EKO EXCEL
EXCELLENCE IN CHILD EDUCATION AND LEARNING

UNIVERSAL BASIC EDUCATION BOARD
LAGOS STATE

Measuring the Continued Progress of the EKOEXCEL Programme

Evidence from government Primary schools in Lagos State

by the end of the 2023-24 school year after 5 years of programme implementation

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Executive Summary

To elevate learning outcomes across the State, the Government of Lagos launched the EKOEXCEL programme in January 2020 as a holistic model for educational transformation.

As of the end of the 2023-24 school year, the programme is serving **343,000 pupils** from all 1,013 government Primary schools across the State.

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

28% of pupils in a typical Primary 2-5 class could not read a single word from a Primary 2-level passage. In mathematics, **two of every five pupils in a typical Primary 2-5 class could not correctly answer a single two-digit subtraction problem** like 28-17, even though this skill should have been mastered by Primary 2 according to the Nigerian Educational Research and Development Council's (NERDC) benchmarks.

After five school years of programme implementation, pupils have made large strides in improving their learning outcomes.

- In reading comprehension, the average pupil in a Primary 2-5 classroom **achieved a score 39 percentage points higher** than their peers prior to the launch of the programme.
- In a typical Primary 2-4 classroom, the average pupil is **reading an additional 18 correct words per minute** in English.
- When solving word problems, the average EKOEXCEL pupil **scored 30 percentage points higher** than what they would have prior to the programme.
- Across most numeracy subskills, **pupils are performing one to two grade levels ahead** of where they would be without the EKOEXCEL programme.

During the 2023-24 school year, pupils continued to make progress in many foundational skill areas.

- On average, the share of non-readers in Primary 2 decreased by 14 percentage points — **a 50% decrease within one year.**
- Primary 3 pupils showed the largest improvements in English reading fluency, **reading 11 words per minute faster** compared to pupils in this grade at the end of the previous school year.
- On average, maths scores at the end of the 2023-24 school year were lower compared to the end of the previous school year. While scores remained high in solving more simple maths problems, such as '32+15', there were larger declines in answering more complex problems, such as '42x6'.

Looking ahead to the 2024-25 school year and beyond, the programme will continue working to build foundational literacy skills across the curriculum, strengthen assessments and data collection, and strengthen day-to-day programme implementation.

Specifically, more effort will be focused on improving pupils' reading comprehension abilities and improving teacher attendance and lesson completion rates.

5 Years of Programme Implementation, In Numbers:

Glossary

Key Terms

absenteeism	When either a pupil or teacher fails to report for or remain at school as scheduled, regardless of reason.
automatic decoding	The ability to rapidly, effortlessly and accurately recognise a written word upon seeing it (Pikulski & Chard, 2005).
baseline	The conditions existing prior to an intervention or at the beginning of a period of time, against which changes can be measured, monitored, and evaluated (OECD, 2022).
benchmark	A reference point or standard against which outcomes can be assessed, established based on comparable data, or what can be reasonably inferred to have been achieved under a similar set of circumstances (OECD, 2022).
chronic absenteeism	When a pupil repeatedly fails to report for or remain at school as scheduled, leading to a significant negative impact on academic performance relative to their peers. The threshold for “chronic” absenteeism is not always clearly defined. In some high-income countries such as the US, a pupil is deemed to be ‘chronically absent’ when they miss 10% or more of the school year (Lara et al., 2018). However, this definition does not necessarily extend to other systems. Given that attendance rates and expectations are highly context dependent, working definitions for what classifies as chronic absenteeism should be determined on a case-by-case basis.
cohort	A group of pupils who are in the same grade and attend a school implementing the EKOEXCEL programme. (ex. All Primary 2 pupils attending all EKOEXCEL schools in the 2023-24 school year.)
comparison group	A group of schools which do not receive the EKOEXCEL programme. These schools act as a point of comparison to schools which do receive the programme (labelled as the treatment group), so that the impact of the programme can be assessed.
correct words per minute ‘cwpm’	A metric used to measure oral reading fluency by the number of words read correctly, out loud, from a given passage.

curriculum	A planned sequence of lessons, designed to foster pupils’ proficiency in content and/or skills. A curriculum typically includes instructional content, activities, and processes for assessing learners’ achievements (UNESCO, 2024). A curriculum may be developed at the national, state, or institutional level, with considerable overlap often occurring among these tiers; typically, broader curricula at the national or state level significantly influence the development of more localised educational programmes.
differentiation	The modification of instruction and curricula to better suit the learning levels and educational needs of pupils.
early childhood education	Schooling, typically for children who are younger than Primary school-age, which focuses on supporting cognitive, physical, social, and emotional development through learning activities; it involves instruction outside the family context to develop skills essential for academic readiness and Primary education (UNESCO, 2011).
empirical (research/ data)	Derived from observed evidence, rather than theory or anecdotal evidence.
enrolment	An individual's registration for an educational programme, public, private, or otherwise. The phrase "rate of enrolment" therefore refers to the proportion of a given population that is enrolled in an educational institution (UNESCO, 2011).
foundational learning	Basic literacy, numeracy, and transferable skills such as social-emotional skills which are required for more complex learning to take place (UNICEF, 2022b).
foundational literacy	Key fundamental skills that are prerequisites for the ability to comprehend written text, including but not limited to: phonemic awareness, print orientation, oral fluency, etc.
foundational numeracy	The ability to perform arithmetic operations and apply them to day-to-day life, including but not limited to: number recognition, addition, subtraction, multiplication, and division, as well as word problems involving these operations (World Bank, 2024a; UNESCO, 2024).
heterogeneity	The state of being diverse in content, characterised by the presence of distinct and varied components. In the context of this report, the term heterogeneity or heterogenous is used to describe the extent to which dissimilar outcomes exist within a system. For example, if there is “a great deal of heterogeneity in Primary 3 fluency rates in state” that means that fluency rates vary widely among Primary 3 pupils within the state. If there is high “heterogeneity by gender”, this means that outcomes for boys are very different from outcomes for girls. Determined relative to that of comparable data sets through standard deviations (National Center of Education Statistics, 2024).

high-income country	This report uses the World Bank's classification of high-income countries: [Countries] with a gross national income per capita, calculated using the World Bank Atlas method, of $13,846 or more in 2022 (World Bank, 2024b).
literacy	Leading organisations in international education reform offer disparate definitions of literacy: **External Definitions of Literacy** World Bank/ UNICEF: "[The ability to] both read and write with understanding a short simple statement about [an individual's] everyday life" (UNICEF, 2022b). UNESCO/ PIAAC/ OECD: Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts (UNESCO, 2024). IALS & ALL: Literacy is using printed and written information to function in society to achieve one's goals and to develop one's knowledge and potential (National Center for Education Statistics, 2003). Demonstrated by the wide variety of definitions above, literacy is incredibly complex and difficult to define. The goal of the EKOEXCEL programme for pupils is to be able to read and comprehend a grade-level passage, as determined by the State Universal Basic Education Board (SUBEB). Unless otherwise noted, the EKOEXCEL programme aligns literacy expectations with the Hasbrouck-Tindal norms (see Appendix D).
lesson completion	Lessons are marked as completed if an educator teaches 80% or more of a scheduled lesson's content within 80-120% of the allotted time. The **rate** of lesson completion is therefore the proportion of lessons a teacher, school, district, etc. completes out of all scheduled lessons in a given timeframe.
levelling	Setting of the difficulty of curricula and lesson content based on pupils' learning levels and previous levelling decisions.
low- and middle-income country/ countries 'LMIC'	This report uses the World Bank's classifications of low- and middle-income countries (World Bank, 2024b): **Low-Income:** Countries with a gross national income per capita, calculated using the World Bank Atlas method, of $1,135 or less in 2022 **Middle-Income:** Countries with a gross national income per capita, calculated using the World Bank Atlas method, of $1,135 to $13,846 in 2022

Lower Secondary education	A level of education that requires the completion of Primary education, and lays the foundation for lifelong learning and human development upon which education systems may then expand further educational opportunities. Programmes at this level are usually organised around a more subject-oriented curriculum, introducing theoretical concepts across a broad range of subjects (UNESCO, 2011).
median	The middle data point in a sequentially ordered data set, or the average of the two middle data points in the set. (Ex. If the data set [2, 4, 7, 1, 2] is ordered sequentially, it becomes [1, 2, **2**, 4, 7] the middle value being 2. The median of this data set is therefore 2.)
non-reader	A pupil who, when presented with a passage, is unable to correctly read a single word aloud within a minute.
numeracy	Major organisations offer varying definitions of numeracy: **External Definitions of Numeracy** World Bank: The ability to make simple arithmetic calculations (World Bank, 2024a). UNESCO: The capacity of a person to engage in all those activities in which numeracy is required for effective function of his or her group and community (UNESCO, 2024). Because this report refers to both numeracy and mathematics, it is important to note that researchers often distinguish numeracy from mathematics by associating numeracy with skills involving numbers which are commonly utilised in day-to-day life (as opposed to higher level mathematics such as calculus) to a greater extent than mathematics (Dion, 2014; Ginsburg et al., 2006; HRSDC & Statistics Canada, 2005; Karaali et al., 2016). This report uses the terms numeracy and mathematics synonymously. Given existing international definitions, the goal of the EKOEXCEL programme is for pupils to be proficient in grade-level mathematics skills, as determined by SUBEB.
oral reading fluency	The rate at which a pupil can read a written text aloud (measured in the number of correct words read aloud from a passage within a minute, or 'cwpm').
phonemic awareness	The ability to understand that spoken words are made up of individual sounds or phonemes.
phonics	The process of learning to read an alphabetic language by correlating letters or groups of letters with sounds.

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

Abbreviations

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

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I. Preamble

Foreword by the Managing Director of EKOEXCEL, Enoh Ugbona

An equitable, quality-driven, and technologically-advanced education system is crucial to further Lagos State's economic growth and prosperity. The future of our State depends on today's children, and it is the education system that provides future graduates with the skills they need to drive long-term economic recovery. Thus, the Government of Lagos has continuously invested in and prioritised the development of the State's public education system. By integrating innovative technological solutions into classrooms across the state, the Government has enabled hundreds of thousands of children — both presently and in the future — to gain the knowledge, skills, attitudes, and values essential for shaping a sustainable future and contributing meaningfully to the economic development of Lagos State.

To ensure Lagos State remains the reference point for impactful, inclusive, and innovative education, the Lagos Government launched the EKO Excellence in Child Education and Learning (EKOEXCEL) programme in January 2020. EKOEXCEL harnesses the transformative power of technology to deliver outstanding learning outcomes to our children and better support their selfless educators. As of the end of the 2023-24 school year, 343,000 children participate in the programme, and 8,600 teachers have received comprehensive training, equipping them with the necessary tools and skills to facilitate a unique learning experience for children. This incredible expansion of the programme is a testament to the hard work and dedication of the State's educators, school leaders, and government.

The primary motivation for this substantial investment is to enhance public education for the benefit of Lagos State's youth. The global shift towards a knowledge-based economy demands that we prepare our children to engage competently and competitively with their peers worldwide. With a strong educational foundation, Lagos' children will be able to navigate a digital era where knowledge is vital for socioeconomic growth and sustainability. The EKOEXCEL programme is the direct result of Lagos State Government's commitment to strategically revitalising education and securing the future of its children.

Over the past five years, the programme has brought positive changes to Lagos' basic education system, achieving large gains in literacy and numeracy. This report highlights compelling evidence of progress, showing that pupils in EKOEXCEL schools are learning at a much faster rate than before the programme. Even children who could not read a single word are now advancing in their learning, because of EKOEXCEL. However, we must maintain the momentum of the successes achieved thus far. This is only the beginning of a larger mission to ensure that every child in Lagos has access to quality education and the opportunity to develop the skills needed to thrive as engaged, capable members of society.

I must commend the enthusiasm and commitment of the leadership of the Government of Lagos' education sector, particularly the Ministry of Education and Human Capital Development, as well as the Lagos State Universal Basic Education Board (LASUBEB). They have demonstrated remarkable determination in undertaking all that is required to bring about the most profound changes to Lagos' education system in a generation. Many thanks to all the teachers, children, and parents for their trust in the EKOEXCEL programme. I appreciate their willingness to work with the Lagos Government and their technical partners, without bias or prejudice, to transform the public education sector in the State.

In conclusion, this report documents the remarkable progress achieved after five years of substantial investment in reshaping the public education system of our dear State. These accomplishments must serve as a solid foundation for the continued growth and sustainability as we gain valuable insights and look towards the future. I hope you find this report useful in assessing the progress that the Government of Lagos State is making to deliver modern, high-quality education to all of Lagos' children, ensuring a brighter future for Lagos State.

Enoh Ugbona

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II. The EKOEXCEL Programme

Overview of the Programme

The Lagos 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 January 2020, it launched the EKO Excellence in Child Education and Learning (EKOEXCEL) programme. EKOEXCEL is a comprehensive, coherently designed programme that strengthens all aspects of public Primary education. It establishes a framework for effective management of the education system, improves teachers' pedagogical skills and professionalism, and raises pupils' learning levels across all subjects through adaptive approaches and a focus on foundational learning.

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

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

The 5 Pillars of the EKOEXCEL Programme

Box 1: Lagos State Government's Commitment to Education

The Government of Lagos State has continually demonstrated a strong commitment to improving the quality and accessibility of public education for all. Over the last two decades, the state government has enacted many initiatives targeting various facets of educational quality. These initiatives have aimed to increase enrolment, enhance support for secondary school pupils, and increase investments in learning materials and infrastructure, all of which are critical for elevating educational outcomes.

The Lagos State Government's commitment to strengthening its education sector is demonstrated through various strategic investments allocated within the state's expanding education budget. Since 2014, the education budget has increased by nearly 100 billion NGN (~80.5 million USD), and much of these investments have been targeted towards improving the quality of schools and education across the State (Lagos State Government, 2014; 2023). In 2019, the State commenced its initiative to recruit an additional 1,000 Secondary school teachers, as a means of improving the standard of Secondary education in Lagos (Olasupo, 2019). Further, in the last five years, the Lagos State Government has allocated more than 23 billion NGN (~18.5 million USD) towards constructing and upgrading school facilities across the State. By 2022, more than 1,000 schools had undergone infrastructural upgrades (Olabiyi, 2022), with an additional 126 new classrooms being constructed in 2023 (Nwannekanma et al., 2023). These investments not only enhance the quality of current schools but also expand access to schooling for children throughout the State.

Alongside increasing educational investments, the Lagos State Government has also shown its commitment to bringing more children into schools across the State. In 2019, the out-of-school population in Lagos State was estimated to be approximately 500,000 children (Oladunjoye & Edward, 2023). Unfortunately, the emergence of the COVID-19 pandemic in 2020 compounded this situation. Pupils across the State lacked essential resources for online learning, such as technology and internet accessibility, which led many pupils to either drop out of school or not return when schools reopened (Eze et al., 2021). To combat this, the Lagos State Government enacted Project Zero — a project designed to bring out-of-school children, and pupils at risk of dropping out during the transition back to in-person learning into schools (Lagos SUBEB, 2020). Since the implementation of Project Zero, the number of out-of-school children at the Primary level has decreased by more than 17,000 (Oladunjoye & Edward, 2023). As such, the ongoing efforts to reduce the number of out-of-school children continue to support the State's goal of enhancing learning for all.

In addition to successful efforts aimed at increasing enrolment, the government has implemented initiatives to improve education delivery and bolster learning outcomes across the State. From 2009 to 2016, the Lagos Eko Secondary Education Project served to enhance teacher training and professional development, improve standardised testing to better measure pupil learning, and offer more performance-based incentives for schools and teachers. By the conclusion of this initiative, JSS3 pupils' average scores on the Basic Education Certificate Examination (BECE) had nearly doubled, and the share of SSS3 pupils obtaining five credit passes[1] on the West African Senior School Certificate Examination (WASSCE) had improved by more than 150% (Roshan et al., 2016). Such improvements in learning outcomes highlight the government's progress in crafting a more equitable and accessible education system.

The strides taken by the Lagos State Government to strengthen its education system reflect the state's commitment to improve educational outcomes for current and future pupils. These efforts have contributed to enhancing educational outcomes for pupils across the State through targeted investments and expanding learning and development opportunities. To build upon these achievements and continue driving improvements across all aspects of teaching and learning, the Lagos State Government launched the EKOEXCEL programme in January 2020.

[1] A "five credit pass" means that a pupil obtained "Credit" or above in a minimum of any five subjects tested on the WASSCE, including English Language and Mathematics.

1. Teaching and learning materials

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

Detailed teacher guides

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

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

Pupil materials

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

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

Assessments

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

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

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

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

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

Teacher training

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

Induction training based on the "Big Four" pedagogical framework

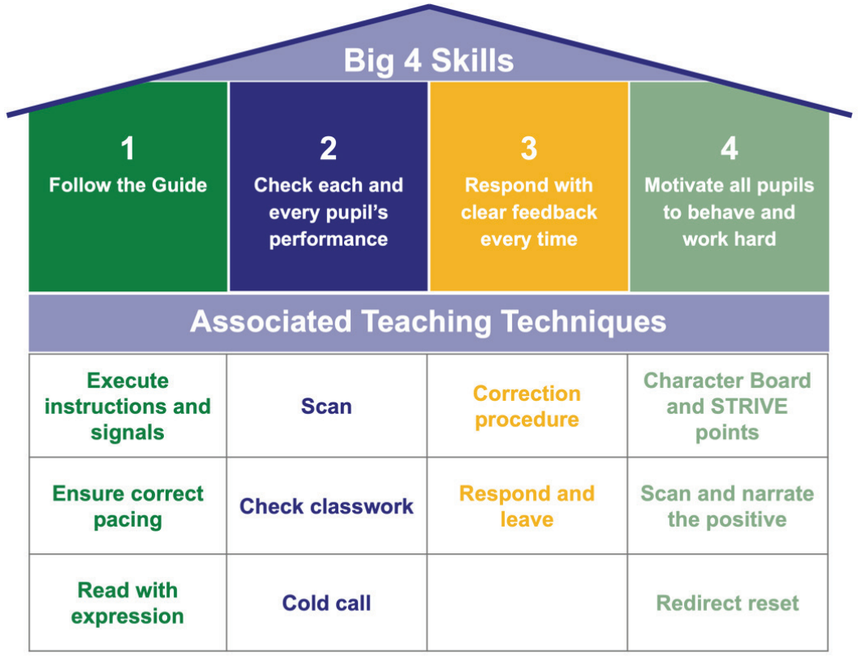
Every teacher in EKOEXCEL schools undergoes an intensive induction training programme that serves as the foundation for implementing the structured pedagogy approach. The 80-hour, in-person training is designed to help train all teachers on the use of the new teaching and learning materials (like the lesson plans) and effective foundational learning methodologies. The training programme is informed by scientific research on the teaching practices and habits of top decile teachers who have a proven track record of delivering large learning gains, and is centred around EKOEXCEL's core pedagogical framework, "**The Big Four Teaching Skills**":

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

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

Ongoing support and coaching for teachers

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



Support for school leaders and regional officials

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

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

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

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

3. Technology integration

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

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

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

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

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

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

> ***The EKOEXCEL programme is well structured, and it helps me as a teacher prepare for my lessons ahead of time by previewing the lesson guides. This gives more time to engage my pupils in the classroom during teaching, and it encourages the pupils to participate actively in the class.***
>
> *-Teacher, Ikeja LGA*

4. Community engagement

Creating and implementing a comprehensive community engagement strategy

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

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

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

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

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

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

Impact evaluation

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

"FACT": Principles Guiding the Design of EKOEXCEL's Impact Evaluations

Formalised evaluation plan

Clear plan
- All aspects of impact evaluation detailed in a **clearly outlined plan** at the outset
- Evaluation activities aligned with programme implementation, and inform programme governance

Policy aligned
- Evaluation plan is developed with full alignment and collaboration with government, in support of education policy goals

Accurate data collection

Frequent assessment
- Baseline assessment at launch to establish starting point
- Subsequent assessment within launch year to measure initial progress
- End-of-year assessments conducted yearly

Contextually relevant, validated assessments
- Foundational learning and curriculum assessments
- Internationally validated
- Locally relevant

Trained enumerators

Comprehensive training for enumerators (and government staff) in
- Assessment administration protocols
- Data entry procedures
- Random pupil selection procedures

to **ensure accurate data collection**

Data quality assurance protocols

Automated checks on collected data prevent errors or data falsification, and **ensure high data quality**

Credible statistical approaches

Appropriate sample sizes
- **Statistical power calculations** to ensure large enough sample size for confidence in results
- **Logistical and financial considerations** ensure manageable scale of data collection

Valid comparison groups

Programme impact calculated using analytical approaches such as
- Randomised control trials (RCTs)
- Difference-in-differences

to enable **benchmarking of learning gains relative to a valid comparison group**

Random selection of pupils and schools
- Randomly selected schools within treatment and comparison groups
- Randomly selected pupils within schools for each round
- Results from the **sample** are **representative** of the treatment and comparison groups

Transparent reporting of results

Formal reports
- Presented to government, local academics, and other stakeholders
- Communicated in public-facing reports

Timely internal reporting
- Communicated to internal stakeholders and jointly analysed to inform continuous programme improvement

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

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

Ongoing monitoring of learning outcomes

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

Ongoing monitoring of other key performance indicators

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

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

III. Methodology to Quantify the Cumulative Impact of the Programme

A key component of the EKOEXCEL programme is the systematic monitoring of the gains achieved across educational outcomes and the identification of areas that require further attention. Through ongoing monitoring, programme leaders can understand how the programme has impacted learning growth thus far, celebrate the milestones that have been reached since the programme's launch, and determine appropriate directions for continued improvement in the future. To that end, this report documents relevant information on the educational outcomes in the state of Lagos prior to and throughout the implementation of the EKOEXCEL programme.

Analytical Approach to Measure the Cumulative Impact of the EKOEXCEL Programme

As the EKOEXCEL programme has been operational across all public Primary schools in the state since the start of the 2020-21 school year, there is not a suitable group against which to benchmark learning outcomes in EKOEXCEL schools. Therefore, this study examines the cumulative impact of the programme — i.e. the effect of the programme in EKOEXCEL schools over the course of five school years of implementation — utilising a **descriptive analysis** to monitor the learning levels in EKOEXCEL schools over time.

For this approach, data were collected as "repeated cross sections" (representative snapshots at each timepoint) rather than as a panel (following the same cohorts of pupils across time). Because these cross sections were taken at different points in the year, and because pupils are expected to grow over the course of a year, it would not be a fair estimation of impact across years to compare learning levels measured at different points in the school year. To enable comparisons at equivalent points in the school year (i.e. the end of Term 3), actual baseline measurements taken at launch (beginning of Term 2 of the 2019-20 school year) were projected to estimate the expected learning levels at the end of Term 3 of the previous (2018-2019) school year. These projected levels were used as the benchmark against which levels measured at the end of 2023-24 were compared, enabling the analysis of the programme's impact after five school years (Figure 3.1). See Appendix F for more details on how projections were calculated for this study.

Timeline for Measuring Cumulative Impact

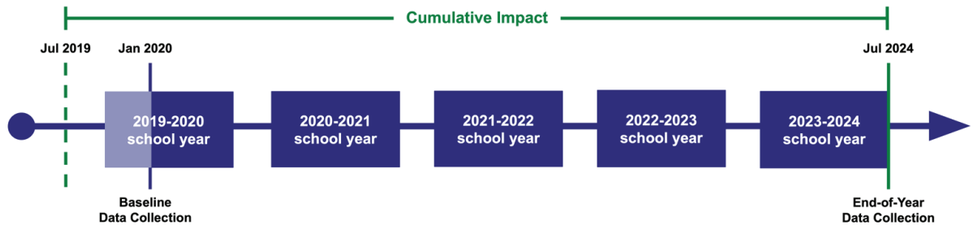


Figure 3.1

Sampling Framework for Schools and Pupils

Schools included in this study

To assess pupils' learning levels at the start of the programme, a random sample of 30 schools from the first cohort that joined the EKOEXCEL programme were assessed in January 2020 (start of Term 2 of the 2019-20 school year). These 30 schools were representative of all 294 schools where EKOEXCEL was initially launched during the 2019-20 school year. The same 30 schools were then followed up with during the July 2024 (end of Term 3 of the 2023-24 school year) round of data collection, enabling the measurement of the programme's impact over the last five school years. Further, following up on the same 30 schools also ensures that any observed changes in performance are due to the programme's impact rather than due to shifts in the schools included in the evaluation.

Pupils assessed for this study

Across the schools that were visited, data were collected from a representative subsample of pupils. At the launch of the programme in January 2020, pupils were randomly sampled from three grades: Kindergarten, Primary 2, and Primary 5. For the July 2024 rounds of data collection, the sample was expanded to include pupils from all grades — Kindergarten through Primary 6 — as part of EKOEXCEL's ongoing efforts to strengthen the precision of the data. For the grades not assessed in January 2020 — i.e, Primary 1, Primary 3, Primary 4, and Primary 6 — the learning levels for the end of Term 3 (2019-20) were projected using the data available from the start of Term 2 (2019-20) (see Appendix F for more details).[2]

Within the 26 schools that were assessed, approximately eight pupils were randomly sampled from each grade for each assessment. As the sampling approach for this study consists of "repeated cross sections" of pupils within the same schools, it tracks the same schools over time but not necessarily the same group of pupils within these schools over time. Instead, a new sample of pupils is randomly selected for each round of data collection. Therefore, while each sample of pupils is broadly representative of their respective school and grade, the data shown in this report are not meant to represent individual pupils' progress over time.

Learning Assessments Used for This Analysis

Early Grade Reading Assessment (EGRA)

The Early Grade Reading Assessment (EGRA) was used to measure pupils' foundational English literacy skills. More specifically, it measures early reading acquisition by assessing critical skills that Primary-age pupils need in order to read with understanding. Since its launch in 2006, EGRA has been adapted for use in more than 65 countries around the world in over 100 languages, allowing for accurate comparisons of foundational English literacy outcomes across various contexts (Dubeck & Gove, 2015). EGRA contains several sub-tasks to measure pupils' literacy skills, such as initial sound recognition, letter name and sound recognition, listening comprehension, familiar word and nonword reading, oral reading fluency, and reading comprehension (see Appendix B for a detailed description of each sub-task). The number of included sub-tasks varies depending on the context of the EGRA as it is administered; the sub-tasks included on the EGRA for each grade in this study can be found in Table 3.1.

At baseline (January 2020), EGRA was administered to pupils in Kindergarten, Primary 2, and Primary 5. At the end of the 2023-24 school year (July 2024), EGRA was administered to pupils in Kindergarten through Primary 6. All sampled grades, with the exception of Kindergarten, were assessed in oral reading fluency and reading comprehension. Oral reading fluency — the ability to read quickly, accurately, and with expression — was assessed in correct words per minute (cwpm) on a Primary 2-level passage. In other words, this measure assessed how quickly and accurately a pupil can read a passage aloud in one minute. Reading comprehension — the ability to understand what is being read — was assessed using questions about the same passage used for measuring fluency. In addition to being assessed with a Primary 2-level passage, Primary 5-6 pupils were also assessed in oral reading fluency and comprehension using a Primary 5-level passage (see Appendix A for the reading passages used).

[2] Learning levels could not be projected for Primary 6, as projections were limited to grades with defined starting and ending points based on the known learning outcomes of Primary 2 and Primary 5.

Table 3.1: Overview of EGRA Sub-Tasks Administered by Grade

EGRA Sub-task	Kindergarten	Primary 1-4	Primary 5-6
Listening Comprehension	✓		
Letter Sound Knowledge	✓	✓	
Identify Onset Sounds	✓	✓	
Non-Word Reading	✓	✓	
Familiar Word Reading	✓	✓	
Oral Reading Fluency		✓	✓
Reading Comprehension		✓	✓

Early Grade Mathematics Assessment (EGMA)

The Early Grade Mathematics Assessment (EGMA) was used to measure pupils' foundational numeracy skills at the start of the programme. Developed shortly after the EGRA, this assessment has been adapted for use in more than 15 countries around the world and serves as a valuable tool for examining how pupils within a country are performing relative to curricular expectations (RTI International, 2014). EGMA assesses proficiency in areas such as numeracy and operations, the metric system, and geometric figures, although the specific subskills measured vary somewhat by grade, based on the national curriculum, test intention and development levels (see Appendix B for a detailed description of the subskills included in the EGMA).

EGMA was administered to Kindergarten, Primary 2, and Primary 5 pupils at baseline (January 2020) and at the end of the 2023-24 school year (July 2024), using appropriately-levelled assessments for each grade (see Table 3.2 for the skills assessed in each grade). While EGMA is useful for assessing foundational numeracy, it is not designed to assess the numeracy skills of pupils in upper-Primary grades. Therefore, in subsequent rounds of data collection, a more grade-appropriate numeracy assessment was administered to Primary 1-6 pupils (see the "Methodology to Quantify the Annual Impact of the Programme" section for more details). However, to maintain comparability from the start of the programme to the end of the 2023-24 school year, EGMA continued to be administered to Kindergarten, Primary 2, and Primary 5 pupils. For the grades that were not assessed with EGMA — i.e. Primary 1, Primary 3, Primary 4, and Primary 6 — learning levels were projected for both rounds of data collection (see Appendix F).

Table 3.2: Overview of EGMA Sub-Tasks Administered by Grade

EGMA Sub-task	Kindergarten	Primary 2	Primary 5
One-to-one Correspondence	✓		
Number Identification	✓		
Quantity Discrimination	✓	✓	
Addition Level I	✓	✓	
Addition Level II		✓	✓
Subtraction Level I		✓	
Subtraction Level II		✓	✓
Word Problems		✓	✓
Multiplication			✓
Division			✓

Summary of assessments

Table 3.3 summarises the assessments administered to evaluate the cumulative impact of the EKOEXCEL programme. Refer to Appendix G for an overview of the data quality assurance protocol used to analyse the results from these assessments.

Table 3.3: Summary of Assessments Used to Evaluate Cumulative Impact

Grade	January 2020 (Start of Term 2 of the 2019-20 School Year)	July 2024 (End of Term 3 of the 2023-24 School Year)
Kindergarten	EGRA, EGMA	EGRA, EGMA
Primary 1	—	EGRA
Primary 2	EGRA, EGMA	EGRA, EGMA
Primary 3	—	EGRA
Primary 4	—	EGRA
Primary 5	EGRA, EGMA	EGRA, EGMA
Primary 6	—	EGRA

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

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

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

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

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

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

IV. The State of Learning in Lagos Before EKOEXCEL

Average foundational literacy levels were low across all Primary grades

Prior to the launch of the EKOEXCEL programme, reading fluency scores in Lagos Primary schools were low, evidencing the fact that many children were off track from ever becoming strong readers. For example, at the start of Term 2 of the 2019-2020 school year, the average Primary 3-4 pupil in Lagos could only read 30 cwpm of a Primary 2-level passage (Figure 4.1). These levels of performance do not meet the most lenient thresholds in education research for what is considered 'fluent', according to which pupils must be able to read at a minimum of 45–60 cwpm to understand a text well and reap the benefits of literacy (Abadzi, 2012).

Figure 4.1

These low average reading fluency rates were driven, in part, by the large number of pupils who could not read at all; close to one-third of the sample could not read a single word from a Primary 2-level passage at the start of Term 2 of the school year. These poor outcomes persisted even in higher classes, such as Primary 4 and 5, where 22% and 10% of pupils, respectively, were unable to read a single word of a Primary 2-level passage after a full term of instruction (Figure 4.2). Such low literacy levels have negative implications for pupils' capacity to access learning across other subjects, as they indicate that pupils did not possess the minimum levels of literacy needed to read or understand grade-level content. Further, these findings indicate that a large 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.

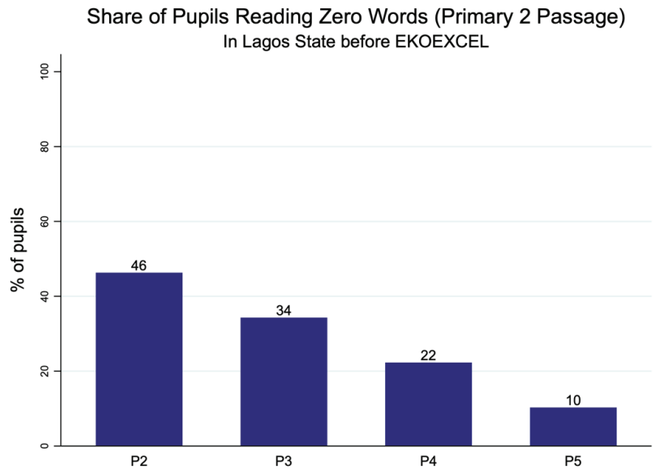


Figure 4.2

A lack of foundational knowledge posed challenges for pupils when engaging with more advanced literacy skills, such as reading comprehension

As a result of these critically low reading fluency levels, reading comprehension was extremely low among Primary pupils. On average, pupils in EKOEXCEL schools scored approximately 10% on a reading comprehension assessment by the second term of the school year. Even in upper Primary (Primary 4-5), the average score was only 16.5%. In fact, 45% of all upper-Primary pupils were unable to answer a single reading comprehension question at this point in the school year, and only 25% of pupils could answer more than three out of five questions correctly. These results are not surprising given that a certain level of fluency is needed to comprehend a text, and the median pupil who scored 0% on reading comprehension was not able to read a single word of a Primary 2 passage correctly. Without the ability to comprehend written text, pupils were unable to benefit from academic materials across all subjects. Therefore, these low comprehension levels were a severe hindrance to the academic potential of children within Lagos State.

V. The Cumulative Impact of the Programme

At the conclusion of the 2023-24 school year, after five school years of implementation for the first cohort of EKOEXCEL schools, pupils have demonstrated meaningful gains in learning. The average pupil is fluently reading English at a substantially faster rate, and pupils are performing more than two grade levels ahead in maths compared to their peers at the start of the programme. Notably, these gains were achieved despite substantial disruptions to education caused by prolonged school closures during the COVID-19 pandemic. EKOEXCEL's sustained success, even after five years of implementation, demonstrates its ability to enhance the return on educational investment in Lagos State. This achievement is driven by continuous support for teachers and pupils, high-quality instructional materials, and a transformative approach to learning.

Box 3: The Continuity of Learning in EKOEXCEL Schools During COVID-19

The emergence of the COVID-19 pandemic in early 2020 induced prolonged school closures around the world, impacting approximately 1.6 billion pupils from pre-Primary to higher education (United Nations, 2020). From March 2020 to February 2021, schools were fully closed for an average of 95 instructional days globally — approximately half the time intended for classroom instruction over this period (UNICEF, 2021). This led to significant learning loss worldwide; on average, pupils lost the equivalent to half a year of learning (Patrinos et al., 2022), with lower-performing pupils experiencing much larger learning losses (Angrist et al., 2021a; Jakubowski et al., 2023). In sub-Saharan Africa — where nearly 90% of pupils were experiencing learning poverty[3] prior to the pandemic (Beeharry, 2019) — pupils who were in Grade 3 when schools closed are expected to lose at least 1.5 years' worth of learning by Grade 10 (Angrist et al., 2021a; Kaffenberger, 2021b). While the extent of learning loss varied across contexts, the impact of the COVID-19 pandemic on education was universally experienced, with the most disadvantaged pupils likely being the most negatively affected.

During this time, education systems were required to quickly adapt measures for remote learning to ensure learning continuity. These systems responded in various ways, depending on factors such as political will, resource availability, and internet accessibility (Meinck et al., 2022). For instance, in many high-income contexts, resources to support remote learning, such as virtual learning environments, digital learning materials, and grade reporting systems, were already established prior to the pandemic, facilitating a quicker transition to online learning. In some of these contexts, pupils and teachers in need were provided with digital learning devices, like tablets or laptops. In other regions where technology and/or internet accessibility were challenges, paper-based resources were also distributed to support the continuation of learning. Additionally, some education systems arranged television and radio broadcasts as an alternative way to distribute lessons without internet. These measures, while potentially effective, only represent a small portion of how global education systems responded to the COVID-19 pandemic; many systems — especially in LMIC — did not have the capacity or support needed to implement effective or long-term solutions. As a result, many school systems either made minimal adjustments, or relied on inconsistent, ultimately ineffective, solutions.

The Lagos State Government launched the EKOEXCEL programme in January 2020, approximately two months before schools were closed across Nigeria. In response to national school closures, EKOEXCEL adapted by launching the **EKOEXCEL@Home** programme to continue supporting learning across its schools. The EKOEXCEL@Home programme took a multi-faceted approach to accommodate pupils with diverse needs and varying levels of accessibility. The key components of EKOEXCEL@Home included digital lesson plans that were aligned with the national curriculum, digital self-study packages with foundational literacy and numeracy practice problems, digitised storybooks from African Storybook, a WhatsApp mobile quizzing platform, and the statewide distribution of MP3 players that were uploaded with audio lessons. The

[3] "Learning poverty" is defined as the percentage of children who fall below a minimum reading proficiency level, as outlined by the Global Alliance to Monitor Learning (n.d.).

combination of strategies ensured that there were ample opportunities for pupils to learn, ensuring that their schooling was not hindered by a lack of access. These were laudable efforts from the Lagos State Government, and allowed pupils in EKOEXCEL to remain on a positive learning trajectory — as reflected in the results of this report.

Despite the significant challenges posed by the COVID-19 pandemic, the EKOEXCEL programme remained committed to delivering high-quality education, even in the absence of in-person instruction. EKOEXCEL@Home played a crucial role in mitigating widespread learning loss, ensuring the continuation of learning during the six-month period of school closures in Nigeria. In this sense, the fact that pupils across EKOEXCEL schools have seen significant improvements in learning outcomes throughout the duration of the programme — as documented in the current report — further highlights the programme's effectiveness in facilitating learning gains for its pupils.

Foundational Literacy

The share of non-readers considerably decreased across all grades

The EKOEXCEL programme has been highly effective in reducing the number of non-readers — those reading 0 correct words per minute. For instance, prior to the introduction of the programme (i.e. the end of Term 3 of the 2018-2019 school year), 38% of Primary 2 pupils were unable to read a single word of a grade-level passage within one minute.[4] **By the end of the 2023-24 school year, after five school years of programme implementation, the share of non-readers in the average Primary 2 class has dropped to 12%, decreasing by 26 percentage points** (Figure 5.1).

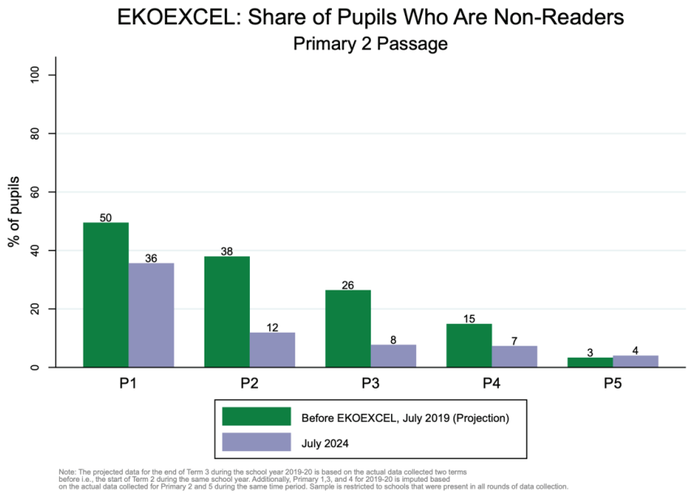


Figure 5.1

[4] Data collected at the start of Term 2 of the 2019-2020 school year were projected to estimate the average learning levels at the end of Term 3 of the 2018-2019 school year. Additionally, data for Primary 1, 3, and 4 are projected based on the actual data collected for Primary 2 and 5 during the same time period. Refer to the Methodology section for more details.

This improvement represents more than two school years' worth of additional progress for pupils who joined the programme at its launch; in these schools, **there are now fewer non-readers in the average Primary 2 classroom than there were in the average Primary 4 classroom prior to the launch of the programme**. Similar trends can be observed in Primary 3 and Primary 4, where the share of non-readers was reduced by more than half. This reduction in non-readers signifies that more pupils are able to read with some degree of fluency — a crucial first step to achieving foundational literacy.

Pupils substantially improved their ability to read fluently in English

Across all grades, the EKOEXCEL programme markedly improved pupils' performance in English reading fluency. **The average pupil in Primary 2-4 is reading 18 more cwpm of a Primary 2-level passage than pupils in these grades did before the programme, a gain equivalent to ~1.3 additional years of learning beyond what would have occurred without EKOEXCEL** (Figure 5.2). Primary 3 saw the largest improvements in this skill, with pupils reading an average of 23 more words per minute than their peers at the start of the programme. To situate these results within a broader global context, the average Primary 3 pupil in an EKOEXCEL school can read 17 more cwpm than the average Primary 3 pupil across 17 other LMIC (Abadzi, 2011). This indicates that pupils are not only improving relative to their peers prior to the programme, but are also becoming more competitive on a global scale. Additionally, pupils across Primary 3-5 are now reaching reading fluency levels at or above 45-60 cwpm, which researchers identify as the threshold at which pupils begin to comprehend a text (Abadzi, 2012). Given these fluency levels, pupils in Primary 3-5 are much better positioned to understand and engage with their learning materials.

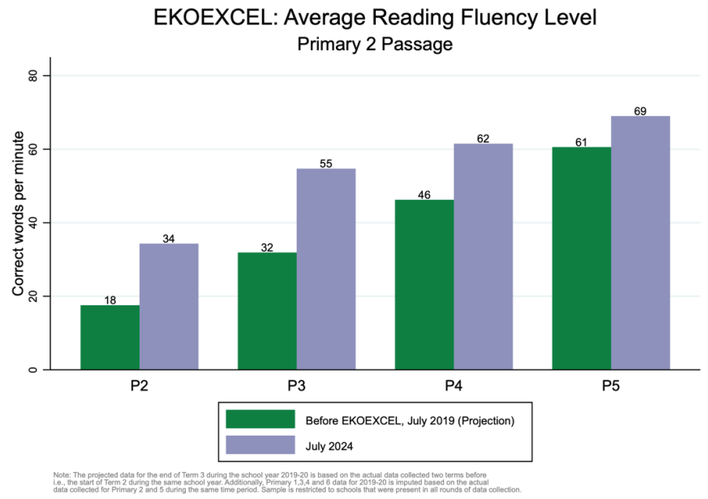


Figure 5.2

> ***The programme has helped me to be better in aspects like spelling and improving my English.***
>
> *-Primary 6 pupil, Agege LGA*

The observed gains in reading fluency were accompanied by even larger improvements in pupils' reading comprehension skills. **In typical Primary 2-5 classrooms, average reading comprehension scores improved by 39 percentage points, increasing from an average of 21% to 60%.** In other words, the average pupil is able to correctly answer two more comprehension questions (out of five) compared to before the programme. The largest improvements occurred in lower grades; in Primary 3, for instance, average scores increased by 47 percentage points. In Primary 2, average scores increased fivefold, with pupils achieving scores that are 13 percentage points (39%) higher than those in Primary 5 prior to the start of the programme (Figure 5.3). These gains are equivalent to gaining 5.25 additional years of schooling in the average Primary 2-3 classroom. Considering that reading with comprehension is the ultimate goal of literacy, the fact that EKOEXCEL pupils are reading and comprehending passages at much higher rates than before the programme is indicative of the substantial progress they have made towards achieving foundational literacy. Importantly, the benefits of developing these skills extend beyond English classes, enabling pupils to meaningfully engage with the curriculum and improve their performance across various core subjects.

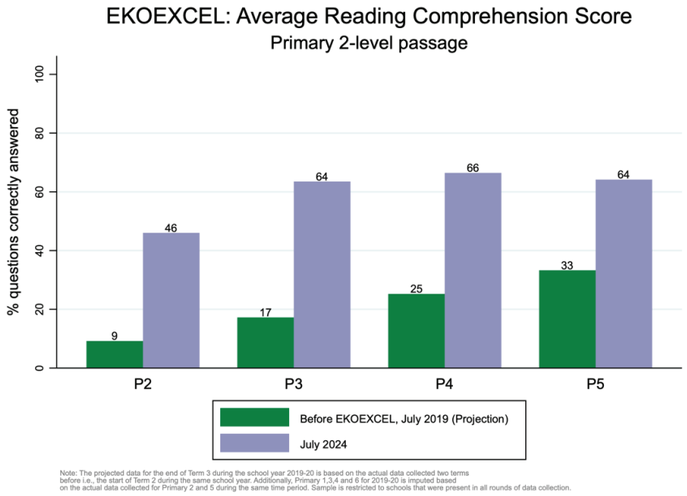


Figure 5.3

The programme is successfully targeting early literacy development in ECCDE

In addition to the improvements in literacy outcomes in Primary 2-5, pupils in ECCDE classes notably improved their proficiency in pre-literacy subskills (e.g., letter sound recognition, familiar word reading, and phonemic awareness), evidencing the programme's ability to reach pupils in the earliest stages of their literacy development. For instance, ECCDE classrooms saw an improvement of more than 22 percentage points in pupils' letter sound recognition skills. Moreover, there has been substantial progress in familiar word reading — the ability to automatically recognise and read words without sounding them out (Wolf, 2018). Specifically, **the average EKOEXCEL pupil in an ECCDE class improved their familiar word reading skills by 9 cwpm, a 450% increase, within five school years.** Pupils in Primary 1 and Primary 2 showed large gains in this skill as well, improving by 7 and 16 cwpm, respectively (Figure 5.4).

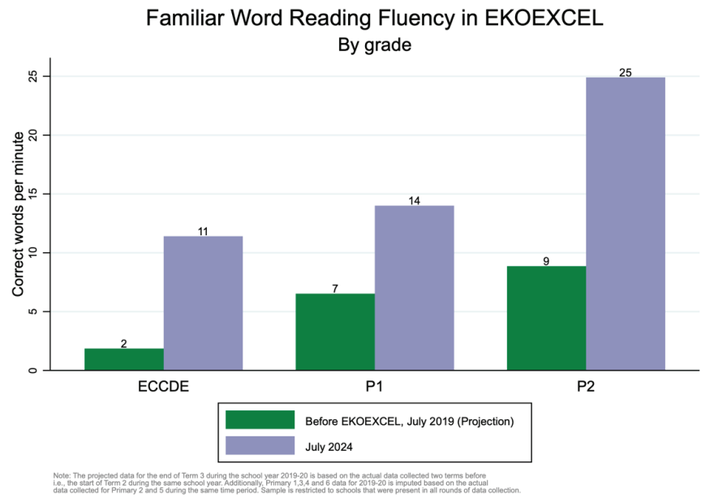


Figure 5.4

These improvements in pre-literacy skills for ECCDE pupils signal continued improvements in foundational literacy in the early Primary grades, and in turn, continued successful engagement with more advanced curricular content in later grades. ECCDE pupils are not only expanding their vocabulary, but also improving their automaticity — the ability to recognise and decode words effortlessly — a key component of reading with fluency. With automaticity, pupils expend less effort on decoding and can focus more on understanding a given text (Aldhanhani & Abu-Ayyash, 2020). Therefore, the observed progress in these skills indicates that EKOEXCEL pupils are successfully building the foundation for reading with fluency and comprehension. Further, it indicates that the programme is effectively equipping early-grade pupils with the skills needed to thrive under the English medium of instruction in EKOEXCEL schools. See Box 4 for more insight on the importance of early childhood education.

Box 4: Investing in Early Childhood Education as a Foundation for Future Learning and Economic Returns

Early childhood education — systemic services designed to foster early learning before Primary education — represents one of the most impactful socioeconomic investments a government can make. The formative years from birth to age five are critical for the development of working memory, cognitive flexibility, and empathy, providing a unique opportunity for early cognitive and socio-emotional growth that significantly influences a child's academic future (Diamond, 2013). Research consistently shows that preschool cognitive skills can predict later educational outcomes, such as enrolment in secondary education, in diverse contexts including Guatemala and The Gambia (Palacios et al., 2022; Milosavljevic et al., 2023). These benefits extend to Primary education, where children who have participated in early childhood programmes exhibit higher attendance rates, better academic achievement, and are less likely to repeat grades or require remedial support (Berlinski & Schady, 2015; Naudeau et al., 2011). Thus, investment in early childhood education pays large academic dividends later in children's lives.

Given the significant returns early childhood education can yield, particularly in systems with low learning outcomes, it is clear that investments in this sector can be highly advantageous. This is true economically as well as academically; high-quality early childhood programmes can yield up to a 13% annual return per child (Heckman & Masterov, 2007), through reduced dropout rates and the development of a more productive workforce. Additionally, large-scale construction of pre-Primary schools and childcare subsidies in low-income communities has been shown to boost maternal employment, further strengthening the workforce (Berlinski & Galiani, 2005, Green & Mostafa, 2011). Despite the need for substantial initial investments to scale and enhance pre-Primary education, the long-term macroeconomic benefits generally surpass the costs, offering a promising return on investment for governments and stakeholders (Sawhill et al., 2006). That said, these benefits can only be realised if pre-Primary education is made accessible, particularly to low-income families.

Particularly in low- and middle-income countries with under-resourced education systems, there are not enough accessible early childhood education programmes for all children to benefit. As of 2022, global enrolment in early childhood education programmes was estimated to be 62% (Bendini et al., 2022). Furthermore, in many contexts where these programmes have expanded, it has occurred without a comprehensive and coherent systems approach. The absence of adequate teacher training and support, quality curricula, and quality assurance frameworks has led to fragmented expansion and inadequate quality. Expanding access to early childhood education without sufficient quality constitutes an inefficient use of limited resources that may bring about negligible or even detrimental effects on learning. Yet entry and training requirements, as well as training opportunities for early childhood education teachers, are often the lowest in education systems. Even with low entry requirements, just 44% of early childhood education teachers in low-income countries have received at least the minimum pre- and in-service training required for teaching at the early childhood education level in their country, compared with 72% of Primary school teachers (UNESCO, 2020).

High-quality early childhood education programmes are a high-yield, cost-effective tool through which governments can bolster pupil achievement, national economic progress, and educational efficacy. Broadening access to early childhood education and investing in the structures that will ensure quality will be a critical component of equipping future generations with the ability to meaningfully contribute towards shaping a better future.

The share of pupils experiencing learning deprivation has drastically declined

The learning gains in foundational literacy achieved through the EKOEXCEL 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" (see Box 5 for more insights on learning deprivation as it relates to tracking global learning poverty). Learning deprivation is generally understood as the percentage of children who, by the end of Primary school, do not meet a minimum proficiency level for reading, as defined by the Global Alliance to Monitor Learning (World Bank, 2021). To analyse the extent of this in the context of EKOEXCEL schools, a metric akin to learning deprivation is estimated by measuring the percentage of pupils who are unable to answer four out of five reading comprehension questions from a Primary 2-level passage. Using this metric, **the share of Primary 2-5 pupils that are experiencing learning deprivation decreased by 40 percentage points after five years of programme implementation** (Figure 5.5). In a typical Primary 4 classroom, the share of pupils facing learning deprivation decreased by 50 percentage points. In other words, the proportion of Primary 4 pupils able to answer at least one reading comprehension question correctly increased from 10% to 60% — meaning six times as many pupils are now able to derive meaning from the texts they are reading compared to before the programme — enabling teachers to reach a much larger share of their class with instruction. Further, reductions in this metric indicate that EKOEXCEL is effectively preparing more pupils to excel in a globally competitive environment and meaningfully participate in society.

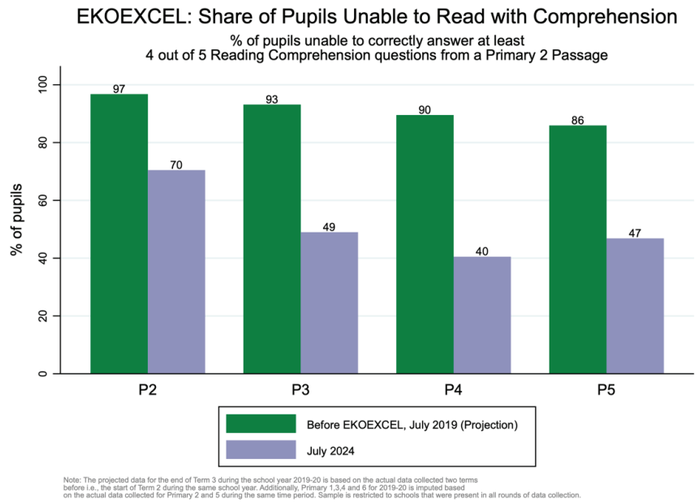


Figure 5.5

Box 5: "Learning Poverty": Tracking Progress Towards Global Development Goals

Over the past 50 years, access to education has greatly improved worldwide, resulting in more children enrolling in school than ever before. Despite this progress, millions of children — particularly those in low- and middle-income countries (LMIC) — are still not acquiring the foundational skills needed to succeed in school, thrive in the workforce, or, ultimately, contribute meaningfully to society (World Bank, 2018). For instance, the average child in a LMIC is expected to complete 10.4 years of schooling, yet, when adjusting for expected learning productivity, this equates to only 6.6 years of effective schooling (World Bank, 2020a). These numbers are symptomatic of a severe learning crisis, in which poor learning outcomes across many LMIC grossly undermine the potential for future social and economic development. If this trend persists, today's generation of pupils risks missing out on $21 trillion in lifetime earnings, equivalent to 17% of the current global GDP (World Bank, 2022).

Recognising the critical importance of improving learning outcomes for economic development, the United Nations established Sustainable Development Goal (SDG) 4, which aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." As part of this goal, SDG 4.1.1(b) focuses on ensuring that all children can read proficiently by the end of Primary school (United Nations, n.d). Tracking progress towards SDG 4 has necessitated a standardised metric capable of capturing the extent of the learning crisis across diverse contexts. To address this need, the World Bank and UNESCO Institute for Statistics jointly developed the concept of "learning poverty". Learning poverty — defined as being unable to read and understand a simple text by age 10 — is a combined measure of two factors: "learning deprivation," the share of children who read below a minimum proficiency level at the end of Primary school, as defined by the Global Alliance to Monitoring Learning, and "schooling deprivation", the share of Primary school-aged children who are out of school (World Bank, 2021).

The learning poverty metric provides a clear picture of pupils' current learning levels worldwide. Unlike other metrics, whose scope is often limited to in-school children and/or the use of a specific assessment, the learning poverty metric measures reading proficiency using a wide range of data across multiple assessments, while also accounting for out-of-school children — thus enabling fair comparisons across varying contexts. Importantly, having a standardised concept that is comparable across contexts enables LMIC to gauge their progress relative to other nations, which allows policymakers to gain a clearer understanding of the current state of learning and, in turn, develop targeted strategies to improve learning outcomes.

As it presently stands, the state of global learning poverty is dire, with an estimated 70% of children in LMIC experiencing learning poverty (World Bank, 2022). However, there are several strategies that education systems can implement to accelerate learning and reduce learning poverty, including the use of structured pedagogy, targeted instruction, and data-driven strategies supported by consistent monitoring and evaluation. Several successful examples already exist; for example, in a government school programme in Kwara State, Nigeria, structured pedagogy and teacher training resulted in a 17-percentage-point reduction in learning poverty among Grade 5 pupils after 43 weeks of instruction. A similar programme in Rwanda achieved a 39-percentage-point reduction in learning poverty among Grade 3 pupils within 17 weeks of instruction. These examples highlight the large impact that targeted interventions can have on learning outcomes. When fully implemented with strong support from all stakeholders, such interventions can significantly improve learning outcomes both in the short and long term. By continuing to use the learning poverty metric to monitor progress, LMIC can implement more effective interventions, driving sustained improvements in foundational learning outcomes and supporting broader economic development.

Foundational Numeracy

Pupils have shown considerable progress in mathematics proficiency

After five school years of programme implementation, the EKOEXCEL programme has considerably improved pupils' maths skills. For instance, across ECCDE to Primary 2, average scores in addition without carrying (i.e. 8+7) improved by 30 percentage points. ECCDE classrooms saw the largest gains in this skill: only 12% of pupils in this grade could correctly solve '8+7' prior to the start of the programme, but by the end of the 2023-24 school year, nearly half of pupils (48%) are able to solve this problem (Figure 5.6). Importantly, this proportion is 23% greater than that of Primary 2 pupils who were able to solve this problem at the start of the programme, indicating that **the average ECCDE pupil is now performing more than two grade levels ahead of where they would be without EKOEXCEL**.

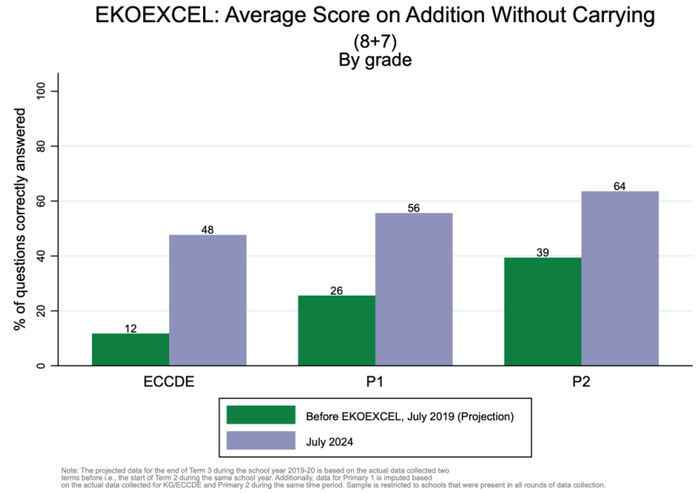


Figure 5.6

Similar to the outcomes in more simple addition problems, Primary grades saw large improvements in the ability to correctly solve more complex addition problems. On average, pupils in a typical Primary 2-5 classroom improved their performance in addition without carrying (i.e. 11+17) by 24 percentage points, an 81% improvement in five school years. Primary 2 and Primary 3 pupils saw the largest improvements in this skill; **in a typical Primary 2 classroom, average proficiency improved by 38 percentage points, more than doubling after five school years and nearly reaching the proficiency level of Primary 5 pupils prior to the programme** (Figure 5.7). Similarly, the average Primary 3 pupil outscored their pre-programme peers by 28 percentage points — surpassing the average Primary 5 pupil prior to the start of the programme. In other words, the average Primary 2-3 pupil is more than two grade levels ahead of their peers prior to the launch of the programme.

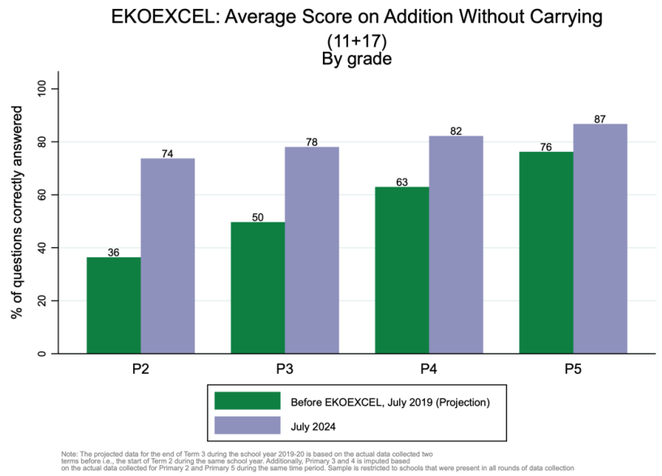


Figure 5.7

These large improvements are also reflected across other subskills, including subtraction without borrowing (i.e. 28-17). In a typical Primary 2-5 classroom, average proficiency improved by 28 percentage points over the course of five school years (Figure 5.8). Notably, proficiency improved by 36 percentage points in Primary 2, meaning the average Primary 2 pupil is now outperforming those who were in Primary 5 at the start of the programme.

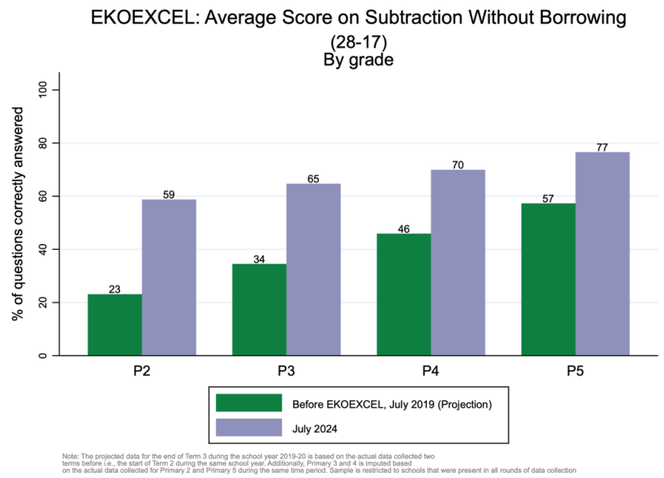


Figure 5.8

> ***[Teachers] believe the programme is a new innovation to education in Lagos State and they are happy to be part of the system. It also makes teaching and learning easier and gives the pupils the opportunity to compete with counterparts across the State.***
>
> *-Head Teacher, Epe LGA*

The observed improvements in operational maths problems have translated into even larger gains in solving word problems

Pupils' proficiency in solving operational maths problems (i.e. problems where only numbers are shown) is a strong indicator of their ability to solve problems that mirror real-life situations, which they are likely to encounter both in and out of school. In EKOEXCEL schools, pupils not only considerably improved in solving problems in the operational sense, but also in the ability to apply those skills to real-life problems. All grades from Primary 2 to Primary 5 made large improvements in their ability to solve mathematical word problems, although early grades such as Primary 2 and 3 saw the largest gains. For instance, pupils in a typical Primary 2 classroom can now correctly answer 62% of the word problems (e.g. "5 children are playing a game. 3 more children join the game. How many children are playing the game altogether?"), up from 28% prior to the start of the programme (Figure 5.9). Pupils' ability to solve word problems not only evidences improvements in numerical proficiency, but also reflects the gains observed in reading comprehension as well, as pupils must possess a certain level of comprehension to be able to understand the contents of a word problem. Therefore, the observed improvements in solving word problems are evidence that more time spent receiving the programme's instruction translates into compounding positive results across multiple subjects.

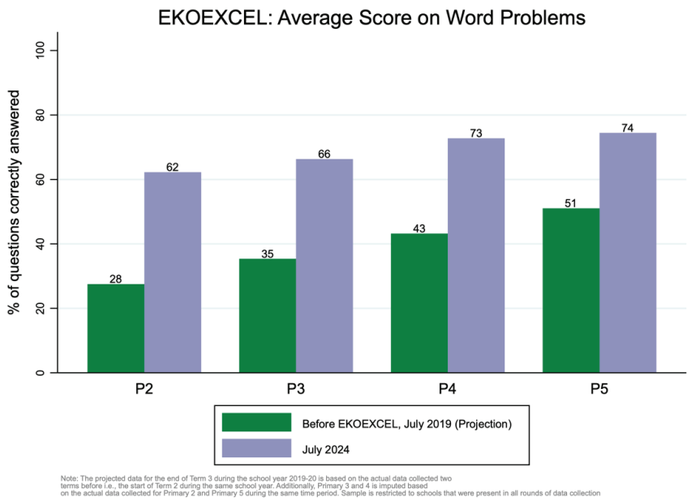


Figure 5.9

VI. Methodology to Quantify the Annual Impact of the Programme

Analytical Approach to Measure the Annual Impact of the EKOEXCEL Programme

In addition to describing the programme's cumulative impact, this study also examines how EKOEXCEL, in a mature phase of implementation, is operating year-to-year. To this end, **annual impact** over the course of the most recent (2023-24) school year is analysed by comparing learning levels measured at the end of the 2023-24 school year with those at the end of the previous (2022-23) school year. Building on the timeline in Figure 3.1 in the "Methodology to Quantify the Cumulative Impact of the Programme" section, Figure 6.1 includes the analysis period and data collection rounds for quantifying annual impact, illustrating how this analysis fits within the broader cumulative impact analysis.

Timeline for Measuring Programme Impact

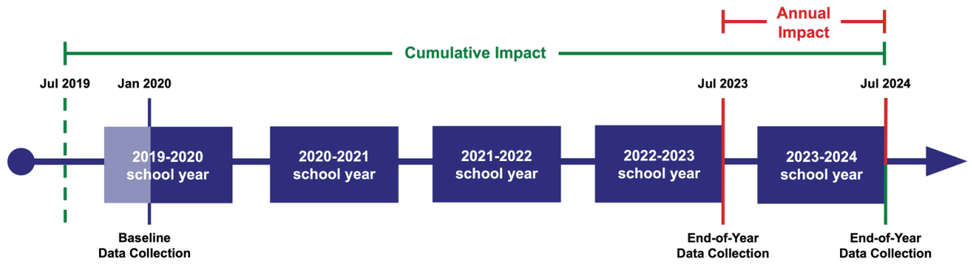


Figure 6.1

Sampling Framework for Schools and Pupils

Schools included in this study

Following its launch, the EKOEXCEL programme underwent large-scale expansion, reaching all 1,013 public Primary schools in the state. Because of this, the initial sample of 30 schools was no longer representative of all EKOEXCEL schools. To obtain a representative sample, additional schools were included in subsequent rounds of data collection.

At the start of the previous (2022-23) school year, the EKOEXCEL team, with inputs from SUBEB, selected a representative sample of 60 schools, distributed across all LGAs. The number of schools sampled per local government area (LGA) was proportional to the total number of pupils in that LGA relative to the total pupil population in the state. The only exception was if the total number of sampled schools within a given LGA was fewer than two, in which case a minimum of two schools per LGA was imposed.

As a note, three schools in the sample of 60 schools assessed in July 2024 were also part of the initial January 2020 round of data collection. Additionally, in July 2023, data could not be collected from four schools that were part of the baseline (January 2020) evaluation due to various operational and logistical factors.[5] As a result, the sample for evaluating the annual impact of the programme consists of a total of 83 schools: the 26 schools that were assessed at baseline and in July 2023, and the 57 new schools that were subsequently added to the sample. When evaluating the annual impact of the programme, the sample was restricted to schools that were present during both rounds of data collection.

[5] While assessments were unable to be conducted in 4 of the 30 schools that were sampled at baseline, the sample of 26 schools is still representative of the first 294 schools that joined the programme in January 2020. See Table 1 in Appendix C for a comparison of the differences in learning outcomes between the 30 schools and the subset of 26 schools.

Pupils assessed for this study

Data were collected from randomly selected pupils in Kindergarten through Primary 6. Within the 86 total schools, approximately eight pupils were randomly sampled from each grade for each assessment. Since these schools were broadly representative of all EKOEXCEL schools, the random selection of pupils ensured that the sample was representative of all pupils in the EKOEXCEL programme.

As previously noted, the sampling approach for this study consists of "repeated cross sections" of pupils within the same schools. This approach tracks the same schools over time, but not necessarily the same group of pupils within these schools over time. Therefore, while each sample of pupils is broadly representative of their respective school and grade, the data shown in this section are not meant to represent individual pupils' progress over time. It is worth noting that, as the programme expands, sampling repeated cross-sections becomes less reliable due to potential shifts in pupil composition over time. While the teacher tablets enable real-time tracking of enrolment, EKOEXCEL does not capture pupils' demographic characteristics. Therefore, results must be interpreted keeping in mind the evolving composition of the pupil population, and thus, the sample.

Learning Assessments Used for This Analysis

Early Grade Reading Assessment (EGRA)

In July 2023 and July 2024, EGRA was administered to pupils in Kindergarten through Primary 6. Pupils in Primary 1-6 were assessed in oral reading fluency and reading comprehension using a Primary 2-level passage. In addition to being assessed with a Primary 2 passage, Primary 5-6 pupils were also assessed in reading fluency and comprehension using a Primary 5-level passage. Refer to Table 3.1 in the "Methodology to Quantify the Cumulative Impact of the Programme" section for an overview of all sub-tasks administered across grades.

International Common Assessment of Numeracy (ICAN)

The expansion of the sample in later rounds necessitated an assessment that was grade-appropriate for all Primary grades and quick to administer. The International Common Assessment of Numeracy (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 — such as number recognition, addition, subtraction, multiplication, and division — all of which are relevant for the age group of pupils in this study. While EGMA serves to assess foundational numeracy in lower grades, it is not designed to assess numeracy among pupils in Primary 3 or higher. 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 (Jamil, 2020). Additionally, ICAN is a shorter assessment than EGMA, allowing enumerators to reach a larger sample size within the same amount of allotted time for pupil assessments (see Appendix A for the full assessment).

ICAN was administered to Primary 1-6 pupils in the July 2023 and July 2024 data collection rounds. The use of ICAN across Primary 1-6 enabled the analysis of how different grades performed on the same assessment, and thus, how pupils progressed grade-on-grade. As ICAN has been used to assess the foundational numeracy skills of more than 20,000 children across 13 different countries, including Nigeria (Jamil, 2020), the use of this assessment also allowed for extensive international comparison, situating results within the broader global context.

Other Data Collected for This Analysis

Pupil attendance and enrolment

EKOEXCEL'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. Aligned with the overall methodology, all public Primary schools in Lagos were implementing the EKOEXCEL programme during the 2023-24 school year, so there are no comparison data available for these metrics.

Teacher attendance and lesson delivery

Data on teacher attendance and lesson delivery are collected through the teacher tablets used by all EKOEXCEL 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. As 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 EKOEXCEL programme.

Qualitative data

This section also includes findings from a qualitative follow-up that was conducted during Term 2 of the 2023–24 school year (February 2024) 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, 470 interviews were carried out with 112 teachers, 41 head teachers, 108 parents, and 209 pupils from different schools across Lagos State. These interviews followed a structured approach (outlined in the protocol in Appendix H) and the results were subsequently analysed using conventional coding practices for qualitative data.

VII. The Annual Impact of the Programme

The previous section ("The Cumulative Impact of the Programme") details the substantial impact of the EKOEXCEL programme following its first five school years of implementation. Building on the positive outcomes observed thus far, this section shifts to focus on short-term trends, using data from the end of Term 3 of both the 2022-23 and 2023-24 school years. Examining the impact of the programme in this set of schools provides insight into whether the programme, in its fifth year, is continuing to effectively support newly participating schools and pupils. This approach also helps pinpoint which programmatic areas are working well, and those in need of further development; in turn, these insights will be used to enhance the programme, and its overall impact, in the coming years.

> ***[The programme] makes [pupils] understand more. It increases their reading and writing ability. It helps the people to know more about the digital world.***
>
> *-Head Teacher, Ikeja LGA*

Foundational Literacy

EKOEXCEL pupils continue to demonstrate increased proficiency in English literacy

After the most recent year of programme implementation, from the end of the 2022-23 school year (July 2023) to the end of the 2023-24 school year (July 2024), EKOEXCEL pupils have continued to show progress in foundational literacy. The share of non-readers continues to drop across grades, with the largest reductions occurring in Primary 2 and Primary 3 classrooms. **Notably, in Primary 2, the share of non-readers has been reduced by 14 percentage points – more than a 50% reduction in one year** (Figure 7.1). As a result, there are now fewer non-readers in the average Primary 2 class than there were in the average Primary 3 class at the end of the previous school year. The sustained improvement in pupils' learning outcomes, even after five years of implementation, demonstrates the programme's effectiveness in fostering long-term gains in Lagos State's Primary schools.

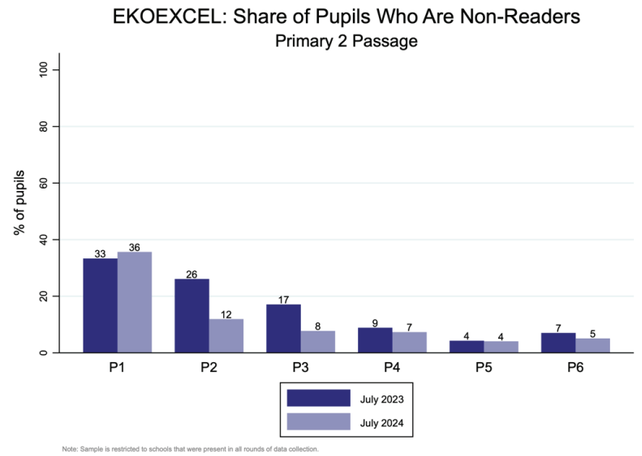


Figure 7.1

That said, the programme's impact was not uniform across all grades in this regard. The share of non-readers in Primary 4 and 6 decreased by 2 percentage points, representing a ~25% reduction since the end of the previous (2022-23) school year. In Primary 5, the share of non-readers held steady at 4%, while in Primary 1, it increased slightly from 33% to 36%. The results observed in upper-Primary are not entirely surprising — as the percentage of non-readers approaches zero, there is limited potential for substantial annual reductions. Further, as EKOEXCEL's learning materials are designed for the median pupil's learning level, there are no targeted interventions for older pupils who cannot yet read, which may help to explain the lack of improvement in Primary 5. That said, there are opportunities to introduce accelerated learning plans for older pupils who have fallen behind, while continuing to support the median learner.

Pupils across all grades made gains in reading fluency

In addition to reducing the number of zero-word readers in most grades, the programme also facilitated improvements in English oral reading fluency across all grade levels. The largest improvements occurred in Primary 3; **on average, pupils in a typical Primary 3 classroom are reading 11 words per minute faster compared to the end of the previous school year, demonstrating a 25% increase in reading fluency within one year** (Figure 7.2). The gains observed in other grades were not as large as those in Primary 3, yet these grades still showed positive improvements. The average pupil in Primary 4 is reading 6 additional words per minute, and the average pupils in Primary 2, 5, and 6 are reading 2-3 additional words per minute compared to pupils in their grades at the end of the previous school year.

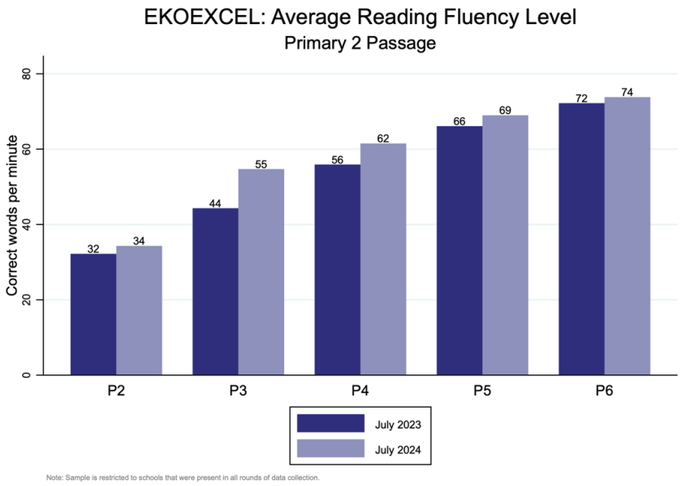


Figure 7.2

Reading comprehension levels remain strong, but have not shown meaningful improvements since the previous school year

While reading comprehension scores substantially increased across all grades over the last five years, scores remained relatively consistent between the ends of the 2022-23 and 2023-24 school years. The results vary across grades, with some grades showing minimal improvements while others show slight declines in progress by the end of the 2023-24 school year, resulting in an overall null effect (Figure 7.3). Although reading comprehension scores at the end of 2023-24 are not appreciably higher than at the end of the previous school year, they are still much higher than before the programme. Across Primary 2-5, average scores are more than three times higher than before the programme launched.

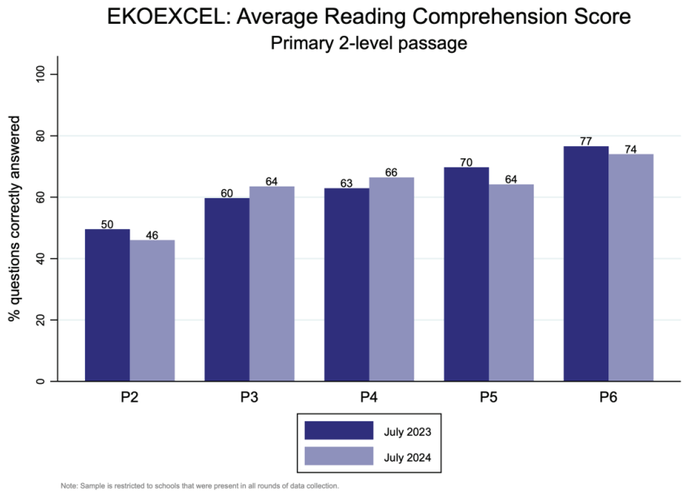


Figure 7.3

One possible explanation for the lack of continued annual improvement in reading comprehension is that pupils need further improvements in oral language skills — the ability to properly listen, speak, and comprehend spoken words (Institute for Multi-Sensory Education, 2023). According to the *Simple View of Reading* (SVR) — one of the most widely validated theories in the field of education (Snow, 2018) — children need both decoding ("fluency") skills and oral language skills to develop reading comprehension skills (see Box 6 for more information regarding this theory). The SVR suggests that even if pupils possess some degree of reading fluency, a lack of oral language skills can hinder their ability to understand, and answer, questions regarding a given text (Gough & Tunmer, 1986; Hoover & Gough, 1990).

In addition to the results in English reading fluency and comprehension, this study finds that pupils across ECCDE-Primary 4 made gains in phonemic awareness — the ability to hear, understand, and manipulate sounds in spoken words (Yopp, 1992) — which is a strong predictor of one's ability to read fluently. However, these classes did not see large gains in oral vocabulary skills, with the exception of Primary 3-4, where there were small improvements in both reading comprehension and oral vocabulary (see Figures 1-2 in Appendix C). This finding aligns with the SVR, suggesting that the limited progress observed in reading comprehension may, at least in part, result from the lack of improvement in oral language skills. In this sense, prioritising oral language development, alongside ongoing efforts to enhance reading fluency, could foster more meaningful gains in reading comprehension over time.

Box 6: The Role of Oral Language in Reading Comprehension and the Simple View of Reading

Learning to read in the early grades is an essential prerequisite for accessing more advanced portions of the curriculum as pupils progress in school (World Bank, 2018). In fact, full mastery of literacy skills by Primary 3 is widely acknowledged by researchers as a major threshold to ensure success throughout the rest of a pupil's academic career (Annie E. Casey Foundation, 2010). Developing reading comprehension is a complex process that requires many pre-skills, and researchers have described the process through a framework called the "Simple View of Reading" (SVR) (Gough and Turner, 1986; Hoover and Gough, 1990). The SVR is one of the most widely validated theories in the field of education (Snow, 2018), — a remarkable scientific feat considering the complexity of this developmental process. The SVR states that children need two main categories of skills in order to develop reading comprehension skills: decoding skills – the ability to sound out words phonetically and eventually to recognise words on sight – and oral language skills – the ability to make sense of language.

Importantly, the SVR claims that the relationship between decoding and oral language is not "additive"; that is, very strong skills in one and weak skills in the other will not add up to fair/moderate reading comprehension. Rather, the relationship is "multiplicative"; that is, very strong skills in one and zero skills in the other will result in zero comprehension. Therefore, decoding and oral language are both necessary for pupils' appropriate development of reading comprehension, although their respective contributions to comprehension are not fixed throughout a child's developmental process (Catts, 2018; Catts et al., 2005; Language and Reading Research Consortium, 2015; Tilstra et al., 2009). In fact, the importance of decoding skills decreases relative to that of oral language throughout child development; as decoding skills reach a level sufficient to enable a child to decode any word encountered, the limit on oral language comprehension becomes the limit on reading (Hoover and Gough, 1990; Lonigan, 2017). Taken together, this evidence points to the importance of learning-oriented interventions that foster literacy holistically through both decoding and oral language.

Currently, most children in low- and middle-income countries (LMIC) have not been able to develop appropriate levels of reading comprehension (UNICEF, 2022a; World Bank, 2018). To address these challenges, it will be critical for literacy interventions to deeply understand how children develop reading comprehension through scientifically derived frameworks like the SVR. Effective literacy interventions, informed by the SVR, should take a holistic approach that dually targets decoding and oral language and that can flexibly adapt pedagogical content based on the local context, so that children in LMIC can develop the critical reading comprehension skills they need to thrive academically and beyond.

Foundational Numeracy

As detailed in the "Methodology to Quantify the Annual Impact" section, Primary 1-6 pupils were assessed with ICAN at the conclusion of both the 2022-23 and 2023-24 school years. While the "Cumulative Impact" section reports results based on EGMA, which was used in all rounds of data collection but was only administered to Kindergarten, Primary 2, and Primary 5 pupils, this "Annual Impact" section reports results based on the ICAN, which was administered across all grades (with the exception of Kindergarten) in 2023 and 2024. This approach yields a more comprehensive view of learning outcomes across grades, and facilitates comparisons with broader national and international benchmarks. The annual impact results for EGMA can be found in Appendix C (Figures 3-9).

Pupils continue to show strong proficiency in performing basic maths operations

Over the last year of implementation, EKOEXCEL pupils maintained high levels of proficiency in more simple maths skills — such as addition without carrying and subtraction without borrowing — an important indicator of their readiness to engage with more complex mathematical content in later grades. **On average, 86% of Primary 1-6 pupils in EKOEXCEL schools are able to solve the subtraction problem '46-21'** (Appendix C, Figure 10), **and 92% of these pupils are able to solve the addition problem '32+15'** (Figure 7.4). Although these figures remain largely unchanged from the end of the previous school year, the consistently high performance across all grades confirms that EKOEXCEL pupils are successfully building their foundational maths skills. Given the already high levels of proficiency, particularly in upper grades, large improvements are difficult to achieve due to a "ceiling effect" (Staus et al., 2021). Therefore, the lack of substantial improvement year-to-year should not be interpreted as a lack of programme effectiveness, but rather an indication that the programme can begin shifting its focus from foundational numeracy towards more complex, curriculum-aligned skills.

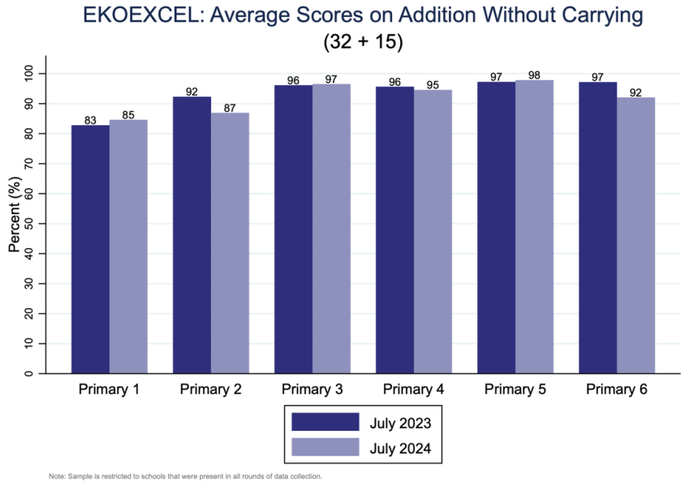


Figure 7.4

Similar outcomes are observed across other skills, including number recognition and single-digit multiplication (Appendix C, Figures 11-12). Notably, 73% of Primary 1 pupils are able to solve '2 x 4', representing a 6 percentage point increase from the previous school year. **Considering that single-digit multiplication is identified as a skill to be mastered by Primary 3, according to national and global curriculum standards, this means that nearly three-quarters of Primary 1 pupils are achieving proficiency in a skill typically mastered two years later**.[6] While not all grades made equally large gains in this skill, these results, nonetheless, demonstrate that many pupils are making progress towards reaching, and exceeding, grade-level benchmarks in maths.

While pupils maintained high levels of performance in basic operations, average proficiency in more complex skills declined across grades

Although pupils demonstrated strong performance in solving more simple maths problems at the end of the 2023-24 school year, there were noticeable declines in the average pupil's proficiency in more complex maths skills, such as two-digit subtraction with borrowing, multiplication with regrouping, and division with a remnant (Appendix C, Figures 13-14). For instance, on problems that require two-digit subtraction with borrowing (e.g. 78-29), scores decreased by 9 percentage points, on average, across all grades (Figure 7.5). Similarly, on problems requiring multiplication with regrouping (e.g. 42x6), scores declined by 3 percentage points, on average, across Primary 1-6. In Primary 4 — the grade at which pupils are expected to master this skill, according to NERDC curriculum standards — the average declined by 12 percentage points, from 66% to 54%.

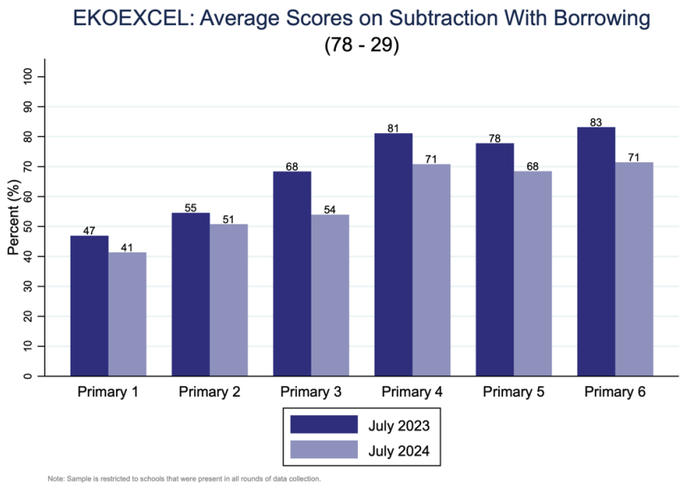


Figure 7.5

Strengthening proficiency in solving word problems is another key area for future improvement

Average proficiency in solving word problems has not improved since the end of the previous school year. For example, when presented with a subtraction word problem (e.g. "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?"), 55% of Primary 1-6 pupils are able to correctly solve the problem as of the end of the 2023-24 school year (Figure 7.6). Considering that 72% of pupils were able to solve this problem at the end of the previous school year, this represents a notable decline in proficiency across all grades. This pattern is consistent for all grades in solving division word problems as well (Appendix C, Figure 15). These results suggest that while pupils are mastering foundational maths skills,

[6] See Appendix E for an overview of how ICAN subskills are mapped onto global curriculum expectations.

they struggle to apply these skills in more complex settings. To bridge this gap, it is crucial to ensure that pupils are supported in developing more advanced skills alongside reinforcing foundational concepts. In doing so, the EKOEXCEL programme can continue to foster learning gains in mathematics and equip pupils with the higher-order skills needed to engage with increasingly complex topics in secondary school and beyond.

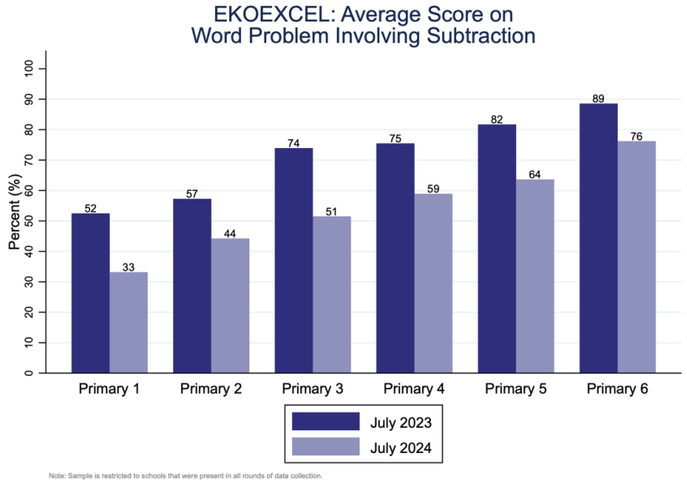


Figure 7.6

Despite the large gains across most foundational skills, children in Lagos' public Primary schools are still working to meet grade-level expectations, highlighting the need for continued investments in education

Over the last five years, EKOEXCEL schools have continuously fostered strong gains in foundational literacy and numeracy skills, enabling pupils to achieve end-of-year learning levels much higher than their pre-programme peers did at a comparable time of year. That said, the levels achieved at the end of the 2023-24 school year were lower overall than at the end of the previous school year. For example, total ICAN scores were, on average, 9 percentage points lower across Primary 1-6, with consistent trends across all grades (Figure 7.7). Based on the findings for individual subskills, the decline in average scores was largely driven by performance in solving more complex problems. Pupils are demonstrating proficiency in more basic operations at the end of 2023-24, but more work is needed to ensure that they can effectively apply these skills to more advanced problems.

Furthermore, continued progress is needed if pupils are to reach national grade-level expectations. For instance, according to Nigeria's curriculum standards, division with a remnant (e.g. 93÷7) is a skill that should be mastered by Primary 4. However, 74% of pupils in a typical Primary 4 class cannot yet solve this type of problem, and 47% of Primary 6 pupils are still unable to solve this problem. Similarly, when solving a problem that requires two-digit subtraction with borrowing (e.g. 78-29) — a skill expected to be mastered by Primary 2, according to Nigeria's curriculum — 49% of Primary 2 pupils cannot yet solve this type of problem, and 29% of Primary 6 pupils are unable to solve this type of problem (Figure 12 in Appendix C). Ultimately, these findings indicate that, while pupils have made considerable progress thus far, Lagos State Primary schools still require continued, strategic investments in order to ensure that all pupils can meet grade-level expectations.

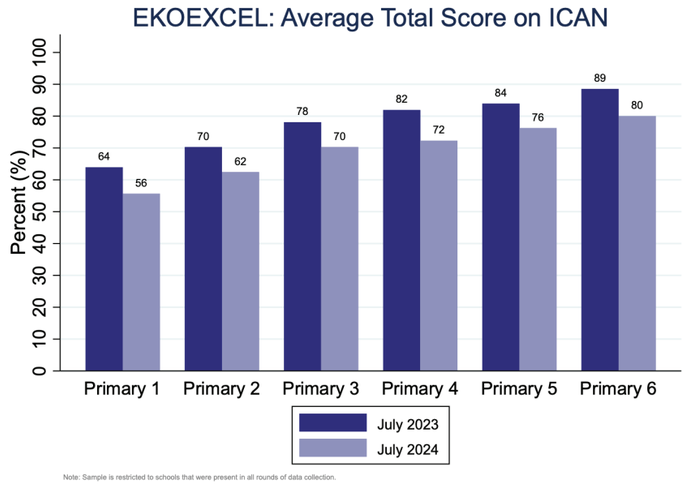


Figure 7.7

Tracking Programme Implementation

It is common for long-running education programmes to see an initial period of rapid gains, followed by a period of more stable growth, which naturally creates a tapering effect year-on-year (Amin et al., 2007; King & Behrman, 2009). Given the maturity of the EKOEXCEL programme, the results observed thus far are consistent with this pattern. The observed trends — i.e. learning outcomes holding steady over the last school year, or improving less rapidly than during the initial phases of the programme — are not necessarily indicative of a diminishing of programme effectiveness, but may instead reflect the natural progression of the programme. Additionally, as pupils attain higher levels of proficiency, there is less room for substantial year-on-year improvement due to ceiling effects. Nonetheless, as the quality of implementation plays a key role in long-term success of the EKOEXCEL programme, it is important to also examine additional factors which could have influenced the observed impact of the programme, such as teacher and pupil attendance, as well as rates of lesson completion.

Average rates of teacher attendance and lesson completion were not as high as the previous school year

The ecosystem of the EKOEXCEL programme enables the tracking of certain classroom behaviours, such as pupil attendance, teacher attendance, and lesson completion. These metrics are tracked automatically through the teacher tablets, which allows for the monitoring of programme implementation in EKOEXCEL schools and classrooms. These data provide insights into the degree to which teachers are adopting the programme and delivering it as intended.

Data collected from the teacher tablets show that teacher attendance rates, while varying throughout the school year, trend upwards overall. Attendance rates remained between 70-90% for most of the school year (Figure 7.8), and in the last five weeks of the school year, the rate of teacher attendance was 79%, on average, across all EKOEXCEL schools. Compared to the average attendance rate during the last five weeks of the previous school year (89%), the rate of attendance for the end of the 2023-24 school year is 10 percentage points lower. 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 EKOEXCEL network of schools. These factors, in turn, are crucial for facilitating learning gains among pupils by ensuring that they receive sufficient exposure to high-quality instruction (see Box 7 for more information on the effects of teacher absenteeism).

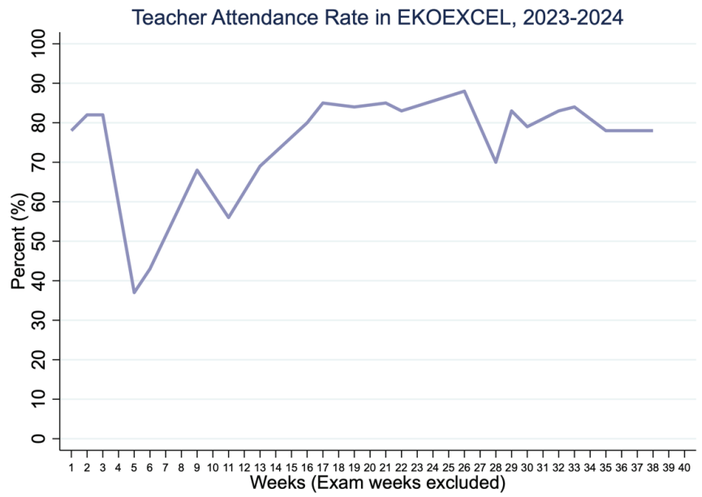


Figure 7.8

Box 7: 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 pupil learning outcomes and enrolment outreach (World Bank, 2018). Teacher salaries in low- and middle-income countries (LMIC) often represent a significant portion of the public education budget. For instance, in Uganda, Tanzania, Nepal, and Namibia, 60–95% of the government budget that is earmarked for education is invested in teacher salaries. Yet, high rates of teacher absenteeism have been consistently recorded across many LMIC: In a global study, teachers were not in school 16% of the time in Bangladesh, 18% of the time in Togo and Senegal, and 45% of the time in Mozambique (Chaudhury et al., 2006). Even among the teachers that were present in school across 8 sub-Saharan African countries, less than half of them were found to be in their assigned classrooms during instructional time when measured by the World Bank via drop-in visits (World Bank, 2018). Hence, the large shares of fiscal resources spent on teacher salaries, coupled with the ingrained prevalence of teacher absenteeism, indicates that the fiscal and educational repercussions of this issue are a serious policy concern that deserve immediate governmental action.

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

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

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

Fortunately, cost-effective, evidence-based solutions have been shown to yield high-impact results that mitigate the harmful consequences of this systemic issue. Studies done by the World Bank and UNICEF suggest that funds should be directed towards improving accountability systems and to the oversight of teachers rather than other applications, such as blindly increasing teacher staffing rates or implementing unconditional salary increases. For example, one study in Chile found that increasing teacher salaries by 4–30% decreased instructional time per pupil 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 pupil 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 pupil learning outcomes.

In addition to being present in the classroom, teachers must also be actively engaged in teaching. The EKOEXCEL programme therefore continuously monitors the rate at which teachers deliver their lessons in entirety. During the 2023-24 school year, rates of lesson completion fluctuated considerably, with weekly averages ranging from 6% to 76% completion (Figure 7.9). In the last five weeks of Term 3 of the 2023-24 school year, the average rate of lesson completion was 45% across all EKOEXCEL schools.[7] Given that the average schedule in Lagos schools includes an average of 4.6 hours of instruction per day (23 hours per week) across Nursery-Primary 6 grades, this amounts to 10.4 hours of instruction being delivered each week. Accounting for the teacher attendance rate during this period (79%), pupils receive approximately 8.2 hours of instruction per week. When comparing this to the hours of instruction received during the last five weeks of the previous (2022-23) school year — approximately 16 hours when accounting for teacher attendance and lesson completion rates — pupils received roughly half as much high-quality instruction per week during the 2023-24 school year.

[7] The average rate of lesson completion for the last five weeks of the school year (45%) was derived by first calculating the weekly average completion rate across all EKOEXCEL schools, and then averaging these rates for the last five weeks of the school year, excluding exam weeks.

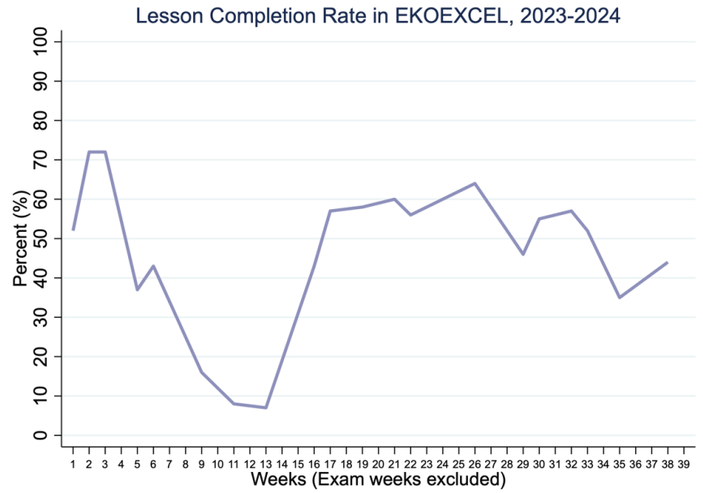


Figure 7.9

Various factors could have contributed to the relatively low and volatile rates in lesson completion. In terms of volatility, there were some weeks when the EKOEXCEL programme was not operational. This affected weeks 12-15 of Term 1, which are the four weeks during which average lesson completion fell below 10%. Possible factors for the low levels of lesson completion may include challenges relating to insufficient time to fully complete certain lessons. While quantitative data are not available to demonstrate the pervasiveness of this issue, interviews conducted at the start of Term 2 of the 2023-24 school year reveal that some teachers and head teachers perceived the lesson plans as progressing too quickly at times, often leaving insufficient time to fully complete certain lessons.[8]

Although low rates of lesson completion most likely indicate that less instruction was delivered (i.e. lower fidelity of programme implementation), they may, in part, also reflect some teachers' efforts to prioritise instructional quality over quantity. During the interviews conducted with school staff, some teachers noted that they spent additional time addressing pupils' questions or providing further explanations on unclear or complex subject material. Whether teachers are thoughtfully slowing down to address pupils' questions or simply falling short of adhering to programme expectations, the low rates of lesson completion indicate that pupils are not receiving all of the content that was designed for them to receive — and master — if they are to progress to the next level. Ultimately, it is crucial for all stakeholders, including teachers and head teachers, to maintain high fidelity in programme implementation, with timely completion of scheduled lessons being a key component.

[8] Out of the 8,600 teachers that were in EKOEXCEL schools during the 2023-24 school year, 112 participated in interviews. Of these 112 teachers, 79 (71%) expressed concerns around the pacing of the lesson plans. However, since the participants were not selected to be representative of all schools in the programme, the concerns raised may not fully reflect the experiences of all teachers.

Pupil attendance remained low, consistent with findings from previous school years

During the 2023-24 school year, the average rate of pupil attendance was 45% across all EKOEXCEL schools (Figure 7.10), indicating that the average pupil attended school less than half of the scheduled school days. Compared to the 2020-21 school year, when the average pupil attendance rate was 23% during the last five weeks of the school year, the attendance rate for the 2023-24 school year is a large improvement. However, compared to the previous school year when the average rate of attendance was 53% during the last five weeks, the 2023-24 rate reflects an overall decline.

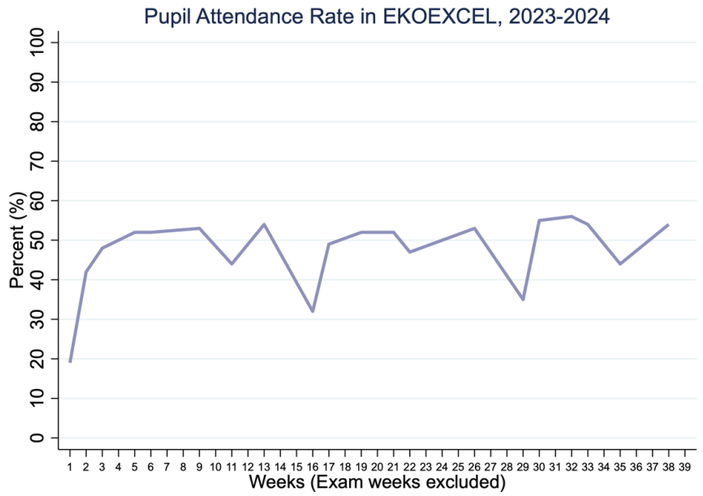


Figure 7.10

Chronic pupil absenteeism poses a serious challenge to the Lagos State education system, as reflected in the observed rates of pupil attendance. A failure to regularly attend school has both immediate and long-term negative effects on pupil achievement; it limits pupils' foundational learning opportunities and increases the likelihood of falling behind and dropping out of school altogether (Lara et al., 2018). External factors such as lack of transportation, poor health conditions, and inadequate educational infrastructure certainly play a major role in driving sustained pupil absenteeism (Amalu & Abang, 2016; Oghuvbu, 2008). While many of these factors fall outside of the programme's direct control, it remains crucial for EKOEXCEL to take all possible actions to increase attendance and address chronic absenteeism. Targeted initiatives, such as community engagement efforts, can help to mitigate these challenges. Additionally, the real-time tracking of attendance through the teacher tablets enables the EKOEXCEL team to use data insights to target those with poor attendance and develop strategies to support them, which can help to ensure more consistent pupil attendance and enable the programme to continue fostering large gains in learning.

Corporal punishment is being replaced by positive classroom management strategies

The EKOEXCEL programme continues to support the Lagos 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 Lagos 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, Lagos State passed the Child's Rights Law in 2007, which bans the use of corporal punishment. In addition, in 2022 the Government implemented its Safeguarding and Child Protection programme, which provides free training for educators on how to ensure the safety of children in and out of schools (Lagos State Government, 2022). To further support the shift away from corporal punishment as a classroom management strategy, the EKOEXCEL 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 suggest that there have been positive overall changes in teachers' behaviours, with more teachers favouring alternative classroom management strategies instead of corporal punishment. Further, many pupils shared that they are now excited to come to school because of the shift in behaviours.

> ***My teacher makes me excited to come to school.***
>
> *-Primary 1 pupil, Somolu LGA*

> ***The introduction of energizers to teaching is really great. It encourages me to do more.***
>
> *-Primary 5 pupil, Somolu LGA*

Parents and educators have seen meaningful changes in Lagos State's education system

Although key programme implementation metrics, such as attendance and lesson completion, varied throughout the school year, qualitative data show that the EKOEXCEL programme has been met with abundant approval from key stakeholders in Lagos State. In interviews conducted during the 2023-24 school year, the vast majority of the 470 pupils, parents, teachers, and head teachers interviewed reported having observed positive changes to the Lagos State education system. Specifically, among the 112 teachers asked "What are your general impressions of the EKOEXCEL programme?", 92 reported having positive experiences with the programme. Only a small minority, 12 teachers, reported negative impressions, while 8 remained neutral. Many teachers highlighted that the integration of technology in schools has made teaching and learning easier, which has led to higher levels of motivation among pupils and staff. Similarly, 91% of parents feel as though their children are learning more with the EKOEXCEL methodology, and report that their children are able to read, write, and do maths at a much higher level than before. The overwhelmingly positive feedback from stakeholders affirms the transformative impact of the EKOEXCEL programme on the Lagos State education system. Even when all of the critical components of an education system are aligned towards a common goal of producing significant learning gains, the quality of this system must be apparent to the surrounding community in order for it to ultimately thrive. It is therefore essential that parents, pupils, and education personnel jointly recognise the benefits of participating in the EKOEXCEL programme. The public response to the EKOEXCEL programme emphasises the impact that the programme has had on communal perceptions of the Lagos State education system. People of Lagos State recognise the positive impact that the programme has had on their schools and children, and are in support of the programme's continuation.

> ***My child learns better and faster than before.***
>
> *-Parent, Ikorodu LGA*

> ***The programme has made work easier and interesting for both teachers and learners. Teachers have more time to rest after work and prepare better for the next day. The fact that all primary schools in Lagos state are taught the same content at the same time make the programme a wonderful programme to maintain.***
>
> *-Teacher, Ikeja LGA*

VIII. Recommendations for Future Programmatic Enhancements

After five school years of implementation, the EKOEXCEL 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. Pupils across all grades have made tremendous strides in foundational literacy and numeracy. In many maths subskills, the average EKOEXCEL pupil is now performing one to two grade levels ahead of their peers prior to the launch of the programme. Additionally, the share of non-readers has been reduced by half across Primary 1-5, and the share of pupils experiencing learning deprivation has decreased by 40 percentage points in the average Primary 2-5 classroom.

Despite the impressive progress achieved thus far, more work is required in order to sustain these positive trends — and build upon them — in the coming years of the programme. For instance, over the past year of the programme (July 2023 to July 2024), the average Primary 1-5 classroom did not experience large improvements in English reading comprehension, despite having seen gains in oral reading fluency. Consequently, proficiency in solving maths word problems did not improve, and there was limited progress across most maths subskills. Therefore, for the 2024-25 school year and beyond, the EKOEXCEL programme will work to build foundational literacy skills across the curriculum, strengthen assessments and data collection to better inform programmatic design, and strengthen day-to-day programme implementation to drive high, consistent rates of attendance and lesson completion.

Increasing Literacy Through a More Cohesive English Course Structure

Despite substantial improvements over the past five years, English literacy levels still fall short of curricular expectations, as defined by both NERDC standards and international benchmarks (see Appendix D). As previously discussed, reading comprehension skills, in particular, did not noticeably improve in the average EKOEXCEL classroom over the past year of implementation. A possible explanation for this is that pupils are not effectively developing oral language skills, without which they cannot comprehend the meaning of a given text, even if they are able to read the text with some degree of fluency.

To facilitate even greater gains in literacy in 2024-25 and beyond, EKOEXCEL is providing English instruction through a more cohesive course structure. Previously, English instruction had been delivered through two independently-designed courses — syllabus English, which covers grade-level content that may be far above many pupils' reading levels, and supplemental English, which provides supplemental instruction aligned with pupils' current reading levels but may not comprehensively cover all syllabus topics. In the 2023-24 school year for Primary 1 and 2, and for all grades beginning in 2024-25 school year, EKOEXCEL is offering two English courses — a levelled reading course and a levelled language course — that are explicitly designed to run in parallel and reinforce each other. This coherence across the two courses will reduce duplication of content, leaving extra time that can be spent on building additional literacy skills, such as oral language, which is a key component in the development of reading comprehension. Both courses will be aligned with pupils' current levels so that all instruction is accessible. Importantly, the new courses will cover NERDC syllabus content for each respective grade, while simultaneously building fundamental literacy skills.

Promoting “Learning to Read” Across the Curriculum

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

There are opportunities for EKOEXCEL to build English literacy across the curriculum, and one key area for this investment is lower-grade Science. With a new course structure, supplemented by new, high-quality, levelled textbooks, this new Science course would adopt a dual-priority approach. First, it would build critical content knowledge, which is essential for reading comprehension. Children with background knowledge of a passage tend to read more effectively than those without such knowledge, making Science proficiency foundational not only for syllabus mastery but also for reading proficiency. Second, the new Science course would adopt 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 would also use evidence-based instructional strategies like ‘duet readings’ and use of rich imagery to support language and vocabulary development. In this way, EKOEXCEL could 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.

Strengthening Assessment Structures and Data Collection to Better Inform Programmatic Design

EKOEXCEL will continue to make meaningful investments in the quality, validity, reliability, and relevance of assessments. Using extensive item-level data from previous years, analysts will explore ways to drive improvements to the design of the exams themselves. These improvements, in turn, will result in more valid and reliable assessments that produce high-quality data and actionable insights that will drive programme design during the next academic year.

In addition, there will be ongoing work to ensure that assessments assess the most relevant and important content of a course. This is critical to ensure that pupils are assessed accurately and also that the results of these assessments will inform key instructional design decisions. By assessing a combination of pre-skills and terminal skills that reflect the sequence of the course itself, programme designers can precisely diagnose the root of any learning failure, and use these data to inform the design of instructional materials to target those learning gaps during future terms of years.

Foundational to this effort to strengthen assessments and use data towards programme design is an ability to capture item-level data at scale. To this end, the programme will be rolling out new and innovative elements of the “Let’s Mark!” assessment system. Let’s Mark! was originally designed to automatically mark multiple-choice exams, and also to upload the item-level data to the programme’s central database. The new functionality will allow for the marking and capture of data from open-response questions as well as multiple choice questions. This will expand the pool of eligible exams that can be marked using Let’s Mark, and also allow for more flexibility on the design of assessments themselves without losing compatibility with Let’s Mark data capture. By unlocking teachers’ ability to use Let’s Mark, EKOEXCEL is simultaneously making teachers’ lives easier, and also creating an opportunity to use at-scale assessment data to make data-driven programme refinements.

Strengthening Day-to-Day Programme Implementation

Over the last five years, the EKOEXCEL programme has made large strides towards improving the operational efficiency and the implementation of the programme. This has been achieved with a unique combination of dedicated field teams and school leadership driving operational excellence, and the use of dynamic and actionable data (via the Spotlight app) to shine a light on key areas of growth at the pupil, teacher, school, or programme level. However, more work remains to be done. In spite of progress, there is still considerable room for improvement in terms of day-to-day programme implementation. For instance, teacher attendance during the last five weeks of the school year decreased by 10 percentage points — from 89% at the end of the 2022-23 school year to 79% at the end of the 2023-24 school year. Additionally, the average rate of lesson completion decreased from 78% to 45% over the same period, resulting in the average pupils receiving half as much instruction as the previous school year. Given that the average pupil attendance rate has consistently remained around 50% for the last three school years, it is crucial to ensure that pupils are able to make the most of their instructional time and maximise learning opportunities when they are present.

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

Looking Ahead

The impressive progress of the EKOEXCEL programme since its launch in January 2020 has validated the ongoing investments made by Lagos State in transforming its education system. The evidence in this report confirms that children who have not yet received high-quality education can quickly advance their learning when provided with the proper support. However, the programme must continue working to sustain these positive trends as the programme enters its sixth year of operations. As a data-driven programme, EKOEXCEL will continue to conduct similarly large-scale, rigorous evaluations for the upcoming school years, and these rounds of data collection will give the Lagos State Government further insights on the impact of the programme: what is going well, and what needs to be strengthened. Continued investments to build foundational skills as well as content knowledge across the curriculum, improve programmatic design, and strengthen day-to-day programme implementation — if done correctly — will drastically improve the quality of teaching and learning across the state.

The EKOEXCEL programme is a bold initiative from the Government of Lagos State. After its fifth year of operations, it has enabled pupils to be on faster, higher learning trajectories than what they could have expected from non-EKOEXCEL 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. Through its EKOEXCEL programme, Lagos State will continue to provide rich, nurturing learning environments across the state, where pupils of all backgrounds will have the unprecedented opportunity to actually learn in school and thrive academically.

IX. Appendix

Appendix A: Learning Assessments

A.1: Oral reading fluency and comprehension assessments

Primary 2-Level Passage

Anna went to the shop to buy a new dress.

She saw dresses with many colours.

She did not know which one to buy. Anna looked and looked. All the dresses were too big. She started to walk home.

Anna ran into the next shop because it began to rain.

She saw a very nice dress. She smiled and bought it.

Reading Comprehension Questions

1. Why did Anna go to the shop? **(Answer: To buy a new dress)**

2. What type of dresses did Anna see at the market? **(Answer: Dresses of different colours; many dresses; big dresses)**

3. Why did she start to walk home? **(Answer: She did not find a dress; the dresses were too big)**

4. Why did Anna run into the shop? **(Answer: Because it started raining)**

5: How do we know Anna liked the dress? **(Answer: She smiled; she bought the dress)**

Primary 5-Level Passage

An island is a body of land that has water all around it.

It does not touch any other land. Most islands form by nature.

There are different kinds of natural islands. One type is the oceanic island. They are made by volcanoes underwater.

When a volcano erupts deep in the ocean, the water cools the lava quickly.

It builds and builds over many years. When the top of the volcano breaks through the water's surface, it becomes an island. Iceland is an example of this type of island.

Coral islands are another type of natural island. Corals are tiny sea animals that have hard surfaces. They grow in groups on top of each other. They also grow up toward the surface of the water. Rocks, sand and dirt get trapped in the coral. When the coral breaks through the water, it becomes an island.

Reading Comprehension Questions

1. What does an island have all around it? **(Answer: Water)**

2. How do most islands form? **(Answer: By nature)**

3. How are oceanic islands made? **(Answer: By volcanoes underwater)**

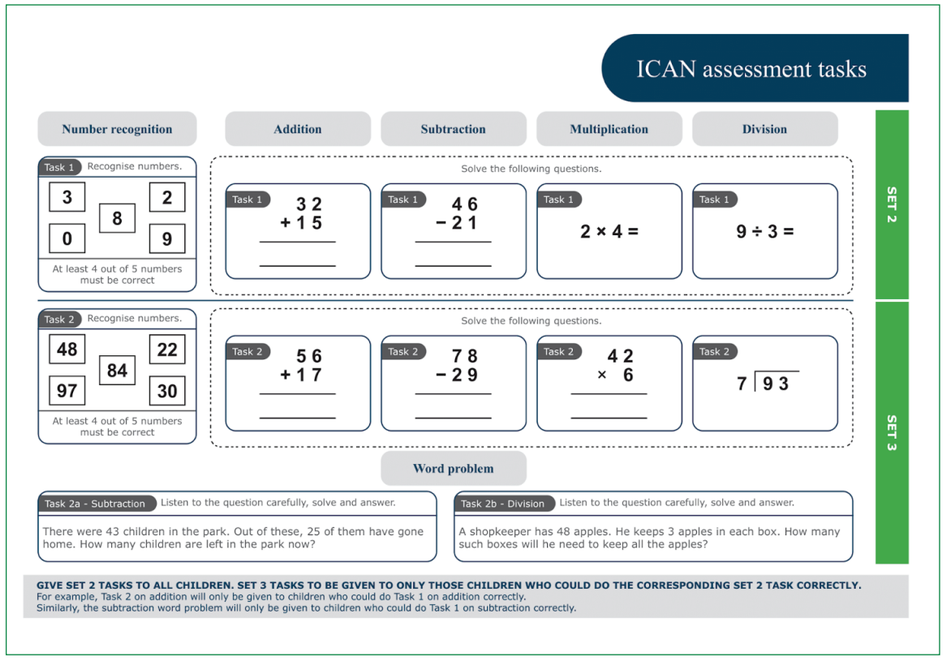
4. How do we know that lava is hot? **(Answer: It says, "the water cools the lava quickly")**

5: What type of island is Iceland? **(Answer: An oceanic island; an island formed by volcanoes)**

6: Why must it take many, many corals to make an island? **(Answer: Because corals are tiny)**

A.2: Mathematics Assessment

International Common Assessment of Numeracy (ICAN)



Appendix B: EGMA and EGRA Subskill and Sub-test Descriptions

The following subskill and sub-test definitions are from the EGRA and EGMA Toolkits, authored by RTI International, and designed to inform proctors how to properly administer the assessment (RTI International, 2014; RTI International, 2016a).

EGMA Assessed Subskills

Sub-test	Definition
Number Identification	The number identification test is timed (60 seconds) with no stop rules, and it consists of 20 items that increase in difficulty. The first three items of the sub-test include the numerals 0,9, and one other single digit number. The next 12 items consist of two-digit numbers from 10 to 99, and the last five items are three-digit numbers from 100 to 999. Pupils are asked to say each number aloud.
Number Discrimination	The number discrimination sub-test is an untimed test of 10 items with a stop rule after four successive errors. Each item consists of a set of two numbers, one of which is greater than the other. The first item is a set of one-digit numbers, the next five items are sets of two-digit numbers, and the last four items are a set of three-digit numbers. Pupils state the higher of each set of two numbers (pointing at the correct number is insufficient evidence for scoring).
Number Pattern Identification	Proficiency in number pattern identification is measured using the Missing Number sub-test. The ability to detect number patterns is an important early skill that can support later mathematical skills such as multiplication and algebra. The Missing Number sub-test is an untimed test of 10 items with a stop rule after four successive errors. The items are presented as four horizontally aligned boxes, three of which contain numbers and one of which is empty (the target missing number). Eight of the items increase in number from left to right; two of the items decrease in number from left to right. Items 1,2, and 6 increase by one (in a set of one-, two-, and three-digit numbers, respectively). Items 3, 4, 5, and 8 increase by tens, hundreds, twos, and fives, respectively. Items 7 and 9 decrease by twos and tens, respectively. The last item with numerals within the range of 1-20 increases by fives, but does not begin with a multiple of five. Pupils are asked to state the number that belongs in the empty box.
Addition and Subtraction	The Addition and Subtraction Level 1 sub-tests are timed tests (60 seconds) consisting of 20 items each that increase in difficulty. No addends are greater than 10, and no sums are greater than 19. The subtraction problems are the inverse of the addition problems. Three of the items mirror three of the Word Problems items. Assessors also keep track of whether the pupil used one of three problem-solving strategies: finger/tick marks, paper and pencil calculation, or mental arithmetic. The Addition and Subtraction Level 2 sub-tests are untimed tests consisting of five items each that increase in difficulty, with a stop rule of four successive errors. Addition Level 2 is not given to pupils who receive a score of zero for Addition Level 1, and Subtraction Level 2 is not given to pupils who receive a score of zero for Subtraction Level 1. No sums are greater than 70. The subtraction problems are the inverse of the addition problems.
Word Problems	The purpose for learning mathematics is to solve real-world problems, which are rarely, if ever, presented as stand-alone equations. Instead, they require interpretation of a problem and an understanding of the operations required to solve that problem. Word problems mimic, in a rudimentary way, these real-world situations. The World Problem sub-test is an untimed test consisting of six items each that increase in difficulty, with a stop rule of four successive errors. Three of these items use numbers that match three items from the Addition and Subtraction Level 1 sub-test. Assessors also keep track of whether the pupil used one of three problem-solving strategies: finger/tick marks, paper and pencil calculation, or solved problem in his or her head. Pupils are also provided with counters that can be used to solve the problem.

EGRA Assessed Subskills	
Subskill	**Definition**
Orientation to Print	The orientation to print sub-task is a measure of concepts of print. It is considered one of the lowest order skills pupils develop as they begin to learn to read. The sub-task is administered by asking pupils questions such as how to hold a book or where the text begins.
Letter Names	The letter names sub-task tests pupils' ability to recognise letters and accurately speak their corresponding name. The pupils are presented with a grid listing letters in a random order. Pupils are asked to read out loud as many as they can, as quickly and carefully as they can, in 1 minute. The EGRA administrator times the child, making note of any mistakes the child makes while calling out the letter names. The score is typically reported as correct letters per minute (clpm).
Initial Sound Identification	The initial sound sub-task is a measure of a pupil's ability to identify the first sound in a word. It also measures a pupil's ability to separate words into sounds and to manipulate those sounds. Pupils are told a word verbally and asked to isolate and pronounce the first sound of the word (the initial sound). The EGRA administrator records the number of correct letter sounds identified.
Phonemic Awareness	The letter sounds sub-task tests pupils' ability to recognise letters and speak their corresponding sounds. Pupils are presented with a sheet listing letters and asked to read out loud as many as they can, as quickly and carefully as they can, in 1 minute. (In some languages, graphemes, or sets of letters and/or symbols representing a single sound, are presented, e.g., in French, "é" is presented separately from "e.") The EGRA administrator times the child and records the number of correct letter sounds per minute (clspm).
Non-familiar Words	The non-word sub-task tests pupils' skill in using letter-sound connections to figure out ("decode") words. While many pupils learn to memorise a broad range of "sight" words, they need skills to decode less familiar words. In this sub-task, pupils are given a list of made-up words that do not exist in the language tested and asked to read out loud as many as they can, as quickly and carefully as they can. The EGRA administrator times the pupil and records the number of correct words per minute (cwpm).
Familiar Words	The familiar word reading sub-task is similar in format to the non-word reading sub-task except that it presents the pupil with a grid containing words they are expected to be able to read at their grade level and have likely encountered before. The pupils are instructed to read aloud as many words as they can in 1 minute. The EGRA administrator times the pupil, making note of any mistakes the pupil makes while reading the words aloud. The score is reported as correct words per minute (cwpm).
Oral Vocabulary	Vocabulary is words and their meanings; this sub-task measures what words pupils know. Research suggests children need to understand at least 90% of the vocabulary in a passage for comprehension to occur. In this sub-task, the EGRA administrator speaks words aloud and asks the pupil to "point" to what they mean (e.g., a body part, a simple object). The administrator records the number of vocabulary words the pupil got correct, with no time limit.
Listening Comprehension	Listening comprehension is a measure of pupils' oral language skills, which also contribute to reading. In this sub-task, the EGRA administrator reads a passage to the pupil, who does not see it. The pupil then responds to questions or statements read by the EGRA administrator.
Reading Fluency (cwpm)	The oral reading fluency (ORF) sub-task measures how quickly and accurately a pupil can read. It is a core component of EGRA because it brings together lower-level reading skills (such as decoding and familiar word recognition) with how quickly and easily the pupil can read a given word (called automaticity). Pupils are given a short, written passage on a topic that is familiar to them. They are asked to read it out loud "quickly but carefully" and are given 60 seconds from when they begin to read. The EGRA administrator times the pupil, making note of any mistakes the pupil makes while reading the words aloud. The score is reported as correct words per minute (cwpm).
Reading Comprehension	Comprehension is the main goal of reading — understanding what is read. Comprehension is a complex task that requires some ability in all other reading skills. This sub-task is paired with the ORF sub-task. Depending on how much of the ORF passage the pupil was able to read, the EGRA administrator asks the pupil up to five questions about the story. The EGRA administrator keeps track of the number of questions answered correctly.

Appendix C: Additional Figures and Tables

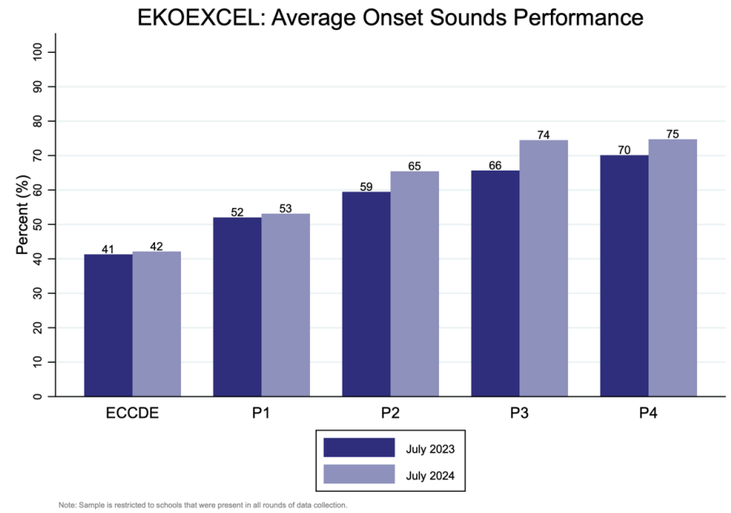
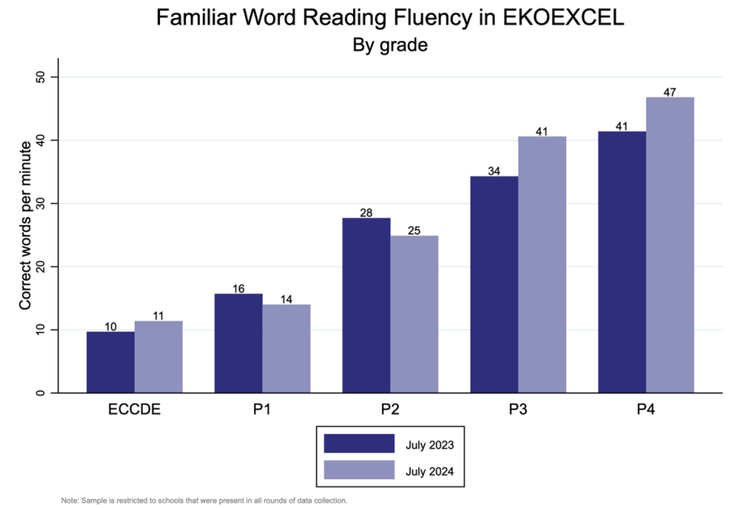


Figure 1



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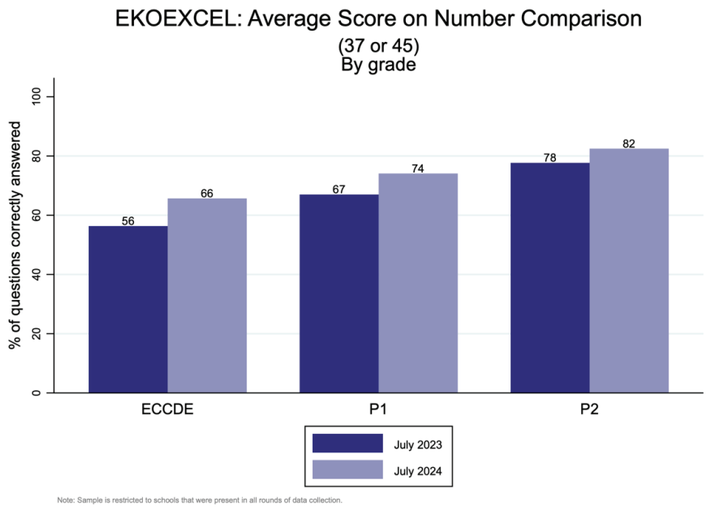

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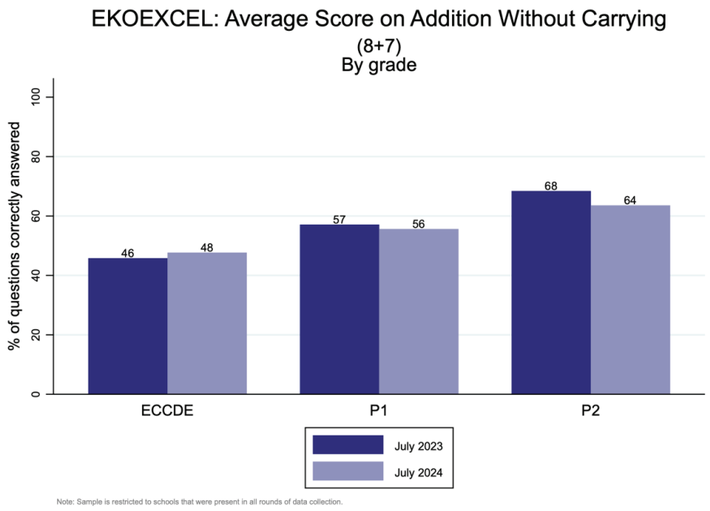

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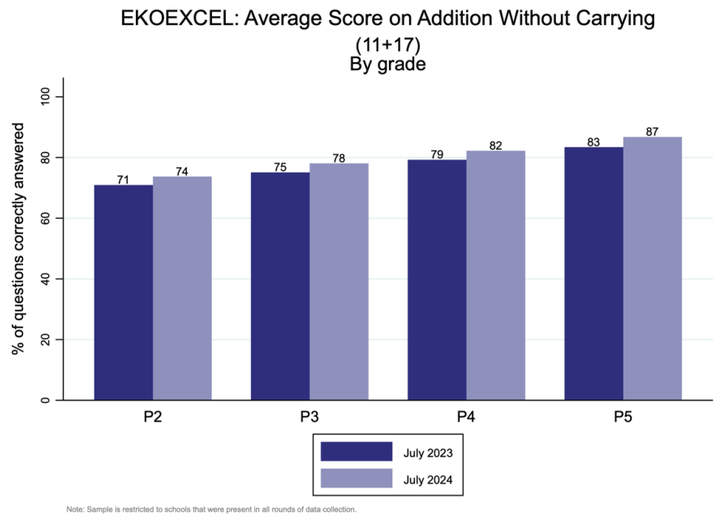

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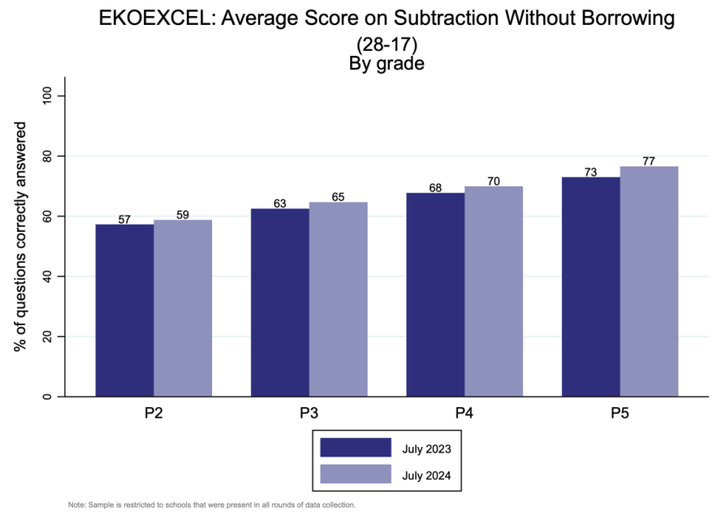

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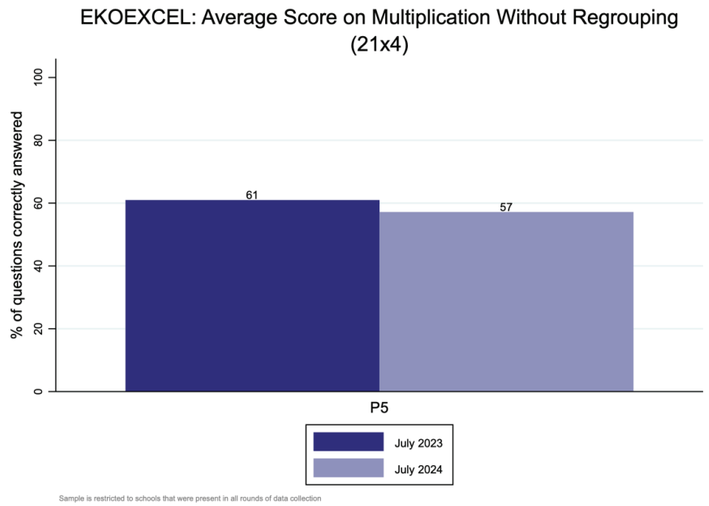

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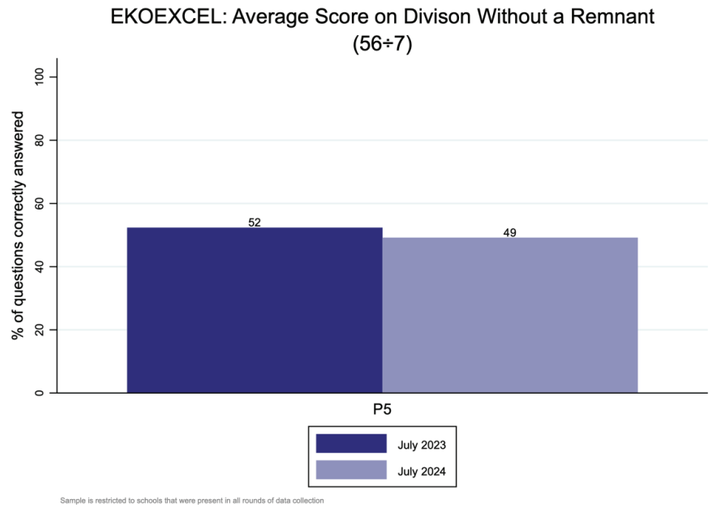

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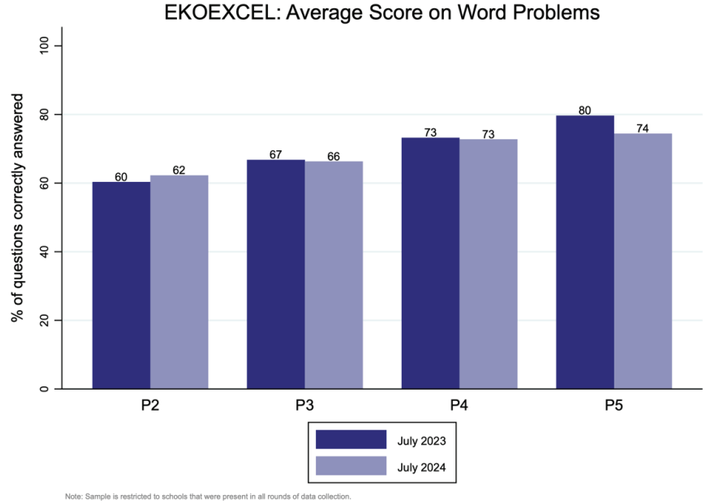

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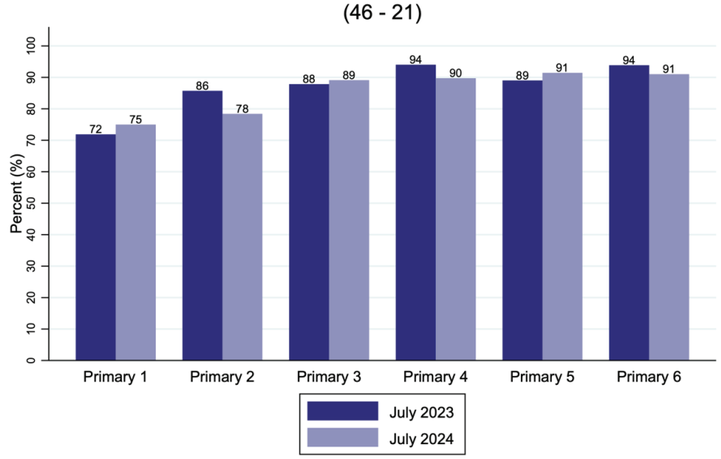

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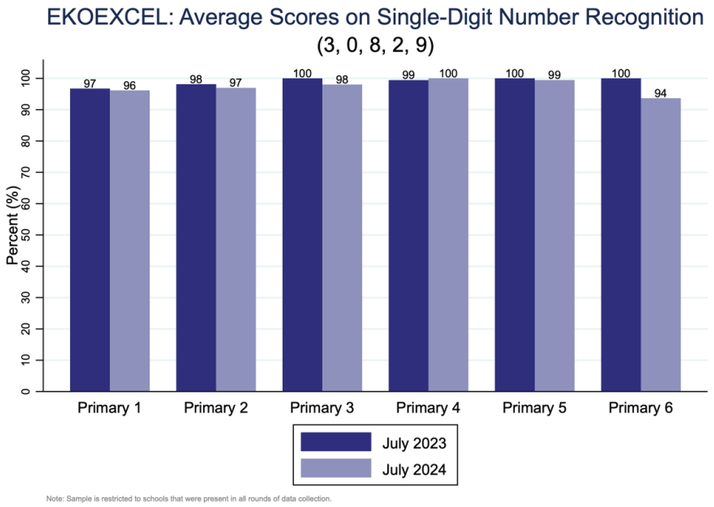

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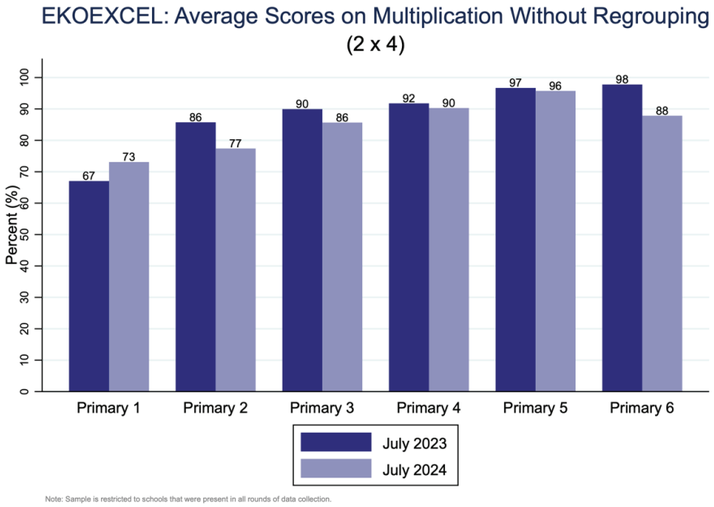

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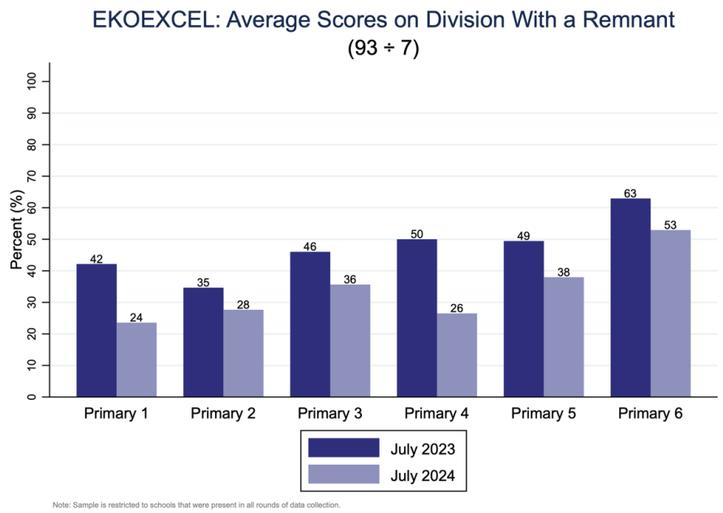

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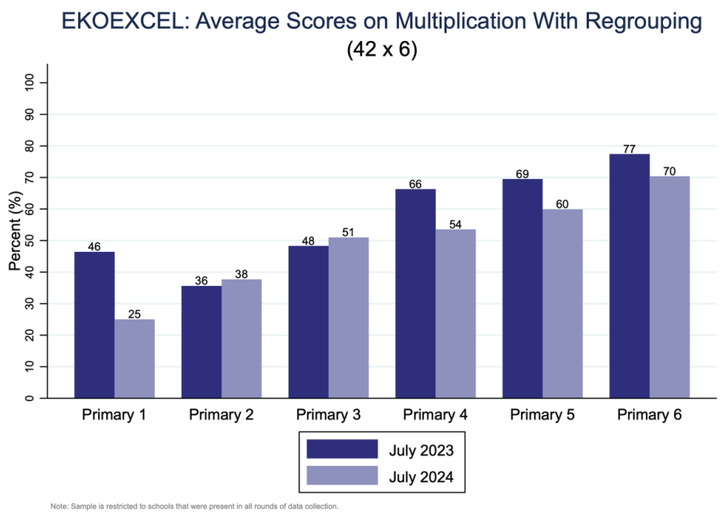

Figure 14

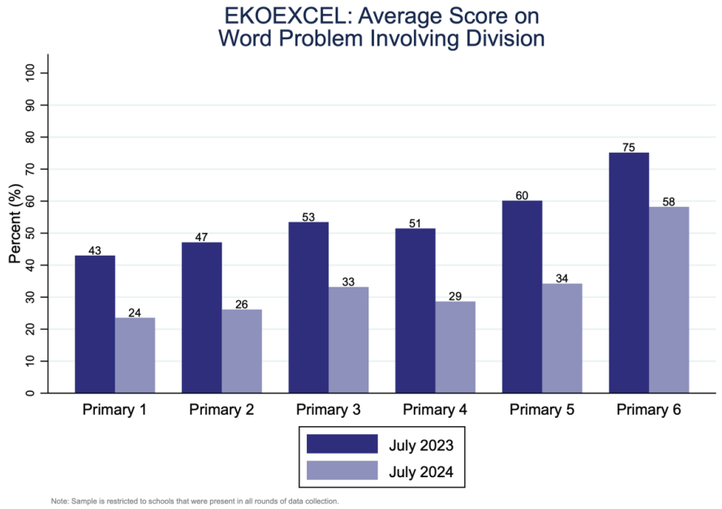

Figure 15

Table 1: Differences in Average Baseline Scores in Primary 1-5 (30 vs. 26 Schools)

Assessment	Assessment Item	All 30 Schools	Difference Between 26 Subset Schools and All 30 Schools
EGRA	Number of Words Read Correctly on a Primary 2-Level Passage	29	0
	Non-Readers on a Primary 2-Level Passage	20.7	0.02
	Number of Words Read Correctly on a Grade-Level Passage	37	-1
	Non-Readers on a Grade-Level Passage	2.9	0.3
	Reading Comprehension - Primary 2-Level Passage	15.6	0.2
	Reading Comprehension on a Grade-Level Passage	7.9	0.0
	Number of Familiar Words Read	4	0
	Number of Non-Familiar Words Read	1	0
EGMA	Quantity Discrimination	45.7	1.2
	Addition Level 1	17.9	0.3
	Addition Level 2	45.2	2.0
	Subtraction Level 1	18.2	0.5
	Subtraction Level 2	30.3	2.1
	Multiplication	21.9	-0.3
	Division	13.3	0.2
	Word Problems	33.4	0.5

Appendix D: Hasbrouck-Tindal Norms

The Hasbrouck-Tindal Oral Reading Fluency Norms are widely used as a tool to benchmark appropriate pupil progress in English oral reading fluency, given their developmental stage at different points of their Primary school experience. These benchmarks are developed based on data from a few different assessments collected primarily in high-income, English-speaking countries. The chart below contains the Hasbrouck-Tindal grade-level benchmarks for pupils in the 10th, 25th, 50th, 75th, and 90th percentiles for each school term. Furthermore, the chart also includes the average expected growth per week from pupils in each percentile.

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

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

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Appendix E: Mapping ICAN Results onto Global Performance Standards

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

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

Given the prominence of the GPF to understand global numeracy standards, this study has created a crosswalk between each skill assessed via the International Common Assessment of Numeracy (ICAN), described in this report, and the grade in which children are expected to master that skill according to the GPF. The study team carefully identified the mathematical benchmarks in the GPF that most closely correspond with assessment items, based on both the exact problem and the skill that is assessed by each problem. The grade level at which assessed pupils should be reaching these benchmarks was then determined by referencing the grade level(s) described under the framework's "Meets Global Minimum Proficiency"[9] threshold. In the following table, the precise alignment between each assessed ICAN skill and the grade-level expectation, per the GPF, for sufficient ability to demonstrate this skill can be found:

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

ICAN skill	Sample problem	Grade-level expectation	Rationale[10] evidenced by GPF expectations
Simple number recognition: One-digit number recognition	3, 0, 8, 2, 9	KG	**G1**: N1.1.1_M Count in whole numbers up to 30.
Complex number recognition: Two-digit number recognition	48, 97, 84, 22, 30	G1–2	**G1**: N1.1.1_M Count in whole numbers up to 30. **G2**: N1.1.1_M Count in whole numbers up to 100.
Simple addition: Two-digit addition without carrying	32 + 15 = ____	G2	**G2**: N1.3.1_M Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols. **G3**: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols (e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).
Complex addition: Two-digit addition with carrying	56 + 17 = ____	G3	**G3**: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols (e.g., 32 + 59; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).
Simple subtraction: Two-digit subtraction without borrowing	46 - 21 =____	G2	**G2**: N1.3.1_M Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols.
Complex subtraction: Two-digit subtraction with borrowing	78 - 29 = ____	G3	**G3**: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols.
Simple multiplication: One-digit multiplication without regrouping (exact multiplication)	2 x 4 = ____	G3	**G3**: N1.3.2_M Multiply and divide within 100 (i.e., up to 10 x 10 and 100 ÷ 10, without a remainder), and represent these operations with objects, pictures, or symbols.
Complex multiplication: Two-digit multiplication with regrouping	42 x 6 = ____	G5	**G5**: N1.3.2_M Multiply, with and without regrouping, and divide, with no remainder, any number by a one-digit number and multiply two, 2-digit numbers, with and without regrouping (e.g., 342 x 4 = __; 42 x 34 = __; 1380 ÷ 5 = __).

[10] In this column, the Global Proficiency Descriptors for each grade level are coded in accordance with which domain and where in the GPF they are located ("N" stands for "Number Operations" and "A" stands for "Algebra"). The "M" at the end of each descriptor's label indicates that this is the expectation for the "Meets Minimum Proficiency" level. To access the GPF firsthand, please follow this link: https://gaml.uis.unesco.org/wp-content/uploads/sites/2/2021/03/Global-Proficiency-Framework-Math.pdf

Simple division: Exact, one-digit short division with no remnant	9 ÷ 3 = ____	G3	**G3**: N1.3.2_M Multiply and divide within 100 (i.e., up to 10 x 10 and 100 ÷ 10, without a remainder), and represent these operations with objects, pictures, or symbols.
Complex division: Short division of a two-digit dividend by a one-digit divisor with a remnant	93 ÷ 7 = ____	G6	**G6**: N1.3.2_M Multiply any number by a 2-digit number, with and without regrouping, and divide any number by a 1-digit number, with and without a remainder (e.g., 3427 x 68; 1380 ÷ 6 = __).
Simple fractions: Recognition of the magnitude of fractions	Which is greater: 4/5 or 3/15	G5	**G5**: N2.1.3_M Compare and order fractions with different but related denominators up to 12. **G6**: N2.1.3_M Compare and order proper or improper fractions with different, unrelated denominators.
Complex fractions: Addition of a fraction and a mixed number	1 1/6 + 1/3 =____	G6	**G6:** N2.2.1_M Add and subtract improper fractions or mixed numbers with different but related denominators.
Simple algebraic equations: Solving for a variable requiring one step	17x = 68 x = ____	G6	**G6**: A3.2.1_M Find a missing value in a number sentence using any one of the four operations.
Complex algebraic equations: Solving for a variable requiring two steps	-5y - 3 = 12 y = ____	G7	**G7:** A3.3.1_M Represent and solve problems, including real-world problems, using a two-step equation with any of the four operations.
Subtraction word problem	There were 43 children in the park. Out of these, 25 of them have gone home. How many children are in the park now?	G4	**G4**: N1.4.1_M Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with and without regrouping, including problems involving measurement and currency units.
Division word problem	A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?	G5	**G5**: N1.4.2_M Solve simple real-world problems involving the multiplication of two whole numbers to 10, and associated division facts.
Fractions word problem	There were 108 goats in the pen. 1/6 of them were black. How many goats were NOT black?	G5	**G5**: N2.3.2_M Solve real-world problems involving the multiplication and division of a proper fraction and a whole number.
Algebraic equations word problem	A number plus 8 equals √144. What is the number?	G7	**G7**: A2.1.1_M Use linear expressions to represent problem situations with a single variable (e.g. The cost of buying cinema tickets online is £12 per ticket plus a £2 booking fee. Write this as an expression where x is the number of tickets purchased). **G7:** A3.3.1_M Represent and solve problems, including real-world problems, using a two-step equation with any of the four operations (e.g., solve 3x + 4 = 22; Some people got on a bus, doubling the number of passengers. At the next stop, 8 people got off, leaving 16 people on the bus. Represent the situation as an equation, and solve to find the number of people on the bus originally).

Appendix F: Projecting Data from Baseline to the End of the Previous Year

The average learning growth for a typical term absent the programme was calculated for all literacy and numeracy subskills. This involved first calculating the difference in learning outcomes between the two assessed grades to establish total learning growth, and then dividing this by the number of terms between those two grades to establish learning in a given term. Using reading fluency as an example, in January 2020 (2019-20 school year) data collection, pupils in Primary 2 scored, on average, **8 correct words per minute** (cwpm), and pupils in Primary 5 scored, on average, **50.9 cwpm**.[11] Therefore, the average growth for pupils in school between Primary 2 and Primary 5, before EKOEXCEL, is **42.9 cwpm**. Since there are three terms in each grade, the estimated average termly growth is 4.8 cwpm (i.e., 42.9 ÷ 3 years ÷ 3 terms per year), as the following table shows:

Table 4.1: Estimated Termly Growth Without the EKOEXCEL Programme

Grade	Score at the beginning of Term 2 of the 2019-20 school year
Primary 2	7.9 cwpm
Primary 5	50.9 cwpm
Growth between Primary 2–Primary 5 before the programme	42.9 cwpm
Estimated growth per term — three terms per grade over three years between Primary 2–Primary 5	**4.8 cwpm**

Using this calculated average termly growth, the data from the start of Term 2 in the 2019-20 school year were projected to estimate the learning levels at the end of Term 3 of the same school year. As end-of-year learning levels are assumed to remain consistent year-to-year without the programme, the projected levels at the end of Term 3 of the 2019-20 school year are equivalent to the expected outcomes at the end of the 2018-19 school year, enabling the analysis of programme impact after five school years.

To enable the monitoring of learning outcomes for the grades not assessed in January 2020 — i.e. Primary 1, Primary 3, Primary 4, and Primary 6 — the learning levels for each grade were projected for all assessed learning outcomes using the data available from the start of Term 2 of the 2019-20 school year. Table 4.2 shows this in the third column, where (as outlined above) the average growth for two terms is added to the observed score in order to project a comparable end-of-year score for Primary 2 and Primary 5 (e.g. for Primary 2, it would be 8 cwpm + 4.8 cwpm/term x 2 terms = 17.6 cwpm). Then, those end-of-year projected scores for Primary 2 and Primary 5 were used to project scores for the remaining grades by adding or subtracting three terms of growth. In other words, for Primary 3, the calculation would be: 17.6 cwpm (the estimated end-of-year score for Primary 2) plus 4.8 cwpm/term x 3 terms in a full school year = 32 cwpm, as the following table shows:

[11] These values are the baseline outcomes in the 26 schools that participated in all rounds of data collection, rather than the 30 schools that were assessed at baseline.

Table 4.2: Estimated Grade-on-Grade Growth Without the EKOEXCEL Programme

Grade	Observed score at the start of Term 2, 2019-20 School Year	Projected score at the end of Term 3, 2019-20 School Year
Primary 1	-	**3.2 cwpm**
Primary 2	8 cwpm	**17.6 cwpm**
Primary 3	-	**32 cwpm**
Primary 4	-	**46.4 cwpm**
Primary 5	50.9 cwpm	**60.8 cwpm**

The methodology to project end-of-year scores for the 2018-19 school year assumes a consistent, linear term-by-term growth across all grades. This approach provides a clear and transparent method for making projections, without the complexity and assumptions that more sophisticated modelling techniques often require, which may not always be reliable. Alternative methods, such as assuming varying learning growth throughout the year, can be difficult to understand and interpret, and there is currently limited evidence in the literature to support their use. Therefore, the most transparent approach with the fewest assumptions has been used. Furthermore, to increase confidence in the results, as presented later, projections were made only for grades with clearly defined starting and ending points for learning outcomes. For instance, in reading fluency, projections were limited to Primary 3 and Primary 4 because their starting and ending points were defined by the known learning outcomes of Primary 2 and Primary 5.

Appendix G: 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 sources of knowledge 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, bringing pupil 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 the **Early Grade Reading Assessment (EGRA)**, which is widely regarded by researchers as an effective literacy measurement procedure. This assessment uses several sub-tasks to measure literacy, including passages to measure **Oral Reading Fluency (ORF)**, the subskill most strongly correlated with others on the path towards reading proficiency, and reading comprehension, the ultimate goal of literacy skills. In terms of reading fluency, pupils are scored based on the number of **Correct Words Per Minute (cwpm)**, and incorrectly read words are also recorded. In order to assess pupil numeracy skills, we use the **Early Grade Mathematics Assessment (EGMA)**, which has been adapted for use in more than 15 countries and serves as a valuable tool for assessing early numeracy skills, as well as 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 underpins some of the major policy decisions needed to benefit pupils to the greatest extent possible, it is vital that the data gathered from them is current and reliable. Therefore, to ensure efficient turnaround and accuracy of assessment scores, NewGlobe dispatches trained enumerators to administer the assessments in the schools it serves. Enumerators are responsible for recording and reporting assessment scores with the utmost precision. In turn, NewGlobe is responsible for effectively monitoring these enumerators' output, to ensure that there are no observances permitted that may compromise the reliability of the data. To execute this undertaking, 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 facilitate analysis of 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 share of observations showing that pupils are non-readers
- **Indicator 2:** The share of observations containing ORF scores of extreme values for a given grade
- **Indicator 3:** The share of observations containing ORF scores that surpass maximum achievable score
- **Indicator 4:** The share of observations containing discrepant ORF scores
- **Indicator 5:** The share of observations containing identical ORF scores
- **Indicator 6:** The share of observations containing ORF scores that are multiples of 5
- **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 share of observations showing that pupils are non-readers

The key question to answer for this indicator is whether the share 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 grade-level ORF passage will also identify many non-readers using the standard-grade 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 share 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 share of observations containing ORF scores of extreme values for a given grade

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 grade. 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 share 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 share of unfeasible 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 share 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 share 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 share of observations containing the exact 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 share 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 a code to flag the issues defined by each indicator, for each of the observations in a data set. The specifics of this code ensure that these flags identify the individual enumerator who completed the observations, thereby establishing accountability norms and governance over performance patterns.

Part 2: Aggregating data for each indicator, by enumerator

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

Part 3: Investigating enumerator alert rates based on indicators

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

Part 4: Reporting enumeration performance to the data collection team

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

Appendix H: Qualitative Data Collection Protocol

Purpose and framing

The goal of this exercise is to objectively understand the most significant ways through which pupils benefitted from the EKOEXCEL programme in the last four years, as well as the major changes teachers and head teachers were able to introduce in the classroom and schools through the trainings they received and the 360-degree support provided by the EKOEXCEL programme. Additionally, we aim to identify key and strategic areas for improvement to continue to transform pupils' learning gains across Lagos State's public Primary schools.

We understand that while the outcomes of the programme were very positive in its first 114 weeks, there might have been some operational challenges as well. Thus, objectively gathering feedback from our head teachers, teachers, parents and pupils will help us identify the best practices, most significant innovations and attitudes that improved teachers' pedagogical skills, school system management, classroom enthusiasm, parent-teacher collaboration and in what specific ways these factors impacted pupils' learning.

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 factors that, in their view, were the most significant in supporting the programme in achieving a smoother programme implementation.

Survey instrument/questions

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

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

How to start the interview?

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

"Thank you for your help today. We are working on understanding how the first months of the EKOEXCEL 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 EKOEXCEL 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, grades taught last semester, and the school where you work?"

Questions for teachers:

1. First, what are your general impressions about the EKOEXCEL 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 EKOEXCEL programme? If so, how helpful do you think it is to teach EKOEXCEL-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 EKOEXCEL 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 EKOEXCEL Programme?
2. What do you think your teachers' general impressions about the EKOEXCEL Programme are?
3. During its first year of operations, the EKOEXCEL programme was rolled out in all Primary levels. Did you notice how the teachers taught the programme between the lower-Primary pupils and upper-Primary 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 EKOEXCEL 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 EKOEXCEL methodology into the classroom?
5. During its first year of operations, the EKOEXCEL programme was rolled out in all primary levels. Did you notice how the teachers taught the programme between the lower-Primary pupils and upper-Primary 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?

Sample data collection

We suggest that the collection of the data happens in an orderly and systematic manner. To do so, the RME team 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.):

Question	Respondent 1 Name: (if available) School: (if available) Grades taught last year: (if available)	Respondent 2 Name: (if available) School: (if available) Grades taught last year: (if available)	Respondent 3 Name: (if available) School: (if available) Grades taught last year: (if available)
Question 1	Response	Response	Response
Question 2	Response	[Not discussed]	Response
Question 3	Response	Response	[Not discussed]
Question 4	[Not discussed]	Response	Response
Question 5	Response	[Not discussed]	Response
Question 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 I: The Learning Crisis: Causes, Contributors, and Consequences

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

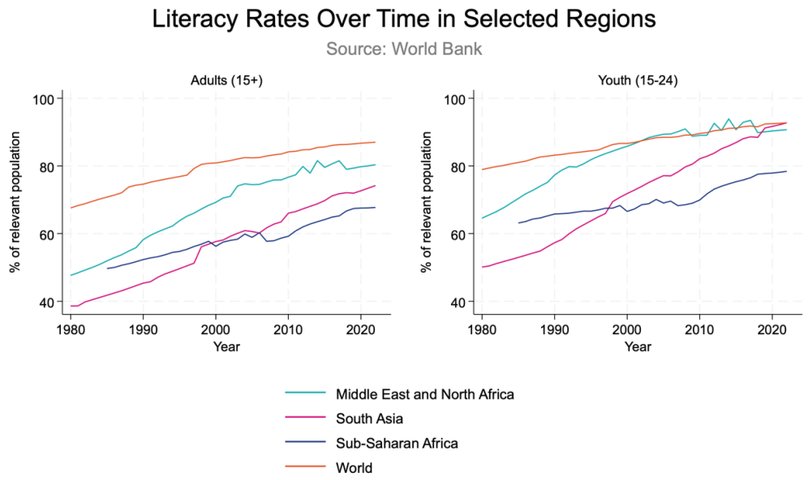
The growing global focus on broadening access to schools has led to significantly improved enrolment rates

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

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

Increased enrolment has been accompanied by growth in literacy rates

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



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

Barriers to enrolment still persist

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

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

Beyond physical, financial, and infrastructural barriers, the quality of education offered by school systems is a crucial factor for ensuring that children not only enter school, but also remain in and advance to the next levels of school. There is a significantly stronger likelihood that pupils will drop out of school or will not transition to higher grades or levels of education if they are not academically thriving (Pritchett, 2013), and the responsibility of ensuring the scholastic achievement of all pupils falls on the education system, to a far greater degree than it is dependent on pupils' backgrounds or characteristics (OECD, 2012; Eble and Escueta, 2022). Ultimately, failure to ensure adequate pupil retention and attainment has negative implications for both the education system and for pupils. It is more costly for education systems to devote educational resources to pupils who must repeat grades or who ultimately withdraw from formal education, and high rates of dropout are equated with lower levels of productivity in the labour force, which is detrimental for individuals and whole societies alike (OECD, 2012; Patrinos and Psacharopoulos, 2018).

Access to education must start with early childhood

While great progress has been made in recent decades towards enrolling larger numbers of school-aged children, children in many contexts enter school later than the intended age, which can profoundly impact the rate at which they master skills during their academic careers and how well they develop into adulthood. For example, in Guinea-Bissau, more than three quarters of children in Primary school are over-age (UNESCO, 2023a), and this is largely due to late enrolment, with only 30% of children beginning

school at the specified age of six (Borgen Project, 2021). In Nigeria, 1.8 million children were attending Primary school after the age of 11 during the 2018-2019 school year (Sasu, 2022). A 2017 study conducted in Uganda found that pupil ages in the final year of Primary school ranged from 12 to 22 years, with most pupils being 16 years old (Nath et al., 2017). In some contexts, late entry is a result of positive systemic changes that have broadened access to education (World Bank, 2020c) by making schooling available to children who were previously barred from it. However, in the long term, it is more advantageous for pupils to be equipped with school readiness by entering a learner-centred environment as early as possible — ideally through early childhood development education (Sosu and Pimenta, 2023). This plays a critical role in ensuring that pupils keep pace with curricular expectations, thereby maximising their potential throughout their academic careers and beyond.

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

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

Enrolment is necessary but not sufficient

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

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

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

Progress is needed on true measures of literacy

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

Distribution of Children Age 0-14 by Region, Enrollment, and Learning Status

Children who do not live in an LMIC

Children who live in an LMIC, but are not enrolled in school

Children who live in an LMIC and are enrolled in school

Children who live in an LMIC, are enrolled in school, and are experiencing learning poverty

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

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

Learning outcomes are weak and urgently require transformative interventions

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

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

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

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

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

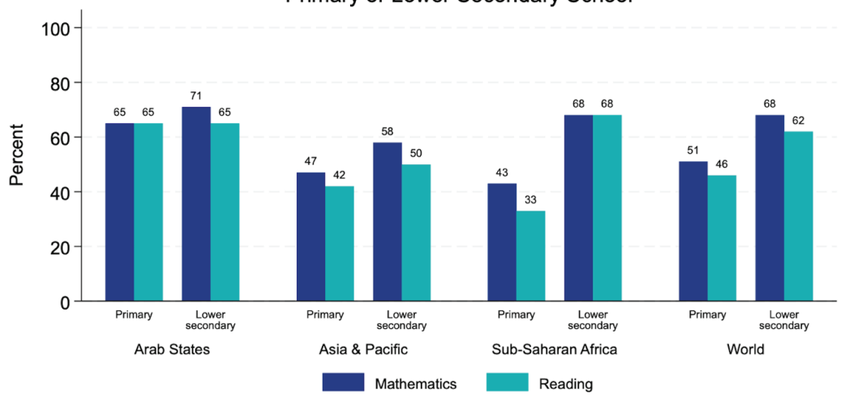
"Without the implementation of effective policy solutions to improve learning outcomes, vast amounts of educational resources will continue to be expended without a meaningful return on investment."

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

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

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

Percentage of Countries With Data to Monitor Progress Toward the Sustainable Development Goals for Learning by the End of Primary or Lower Secondary School



Source: World Development Report 2018 Data

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

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

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

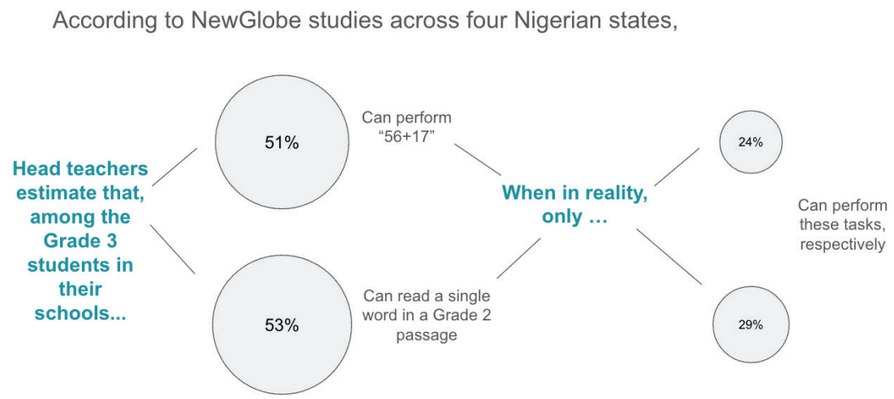
While longer school closures are correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in pupils' ability to keep pace with academic expectations. However, in nearly all low-income countries, more than half of the population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

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

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

Policymakers often underestimate the extent of the learning crisis

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



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

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

Increased heterogeneity in learning levels poses a new challenge

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

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

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

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

The causes for weak learning outcomes are many

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

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

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

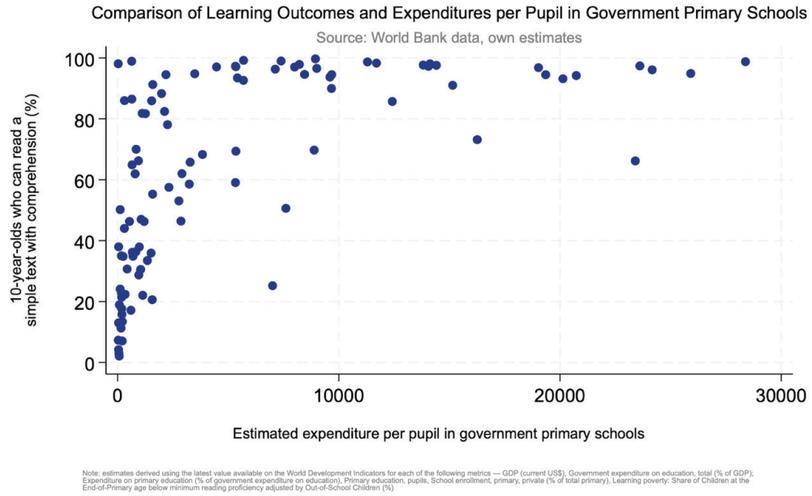
In response, it is imperative for education systems in LMIC to maintain momentum with holistic and proven-effective approaches, so that gaps in educational achievement do not widen during misdirected pursuits. Furthermore, curricular design should justify how and why material or technological inputs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

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

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

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

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



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

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

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

Low teacher content knowledge can translate into poorly executed pedagogy

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

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

Box 8: Meeting Children Where They Are: Designing Curricula to Target Appropriate Learning Levels

Curricula play a crucial role in educational systems because they establish standardised content and instructional approaches on a system-wide scale. Ideally, curricula should align with the economic and developmental needs of pupils and the country. However, in many low- and middle-income countries (LMIC), researchers have documented the common discrepancy between pupils' actual performance and curricular expectations, particularly in the early grades — resulting in "overambitious curricula" (Pritchett & Beatty, 2015). In part, the misalignment between curricula and pupils' learning levels is due to inadequate measurement; that is, pupils are not being assessed in the early grades for their mastery of foundational skills, and/or the results from these assessments are not systematically informing whether pupils move to the next level. In addition, misalignment can result from curricula that inherently outpace children's cognitive

capabilities. For example, in Meghalaya, India, 10 year old children are expected to accurately find the "smallest whole number by which [a number can] be divided so as to get a perfect square, and find the square root of the number obtained" (NCERT, 2018). Even in high-performing countries such as South Korea, pupils are not expected to solve this type of problem until age 12 (Park, 1997). This discrepancy between expectation and capacity has been suggested to be one of many contributors to the current learning crisis (Glewwe et al., 2009; Muralidharan et al., 2019). Importantly, the consequences of poorly structured curricula that drive low foundational literacy and numeracy outcomes are not exclusive to the early grades, due to the cumulative nature of learning. Pupils who perform poorly in early elementary school are more likely to drop out when compared to their peers (World Bank, 2018). Conversely, mastery of foundational literacy and numeracy (FLN) skills is correlated with future success in Secondary school and future employment opportunities (Evans & Hares, 2021; Muralidharan & Sundararaman, 2010). Therefore, effectively implemented, large-scale curricular reforms focusing on foundational literacy and numeracy in LMIC can bridge the gap between pupils' knowledge and policymakers' educational goals and lead to improved learning outcomes and increased regional economic productivity.

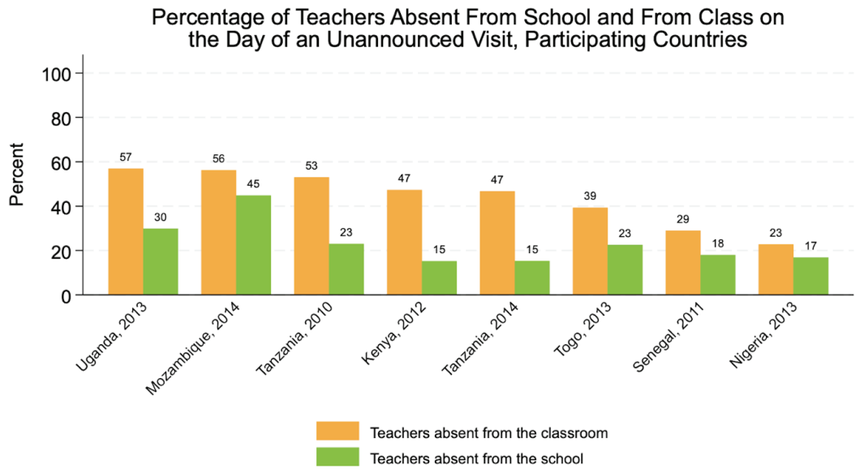
Curricular changes that align instruction with pupils' measured levels, particularly with respect to FLN, have been shown to assist low-performing pupils in achieving national standards. For example, a study in India implemented a curriculum that was better suited to the median pupil's level with scientifically tested learning materials and accessible technology, which resulted in increased achievement in maths and Hindi after just 4.5 months (Muralidharan et al., 2019). In Tanzania, targeted restructuring of early elementary curriculum to better suit the median pupil's performance was found to increase all participating pupils' proficiency in literacy and numeracy in Grades 1 and 2. Pupils were twice as likely to reach minimum proficiency in Grade 2 maths and significantly improved their language proficiency when compared to their peers who did not receive the restructured curriculum (Rodriguez-Segura & Mbiti, 2022). In both studies, researchers note that a key element to the success of these programmes was the initial low learning outcomes in the nation. Bringing instruction closer to the average pupil's levels led to wide-spread benefits, as the median pupil in many LMIC tends to have similar outcomes to the lowest performing pupils. Also, in both India and Tanzania, these curricular reforms were found to be cost-effective in that they did not require expensive inputs, such as increased staffing in schools or additional classroom resources. Because curricula can be restructured and implemented on a system-wide scale with minimal cost, curricular reforms can yield high returns on learning outcomes in LMIC.

To effectively develop and implement high-quality curricula, data collection and effective educational pedagogy must be incorporated with intention. Accurate and regular data collection on pupil performance is crucial for tailoring the curriculum to the needs of the pupil population. Analysing pupil performance throughout the academic year enables policymakers to identify areas where pupils are struggling and allocate more attention accordingly. In a curriculum reform in Costa Rica (Rodriguez-Segura, 2020), the lack of monitoring teaching methods and reliance on end-of-year results resulted in unintended consequences, such as long-term grade repetition and insufficient improvement in reading skills. However, when curriculum reforms are aligned with the median pupil's academic performance and incorporate effective pedagogical practices at the individual level, they can successfully enhance learning outcomes on a broader scale (Rodriguez-Segura & Mbiti, 2022). Well-designed curricula provide clear guidance to teachers regarding prioritised topics, pacing, and learning objectives for pupils at different academic stages, leading to improved learning outcomes without requiring high-cost measures, such as additional teachers or instructional time. By prioritising mastery of essential pre-skills in curricula before introducing new content, governments can significantly enhance the likelihood of meaningful learning outcomes for both whole classes and individual pupils.

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

Strong governance is essential for encouraging teacher professionalism and accountability

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



Source: World Development Report 2018 Data

Effective school-monitoring practices are essential to address high rates of absenteeism across LMIC, but they are not always utilised to ensure consistent teacher attendance. In Tanzania, for instance, only 30% of schools reported that recent visits from Ministry of Education officials were related to teaching and learning. In a sample of public schools in India, no teachers with high absenteeism rates were dismissed by principals during their tenure (Mbiti, 2016). Additionally, UNICEF's Time to Teach study found that in several West and Central African countries, school leaders refrained from sanctioning frequent absenteeism due to uncertainty about the education system's hierarchy or doubts that corrective action would follow (Karamperidou et al., 2020).Regular observation by school leaders and the introduction of programmes that tie professional benefits for teachers directly to academically constructive behaviours can lead to reduced absenteeism and improved classroom engagement, which naturally benefits pupils. For instance, a study of public schools in India showed a 25% reduction in overall absences and a 40% reduction in unauthorised absences when regular school inspections were conducted (Muralidharan et al., 2017). In another case, financial incentives that required teachers in India to take time-stamped photos with their class at the beginning and end of the school day led to better teacher attendance and, consequently, improved learning outcomes (Mbiti, 2016). Such initiatives not only enhance pupil learning gains but also establish professional expectations that can positively influence future generations of teachers.

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

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

Effective policymaking starts with reliable data

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

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

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

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

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

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

Still, it should be recognised that the current amount of funding being devoted to education quality improvement is significant. On average, 14% of worldwide government expenditures are devoted to education, according to USAID (2018), and an average of USD 5 trillion is spent on education every year across the globe. A UNESCO report calls for an additional USD 500 billion of yearly education funding from low- and middle-income countries, specifically, to reach SDG 4 by 2030 (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 pupil performance, which will in turn contribute to pupil retention. Therefore, concerted effort towards solving the learning crisis is the foremost proposed action to ensure the cost-effectiveness of education funding and increased opportunity for sustaining these investments over time.

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

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

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

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

Elevating education quality standards drastically improves educational equity

It is often the case, across LMIC, that pupils from relatively disadvantaged socioeconomic backgrounds display lower performance in foundational literacy and numeracy competencies, in addition to being less likely to remain in school for the duration of or following their Primary school careers. These disparities increase over time, which highlights the necessity of early interventions that create equitable learning opportunities and foster gains for pupils from all wealth groups (DHS, 2014, 2015–16; Spaull and Kotze, 2015). Research indicates that improving pupil mastery of foundational skills in an education system, regardless of the variety of socioeconomic backgrounds of the pupils comprising it, narrows gaps in academic performance — the very gaps that have been attributable to differences in pupil background — by providing the appropriate substructure pupils need before becoming exposed to more advanced concepts (Crouch et al., 2021; Asim, 2020). The implication of a narrowing learning divide, furthermore, is that a greater number of pupils become important contributors to a knowledge-based economy from which they otherwise would have been excluded.

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

Education systems must be improved holistically

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

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

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

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