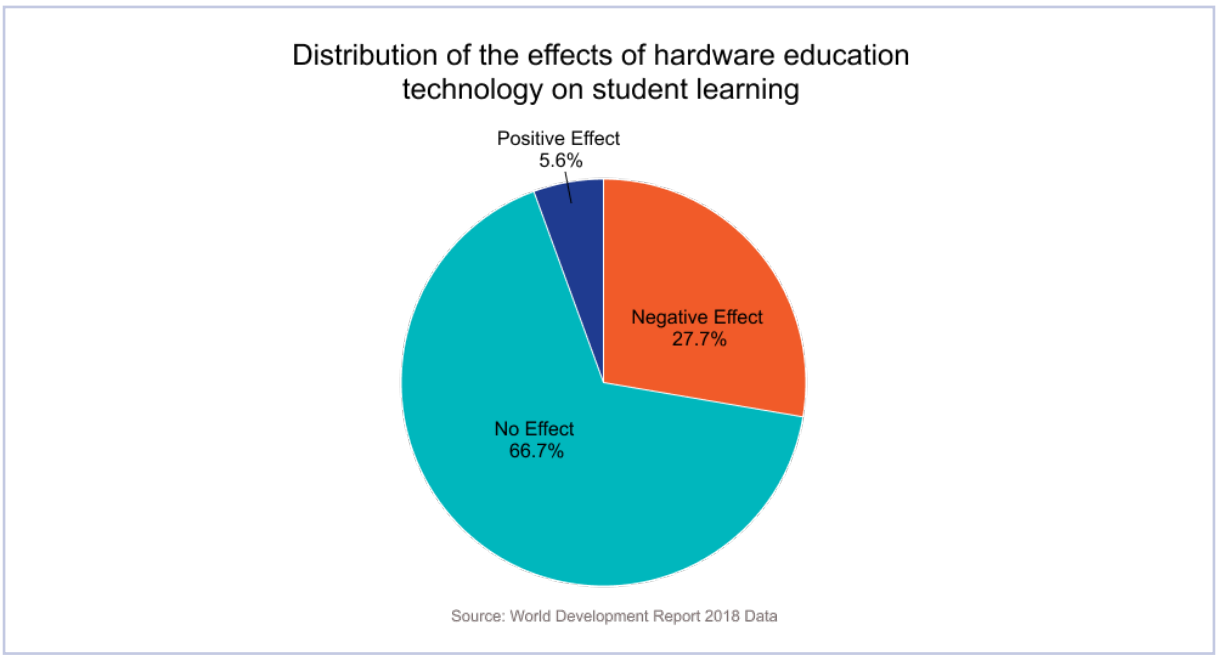
In this sense, teachers need the support of impactful tools and resources, and the motivation of effective leadership, in order to implement systemic changes to education systems in their classrooms, which students will require to overturn the severe learning losses incurred in recent years. Education 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 students.

3. The causes for weak learning outcomes are many

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

Although the ongoing challenges to education systems both during and following the COVID-19 pandemic are severe, there are more global resources currently dedicated to education than ever before. This has created a path for policy interventions to often focus on input-based solutions when education systems are not meeting quality standards. A lack of tangible resources like paper, textbooks, or technological hardware in some schools, for example, have been looked at as hindrances to elevating learning. This is a worthy concern, in some cases. For instance, one study found that less than half of all students in Niger and Nigeria had paper to write on, while there was only 1 maths textbook for every 66 students in Togo (World Bank, 2010–2014). Such inconveniences can bog down the learning process when instructional efficiency is of the utmost importance. In this sense, inputs are necessary to a degree, but they are not nearly sufficient as a standalone improvement effort.

Furthermore, while targeted, scaled investments in education are needed to improve learning outcomes, misguided efforts to enhance schooling can have the unintended consequence of exacerbating already-problematic learning levels. If the specific factors inhibiting learning gains in a school have not been identified or had resources allocated specifically to them, indiscriminate expenditures on ostensibly beneficial changes may have little effect, while existent problems persist. In other words, the mere injection of materials into sparse classrooms has not been shown to result in higher levels of academic achievement, and may even function as a detractor. In 2008, for example, textbooks distributed to Sierra Leone were discovered unused in a cupboard during a follow-up inspection. Speculations indicate a hesitancy to risk damaging a resource such as these when they are a rare classroom feature (World Bank, 2018), but a lack of use in this regard is a lack of advantageous potential for student learning, and signifies non–cost-effective spending on education improvement.

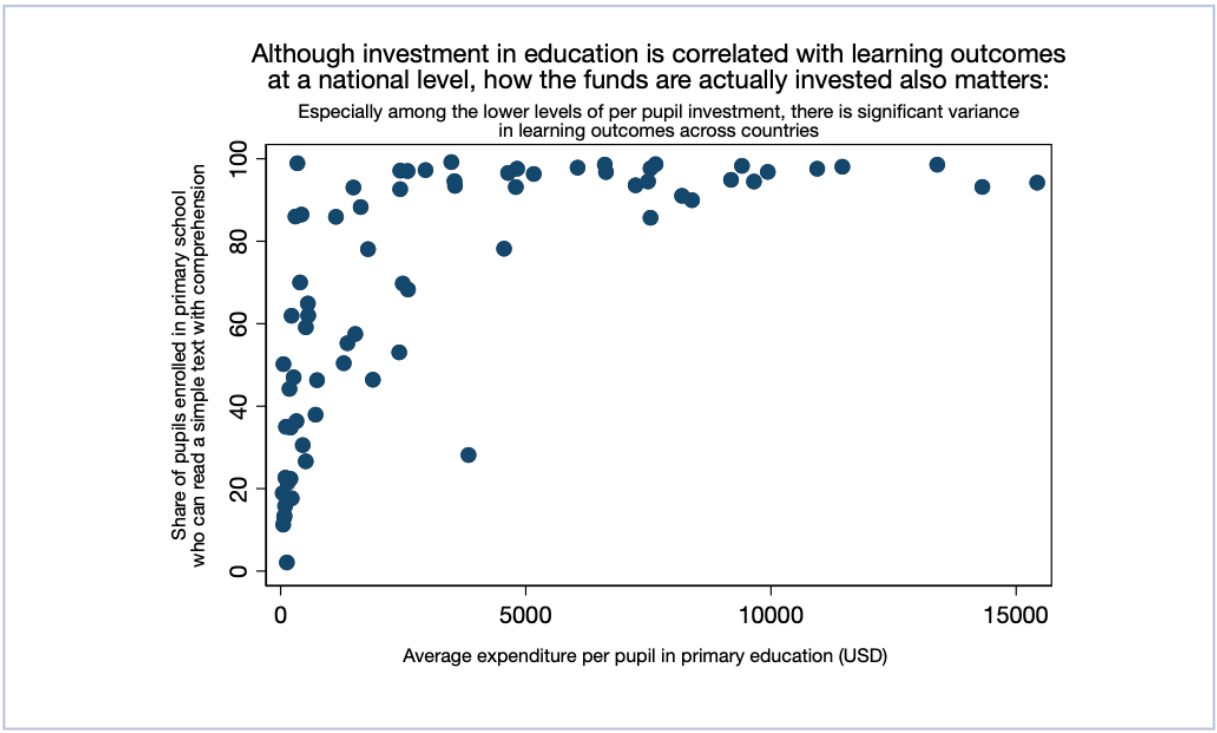


Another, more far-reaching example is the One Laptop per Child (OLPC) initiative, which was a lofty aspiration to enhance learning via technology access in 42+ countries (Yanguas, 2020). One year after successful distribution, however, almost half of teachers reported rarely or never using the laptops in the classroom (World Bank, 2018). A variety of studies across part of the developing world conveyed neutral or negative results stemming from OLPC on academic outcomes. In some cases, students were spending 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 produced from the OLPC initiative, showing that the introduction of edtech hardware only has a 6% positive effect on student learning, while the other 94% of the effect on student learning is neutral or negative. In response to this, it is imperative for education systems in LMIC to parcel out and maintain momentum with proven-effective approaches, so that gaps in educational achievement do not widen during side-tracked 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 a complementary additive, not a substitute (World Bank, 2018).

To accomplish this requires ensuring that resources used by education systems in LMIC are supported by evidence of their confirmed impact on learning gains, which, in turn, ensures that investment in them is cost effective. Framed differently, policy decisions about which resources are allocated to these education systems, and for what purpose, are more pivotal than the amount of resources that are allocated, above a certain threshold. This concept becomes more clear when examining a distribution of per-student expenditures across countries, which also shows a large range of learning outcomes. In the majority of these contexts, high literacy rates exist alongside relatively high per-student expenditures, but this is not a causal relationship. Firstly, It's important to highlight that numerous assessments indicate that high-income countries that have achieved exemplary — or at least, satisfactory — learning outcomes have consistently maintained these outcomes for three-quarters of the past century. Therefore, these countries do not have the same goal of positively overhauling the quality of their education systems as LMIC do (Pritchett, 2013). Furthermore, the value brought to high-income countries' economies by the stronger knowledge base of their citizens contributes to their ability to funnel comparatively larger portions of their budget back into education systems, resulting in higher per-student expenditures that largely perpetuate existing learning levels.

Secondly, there is considerably more variation in learning outcomes when expenditures are below approximately USD 5000. In this sense, poor learning outcomes do not directly correlate with low per-student expenditures. Instead, this variation highlights the possibility and importance of prudent monetary allocations toward initiatives that can transform education quality, which do not need to come at an untenable cost. In these contexts where per-student funding availability is low, there is also increased risk of regression or stagnation in learning resulting from misallocated expenditures, however. For this reason, cost-effective approaches to transforming education in LMIC must be supported by strong evidence of their effectiveness. Increased investments in education by currently low-spending countries will produce improved learning outcomes for generations of students, who will in turn contribute to the economic growth of their countries.

Overall, the basis for allocating educational resources must be steered away from prioritising high visibility and instead be directed toward strategies that will yield measurable results. This is the necessary starting point for whole education systems and the students they serve that require a strong learner-centred foundation prior to the accumulation of conspicuous academic inputs. These education systems must, first and foremost, leverage their existing and essential components to facilitate better stakeholder performance and establish a resilient learning environment.



b. Low teacher content knowledge can translate into poorly executed pedagogy

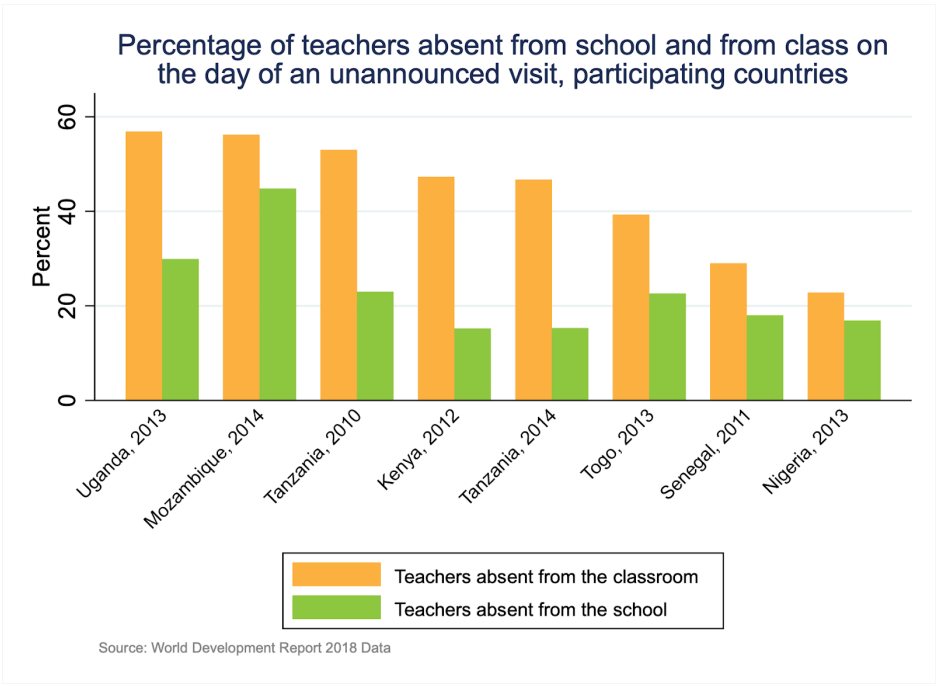
Teachers are at the core of what can be accomplished in any given classroom, and are the single-most influential input across all education systems (Vegas, 2020). The level of competency they possess in professional aptitudes and their cultivated rapport with emerging learners are what equips them to assess learning levels and aid students in fulfilling their academic potential. In some instances, though, teachers in LMIC may lack the content knowledge necessary to sufficiently coach struggling students. In 14 sub-Saharan African countries, for example, teachers performed at the same level on reading tests as their highest-performing grade-6 students (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' mastery of subject matter can have negative implications for student achievement. In some contexts, as much as a third of students' inability to meet curricular expectations (30%) was found to be due to a lack of teacher content knowledge. Findings such as this are corroborated by evidence showing that large proportions of teachers in Kenya and Togo could not accurately correct at least 80% of student answers on a fourth-grade mathematics test — therefore demonstrating an inability to evaluate whether students are learning or to guide students towards that goal (Brunetti et al., 2021).

This may lead teachers to cater to higher-performing students in order to maintain instructional flow, or to push through the curriculum without identifying areas in which students need more support. These would be in direct contrast with the classroom approaches that students often need most to succeed, like ability-grouping, and can encourage student dropout (World Bank, 2018). To examine the issue more closely, a variety of studies have assessed the extent to which teachers are lacking pedagogical skills. The World Bank's Service Delivery Indicators report indicates, for example, that the average teacher in Indonesia scored only 25% on a pedagogy assessment in 2019 (World Bank, 2020), while the average teacher in Madagascar in 2014 scored only 23% on pedagogy assessments (Wane and Rakotoarivony, 2017). In Pakistan, among Primary-school teachers who were evaluated on a number of pedagogical skills in areas like lesson facilitation, checks for understanding, and fostering critical thinking using the TEACH tool, almost two-thirds of teachers (63%) achieved scores between two and three out of five, with the most teachers earning the lowest scores in the areas of fostering critical thinking, feedback, and social and collaborative skills (Molina et al., 2020).

However, 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 dissemination of the lesson with students' ability to achieve mastery of foundational concepts.

c. Strong governance is essential for encouraging teacher professionalism and accountability

Regardless of whether teachers possess ideal levels of content knowledge and pedagogical best practices or not, it is irrefutable that teachers must value professionalism and accountability to be effective. For that to happen, they must be bolstered by effective governance administered by informed policymakers. However, evaluative reports suggest that these crucial pieces are not always in place. Across eight African nations studied between 2010 and 2014, for example, teachers were often absent from their classrooms, or from school entirely. In Mozambique, Uganda, and Tanzania, the amount of time teachers were absent from school was close to or more than 50% (World Bank, 2018). Absenteeism to this extent 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 by teachers who are present interrupting their class time to check in on other classrooms that are unsupervised due to absenteeism and a lack of substitute coverage (Bashir et al., 2018; World Bank, 2018). Teachers who must integrate these unattended students into their own class are forced to dilute the benefits of ability-grouping and disrupt the appropriate scope and sequence of academic content by imparting it to those for whom it was not intended.



Effective school-monitoring practices are what is required to mitigate high rates of absenteeism across LMIC, but these are not always effectively leveraged for incentivising teacher or whole-school compliance with consistent attendance. In Tanzania, only 30% of schools reported that a recent visit from ministry of education officials was related to teaching and learning. Across a number of public schools sampled in India, not one of the teachers with a high number of absences had been dismissed by the principal during their tenure (Mbiti, 2016). Additionally, according to UNICEF's Time to Teach Study, school leaders in a number of West and Central African contexts did not issue sanctions against frequent absenteeism due to confusion about the education system's hierarchy or a lack of faith that corrective action would be taken (Karamperidou et al., 2020).

However, regular observation by school leaders and the introduction of programmes that tie professional benefits for teachers directly to academically constructive behaviours can result in reduced absenteeism and time off task, which, naturally, carries positive effects for students. In public schools studied in India, for example, there was a 25% decrease in overall absences and a 40% decrease in unauthorised absences when regular school inspections were conducted (Muralidharan et al., 2017). In another study, learning outcomes were improved by way of better teacher attendance when teachers in India were financially incentivised to take time-stamped photos with their class at the beginning and end of the school day (Mbiti, 2016). In addition to facilitating their most desired effect — a positive impact on student learning gains — initiatives like these can set expectations for education professionals that not only improve current situations, but also carry into the next generations of incoming teachers.

The issue of teacher shortages extends beyond frequent absences, especially when considering daunting student-teacher ratios across South Asia, the Middle East, and Africa. These range from 35:1, on the lower end of the spectrum, up to 90:1 (World Bank, 2018). While this can significantly constrain the teacher to devote more time to classroom management tasks than instruction, which has been found to detract from student achievement (Molina et al., 2020), hiring more teachers to reduce class sizes in western Kenya, for example, did not correlate with improved teacher performance. Instead, the increase in the number of staff reduced the sense of urgency and personal responsibility felt by teachers to optimise their instruction. Although it was intended to provide more capacity for differentiating instruction, the expansion of staff was not accompanied by regular teacher observation and constructive coaching. Therefore, it led to a diffusion of responsibility among teachers and failed to account for other priorities these teachers may have had, which was evidenced by a significant portion who shifted their focus to seizing employment opportunities for relatives (Mbiti, 2016).

A critical aspect of ensuring the optimisation of student learning opportunities through teachers is to ensure that teachers are adequately supported by the education systems in which they operate. This support should come in the form of relevant, consistent in-service training, as this is a critical component for professional performance that many teachers do not receive (World Bank, 2018). In 21 countries studied across the globe, for instance, between one-third and more than one-half of Primary-school teachers were not trained according to UNESCO's 2017 data, and the quality standards that define training differ among these countries (Montoya, 2019). Many teachers also grapple with heavy workloads that include administrative responsibilities not related to instruction, and a dearth of teaching and learning materials to aid them with meeting expectations for their instruction. On these fronts, non-teaching education personnel can also benefit from receiving professional development that better equips them to manage schoolwide responsibilities and provide coaching to teachers. The use of structured pedagogy can alleviate the burden on teachers preparing their own lesson plans when they do not have time to design them well, or design them at all.

d. Important considerations for effective policymaking in developing education systems

The joint performance of all stakeholders in an education system is pivotal for fostering student success, and is equally capable of undermining said success. The latter is especially plausible when policymaker decisions do not properly leverage all components of the education system towards achieving a clear objective of enhanced student learning. Yet, policymakers seeking to enact change for learning-deprived schools can be inhibited by an absence of metrics providing necessary insight into the state of learning, and may therefore lack the context with which to make viable recommendations. This insufficiency of actionable data is widespread in the parts of the world where such data are needed most. World Bank research has attested to the fact that the vast majority of the countries that represent the global population are low- and middle-income countries, which have historically lacked assessment results that reliably compare learning outcomes on an international scale, but also 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 begins with the system-wide collection of robust, regular measurements of the state of learning.

Even in instances when evidence of student performance is available, policymakers may be inclined to abide by the falsely representative or misleading optics it can present. If, for instance, students who were identified as the lowest performing at a given point in time withdraw from school in higher proportions than mid- to high-performing students, subsequent assessments will appear more favourable on average, but learning gains will not have improved (World Bank, 2018). In this sense, regulatory stakeholders may more accurately gauge the success of the education system by examining the participation and performance trends of these low-performing students. From a broader perspective, it should be recognised that sectionalised data points are not solely representative of an education system's learning-centric achievements. Rather, the effectiveness of its strategies must be observable in all measures of accountability.

In an ideal case, struggling students would be equipped with the necessary tools to strengthen their capacities and grow toward keeping pace with their higher-performing peers. A significant hindrance to achieving this goal is that the facilitation of learning gains among low-performing students may not be well-integrated into the academic framework of an education system. Evidence points to curricular design that, in many cases, favours top-performing students rather than the median student (Mbiti, 2016). Research further suggests that overly complex, fast-paced curricula in LMIC are a deterrent to all students' learning (Pritchett and Beatty, 2012), despite being implemented with the intention of setting rigorous expectations for academic achievement. In response to this, policymakers should adopt a gradational approach by first familiarising themselves with the curriculum in a given education system, and then taking the steps necessary to understand if, how, and why certain students are not keeping pace with it, while incorporating the pedagogical factors that will foster achievement in that system's particular context. In doing so, the policy will focus on targeting students at level, thus allowing them to master the foundational content on which they will build schema that will translate into cumulative mastery.

Teachers can collaborate with policymakers to accomplish the goal of elevated student learning via a multi-tiered feedback structure. Such a structure begins with formative assessments conducted in the classroom, which allow teachers to identify struggling students, and expands to national assessments and examinations, which provide insight into the functionality of the education system as a whole, and international large-scale assessments (ILSAs), which evaluate the effectiveness of education systems across countries and over time (World Bank, 2018; Rocher and Hastedt, 2020). In turn, the broad reforms education leaders introduce by discerning core effective principles from this host of information sources will ultimately return the benefit to classrooms and teachers.

Importantly, policymakers and education personnel alike should be prepared to recognise that reforms targeting pedagogical improvement and increased accountability are not always as conspicuous as input-based policy changes or efforts to increase enrolment and attendance. Nonetheless, the appropriate interventions have the ability to drive unprecedented learning, which is the strongest indicator of any initiative'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.

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

a. The projected economic consequences of low education quality far outweigh current investments in education, but there is potential for substantial economic gains through improved education

Students with strong learning outcomes are more likely to achieve higher educational attainment and are subsequently more productive and fulfilled when operating within the labour market. For example, research conducted by the World Bank in 2018, based on observations in 139 countries, found that there is a 9% average increase in wages for every additional year of schooling that an individual receives (Patrinos and Psacharopoulos, 2018). However, the inverse of this situation also applies. Students who are currently learning deprived stand to lose a collective 10 trillion USD in potential labour earnings over the course of their working lives, which will have a broader detrimental impact on the economies in which these former students live and work. Foregone earnings of this magnitude are equivalent to one-tenth of the global GDP, and are twice the global annual public expenditure on Primary and Secondary education (Azevedo, 2018). Additionally, comprehensive research conducted in 2022 via the RISE programme shows that student performance deficits will lead to the loss of 700 trillion USD from the global economy by the year 2100 (Gust et al., 2022). Therefore, the enormity of financial losses that could be incurred as a result of education systems that do not meet the needs of the global student population is clear, which not only precludes those students from personal prosperity, but also detracts from opportunities to invest in education for the generations that follow them.

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 (2022). 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 student performance, which will in turn contribute to student 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.

b. Supporting cognitive development in childhood is critical for ensuring a competent knowledge base in adulthood and facilitates improved pedagogy in classrooms

Missed learning opportunities early in life can have a stunting effect on students' learning trajectories as they progress through their education careers. Though the brain continues to adapt to its environment and foster learning throughout life, it functions best when given a strong foundation during childhood on which to sequentially build in increasingly complex ways. In other words, students who lack mastery of fundamental content from the early grades onward are at a greater risk of making detrimentally slower progress due to the cumulative nature of learning, which is particularly consequential in a finite formal education period (World Bank, 2018; Eble and Escueta, 2022). The negative effects of foregone childhood learning are compounded by the fact that the synapses responsible for forming sensory pathways, understanding language, and performing higher cognitive function gradually plateau as children approach early adulthood. For these reasons, a strong skills base is essential for supporting the pursuit of an intensifying, comprehensive education that adequately prepares graduates for participation in larger society (World Bank, 2018).

There is further evidence to support the idea that foundational skills constitute a pivotal building block that encourages students' academic success. A series of observations conducted by researchers (Hwa and Duong, 2021) in high-performing classrooms led to some major conclusions about effective teaching and learning. One of these was that foundational skills should be treated as opportunities to learn more advanced knowledge. It was found that ensuring mastery of fundamental concepts in this way provides more advantage for student learning, according to this study, because it allowed teachers to connect new concepts to those previously learned, and to eliminate rote memorisation in favour of more meaningful practice. Via this approach, students develop a greater capacity to acquire and retain a broader scope of knowledge throughout their education careers. What is troubling, though, is that there are still many examples of curricula in LMIC that do not prioritise student mastery of foundational literacy and numeracy sub-skills, which will ultimately hinder student participation in subsequent tiers of instruction.

Conversely, students who are able to engage with and apply foundational skills are better equipped to develop metacognitive thinking from the earlier grades onward. Those students who were encouraged by their teachers to analyse their own learning process tended to display better learning performance and expressed more interest in learning, according to the study (Hwa and Duong, 2021). Therefore, the benefits of encouraging cognitive development via a learning-centric environment compound over time and permeate throughout an education system by allowing teachers to refine their instruction and granting students the agency to actively contribute to their own educational achievement, which ultimately results in more high-yielding classrooms.

c. Elevating education quality standards drastically improves educational equity

It is often the case, across LMIC, that students 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 students from all wealth groups (DHS, 2014, 2015–16; Spaull and Kotze, 2015). Research indicates that improving student mastery of foundational skills in an education system, regardless of the disparate socioeconomic statuses present in the classroom population, narrows gaps in academic performance — which have been attributable to differences in student background characteristics — by providing the appropriate substructure students need before becoming exposed to more rigorous concepts (Crouch et al., 2021; Asim, 2020). The implication of a narrowing learning divide, furthermore, is that a greater number of students 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, students' 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 and Escueta, 2022). In this sense, devoting education resources towards achievement of foundational skills raises performance standards for all students, and therefore promotes the upward mobility of all citizens in a society.

d. Education systems must be improved holistically

Optimising investments in education necessitates the alignment of whole education systems towards the common goal of producing learning in foundational skills and beyond. Given that education systems are composed of distinct components — teachers, students, school infrastructure, school leaders, and so on — reform initiatives are often oriented towards adjusting the quality or performance of one of these components to better match the patterns of those observed in high-functioning education systems (Pritchett, 2013; Spivack, 2021). However, approaches like this fail to consider a critical piece of education systems, which is that their components interact in specifically defined ways. Moreover, these relationships between these systematic elements both elucidate and enforce the objective of the entire education system (Spivack, 2021).

When the objective of one component of the education system is misaligned with those of the system as a whole, or when there is no clear objective being carried out, education quality and learning outcomes suffer (Kaffenberger, 2021). It is not simply the individual components of the education system that must be adjusted in response to this; the processes by which they either support or compromise one another must also be evaluated and shifted towards greater effectiveness in driving meaningful learning.

In recent decades, education systems across LMIC have centred themselves around making schooling more accessible for all children, in order to increase enrolment and attendance, and have achieved widespread success in this regard (Spivack, 2021). In order to address the current, pressing need to increase the learning levels of students — which is not only pivotal for maintaining high enrolment and attainment rates, but also underpins a student's ultimate ability to carry the benefits of their academic careers into the rest of their lives — education systems must be similarly aligned with comprehensive accountability and unified coherence.

Appendix I: Works Cited

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