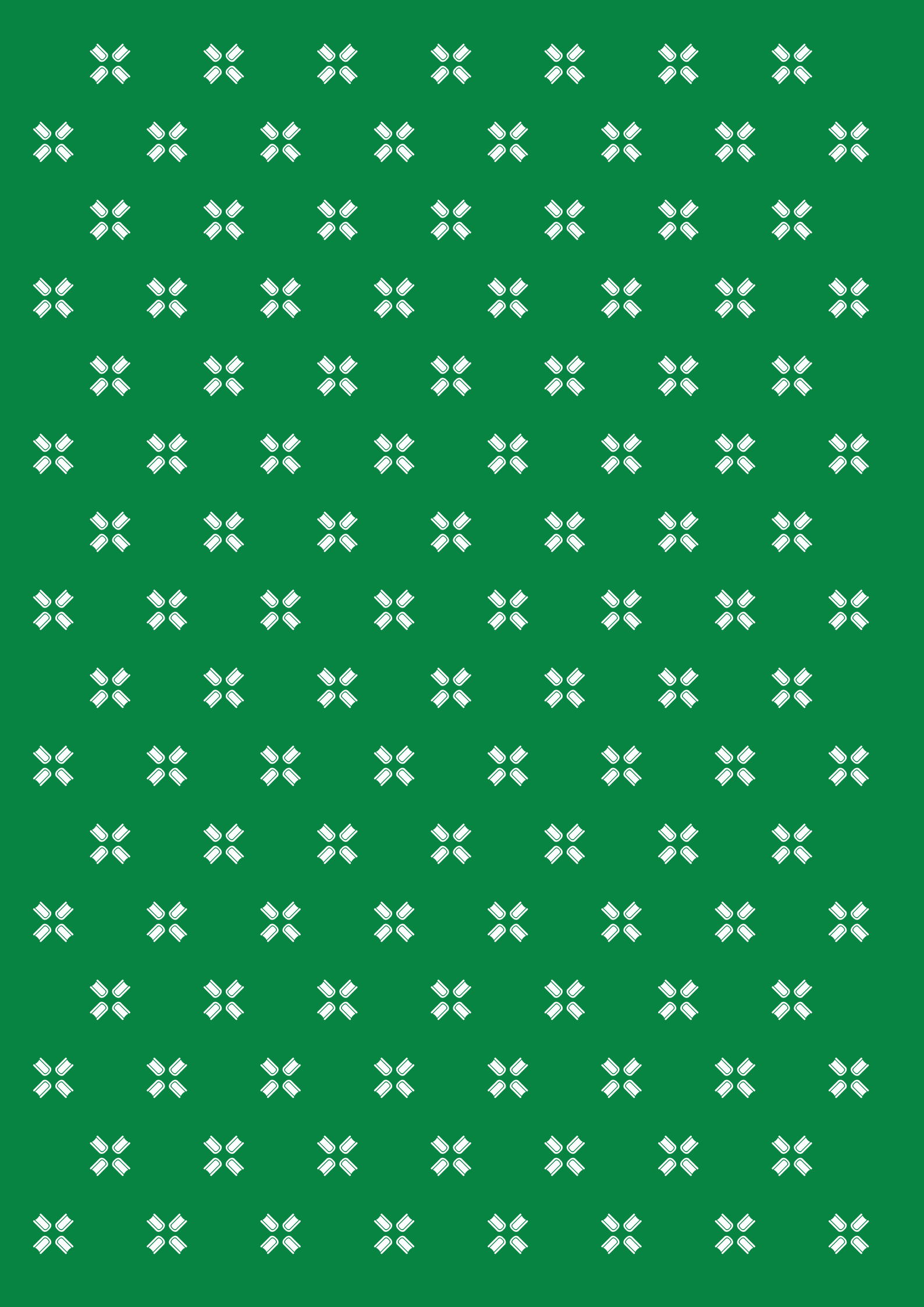
EKOEXCEL
EXCELLENCE IN CHILD EDUCATION AND LEARNING

UNIVERSAL BASIC EDUCATION BOARD
LAGOS STATE

Can Data-Informed Management and Structured Pedagogy Improve Learning?

Evidence from government schools in Lagos State

By the end of the 2022-23 school year after close to four school years of programme implementation



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Professor Patrick Akinsanya, Dr Olaotan Kuku, Sylvester Mchihi, Daniel Rodriguez-Segura, Pranav Bhargava, Keuna Cho, Priscilla Lu, Savannah Tierney, Anchal Khandelwal, and Jinrong Zuo

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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.

By the end of the 2022-23 school year, the programme was serving 446,926 pupils from all 1,013 government Primary schools across the State.

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

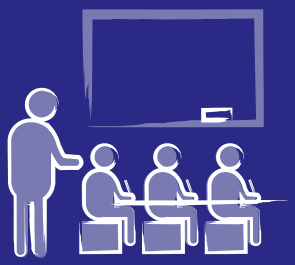
28% of pupils in a typical Primary 2-5 class could not read a single word from a Primary 2-level passage. In numeracy, **two of every five pupils in a typical Primary 2-5 class could not correctly answer a single two-digit subtraction problem** like 28-17, even though this skill should have been mastered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

After close to 4 school years of programme implementation, pupils experienced dramatic gains in foundational learning despite the disruptions to school caused by the COVID-19 pandemic during this period.

- The average **Primary 2 pupil** is now **reading as fluently as the average Primary 3 pupil** before the start of the programme.
- The share of non-readers in a typical Primary 2 classroom decreased by 12 percentage points, representing nearly **a one-third reduction in non-readers in Primary 2** since the start of the programme.
- **Close to 60% of Primary 5 pupils** can now read a Primary 2-level passage with comprehension (akin to the World Bank's "learning deprivation" metric), a **significant increase** from just 14% three years ago —nearly **four times the previous rate.**
- In most numeracy subskills, pupils are now **learning at levels two grades higher** than where they were performing before the start the programme.
- Pupils in a typical Primary 2 classroom can now **correctly solve 60% of word problems,** a big improvement from 28% before the programme started. On average, a Primary 2 pupil is now doing much better than a Primary 5 pupil did before the EKOEXCEL programme, effectively **gaining three extra years of schooling.**

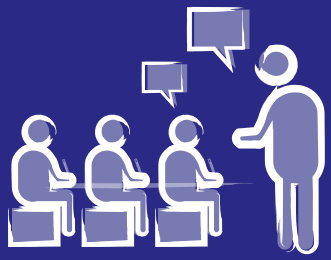
By the end of the 2022-23 school year, teachers were spending more time in the classroom, delivering high-quality instruction than during the initial years of the programme.

From the last five weeks of the 2020-21 school year to the last five weeks of the 2022-23 school year, the rate of teacher attendance has improved by 4 percentage points and **the proportion of lessons delivered to completion surged by 31 percentage points,** from 47% to 78%.



A study of learning growth during the 2022-23 school year reveals that pupils made significant progress overall.

Although the rate of learning varies by LGA and school, enabling policymakers and programme leaders to identify areas of stronger growth and transmit best practices to other areas and schools to improve learning at higher rates.



Four Years of EKOEXCEL Programme, in Numbers

2x

Increase in performance on Word Problems for pupils in the average Primary 2-4 classes

2+

Additional years of learning in the Addition subskill for pupils in an average Kindergarten class over one school year

5x

Improvement in reading comprehension scores in a typical Primary 2 class

34%

Reduction in the share of non-readers in a typical Primary 1 class

66%

Increase in the average rate of lesson completion in EKOEXCEL schools

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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 paramount to the economic development and prosperity of Lagos State. Its children are the future of our State, 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 Lagos, 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 and nationhood 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. By the 2022-23 school year, 1,013 schools across 20 LGAs in the State participated in the programme, and 13,101 teachers 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 significant 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.

In only four years, the programme has begun to transform Lagos' basic education system with notable achievements in literacy and numeracy. The findings of this report are both exciting and encouraging; pupils in EKOEXCEL schools are learning significantly more than they were before the programme. Even children who could not read a single word are now advancing in their learning, thanks to the EKOEXCEL programme. However, it is important not to become complacent with this initial success, as incredible as it may be. This is merely the beginning. There is still work to be done to ensure that every child in Lagos has the opportunity to learn and develop the skills they need in order to reach their full potential as hard-working citizens.

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 (SUBEB). 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 four years of substantial investment in reshaping the public education of our dear State. These early 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 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

Acknowledgments

The successful completion of this report is due to the support and instrumentality of many people. First, we would like to thank the Governor of Lagos State, Babajide Sanwo-Olu, for his commitment to the transformation of public education in Lagos and for creating an enabling environment for us to conduct this study. We sincerely appreciate the Executive Chairman of the Lagos State Universal Education Board (LASUBEB) Hon. Dr Hakeem Shittu, the Permanent Board Members, the Head of Departments, his entire team and the entire Lagos State Ministry of Education (MOE) under the leadership of the Honourable Jamiu Tolani Ali-Balogun, the Honourable Commissioner for Education and the Permanent Secretary Mr Abayomi Abolaji for the partnership and guidance they provided throughout the planning and execution of this study.

Many thanks to the Chairman of the EKOEXCEL and the Steering Committee Honourable. Dr Adebayo Adefuye, the Lagos SUBEB Director EKOEXCEL Mrs Eniola Olatunde, the Director Planning, Research, and Statistics for Lagos SUBEB Mr Vincent Adekoya with his team, the Director School Support Services Mr Segun Aina with his team and the Lagos SUBEB desk officer for EKOEXCEL, Mr Odufejo Adeniyi for their commitment to the rigorous process of our measurement and evaluation system. We would also like to thank the Education Secretaries and all school Head Teachers and Teachers who welcomed the study teams into their schools and classrooms. We are grateful for the input and guidance of Demi Chen, Alya Shaiful Bahari, Marlee Mullane, Melanie Gaudet, Tobias Mitchell and the entire EKOEXCEL team under the leadership of the Group Managing Director Dr Olusoji Akinyele and the Managing Director, Mrs Enoh Ugbona.

Finally, we owe our deepest gratitude to the field team, the backbone of this project: Mrs Ayeni Olayinka, Fowowe O.T (Mrs), Adesida Abiodun Arike, Abidoye Najeem Olawale, Adeleke Omolara, Bella O.A, Alaiye Olugbenga Tobias, Oniyide Sheun Adebowale, Olajire Kayode Sunday, Onayemi A.O, Hanid S.I (Mrs), Gbadamosi Rashidat Folashade, Oretolu E.O, Makinde H.O, Balogun F.I.O, Adediran Adewale Olayinka, Aina O.O, Adaegba A.O, Taiwo E.O, Ibrahim W.F, Taiwo Johnson Setonji, Abudu Shakiru Adesoji, Enwereji Dorathy Ahuana, Etiko Hammed Oluwadamilola, Patinthode B.F, Duyile B.O (Mrs), Hassan Yusuf Adewalo, Akapo Tosin Alfred, Whenu Sesi Monday, Adegun Samson Oluwafemi, Uthman Abdulrasaq, Laguda Sikirat, Gbenle Taofeeq Oluwafemi, Ogunlaja Matthew Olamide, Bamgbose G.A, Balogun A.O, Hungbo Sunday Huntoyon, Ashiru Olamiji Adetoun, Balogun Ridwon Oladele, Fowosere Gafar, Adepegba Abiodun Adeyanju, Oladoye J.O, Rahamon Muri Olasemi, Odelana A.T., Atewologun B.B, Ogunkoya Olubukola Olayinka , Lawal R. O, Olugbodi S.O, Otunuyi Idiat Oluwakemi, Awoyemi Adebisi, Amodu Taofeek Olorunjedalo, Adeniyi Kehinde Morufu, Omomoyesan Solomon Adeoye, Ogunbowale O.K Oladunmiye, Olatunde Motunrayo, Yekeen Oladele Muritala, Ali Muhammed, Olukoya Nkechi Augustina, Fajoye Lateef Ibrahim, Akinola R.A (Mrs), Ayodele Ademola Emmanuel, Akinyemi Olusegun Peter, Balogun A.K, Bishi Omobola Basirat, Salaudeen B.B, Akingbade Hannah Abiola, Oluwole, Adeola Olaniran, Oyedeji S.O, Mustapha Adenike, Pitt T.R., Adebowale A.J, Ajayi Abimbola Ayobami, Owoyemi Muftau Alade, Akinnusi F.A, Gidado Azeezat Edosa, Balogun Kabiru, Odu Olayinka, Okunade Memunat, Ajayi Olufunke Eunice, Alonge F.O (Mrs), Oyemakinde Beatrice Aina, Obamoyegun Peter Owolabi, Renner Lucy O.,Adeyeri A.A, Oyelayo Ayodele Alabi, Hundeyin Adebayo Bodunrin, Adams A.L, and Adedayo Aderemi Adeniji.

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 holistic, 360-degree programme strengthening all aspects of the public Early Childhood and Primary education system. Through EKOEXCEL, school leaders and teachers are empowered to deliver transformative education to each child. The programme is dedicated to accelerating learning in all subjects and equipping all pupils with mastery in foundational skills encompassing reading, language, and mathematics. See Box 1 for additional insight into previous initiatives enacted by the Lagos State Government to improve educational outcomes.

EKOEXCEL is anchored in five core pillars:

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

The programme has five central goals:

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

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, 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.

EKOEXCEL: A Holistic Programme with Integrated Features

Academic Planning and Lesson Mapping

EKOEXCEL drives pupil learning by providing school leaders and teachers with the tools and support they need to deliver life-changing education to each and every child. Moreover, EKOEXCEL also offers government and programme leaders visibility into the minute-by-minute experience of pupils, teachers, and schools. This digital and operational transparency ensures that leaders can work in close collaboration and make strategic, data-driven decisions to improve the quality of education on a system-wide scale. Importantly, EKOEXCEL schools remain under the purview of the Lagos State Universal Basic Education Board (SUBEB). As such, each EKOEXCEL school receives the same level of scrutiny and monitoring across the Lagos State along with the additional support provided by the programme.

Below, the core pillars that enable the EKOEXCEL programme to ensure high-quality learning in each and every classroom are highlighted:

1. **Scientifically-based learning materials aligned with State curriculum**

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

EKOEXCEL enables the teaching of the national curriculum, while also building foundational skills that serve as the building blocks that allow access to all curricular content. EKOEXCEL's lesson materials cover all curriculum-mandated subjects, and include lessons that strengthen the core foundational literacy and numeracy skills necessary for pupils to meaningfully engage with and master the content in the national curriculum. Importantly, lesson content in the foundational areas is levelled — that is, adjusted to actual learning levels as measured in schools — so that instruction can be aligned with pupils' current learning needs. EKOEXCEL aims to meet pupils where they are, thus more effectively raising learning levels and guiding progress towards grade-level standards.

The quality of instructional materials is constantly evaluated through several mechanisms. First, continuous and comprehensive assessments of pupils' learning are administered termly, and the data are automatically captured from these assessments, providing ongoing visibility into pupils' progress across the entire system. Second, EKOEXCEL programme officers observe lessons each day, evaluating the quality of the design and opportunities for improvement. This continuous cycle of observation and iteration ensures that each and every lesson drives effective classroom instruction and contributes to optimised learning outcomes (For more information regarding structured pedagogy, see Box 2).

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

> *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 A at Oke Ira Primary School, Ikeja, Lagos

2. Technology-enabled instructional model

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

> *The EKOEXCEL programme has improved the teaching and technological skills of the teachers, and pupils are now learning very fast and participating actively in the classroom. Pupils are now very motivated and enthusiastic about coming to school, and you can see that from our daily classroom attendance*
>
> – Headteacher A at Oke Ira Primary School, Ikeja, Lagos

3. Data-driven training, coaching, and ongoing professional development

High-quality instructional materials are necessary but not sufficient to transform teaching and learning in the classroom; in addition, teachers need professional development, as well as ongoing support from school leaders. One key component of EKOEXCEL's data-driven professional development programme is induction training. Induction training is conducted at the outset of the programme, within each phase of expansion, and supports new teachers beginning their careers in EKOEXCEL schools.

EKOEXCEL induction training has three core objectives:

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

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

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

4. 360-degree support teams

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

5. Technology-driven monitoring and reporting

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

> *The Programme has made teaching and learning seamless. It has really helped to improve the literacy and numeracy skills of pupils. The technology is really advanced and innovative and it enables the teachers to preview lessons ahead*
>
> – Teacher B at Oke Ira Primary School, Ikeja, Lagos

Box 2 Enhancing Learning Outcomes Through Structured Pedagogy

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

According to the World Bank, structured pedagogy is a package for educational systems that consists of inputs such as lesson plans, learning materials, and ongoing teacher training. Structured pedagogy has been classified as a highly cost-effective intervention by an advisory panel made up of international education experts (GEEAP, 2023). This makes pedagogy reform and implementation particularly attractive for countries who are facing budgetary challenges and inequitable learning outcomes, as it equips teachers with expertly developed and coherent materials, benefiting pupils regardless of external factors such as location, income, or background (World Bank et al., 2023). Evidence indicates that structured pedagogy has significantly improved learning outcomes in several LMIC. For instance, the RARA (Nigeria Reading and Access Research Activity) programme focusing on supporting teachers with lesson plans and effective strategies resulted in substantial gains in language fluency for Primary 2 pupils, equivalent to almost half a year of additional schooling (RTI International, 2015). Similar patterns were observed in a 2018 study by Research Triangle International (RTI), which highlighted the contribution of structured lesson plans to improved learning outcomes across 19 education programmes in 13 countries (Piper et al., 2018). In a randomised control trial, conducted by a group of education experts led by Nobel Prize-winner Dr Michael Kremer, pre-Primary and Primary pupils enrolled in Kenyan schools using structured pedagogy for two years experienced average learning gains equivalent to 1.5 and 0.8 additional years of schooling respectively, ranking in the 99th percentile of effect sizes measured in LMIC education studies (Gray-Lobe et al., 2022). A comparable model evaluated in government schools in Rwanda also yielded substantial gains after only 17 weeks of instruction (Rodriguez-Segura et al., 2023). While evidence supports the positive impacts of structured pedagogy, it is important to note that this intervention is not monolithic in its ability to improve learning outcomes.

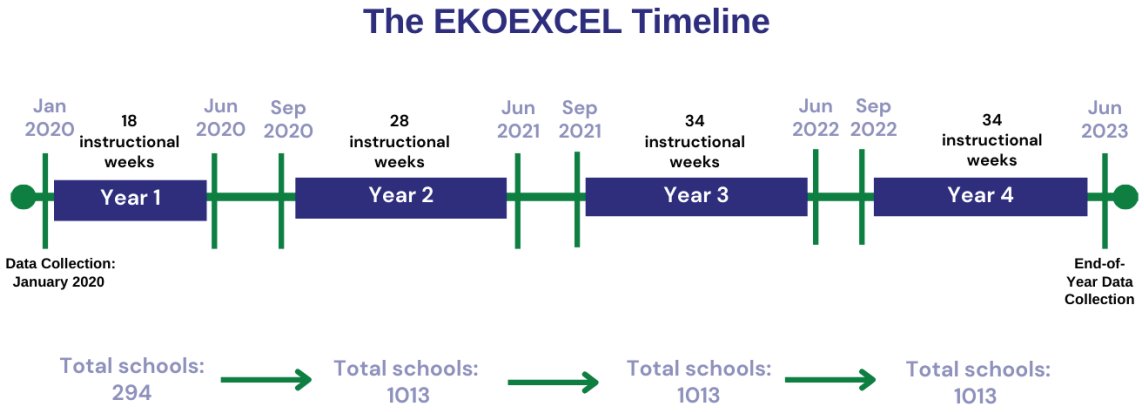
The efficacy of structured pedagogy relies on well-crafted implementation, comprehensive support, and monitoring. Empirical research indicates that structured pedagogy, when lacking research-supported methodologies and adequately trained educators to implement it, can lead to diminished or negligible effects on learning outcomes. In sub-Saharan African school systems between 1990 and 2010, despite the provision of new lesson plans and materials, learning outcomes stagnated due to inadequate teacher training (Hassan et al., 2022). Similar studies in Kenya, Uganda, and Malawi found that after implementing reformed pedagogy, teachers who received minimal training exhibited lower levels of effectiveness (Piper et al., 2018). To address this issue, robust monitoring

mechanisms are essential. The same 2018 studies have shown that incorporating effective teaching aids, prioritising core competencies like literacy and comprehension, and reinforcing prior knowledge positively impacts learning outcomes. Through effective implementation strategies, resources tailored to diverse classroom settings, and comprehensive training, structured pedagogy can improve learning outcomes and empower teachers to facilitate meaningful educational experiences for pupils.

III. Methodological Considerations to Quantify EKOEXCEL's Long-Term Impact After 4 School Years of Implementation

Statistical Approach to Identify the Impact of the EKOEXCEL Programme

During the 2022-23 school year, the EKOEXCEL programme was operational across all schools within the state. Consequently, this meant there was no longer a suitable group for comparison for this study, as all public Primary schools in Lagos State were implementing the EKOEXCEL programme by then. Therefore, assessing the programme's impact on learning outcomes necessitated a longitudinal approach, comparing average learning levels before and after the introduction of EKOEXCEL. Specifically, this approach examines the progression of learning levels approximately 4 school years (three school years and two terms to be precise or 114 weeks of programme implementation) after the launch of EKOEXCEL in January 2020 (Term 2 of the 2019-20 school year). Analysing the changes in learning levels over this period allows for comparing the improvements driven by EKOEXCEL to those that would have occurred absent the programme. To conduct this analysis, data on learning outcomes were gathered from a subset of schools that were a part of the EKOEXCEL programme at its outset in January 2020 (start of Term 2 of the 2019-20 school year) and again after 4 school years of programme implementation, during July 2023 (end of Term 3 of the 2022-23 school year).



However, this approach to measuring learning gains confronted an important empirical challenge. Firstly, the data collected in the 2019-20 school year coincided with the commencement of Term 2, which is two terms earlier than the point at which data were collected in the 2022-23 school year (at the conclusion of Term 3). Therefore, to keep the comparison accurate, it was necessary to adjust the data to ensure learning outcomes were being compared across the same time periods for both school years.

To resolve this challenge, 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 growth in a given term. Using reading fluency as an example, in January 2020 data collection (2019-20 school year), pupils in Primary 2 scored, on average, 7.4 correct words per minute (cwpm), and pupils in Primary 5 scored, on average, 51.1 cwpm. Therefore, the average learning growth for pupils between Primary 2 and Primary 5, before EKOEXCEL, is 43.7 cwpm. Since there are three terms in each grade, the estimated average termly growth is 4.9 cwpm (i.e. 43.7 ÷ 3 years ÷ 3 terms per year), as the following chart shows:

Table 3.1: Calculation of the average termly learning growth prior to EKOEXCEL using reading fluency as an example

Grade	Score at the beginning of Term 2 of the 2019-20 school year
Primary 2	7.4 cwpm
Primary 5	51.1 cwpm
Growth between Primary 2–Primary 5 before the programme	43.7 cwpm
Estimated growth per term — three terms per grade over three years between Primary 2–Primary 5	4.9 cwpm

Using this calculated average termly growth, the data collected at the start of Term 2 in the 2019-20 school year was projected to estimate the learning levels at the end of Term 3 for the same school year. This projection of learning levels acts as a "baseline", showing what the learning levels would have been had the programme been absent. By doing so, the projected learning levels at the end of Term 3 in the 2019-20 school year can now be fairly compared with the learning levels from the same time of the 2022-23 school year.

Another challenge that necessitated projecting the learning levels at the end of the 2019-20 school year was the difference in the grades assessed during the two data collection rounds. While the data from the January 2020 data collection round only covered Kindergarten, Primary 2, and Primary 5, the data collected from the July 2023 round spanned all grades from KG to Primary 6 in order to strengthen the precision of the data. More reasoning behind selecting these grades is explained in the section *"Sampling Framework"*. As a result, for the grades not assessed in January 2020 — such as Primary 1, Primary 3, Primary 4, and Primary 6 — the learning levels for the end of Term 3 (2019-20) had to be projected using the data available from the start of Term 2 (2019-20).

The table below (Table 3.2) 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 7.4 cwpm + 4.9 cwpm/term x 2 terms = 17.2 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: 17.2 cwpm (the estimated end-of-year score for Primary 2) plus 4.9 cwpm/term x 3 terms in a full school year = 31.9 cwpm, as the following table shows:

Table 3.2: Reading Fluency scores projected at the end of the Term 3, 2019-20 School Year

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	-	2.5 cwpm
Primary 2	7.4 cwpm	17.2 cwpm
Primary 3	-	31.9 cwpm
Primary 4	-	46.6 cwpm
Primary 5	51.1 cwpm	60.9 cwpm

This statistical approach was used to calculate the projected scores for all outcomes of interest across literacy and numeracy. To make the analysis robust to potential changes in the core sample, comparison was restricted to the same set of schools from which the data were initially collected. More information on these schools can be found below in the subsequent sections.

The methodology to project end-of-year scores for the 2019-20 school year assumes a consistent, linear term-by-term growth across both Kindergarten and the Primary 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.

Finally, unless stated otherwise, the results presented after approximately 4 school years of the programme are aggregated for all schools. The first 294 schools had 18 weeks of instruction, or two full-terms i.e. Terms 2 and 3 of the 2019-20 school year. Over the next three years, the programme grew to 1,013 schools, providing three full school years of instruction. As a result, pupils in the original 294 schools received a total of three school years and two full-terms (approximately four school years) of instruction, while those who joined in 2020-21 received three school years.

Sampling Framework for Schools and Pupils

Schools included in the study

In January 2020, a subset of 30 schools that were part of the initial cohort of the EKOEXCEL programme were evaluated to yield the learning levels at the start of the programme. These 30 schools were carefully selected to be representative of the first cohort of schools where EKOEXCEL was first implemented in the 2019-20 school year. The same 30 schools were then followed up during July 2023 (the end of Term 3 of the 2022-23 school year) data collection round. Assessing these 30 EKOEXCEL schools allowed the measurement of the programme's impact after approximately 4 school years of programme implementation. Following up on the same 30 EKOEXCEL schools also ensured 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, as their initial level from January 2020 was already known.

During the follow-up in July 2023, while the intention was to cover all the 30 schools that had been assessed before in January 2020, four schools missed out on the assessment due to various operational and logistical challenges. Therefore, the results presented after the 4 school years of implementation in the subsequent section pertains to the 26 schools that were assessed during both rounds of data collection. This approach ensures that the observed changes in performance reflect the programme's impact, even though it is limited to the subset of schools that could be followed up.

Pupils assessed for this study

During both rounds of data collection — at the start of Term 2 in January of the 2019-20 school year and at the end of Term 3 in July of the 2022-23 school year — a random sample of pupils was drawn from each selected school, grade, and stream to assess foundational literacy and numeracy outcomes.

In the January 2020 data collection, pupils were randomly sampled from three grades: Kindergarten, Primary 2, and Primary 5. In contrast, the July 2023 data collection involved a representative sample of pupils from the same 30 selected schools, but this time, pupils from all grades, Kindergarten to Primary 6, were included. Including additional grades like Primary 1, Primary 3, Primary 4 and Primary 6 allowed for a comparison between the observed learning levels at the end of the 2022-23 school year and the projected learning levels at the end of the 2019-20 school year.

Across both rounds of data collection, the sampling process for pupils remained consistent. First, a stream within each school and grade was randomly selected. Then, either eight pupils within this stream were sampled, or if the stream had fewer than eight pupils, all pupils in the stream were sampled. To ensure gender balance, it was verified that at least 30% of pupils per grade were from each gender. If there were not enough pupils of one gender to achieve this, all pupils from that gender were sampled.

Assessments Used in Data Collection

The importance of measuring foundational learning skills

A core part of the EKOEXCEL programme is the improvement of the foundational skills of pupils — particularly foundational literacy and numeracy. FLN is usually understood as the set of basic skills children must master to learn higher-order concepts at school (Evans and Hares, 2021) and which are intended to be developed in the first years of Primary education (see Box 3). Ultimately, it is imperative to understand the pupils' level of foundational literacy and numeracy subskills to ensure that the EKOEXCEL programme meets the needs of all learners through appropriately levelled instructional materials.

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

Over the last few decades, educational enrolment in LMIC has been catching up with the enrolment rates in high-income countries (HIC). However, international standards of literacy and numeracy indicate that the average pupil in LMIC performs worse than 95% of the pupils in HIC (World Bank, 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 (United Nations Children's Fund, 2022).

Foundational skills are necessary to effectively advance learning, comprehension, and problem-solving skills in their future academic careers and personal lives. Lacking foundational skills in the early 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 ethnic group, or whether the child is in school. It is also important that foundational skills are mastered in early grades, as learning gaps emerge early and widen throughout grade progression (Belafi et al., 2020). Additionally, developing both conceptual and procedural knowledge helps pupils cultivate a well-rounded understanding of foundational skills, which contributes to mastering the skill and being able to apply it in other contexts (Kilburn, 2020). Implementing all these components in conjunction is necessary for a more comprehensive and equitable approach to teaching and learning.

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

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

Early Grade Reading Assessment (EGRA)

A common way of measuring pupils' foundation literacy levels is through the Early Grade Reading Assessment (EGRA). The EGRA contains a wide range of one-on-one, orally administered sub-tasks that assess pupils' skill levels in English literacy. This tool was developed by the Research Triangle Institute (RTI) in conjunction with USAID and has been used by education ministries and multilateral agencies worldwide (Dubeck & Gove, 2015; USAID, 2014). The measurement of these literacy constructs can determine whether the EKOEXCEL programme creates a strong foundation for the youngest learners to thrive and succeed once they reach the Primary grades.

EGRA was administered to each grade participating in both rounds of data collection, January 2020 (2019-20) and July 2023 (2022-23). In January 2020, EGRA was administered to Kindergarten, Primary 2, and Primary 5. In the follow-up round in July 2023, the reading assessment was expanded to include all grades from Kindergarten to Primary 6. Evaluating the same grades as in the January 2020 study provided a comprehensive evaluation of the EKOEXCEL programme's long-term impact, while including the additional grades allowed for comparing their performance against the July 2020 projections, as discussed earlier. A summary of the reading assessment administered in both rounds of data collection is described below.

Table 3.3: Summary of the Reading Assessments administered to different grades in the January 2020 evaluation for the 2019-20 school year and July 2023 evaluation for the 2022-23 school year

Reading Assessments Administered by Different Grades	January 2020 Evaluation ("Start of Term 2 of the 2019-20 School Year")	July 2023 Evaluation ("End of Term 3 of the 2022-23 School Year")
Kindergarten	✓	✓
Primary 1		✓
Primary 2	✓	✓
Primary 3		✓
Primary 4		✓
Primary 5	✓	✓
Primary 6		✓

The EGRA sub-tasks are administered depending on the grades assessed, and they start with the most basic subskills of listening comprehension and reading: letter sound and word sound knowledge — which was conducted on all pupils. In addition, a few grades were also assessed on their oral reading fluency and reading comprehension skills through stories that were levelled appropriately for those grades. By administering the same EGRA sub-tasks in both data collection rounds, the performance of the 30 schools assessed in January 2020 could be directly compared to their performance in July 2023. The reading passages used to assess fluency and comprehension can be found in Appendix A, and a detailed overview of the different EGRA sub-tasks can be found in Appendix C.

Table 3.4: An overview of the different EGRA sub-tasks administered across the different grades in the two evaluation periods of January 2020 (2019-20) and July 2023 (2022-23)

EGRA Sub-task	Kindergarten (January 2020 and July 2023)	Primary 2 (January 2020) and Primary 1-4 (July 2023)	Primary 5 (January 2020) and Primary 5-6 (July 2023)
Listening Comprehension	✓		
Letter Sound Knowledge	✓	✓	
Identify Onset Sounds	✓	✓	
Non-word Reading	✓	✓	
Familiar Word Reading	✓	✓	
Passage Fluency I (Primary 2-level)		✓	✓
Reading Comprehension I		✓	✓
Passage Fluency II (Primary 5-level)			✓
Reading Comprehension II			✓

Early Grade Mathematics Assessment (EGMA)

The Early Grade Mathematics Assessment (EGMA) was used to measure the foundational numeracy skills of pupils. Like the EGRA, the EGMA is a tool developed by RTI and USAID that contains a wide range of one-on-one, orally administered sub-tasks that assess pupils' subskill levels in numeracy (Platas et al., 2016). The measurement of these constructs in numeracy helps understand whether the EKOEXCEL programme is creating a strong foundation for the youngest learners to thrive and benefit from the programme once they reach the Primary grades.

In July 2023, EGMA was administered to pupils in Kindergarten, Primary 2, and Primary 5 as a follow-up to the grades selected during the January 2020 study for Year 1 (Term 2, 2019-20). A summary of the EGMA assessment administered in both rounds of data collection is described below:

Table 3.5: Summary of the Math Assessments administered to different grades in the January 2020 evaluation and July 2023 evaluation

Numeracy Assessments Administered by Different Grades	January 2020 Evaluation ("Start of Term 2 of the 2019-20 School Year")	July 2023 Evaluation ("End of Term 3 of the 2022-23 School Year")
Kindergarten	✓	✓
Primary 1		
Primary 2	✓	✓
Primary 3		
Primary 4		
Primary 5	✓	✓
Primary 6		

EGMA captures subskill competencies in numeracy and operations, the metric system, and geometric figures (shapes) in conformity with guidelines from the national mathematics curriculum. The EGMA sub-tasks range from basic counting and number identification to timed exercises for simple and complex numeracy questions. The selected sub-tasks were levelled to the pupils' grades.

Through EGMA, each grade is assessed on the collection of sub-tasks that appropriately align with the subskill range likely to be covered or encountered within the grade, with a few exceptions that allow for capturing growth beyond expectations. For example, the Level 1 subtraction sub-task in the EGMA contains basic subtraction problems that pupils are expected to learn by the end of Primary 1. A detailed description of the different EGMA sub-tasks can be found in Appendix C.

An overview of the different sub-tasks administered across these grades can be found in the table below:

Table 3.6: Summary of the different EGMA sub-tasks administered in Kindergarten, Primary 2, and Primary 5 during the January 2020 and July 2023 evaluation period

EGRA 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 3.7 summarises all the pupil assessments used during both data collection rounds to measure the impact of the EKOEXCEL programme since its implementation in January 2020. Refer to Appendix E for an overview of the data quality assurance protocol used to analyse the results from these assessments.

Table 3.7: Summary of all assessments administered to different grades in the January 2020 evaluation for the school year 2019-20 and July 2023 evaluation for the 2022-23 school year

All Assessments Administered by Different Grades	January 2020 Evaluation ("Start of Term 2 of the 2019-20 School Year")	July 2023 Evaluation ("End of Term 3 of the 2022-23 School Year")
Kindergarten	EGRA	EGRA, EGMA
Primary 1	-	EGRA
Primary 2	EGRA	EGRA, EGMA
Primary 3	-	EGRA
Primary 4	-	EGRA
Primary 5	EGRA	EGRA, EGMA
Primary 6	-	EGRA

Other data used to support the analysis

Longitudinal Metrics on Pupil Attendance and Enrolment

EKOEXCEL's ecosystem allows the programme team to track metrics on pupil attendance and enrolment in real-time through EKOEXCEL Teacher Tablets. Analysis of these data is completed by comparing average network-wide attendance and enrolment over the four school years of EKOEXCEL's implementation. 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 schools were implementing the EKOEXCEL programme during the 2022-23 school year. Consequently, pupil attendance and enrolment data were tracked across all schools in the 2022-23 school year, with no comparison schools available.

Teacher Attendance and Lesson Delivery

Data on teacher attendance and lesson delivery are collected for all EKOEXCEL teachers. To mark their attendance, teachers are required to sync with their head teacher prior to their first lesson of the day. If a teacher fails to sync, they are marked as not in attendance. Data on lesson delivery are collected through the teacher tablet used by all EKOEXCEL teachers. 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.

IV. The State of Learning in Lagos Before EKOEXCEL

Education systems across the developing world are facing an education crisis, and Lagos State was no exception

Evidence collected through nationally representative surveys and international studies suggests that educational outcomes in LMIC are very low compared to global standards to ensure proper pupil development (World Bank, 2018; see Appendix G). Some of the challenges identified by previous research, underpinning this crisis, are an increasing rate of out-of-school children (UNESCO, 2023) and low learning levels across key foundational skills. In some education contexts, the share of pupils who are not enrolled in school has increased steadily in the last decade, signalling serious issues with pupil retention and grade attainment in government schools.

Once in school, pupils across most LMIC also struggle with foundational literacy throughout Primary school. Foundational literacy skills are vital for learning in all subjects, and the poor performance in their native language and English suggests that many pupils enrolled are left behind in the classroom achieving little learning. Even by the end of secondary school (typically Primary 8), many pupils cannot read sentences in English. The fact that a significant proportion of pupils are progressing through their Primary education without mastering the ability to read a Primary 2-level passage speaks to the poor quality of education that pupils receive.

This critical lack of opportunity for progress in foundational skills is a major hindrance not only to further advancements in learning, but also to full participation in everyday life. For instance, it would be difficult for these children to perform basic measurements or conduct monetary transactions, and otherwise meaningfully contribute to society, without having mastered foundational skills. Below, this report presents evidence that this educational crisis was also present in Lagos State, prior to the introduction of the EKOEXCEL programme.

Average foundational literacy levels were low across all Primary classes

Reading fluency scores in Lagos schools prior to EKOEXCEL were low, placing many children off track to ever becoming strong readers. The average Primary 3 - Primary 4 pupil in Lagos could only read 30 correct words per minute (cwpm) of a Primary 2-level passage at the start of the second term of the school year 2019-20 (Figure 4.1). These levels of performance do not meet some of 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).

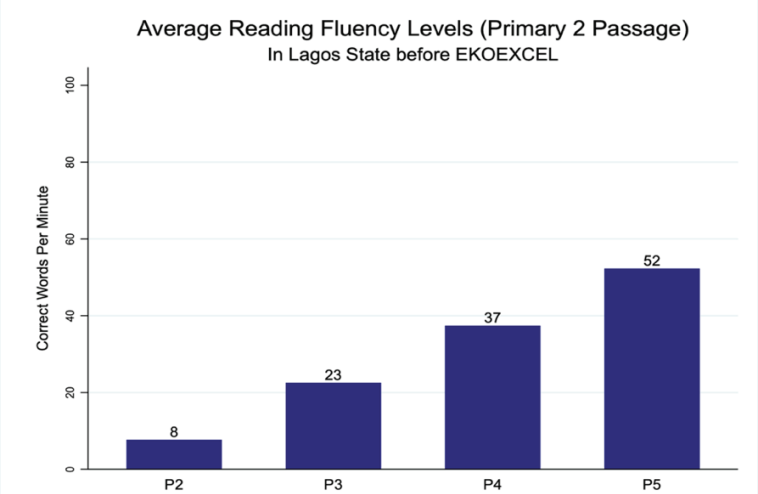


Figure 4.1

These low average reading fluency outcomes 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 by Term 2 of the school year 2019-20. 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). These low literacy levels had negative implications for pupils' capacity to access learning across other subjects, as they did not possess the minimum levels of literacy needed to read or understand grade-level content. Further, these findings indicated that a significant proportion of pupils were leaving Primary school without acquiring the necessary foundational literacy skills needed to meaningfully engage with secondary-school-level curricula, placing them progressively further behind as they struggled to tackle more challenging concepts.

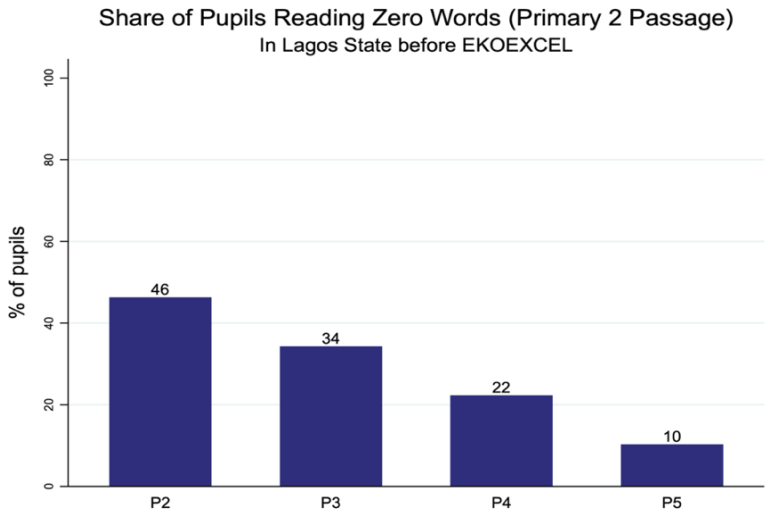


Figure 4.2

Low reading fluency translated into low reading comprehension levels

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 (Figure 4.3). 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. Worryingly, only 25% of pupils could answer more than three out of five questions correctly. This is 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. (See Appendix A for reading passages and corresponding comprehension questions used to assess pupils). 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.

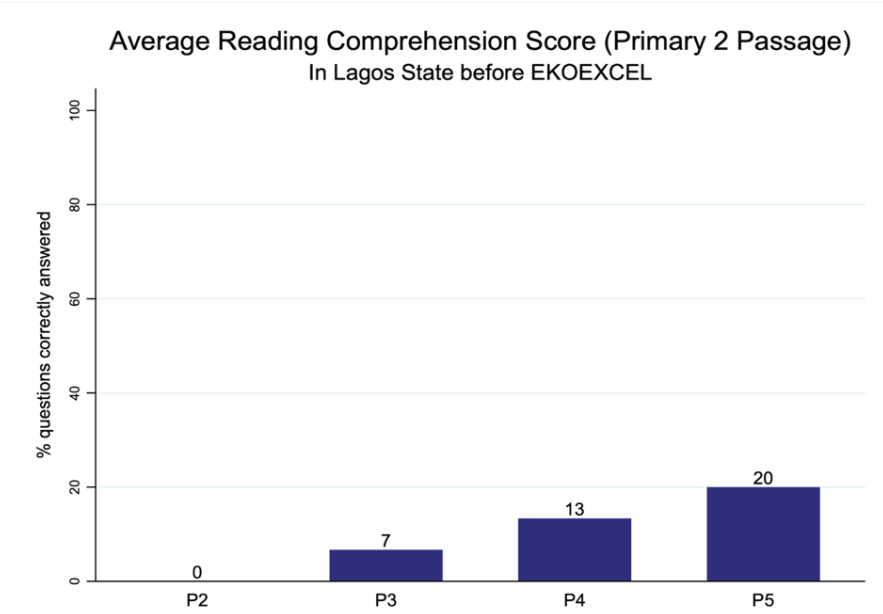


Figure 4.3

V. Achievements Since the Start of the Programme, After 4 School Years of Implementation

In 2022-23, EKOEXCEL entered its fourth year of implementation. With close to four years of the EKOEXCEL programme in place, insights at the system level can now be derived. Questions such as *"how has the education system of Lagos been impacted by EKOEXCEL, and how has the EKOEXCEL programme developed over time?*" can now be addressed. An effective approach to illustrate this involves considering a scenario in which EKOEXCEL was absent in Lagos, and traditional learning continued unchanged. By comparing outcomes from July 2020 (or rather, the projections based on January 2020 data) that represent learning levels in the absence of EKOEXCEL, to outcomes in July 2023 with EKOEXCEL fully implemented, insights into the programme's impact over the years can be identified. To accomplish this, previous rounds of data collection, such as the data gathered in January 2020 (start of Term 2, 2019-20 are utilised and compared to outcomes from the data collected in July 2023 (end of Term 3, 2022-23). The subsequent section will present the findings.

Box 4 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., 2021; Jakubowski et al., 2023). In sub-Saharan Africa — where nearly 90% of pupils were experiencing learning poverty[2] 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., 2021; Kaffenberger, 2021). 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 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

Three school years and two terms since EKOEXCEL's launch, pupils are reading more proficiently

After close to 4 school years of implementation since the launch of the EKOEXCEL programme, pupils in EKOEXCEL schools are reading far more proficiently. For instance, pupils in a typical Primary 2 classroom can now read 14 more correct words per minute (cwpm), on average, beyond what they could read before the EKOEXCEL programme (Figure 5.1). Specifically, after approximately 4 school years of EKOEXCEL, pupils in a typical Primary 2 classroom can now read the same number of correct words per minute that pupils in a typical Primary 3 class were projected to read at the end of the 2019-20 school year in the absence of EKOEXCEL. In other words, pupils from Primary 2 are one year ahead in terms of learning compared with pre-EKOEXCEL learning levels. Moreover, pupils in a typical Primary 3-5 class can now read with an average reading fluency of at least 45 cwpm; given that 45-60 cwpm is a threshold at which pupils begin to comprehend text (Abadzi, 2012), pupils will likely have greater access to written content in other subjects. In essence, after close to four school years of EKOEXCEL, the programme is on a promising pathway towards ensuring literacy proficiency, establishing the foundation for future learning in other subjects as well.

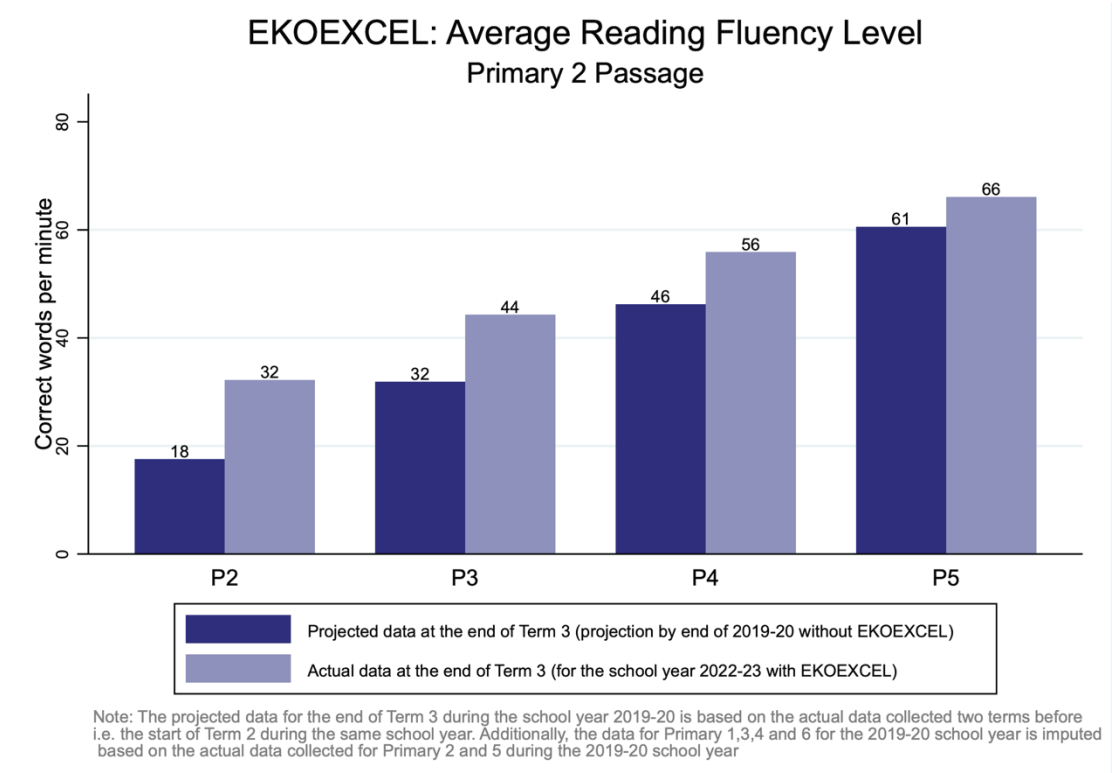


Figure 5.1

[2] "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.).

EKOEXCEL has also reduced the share of pupils who cannot even read a word

The share of pupils in a typical Primary 2 classroom who could not read a single word from a Primary 2-level passage decreased from 38% to 26%, a reduction of 12 percentage points in a span of three years (Figure 5.2). The share of non-readers in a typical Primary 2 classroom is now nearly equivalent to the share of non-readers projected for a typical Primary 3 classroom in the absence of the EKOEXCEL programme at the end of the 2019-20 school year. In other words, pupils from Primary 2 are one year ahead in terms of learning compared with pre-EKOEXCEL learning levels. Primary 3 pupils exhibit similar patterns. Additionally, the share of pupils in a typical upper Primary classroom, i.e. Primary 4 - Primary 5, who could not read a single word from a Primary 2-level passage decreased from 9% to 7%, on average.

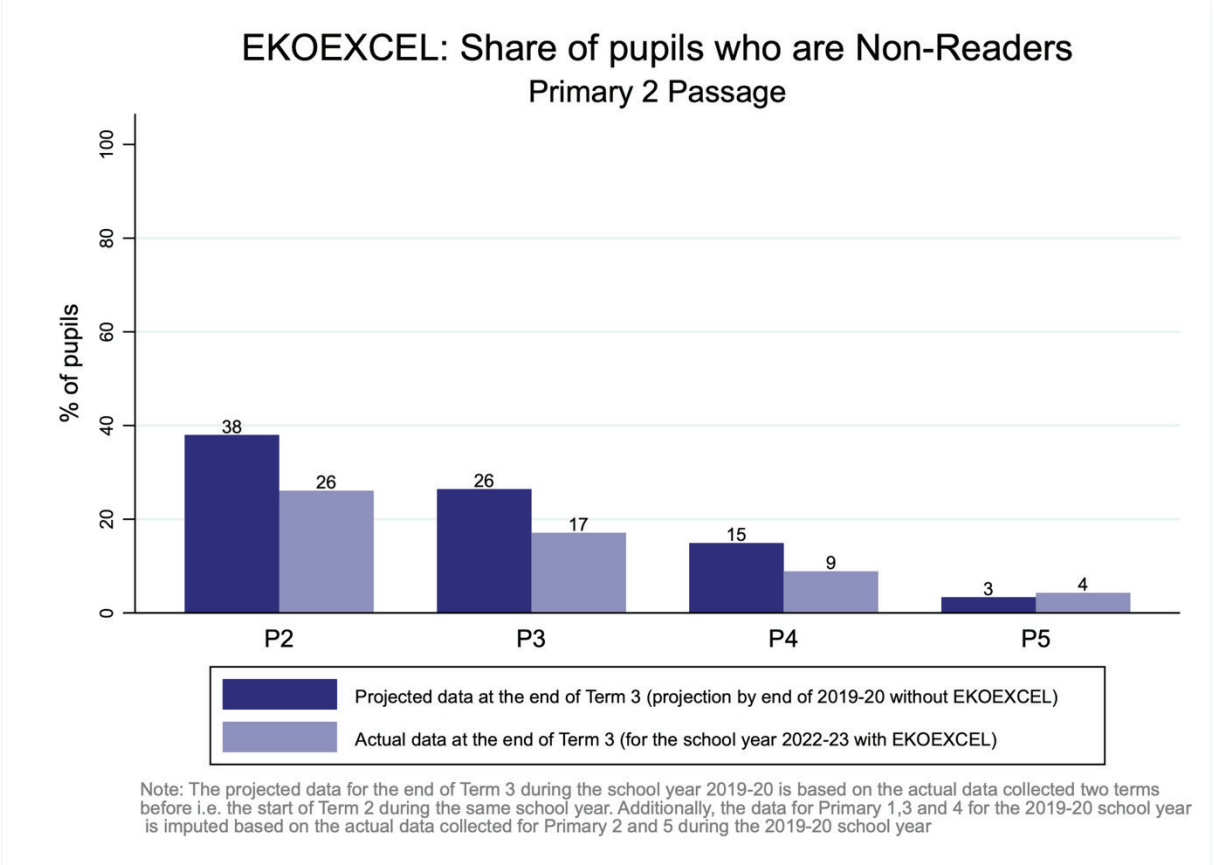


Figure 5.2

Pupils across all grades can now read with dramatically better comprehension

Increased reading fluency was accompanied by an increase in reading comprehension. **EKOEXCEL pupils in a typical Primary 2-5 classroom can now correctly answer 60% of the comprehension questions - approximately three times compared to when the programme was not in place** (Figure 5.3)**.** The improvement in reading comprehension among Primary 2 pupils is particularly noticeable, with their skills improving by more than five times compared to levels observed before the programme. These are encouraging results, as reading with comprehension is a bedrock of being able to learn even more advanced subjects and constructs later on in life. EKOEXCEL has made substantial progress within approximately four school years of implementation, positioning pupils on a promising trajectory towards achieving advanced levels of literacy proficiency. This proficiency, in turn, is expected to have a significant bearing on their overall performance across various core subjects. For more information on the connection between reading fluency and comprehension, see **Box 5**.

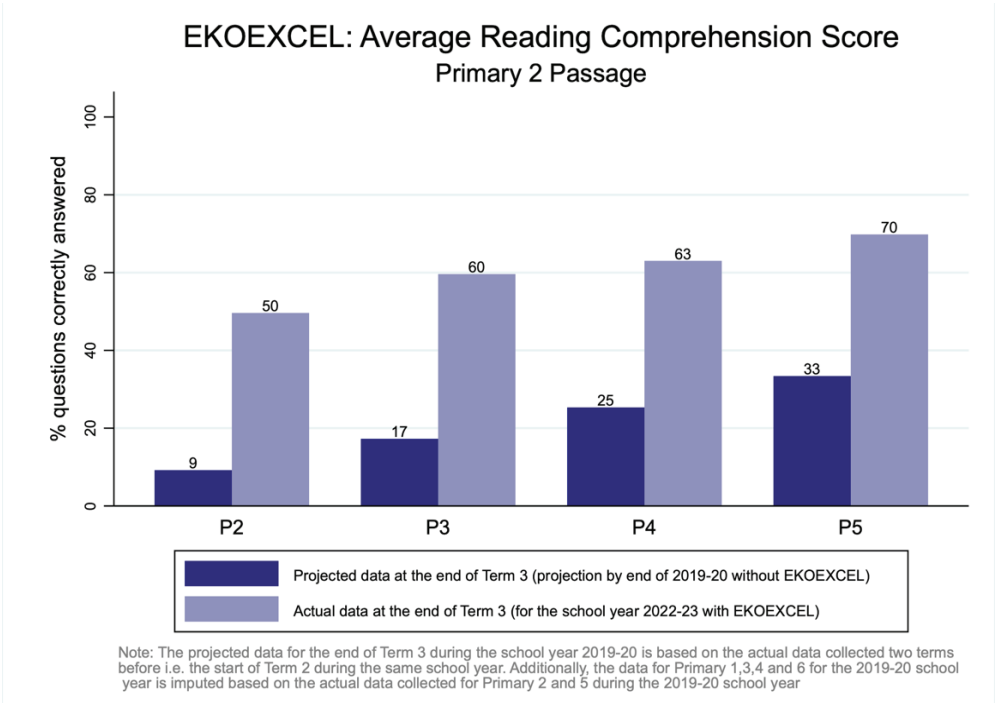


Figure 5.3

Another way to assess the impact of EKOEXCEL on foundational literacy is by examining the increase in the number of pupils who can now read with comprehension compared to before the start of the programme. This is evaluated using a metric akin to "learning deprivation", a construct defined by the World Bank as the percentage of pupils unable to read a simple passage with comprehension by age 10. In this report, the metric akin to the “learning deprivation” construct refers to the inability to correctly answer at least 80% of the questions on a reading comprehension assessment. According to this measure, approximately 60% of Primary 5 pupils can now read a Primary 2-level passage with comprehension, a significant increase from just 14% three years ago — nearly four times the previous rate (Figure 5.4).

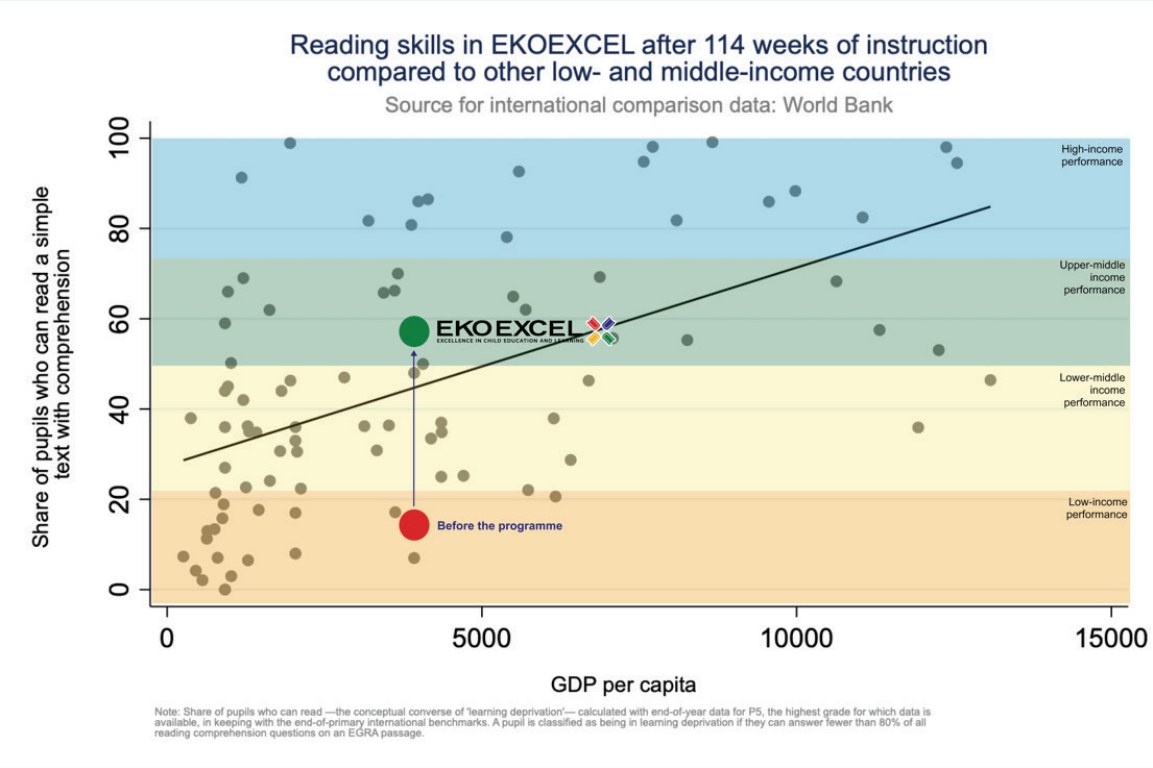


Figure 5.4

I can read very fast now. My teachers teach us very well and motivate us with energizers and songs in the classroom. I feel very bad any day I miss a school because I know a lot will be taught

– Pupil A at Local Authority Primary School Ipara, Badagry, Lagos

Box 5 The Relationship between Oral Reading Fluency and Reading Comprehension

Being able to read with comprehension is the ultimate goal of literacy. Reading comprehension is a complex skill which encompasses a wide range of cognitive capacities such as attention, memory, critical analytic ability, inferencing, and visualisation (Snow, 2002), and as such, it is a challenging construct to measure and compare across contexts. There are various ways in which evaluators can assess comprehension, including multiple choice questions, fill-in-the-blank tasks, and writing summaries (Habib, 2016). Certain administration characteristics like timing and rereading practices can also make a difference in the quantification of reading comprehension outcomes. Furthermore, the use and types of administration practices vary greatly across assessments, making it difficult to establish a standardised measure of reading comprehension levels.

Education research has consistently documented a strong, positive relationship between "oral reading fluency" and reading comprehension. "Oral reading fluency" (ORF), or simply "fluency," refers to the efficient, effective word recognition skills that allow a reader to derive meaning from the text. Fluency is typically composed of three major components — accuracy, the ability to precisely decode words; automaticity, the capability to recognise and decode words effortlessly; and prosody, the skill to read a text with appropriate expression and intonation (Aldhanhani & Abu-Ayyash, 2020; Pikulski & Chard, 2005) — and is typically measured in units of "correct words per minute" (cwpm), enabling a simpler comparison across contexts than other units of measurement of literacy outcomes.

Importantly, researchers have established a clear link between fluency and reading comprehension. For instance, using the Early Grade Reading Assessment, (Jiménez et al., 2014) found fluency to be a key predictor of reading comprehension performance, with pupils who had high ORF scores exhibiting significantly higher average comprehension scores. Additionally, interventions that focus on increasing fluency have demonstrated considerable improvements in reading comprehension (Klauda & Guthrie, 2008). Often, a significant portion of pupils who struggle with comprehension find that their issues stem from a deficiency in oral fluency (Aldhanhani & Abu-Ayyash, 2020; Abadzi, 2011). Hence, a lack of appropriate reading fluency negatively impacts both the further development of reading comprehension and academic performance throughout subsequent years of schooling.

Given the close empirical relationship between fluency and reading comprehension, ORF can be used as a proxy for assessing broader literacy skills. Fluency involves many of the same processes that make up reading comprehension, and in contrast to reading comprehension, is easy to measure, comparable across contexts, and is a construct for which there are well-known benchmarks (Pikulski & Chard, 2005; Rodriguez-Segura et al., 2021). Therefore, the value of measuring fluency lies not only in its intrinsic significance but also in its role as a signal that prefigures important, harder-to-measure skills such as reading comprehension.

Foundational Numeracy

Pupils are now far more proficient in solving simple numeracy sub-tasks

Number Comparison

Number comparison is a key skill that pupils in early grades need to master in order to do numeracy operations in later grades. After close to four school years of the EKOEXCEL programme, the average pupil in a KG class is at the same level of proficiency as that of the average Primary 1 pupil prior to the programme (Figure 5.5). In other words, the average pupil in KG has gained the equivalent of almost a year's worth of schooling. While the gains in Primary 1 and Primary 2 are small, the fact that pupils in a typical Primary 2 class are nearing high levels of proficiency is encouraging to see. Overall, with this increased proficiency, EKOEXCEL is setting up young pupils on a path to acquiring foundational numeracy skills, crucial for many other outcomes in life.

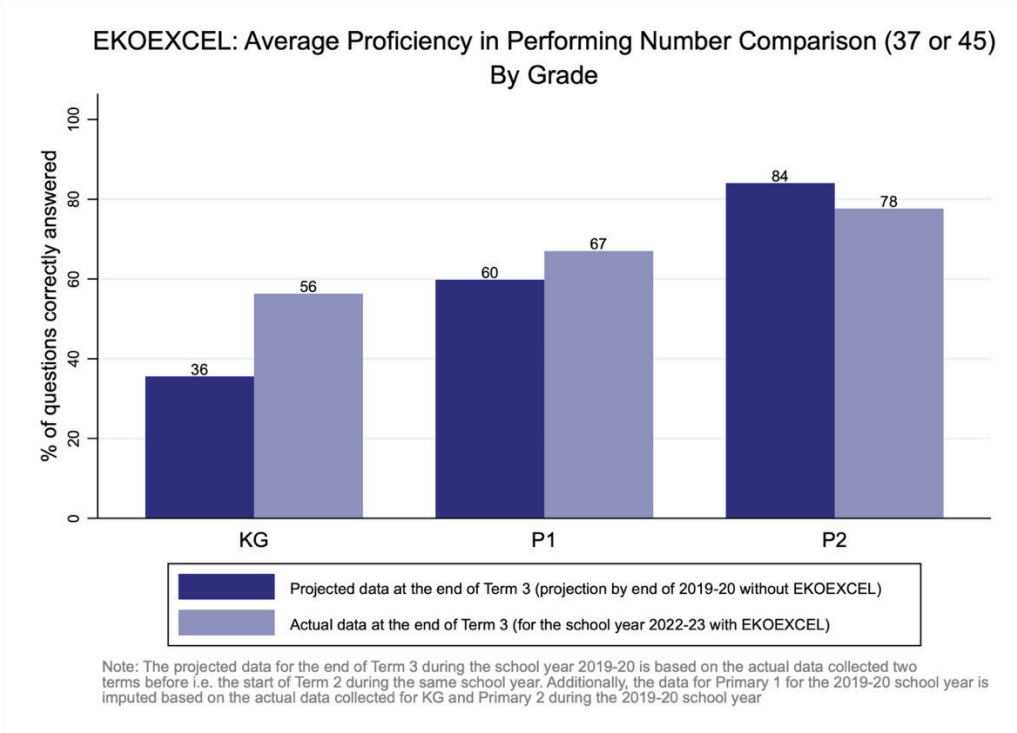


Figure 5.5

Addition

Compared to the modest gains seen in more basic numeracy skills like number comparison, there are large gains in number operations. With the EKOEXCEL programme, pupils in a typical KG class can now do simple addition tasks, like 7+8, more accurately than the average Primary 2 pupil prior to EKOEXCEL (Figure 5.6). This is equivalent to over two years worth of additional schooling for pupils who underwent the programme. Overall, all Primary grades are making remarkable progress. On average, pupils across KG to Primary 2 correctly solved ~60% of the simple addition tasks - a large jump from learning levels at the start of the programme (~25%).

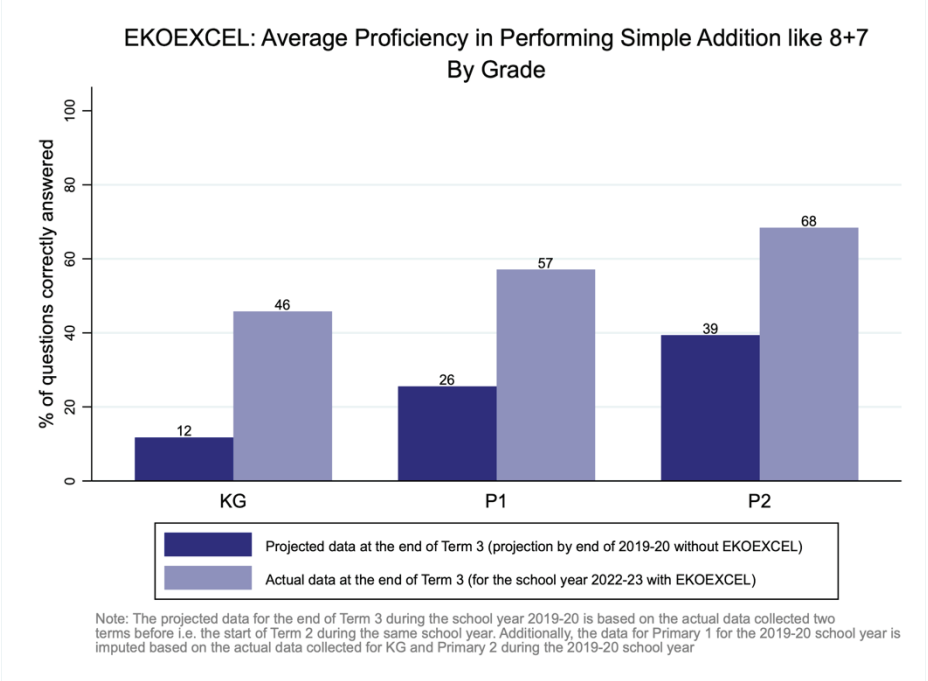


Figure 5.6

Subtraction

Along with improvements in simple numeracy sub-tasks, there are big improvements in complex operations like Subtraction. For instance, pupils in a typical Primary 2 class are now more proficient in correctly solving complex subtraction sub-tasks, like 28-17, than pupils in a typical Primary 5 class before the programme (Figure 5.7). In other words, after 4 school years of implementation of the EKOEXCEL programme, pupils in a typical Primary 2 class have gained equivalent to almost three years of learning. Such increased proficiency with operational problems gives pupils the tools needed to develop their capacity for word problems and other complex operations, as they are able to apply a skill that they have mastered to new, more challenging, and more practical applications.

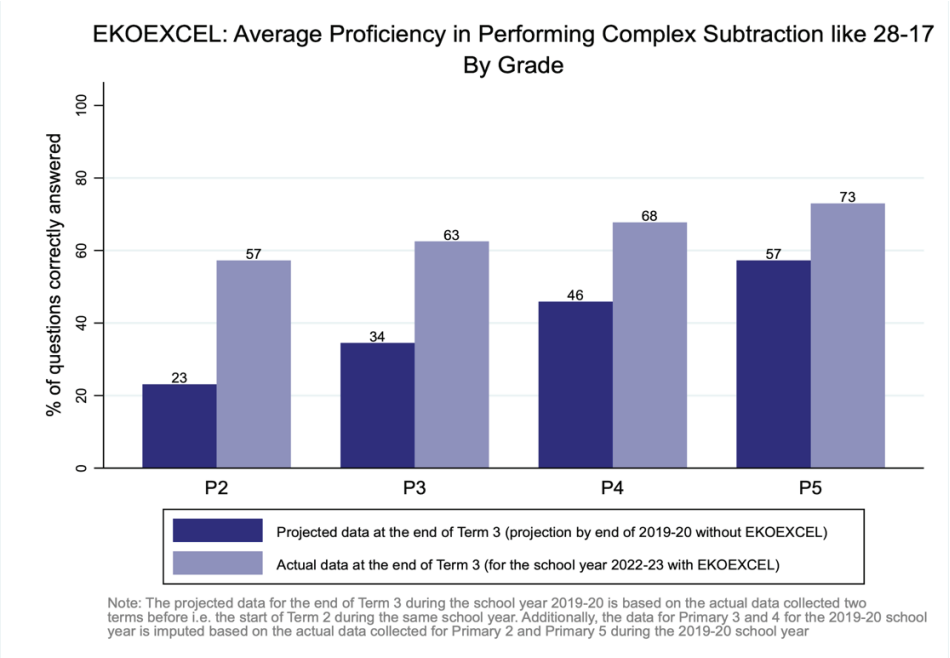


Figure 5.7

Word Problems

Pupils' proficiency in correctly solving maths problems in a computational sense is a leading indicator of their ability to solve problems that mirror real-life situations, which they are likely to encounter both in and out of school. With the EKOEXCEL programme, pupils not only excelled in number operations but also in the ability to apply those skills to real-life problems. While all grades from Primary 2 to Primary 5 showed large improvements in their ability to solve numeracy word problems, early grades such as Primary 2 and 3 showed the most dramatic improvements of all. Pupils in a typical Primary 2 classroom can now correctly answer 60% of the word problems (For example: "*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 5.8). The average pupil in a Primary 2 class is also now dramatically outperforming the average Primary 5 pupil prior to EKOEXCEL. This is equivalent to gaining more than three year's worth of schooling — a truly big increase relative to gains seen in other educational contexts. Pupils' ability to solve word problems not only evidences improvements in numerical proficiency, but it 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 for EKOEXCEL pupils.

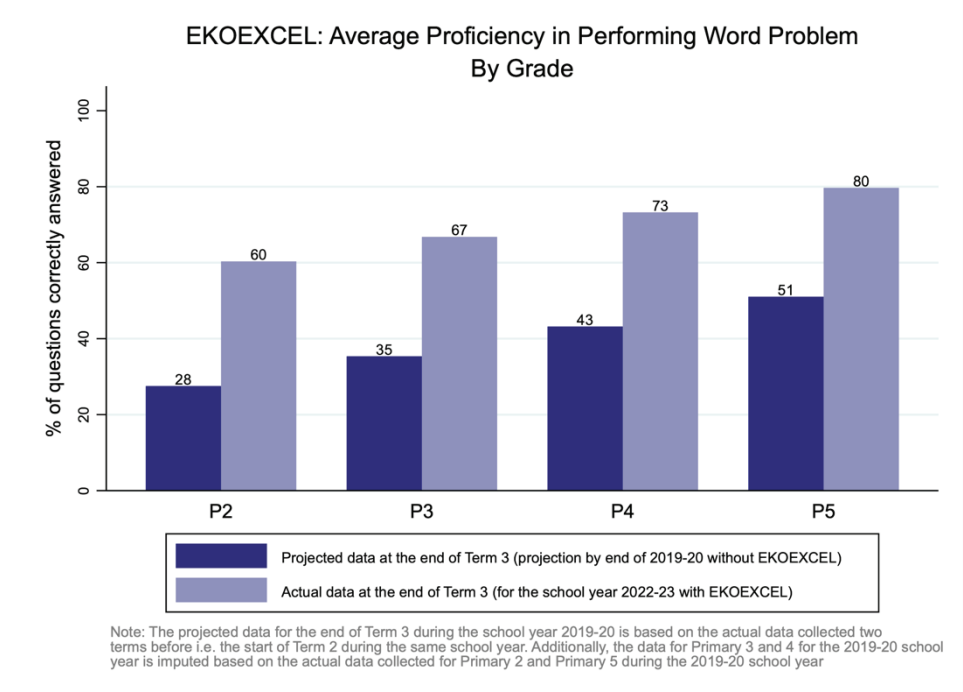


Figure 5.8

The programme is very beneficial to the pupils as it has tremendously improved their literacy and numeracy skills

– Head Teacher A at Local Authority Primary School Surulere, Lagos

Tracking Programme Implementation

Pupil enrolment in EKOEXCEL schools has increased since the start of the programme

One data-driven approach to assess the change in enrolment through the 4 school years of programme implementation is to compare the enrolment at the start of the programme to the end of the 4 school years i.e. end of the 2022-23 school year. However, during this time, the programme has grown significantly, both in scope and size. Not only has the programme now expanded to all schools in Lagos State, but also expanded to grades like Primary 6. Therefore, to present an accurate picture of the change in enrolment and not overestimate it, enrolment is compared amongst the 30 schools that were part of the initial evaluation of the EKOEXCEL programme at the start of Term 2 of the 2019-20 school year. Similarly, the comparison is also restricted to only Kindergarten and the five Primary grades to which the programme was rolled out at first.

In the 30 schools studied, enrolment across KG to Primary 5 increased by about 26%, with a notable 27.5% rise in Primary 5, adding 544 pupils (Figure 5.9). These trends are highly encouraging, as they indicate that more children are now receiving high-quality education, and that parents have greater trust now in the public education system. This surge in enrolment could also suggest a decrease in the number of out-of-school children in the state or a shift away from private schools (see **Box 6** for more information regarding issues surrounding out-of-school children).

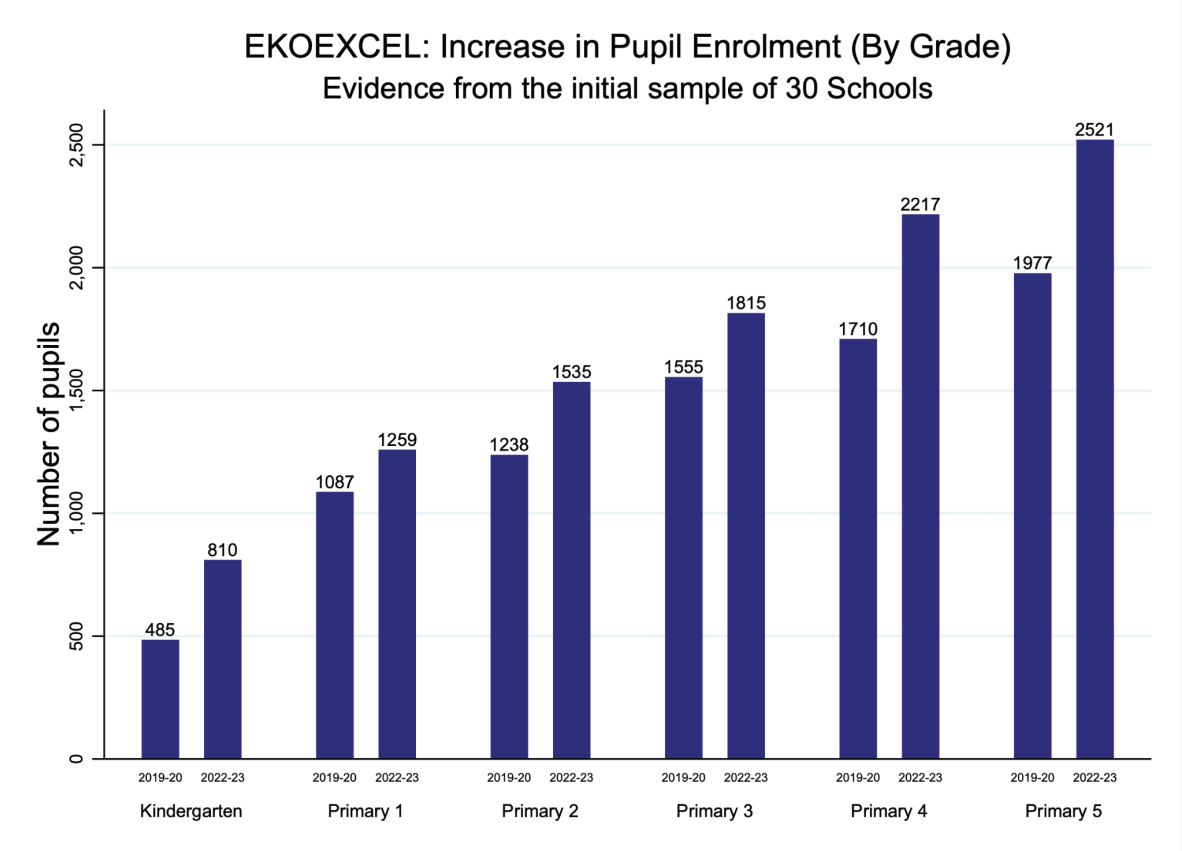


Figure 5.9

Moreover, it is important to note that these enrolment trends could have potentially impacted the learning gains observed after approximately 4 school years of implementation. The significant rise in enrolment includes pupils who joined later in the programme and therefore, received a lower dosage of instruction than those who were present since the programme's inception in January 2020, giving them less quality time to improve their learning. If the pupils who joined later, as well as those who otherwise would have dropped out had the programme been absent, are indeed lower performing, the results on learning outcomes after approximately 4 school years are likely understating the programme's effect, particularly for pupils that were part of the programme from the start and would not have dropped out regardless of the implementation of the programme. Hence, the fact that the programme not only saw an increase in the enrolment across Primary 1-5 but also saw large, positive gains in learning amongst pupils over this period speaks to the overall effectiveness of the EKOEXCEL programme.

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

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

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

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

The learning crisis refers to the chronically weak learning outcomes still present across global education, with a particular concentration in LMIC. If the perceived value of education is low, parents will be less likely to enrol and send their children to school. This is an expected response, as in a context of limited resources, parents have to make difficult decisions on where to allocate their scarce resources (Rivken, 2005), and will be more likely to put these towards education if they believe this investment will indeed reap rewards. While there are a variety of ways through which to improve parents' perception of an education system, increasing learning outcomes has been consistently cited as the most effective (Alderman, 2001), and therefore represents an effective route through which to increase enrolment worldwide. For each year of learning a child receives, their future earnings will increase (World Bank 2017), helping those newly enrolled pupils, who typically come from marginalised communities, to lead healthier, wealthier, and more productive lives. This in turn will reduce poverty, another factor suppressing enrolment, creating a positive cycle of educational enfranchisement uplifting the world's most vulnerable learners.

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

Teachers spent more time in the classroom, delivering high-quality instruction with pedagogically-sound teaching methods

Over the course of 4 school years of programme implementation, there has been a general upward trend in pupil attendance, teacher attendance, and lesson completion rates, important factors for a high-quality instruction.

Since the launch of the EKOEXCEL programme in January 2020, the landscape of education has seen significant changes, particularly due to the impact of COVID-19. By the end of the 2020-21 school year, the first full year of resumed programme implementation post COVID-19, teacher attendance stood at 85% during the final five weeks of the last term (Figure 5.10). After two years to the end of the 2022-23 school year, teacher attendance during the last five weeks had risen to 89%, marking an increase of 4 percentage points.

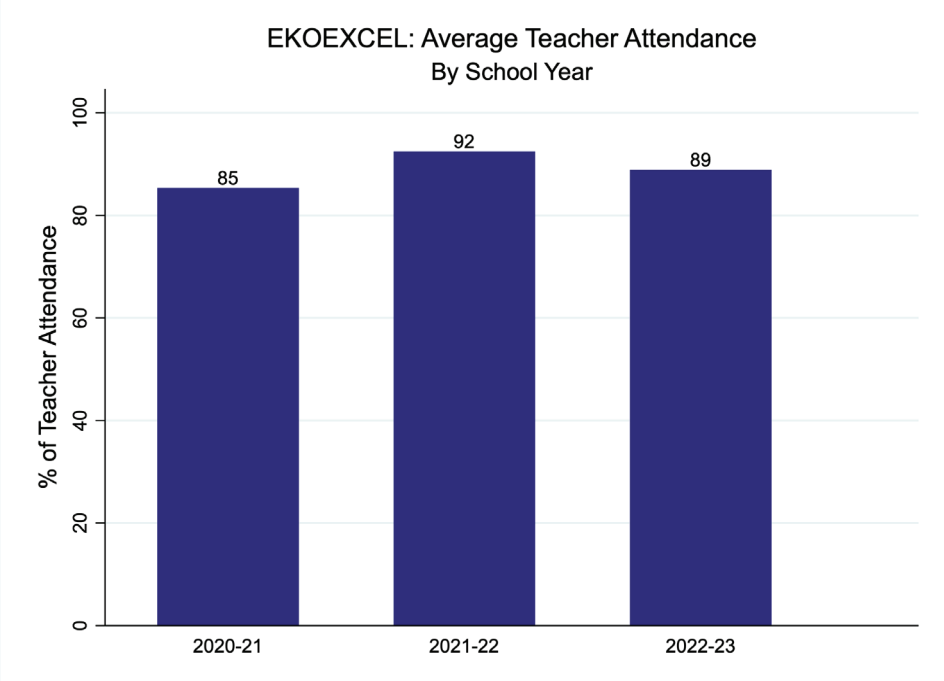


Figure 5.10

This increase in teacher attendance is significant not only for pupils' learning outcomes, but also for optimising the utilisation of fiscal resources allocated to teacher salaries. In other words, teacher absenteeism means that public funds are expended to cover salaries for teachers who are not at all consistent in fulfilling their responsibilities.

When schools closed in March 2020 due to COVID-19, the delivery of lessons was severely disrupted, resulting in few or no lessons being completed by the end of 2019-20 school year. However, despite these challenges, there was a remarkable and steady improvement in teachers' lesson completion rates over time. The proportion of lessons delivered to completion surged from 47%, on average, during the last five weeks of Term 3 in the 2020-21 school year to an impressive 78%, on average, during the same period of the 2022-23 school year (Figure 5.11).

It is essential to note that the method used to determine this figure employs a stringent criterion for "lesson completion", stipulating that at least 80% of the content must be covered within a time frame that deviates no more than 20% from the allocated duration. Consequently, the stated lesson completion rate requires acknowledgement that other lessons might have commenced and even concluded, but fell short of meeting this stringent benchmark for any number of reasons, though instruction may have still occurred covering all or a portion of the given lesson.

> *My child's teacher now makes sure she teaches and completes all the lessons for the day, and I have noticed a great improvement in my child's reading and writing in English. The EKOEXCEL Programme is a great initiative, and I want my child and more children in Lagos State to continue to learn under the programme*
>
> – Parent of Pupil A at Irepodun Nursery And Primary School I, Kosofe, Lagos

In light of improvements in teacher attendance, the concurrent increase in the lesson completion rate is unsurprising. If teachers spend more time in their classrooms as a result of the EKOEXCEL programme, the completion of more lessons becomes more plausible and more feasible.

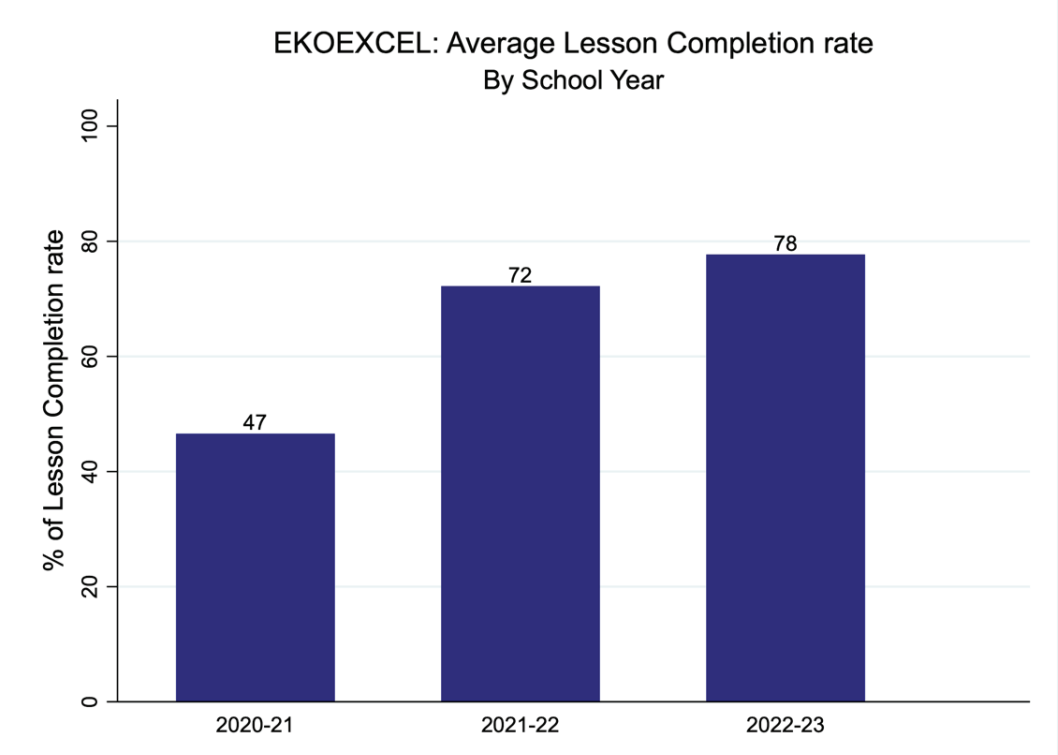


Figure 5.11

Yet another potential indicator of EKOEXCEL's success in delivering high-quality education to pupils has been the notable increase in pupil attendance over the past three school years. At the conclusion of the 2020-21 school year, pupils attended an average of 23% of all school days during the final 5 weeks. However, two years later, during the 2022-23 school year, this figure surged to 53%, more than doubling the initial levels of attendance (Figure 5.12). While there remains progress to be made before pupil attendance reaches significantly higher levels (e.g. above 80%), the significant growth witnessed after just two years of implementing the EKOEXCEL programme is indeed encouraging.

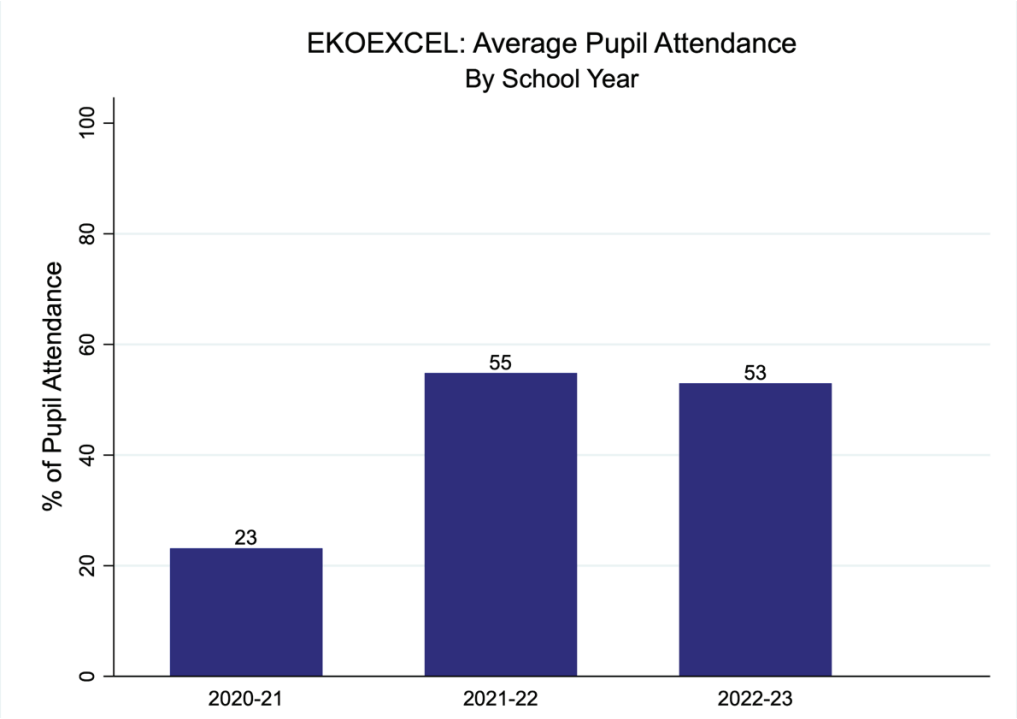


Figure 5.12

My teacher doesn't miss any class, and I also come to school every day because I know my teacher will come to school. I can now read better and faster, and I want to continue learning under the EKOEXCEL programme

– Pupil A of Community Primary School Iba-Oloja, Ibeju Lekki, Lagos

I come to school regularly because I know our teacher will be in school to teach us. I can now read better and solve mathematics better, too. Our teacher is always punctual and regular to school, and she treats us very well

– Pupil A at LA Nursery and Primary School, Amuwo-Odofin, Lagos

VI. Methodological Considerations to Quantify Programmatic Learnings From EKOEXCEL After 34 Weeks of Implementation in the 2022-23 School Year

Statistical Approach to Identify the Programmatic Learnings from the EKOEXCEL Programme

The second data-driven approach to continuously improve the EKOEXCEL programme adopts a shorter-term perspective on learning advancement within the state. Specifically, this approach focuses on assessing the within-year learning growth of pupils and schools observed during the 2022-23 school year to identify pockets of excellence, areas where further improvement is needed, and factors associated with learning improvements.

To illustrate these programmatic learnings, data on learning outcomes was meticulously gathered from a carefully selected sample of 60 schools spread across all LGAs, representing all public schools enrolled in the EKOEXCEL programme at scale. The process began with data collection at the start of Term 1 in September 2022 of the 2022-23 school year, followed by a subsequent round of data collection at the end of Term 3 in July 2023 of the same school year.

Specifically, the data collected at the end of the 2022–23 school year was compared to the data collected at the start of the same school year for the *same pupils*. This method, known as **"trajectory analysis"** has been used to understand how literacy develops in pupils with reading difficulties and has also been leveraged by research communities to diagnose issues with education systems in LMIC (Skibbe et al., 2008; RISE, 2021).

The intention behind a trajectory analysis is that, by following the same schools and, for the most part, the same pupils in Lagos for a full school year, the approach will provide access to a comprehensive dataset on how foundational skills evolve through a school year, while also providing a tight grasp on data quality by minimising the potential for "selection bias" and "measurement error." By collecting this type of data, the report highlights whether the learning pace of pupils in a given LGA or school is significantly higher or lower than expected than other LGAs, providing insight into learning disparities or heterogeneity within Lagos' education system.

Additionally, data on key indicators such as pupil enrolment, pupil attendance, teacher attendance, and lesson completion, gathered from all EKOEXCEL schools, was also collected for this selected sample of 60 schools. Gathering such data can help highlight which school- and teacher-level factors are most associated with strong growth, which, in turn, allows the EKOEXCEL programme to keep improving the education quality within the State.

Sampling Framework for Schools and Pupils

Schools included in the study

At the start of Term 1 in September 2022 (2022-23), the EKOEXCEL team, with inputs from SUBEB, selected a representative set of 60 schools distributed across all LGAs. These 60 schools were selected as a representative sample of schools from Lagos State to ensure that the patterns observed in the data reflect the true state-level trends.

In the September 2022 data collection round, the aim was to sample a given number of schools within each LGA that is proportional to the number of pupils in the same LGA relative to the total pupil population in the state. Implementing this sampling strategy also ensured a minimum number of schools per LGA to minimise the risk of spurious findings at an LGA level that can result from smaller sample sizes. Therefore, the sampling method ensured that the number of sample schools per LGA was proportional to the total number of pupils. The only exception was if the total number of sampled schools in an LGA was fewer than two, in which case a minimum of two schools per LGA was imposed.

Incidentally, three schools from the September 2022 data collection were also part of the initial January 2020 evaluation. Nevertheless, these three schools underwent the same assessments in July 2023 as the other 57 schools assessed in September 2022 to capture the within-year learning growth patterns, as outlined in this section. Additionally, these three schools also underwent the same assessments as the other 27 schools assessed in January 2020, to evaluate the long-term impact of the EKOEXCEL programme after approximately 4 school years of implementation (as referenced in Section 4).

Pupils assessed for this study

During the September 2022 data collection for the 2022-23 school year, data were collected for *randomly* selected pupils across Primary 1 to Primary 4 in the 60 EKOEXCEL schools selected. To the extent possible, a longitudinal follow-up was done in July 2023 on the same pupils assessed during the September 2022 data collection. The aim was to create a “longitudinal panel” at the pupil level for foundational learning outcomes. Specifically, the same pupils in Primary 1 to Primary 4 were followed throughout the school year. Additionally, in the same schools, pupils from KG, Primary 5, and Primary 6 were assessed during the July 2023 data collection. Although these three grades were not included in the trajectory analysis and therefore not used to examine within-year learning growth, assessing them provided valuable insights into the learning levels representative for these grades at the end of the 2022-23 school year.

Like with the random selection methodology, for every school, eight pupils were assessed for each grade from KG to Primary 6. Moreover, for Primary 1 to Primary 4, if a pupil who took the assessment in September 2022 was not found in the data collection round of July 2023, the pupil was replaced with another randomly selected pupil to maintain a minimum sample size representative of all pupils in the State.

A point to note is that the longitudinal follow-up on pupils is not necessarily required to create a longitudinal panel at the school or LGA levels, as representative data were collected for each school during each round. However, this approach strengthened the validity of the results. It provided deeper insights into how pupils develop their foundational literacy and numeracy (commonly referred to as “FLN”) skills without concerns that the results might be affected by changes in the sample between each round of data collection.

Assessments Used in Data Collection

Learning assessments used

Early Grade Reading Assessment (EGRA)

A shortened version of EGRA was administered to pupils in Primary 1 through 4 across all 60 EKOEXCEL schools during the September 2022 data collection. In the July 2023 follow-up, the EGRA was extended to include pupils from Kindergarten through Primary 6 in all 60 assessed schools. Despite the September 2022 assessment using a shortened version of EGRA, both assessments are comparable as the sub-tasks were consistent across both (see Table 6.1)

Table 6.1: Summary of the EGRA assessments administered to different grades in the September 2022 and July 2023 evaluation for the 2022-23 school year

Reading Assessments Administered by Different Grades	September 2022 Evaluation ("Start of Term 1 of the 2022-23 School Year")	July 2023 Evaluation ("End of Term 3 of the 2022-23 School Year")
Kindergarten		✓
Primary 1	✓	✓
Primary 2	✓	✓
Primary 3	✓	✓
Primary 4	✓	✓
Primary 5		✓
Primary 6		✓

By administering the same EGRA sub-tasks to the same Primary 1 to 4 pupils that were involved in the September 2022 evaluation, a longitudinal panel data could be built allowing the benchmarking of pupils' learning growth trajectories after one academic year.

Table 6.2: Summary of the different EGRA sub-tasks administered across Kindergarten to Primary 6 during the September 2022 and July 2023 evaluation period.

EGRA Sub-task	Kindergarten (Only July 2023)	Primary 1 to 4 (September 2022 & July 2023)	Primary 5 to 6 (Only July 2023)
Listening Comprehension	✓		
Letter Sound Knowledge	✓		
Identify Onset Sounds	✓	✓	
Non-word Reading	✓	✓	
Familiar Word Reading	✓		
Passage Fluency I (Primary 2-level)		✓	✓
Reading Comprehension I		✓	✓
Passage Fluency II (Primary 5-evel)			✓
Reading Comprehension II			✓

International Common Assessment of Numeracy (ICAN)

In addition to the EGMA, pupils' foundational numeracy subskills can also be assessed using the International Common Assessment of Numeracy (ICAN). ICAN, developed by the People's Action for Learning (PAL) Network (2020), is an increasingly popular tool for measuring performance across a range of core numeracy competencies. Specifically, ICAN assesses five domains: number recognition, addition, subtraction, multiplication, and division. Within each domain, there are 2 tasks. Task 1 is a simple application of the concept (for example, addition without carrying). If the pupil answers Task 1 correctly, they attempt Task 2, which is a more challenging application of the concept (for example, addition with carrying). Two of the domains (subtraction and division) also include a separate word problem as part of Task 2.

Similar to EGRA, ICAN was administered to pupils in Primary 1 through 4 across all 60 EKOEXCEL schools during the September 2022 data collection. During the July 2023 evaluation, ICAN was administered to the same pupils in Primary 1 through 4 that had been involved in the September 2022 evaluation. As mentioned earlier, by administering the same assessment to the same pupils involved in the September 2022 evaluation for 2022-23, the longitudinal panel data enabled the benchmarking of pupils' learning growth trajectories after one academic year. In addition, ICAN was also administered to Primary 5 and Primary 6 pupils during the July 2023 evaluation to assess their current foundational numeracy skills (see Appendix B for the full assessment).

Table 6.3: Summary of the numeracy assessments administered to different grades in the September 2022 and July 2023 evaluation for the 2022-23 school year

Numeracy Assessments Administered by Different Grades	September 2022 Evaluation ("Start of Term 1 of the 2022-23 School Year")	July 2023 Evaluation ("End of Term 3 of the 2022-23 School Year")
Kindergarten		
Primary 1	✓	✓
Primary 2	✓	✓
Primary 3	✓	✓
Primary 4	✓	✓
Primary 5		✓
Primary 6		✓

The selection of ICAN for this study reflects its growing popularity as the go-to tool to assess foundational numeracy. ICAN fills an important gap for numeracy assessment. Global assessments like PISA and TIMMS target older pupils and assess more complex mathematical topics, while popular assessments like the EGMA assess foundational numeracy at lower grades, but are not designed to assess numeracy among pupils older than Primary 3. ICAN occupies this middle space, making it uniquely suitable for a Primary 1 to 6 evaluation. By using ICAN across Primary 1 to 6, it can be illustrated how different grades perform on the same assessment (and thus, how pupils progress grade-on-grade).

Summary of assessments

Table 6.4 summarises the pupil assessments used during the data collection rounds of September 2022 and July 2023 to measure the within-year learning trends and illustrate the programmatic learnings for the betterment of the EKOEXCEL programme. Refer to Appendix E for an overview of the data quality assurance protocol used to analyse the results from these assessments.

Table 6.4: Summary of all assessments administered to different grades in the September 2022 and July 2023 evaluation for the 2022-23 school year

All Assessments Administered by Different Grades	September 2022 Evaluation ("Start of Term 1 of the 2022-23 School Year")	July 2023 Evaluation ("End of Term 3 of the 2022-23 School Year")
Kindergarten	-	EGRA
Primary 1	EGRA, ICAN	EGRA, ICAN
Primary 2	EGRA, ICAN	EGRA, ICAN
Primary 3	EGRA, ICAN	EGRA, ICAN
Primary 4	EGRA, ICAN	EGRA, ICAN
Primary 5	-	EGRA, ICAN
Primary 6	-	EGRA, ICAN

Other Data Used to Support the Analysis

Longitudinal Metrics on Pupil Attendance and Enrolment

As mentioned before, EKOEXCEL's ecosystem allows the programme team to track metrics on pupil attendance and enrolment in real-time. This sheds light on whether pupil attendance and enrolment during the 2022-23 school year, are correlated with learning gains through the school year.

Teacher Attendance and Lesson Delivery

As mentioned before, data on teacher attendance and lesson delivery are collected for all EKOEXCEL teachers. To mark their attendance, teachers are required to check-in with their head teacher prior to their first lesson of the day. If a teacher fails to check-in, they are marked as absent/not present. Data on lesson delivery are collected through the teacher tablet used by all EKOEXCEL teachers. 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.

Teaching Practices

Finally, in order to better understand actual teaching behaviours in the classroom, this study uses an adapted version of the TEACH Observation Tool. Originally developed by the World Bank (2022) for use in classrooms in low- and middle-income countries (LMIC), the TEACH tool is designed to measure teaching practices which are pedagogically sound and empirically proven to be effective. To assess what teaching practices - one of the most proximal inputs to improve learning outcomes - could have potentially contributed to gains in learning outcomes during the 2022-23 school year, the EKOEXCEL team collected data on pedagogical practices at the start of the 2022-23 school year.

The data offer insights into how the quality of teaching correlates with learning outcomes following the implementation of the EKOEXCEL programme, and guide ongoing programmatic decisions regarding classroom management strategies and pedagogical practices as the programme progresses. Typically, data collected using the TEACH tool can be used to make comparisons between those schools participating in the programme and those who are not. However, with the expansion of the EKOEXCEL programme to all public Primary schools in Lagos State in the 2022-23 school year, such comparisons are not possible anymore.

Qualitative Data

This evaluation also conducted a qualitative follow-up during Term 2 of the 2022–23 school year (February 2023), 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, 503 interviews were carried out with 112 teachers, 74 head teachers, 108 parents, and 209 pupils from different schools across the State. These interviews followed a structured approach (outlined in the protocol in Appendix F) and the results were subsequently analysed using conventional coding practices for qualitative data.

VII. Programmatic Learnings From EKOEXCEL After 34 Weeks of Implementation in the 2022-23 School Year

The preceding section underscored the substantial long-term learning advancements facilitated by EKOEXCEL following 4 school years of programme implementation. Building on these positive outcomes, this section shifts focus to short-term trends, using data from Term 1 (September 2022) and Term 3 (July 2023) of the 2022-23 school year to identify areas of strength and growth. While the large average gains already presented demonstrate that the programme is effective and beneficial for stakeholders, the purpose here is to pinpoint where *further improvements* can be made. By examining the within-year learning outcome trends, particularly in regions or schools with relatively lower performance, the aim is to enhance the programme's impact in the coming years. This approach underscores EKOEXCEL's ongoing success in maximising educational investment in Lagos State through continuous data-driven support for teachers and pupils, high-quality instructional materials, and the programme's transformative approach to learning.

Healthy Gains in Learning Over the Course of a School Year

Reading fluency rates have increased for all classes since the start of the school year

Over the course of the 2022-23 school year, for a total of 34 weeks of programme implementation, pupils made significant progress in reading a Primary 2-level passage with accuracy. Pupils, on average, are reading 14 more cwpm at the end of the 2022-23 school year than they were able to prior to the start, improving their fluency by 52% (Figure 7.1). Pupils in Primary 2 experienced the highest growth, almost doubling the number of words they could read with accuracy. Primary 1 pupils at the end of school year are now reading more cwpm than Primary 2 pupils could read at the start of the year (a trend that is also observed among Primary 2 and Primary 3 pupils).

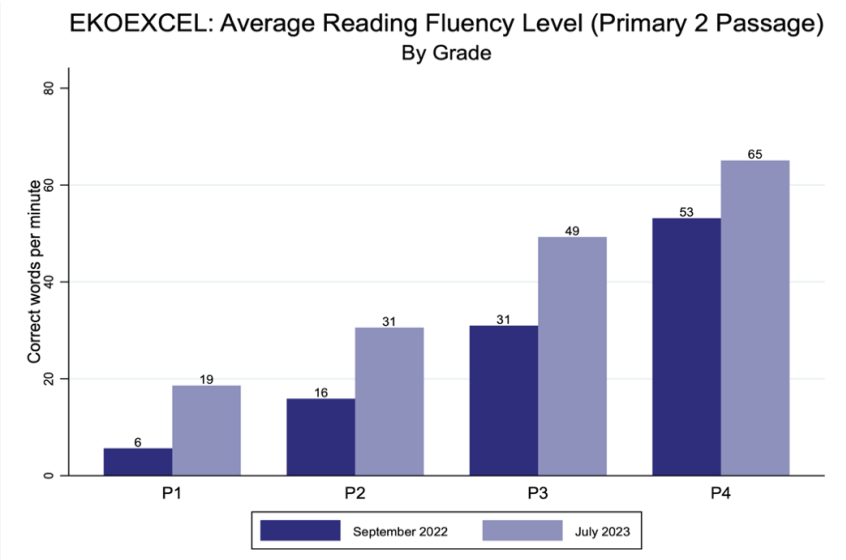


Figure 7.1

Over the course of the 2022-23 school year, Primary 3 and Primary 4 pupils also, on average, crossed the threshold of 45-60 cwpm, which education researchers regard as the minimum threshold required for active reading comprehension. The fact that the average pupils in Primary 3-4 classes are reaching this level indicates that they are becoming more prepared to access greater learning in all subjects and take on increasingly advanced subject matter as they approach higher grades. Importantly, the improvements in reading fluency, most likely achieved through the implementation of EKOEXCEL, in just one school year speaks to the meaningful impact that the programme has had on education for pupils throughout the State.

Pupils' foundational numeracy capabilities have also improved through the school year

After 34 weeks of programme implementation, pupils across lower-Primary grades (Primary 1-3) experienced improvements in their foundational numeracy capabilities. For example, at the start of the 2022-23 school year, only 11% of pupils in Primary 1 could solve an addition problem like 29 + 15 (Figure 7.2). By the end of the school year, the proportion increased remarkably to 52% - almost a fivefold increase.

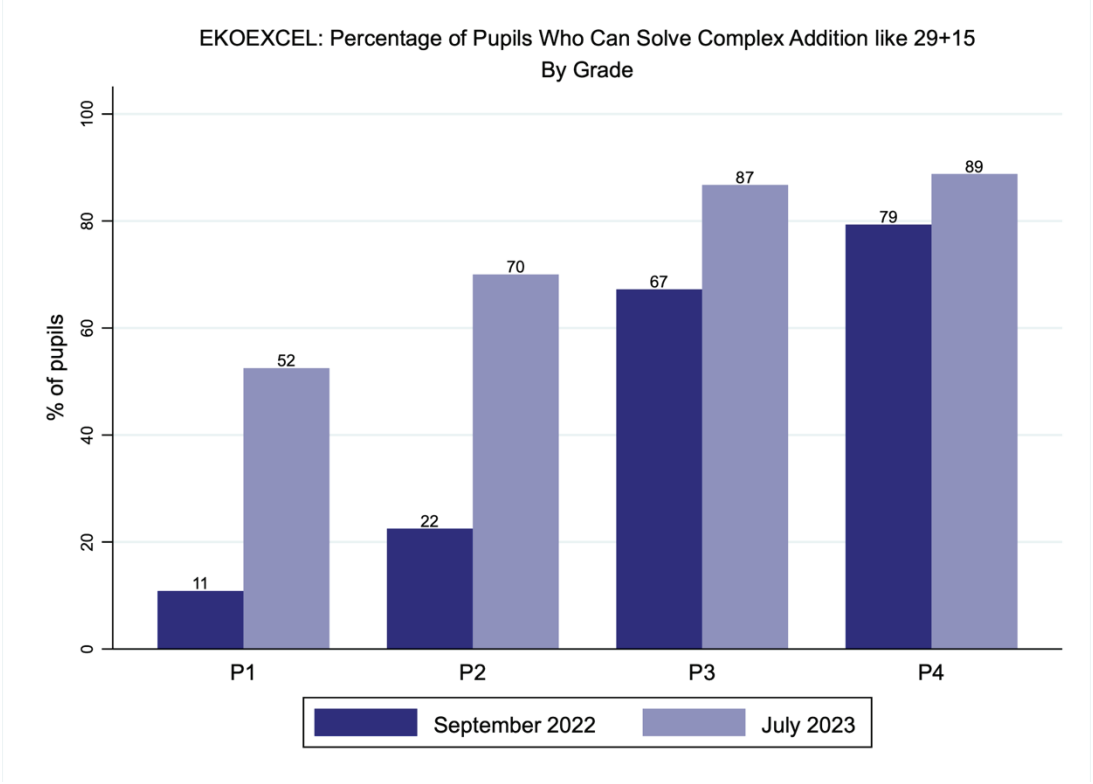


Figure 7.2

In many other subskills, pupils are now performing at a higher level than their peers who were at least one class ahead prior to the programme. For example, the proportion of Primary 1 pupils who can solve a two-digit subtraction problem with borrowing (i.e. 78 - 29) equals the proportion of Primary 3 pupils who were proficient in this subskill at the start of the school year (Figure 7.3). Similarly, the proportion of Primary 1 pupils who can solve an exact short division problem (i.e. 8 ÷ 2) surpassed the proportion of Primary 3 pupils who were proficient in this subskill at the start of the school year (see Appendix D). These gains suggest that the continued high-quality, targeted instruction provided by the programme is better positioning pupils on the path towards foundational numeracy proficiency.

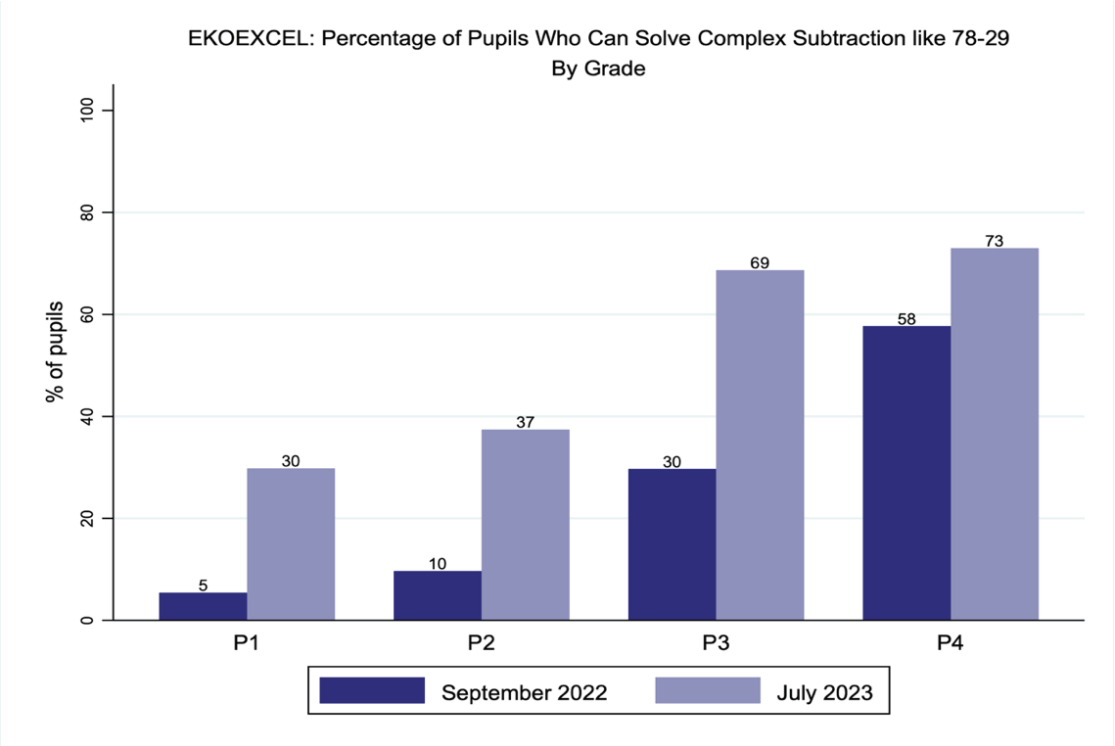


Figure 7.3

The teachers' attitude has changed as they come to school early and regularly and they appear more motivated through their good behaviour to parents and learners, and because of all these changes, my children have greatly improved in their studies, especially in English language and mathematics, and they are always competing amongst themselves at home

– Parent to Pupil A of Maidan Nursery and Primary School Mile 12, Ikeja, Lagos

Additional Insights to Inform Programmatic Design

Both boys and girls are equally proficient across literacy and numeracy, maintaining gender parity on learning outcomes

At the beginning of the 2022-23 school year, both boys and girls, on an average, could read 27 cwpm. At the end of the 2022-23 school year, after 34 weeks of instruction, both genders, with girls slightly doing better than boys, are now able to read close to 40 cwpm (Figure 7.4).

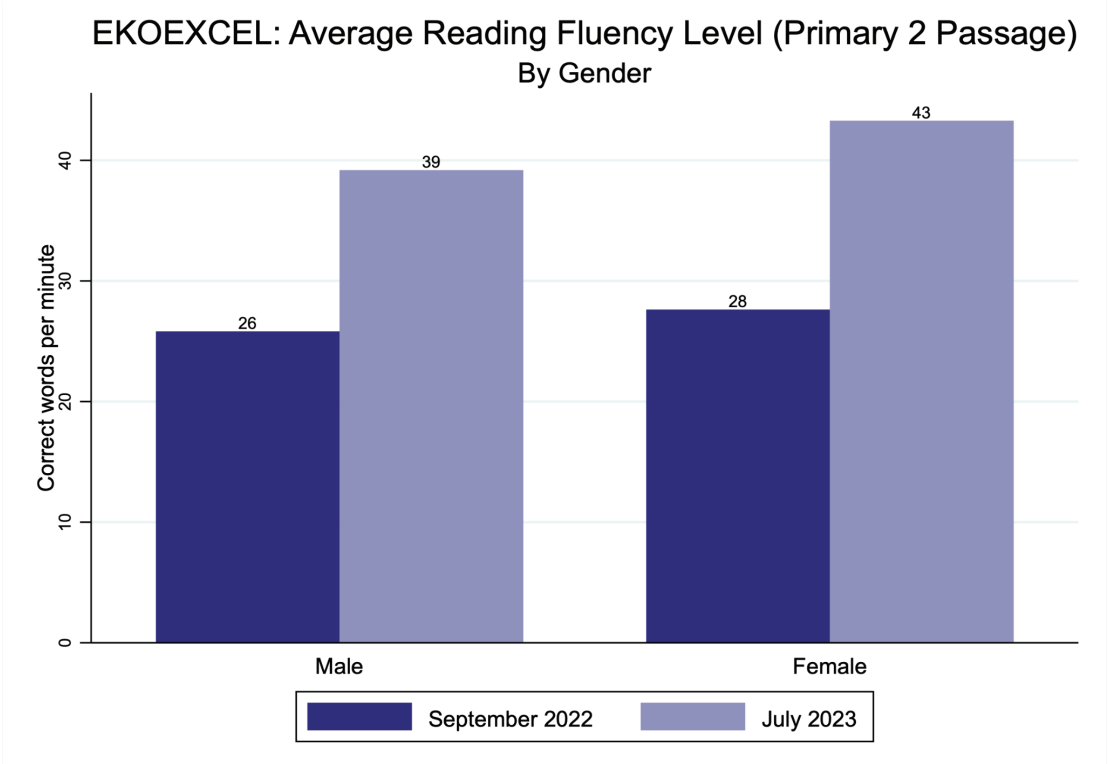


Figure 7.4

Pupils of both genders are equally proficient in numeracy subskills. For instance, the proportion of boys who could solve a two-digit simple subtraction problem (like 49 - 21) at the start of the 2022-23 school year was 69%, just 1 percentage point lower than girls. After 34 weeks of instruction, almost 4 out of 5 boys and girls are now able to solve the subtraction problem, showing equal progress of 13 percentage points from before (Figure 7.5). EKOEXCEL made significant strides by ensuring that both boys and girls are equally proficient, an important hallmark of Lagos State's education system.

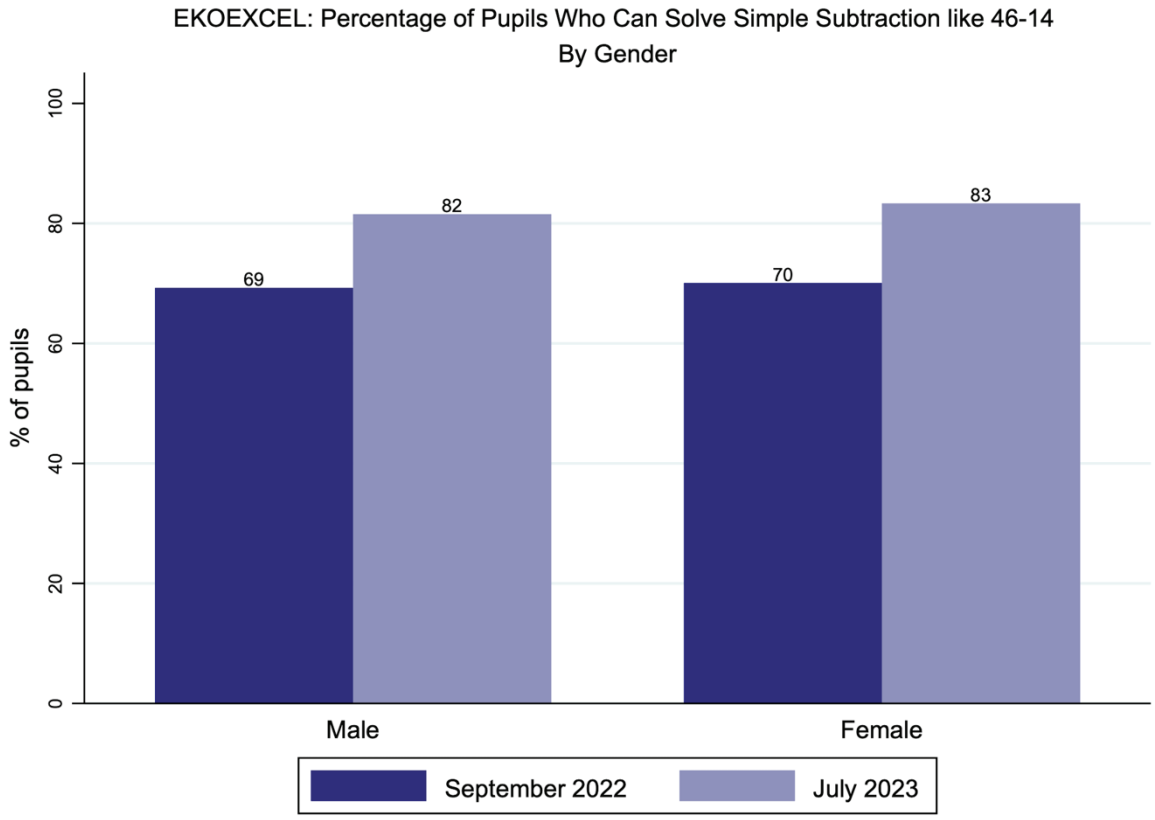

EKOEXCEL: Percentage of Pupils Who Can Solve Simple Subtraction like 46-14
By Gender
% of pupils
0
20
40
60
80
100
69
82
70
83
Male
Female
September 2022
July 2023

Figure 7.5

Most pupils showed considerable progress in learning, although outcomes significantly varied across LGAs

The EKOEXCEL programme was operational across all 20 LGAs in the state during the 2022-23 school year. While on average pupil learning levels increased across the state and many LGAs demonstrated significant progress — regardless of their initial starting points or baselines — some clusters of LGAs still showed room for improvement. For instance, in certain LGAs, progress lagged behind others with similar learning levels at the start of the 2022-23 school year (Figure 7.6). Thus, there remains an opportunity to enhance the implementation of EKOEXCEL in these particular LGAs in the upcoming years. Additionally, there is valuable insight to be gained from LGAs that experienced strong improvements, providing opportunities for knowledge sharing and learning best practices for implementation strategies.

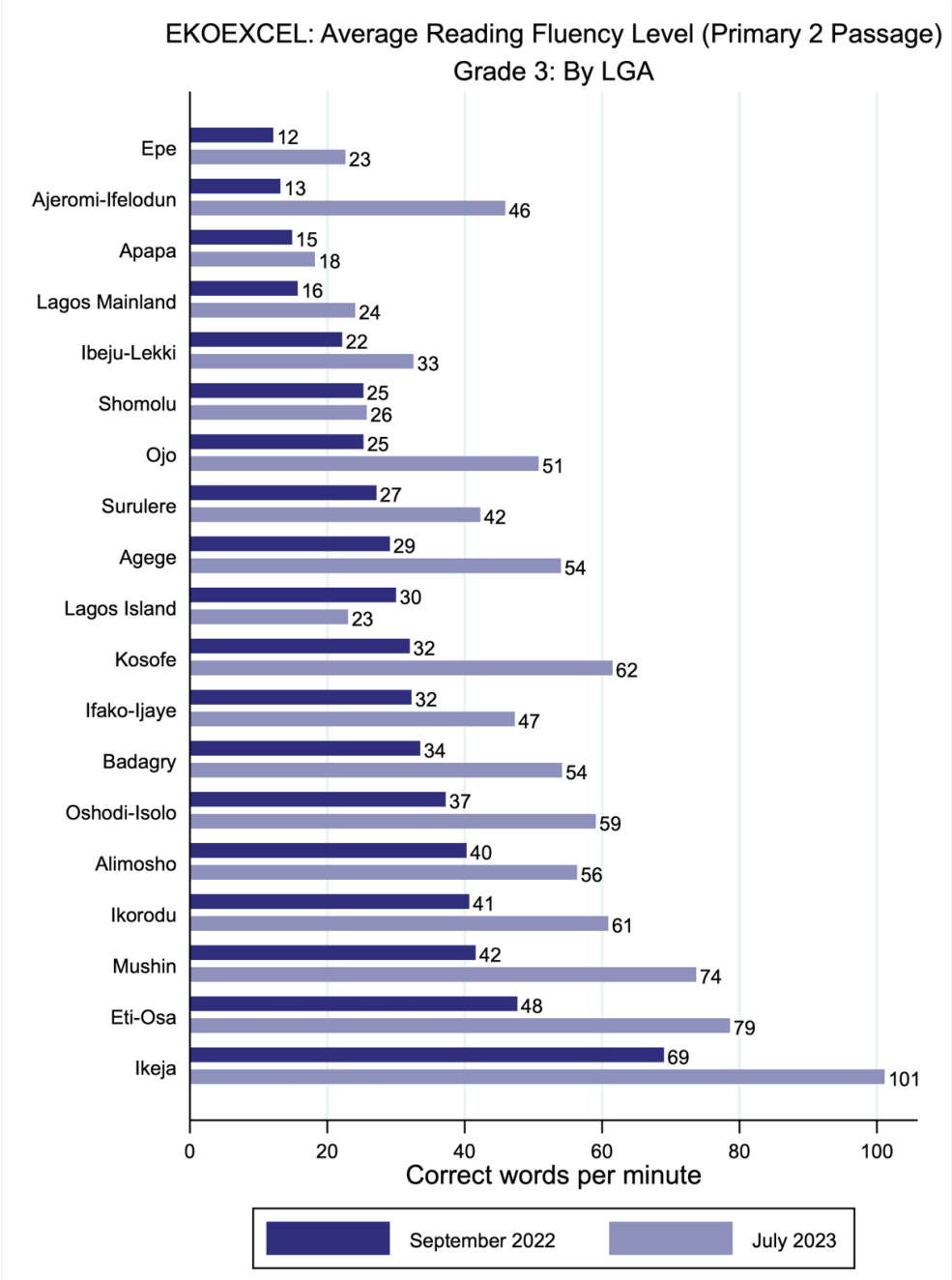


Figure 7.6

To understand the differences in learning outcomes and trajectories across LGAs, this report uses Primary 3 as an example. The grade shows significant variability in learning levels at the start of the 2022-23 school year, as well as variable learning improvements throughout the year at the LGA level. By examining variations in both the learning levels at the outset of the school year and subsequent learning gains, LGAs can be categorised into four groups, which aims to pinpoint areas where programme implementation can be enhanced and improvements can be identified. To ensure the robustness of the results and to demonstrate that they are not contingent on the selection of a specific grade, correlations between gains in learning outcomes are analysed (see Appendix D) across different grades. The findings reveal a consistent positive correlation in these classifications, irrespective of the grade chosen.

I. **LGAs demonstrating above-average baseline and above-average improvement:** these LGAs, began with a relatively higher learning levels at the start of the 2022-23 school year, indicating favourable starting points and conducive pre-existing conditions that enabled learning before the commencement of the 2022-23 school year. These favourable conditions may include better implementation of the EKOEXCEL programme over time and stronger teaching quality among others. It was somewhat expected for such LGAs to perform well given their already above-average baselines, therefore, it remains encouraging to witness their continued above-average progress. Notably, in the context of the EKOEXCEL programme for the 2022-23 school year for the sub-group of Primary 3, these LGAs include *Ikeja, Eti-Osa, Mushin, Oshodi-Isolo, Kosofe, Ikorodu, and Badagry.* For instance, in September 2022, pupils in Ikeja, were able to read 69 cwpm, on an average, more than 40% higher than the second best LGA, Eti-Osa. Later, over the course of the 2022-23 school year, Ikeja showed higher improvement than most — a gain of 32 cwpm (~46% increase) after 34 instructional weeks. One such driver of these high improvements could be an above-average programme implementation relative to other LGAs, with pupils in these LGAs attending an average of 57% of class days and a lesson completion rate of 61%.

II. **LGAs demonstrating above-average baselines and below-average improvements:** these LGAs began with relatively higher learning levels at the start of the 2022-23 school year but showed below-average improvement during the school year. Although these LGAs achieved a higher lesson completion rate (64%) and better pupil attendance (59%) compared to other LGAs, their progress was minimal. This suggests that even a strong programme implementation may not be enough and factors such as varying levels of pupil engagement or specific local challenges may have hindered further growth. To address this, it will be useful to both investigate these contextual factors and adopt best practices from LGAs with similar starting levels that achieved higher improvements. In the context of the EKOEXCEL programme for the 2022-23 school year, Alimosho and Ifako-Ijaye are examples of LGAs that, despite starting with an average reading fluency of 40 cwpm, only saw a modest increase of 16 cwpm after 34 weeks, which is 2 cwpm below the average gain across all LGAs.

III. **LGAs demonstrating below-average baselines and above-average improvements:** these LGAs started the 2022-23 school year with lower baseline performance, suggesting they faced pre-existing challenges or deficiencies in education prior to the EKOEXCEL programme. Despite these initial hurdles and potential educational disparities, these LGAs achieved notable improvements, reflecting successful practices that allowed them to surpass expectations. By examining the effective strategies used in LGAs like *Ojo, Ajeromi-Ifelodun*, and *Agege*, other LGAs can gain valuable insights. It is especially important to learn from these examples, as their significant learning gains occurred despite gaps in programme implementation — evidenced by a lesson completion rate of 54%, which was notably lower than the rates of over 60% seen in other LGAs.

IV. **LGAs demonstrating below-average baselines and below-average improvements:** these LGAs started with a relatively lower baseline than other regions. Like the group immediately above, it could be indicative that there were pre-existing challenges, deficiencies or gaps with the status of education prior to the implementation of the EKOEXCEL programme in the 2022-23 school year. In the context of EKOEXCEL, these LGAs include Lagos Island, Surulere, Shomolu, Ibeju-Lekki, Lagos Mainland, Apapa, and Epe. For instance, in September 2022, pupils in Shomolu demonstrated an average reading fluency of 25 correct words per minute (cwpm). However, after 34 instructional weeks, or by the end of the 2022-23 school year, Shomolu showed no improvement, remaining at the same level of reading fluency as before. It will be crucial to provide enhanced support to these LGAs in the upcoming years, as they represent areas for improvement within the EKOEXCEL programme's progress among pupils. One such improvement area is increasing pupil attendance, with pupils in these LGAs attending an average of 54% of class days, the lowest of all other LGA sub-groups.

A stylised version of the classification is provided below in Figure 7.7 with recommendations identified.

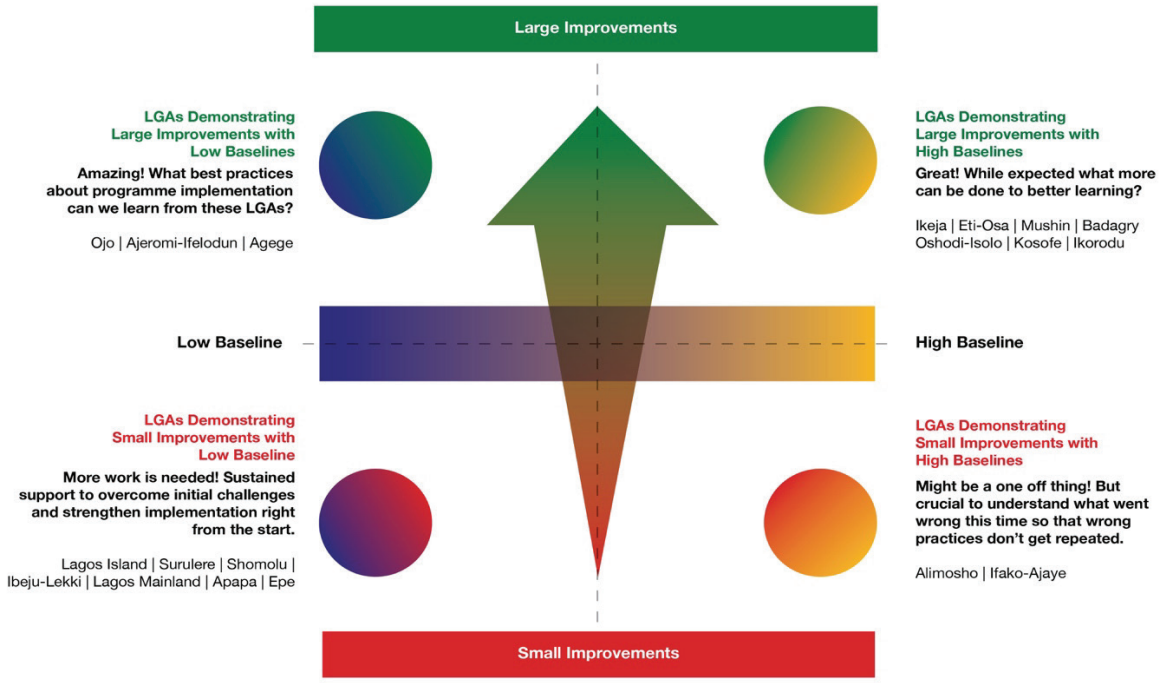


Figure 7.7

Variations in the rates of pupil attendance and lesson completion may hinder all pupils from progressing at the same rate

The results from the 2022-23 school year revealed that pupil attendance varies considerably across LGAs, highlighting the need for greater pupil participation as the EKOEXCEL programme continues. As EKOEXCEL pupils are key stakeholders in the programme, the quantity of effective education they receive is influenced not only by the consistent quality performance of school staff, but also by the extent to which they regularly engage with their own schooling. During the 2022-23 school year, the average rate of pupil attendance varied significantly across LGAs, with the rate of pupil attendance ranging by 24 percentage points between the LGAs with the highest and lowest rates of attendance (Figure 7.8). While various factors could have influenced the observed differences in attendance, it signals an important detractor from pupil learning. Moving forward, sustaining high levels of pupil attendance will remain a priority in the ongoing implementation of the EKOEXCEL programme in order to maximise the programme's potential to enhance learning. To do this, continuous participation and buy-in from all stakeholders — including teachers, parents, and pupils — are necessary, so that pupils in Lagos State can continue to build stronger foundational skills and achieve greater learning outcomes.

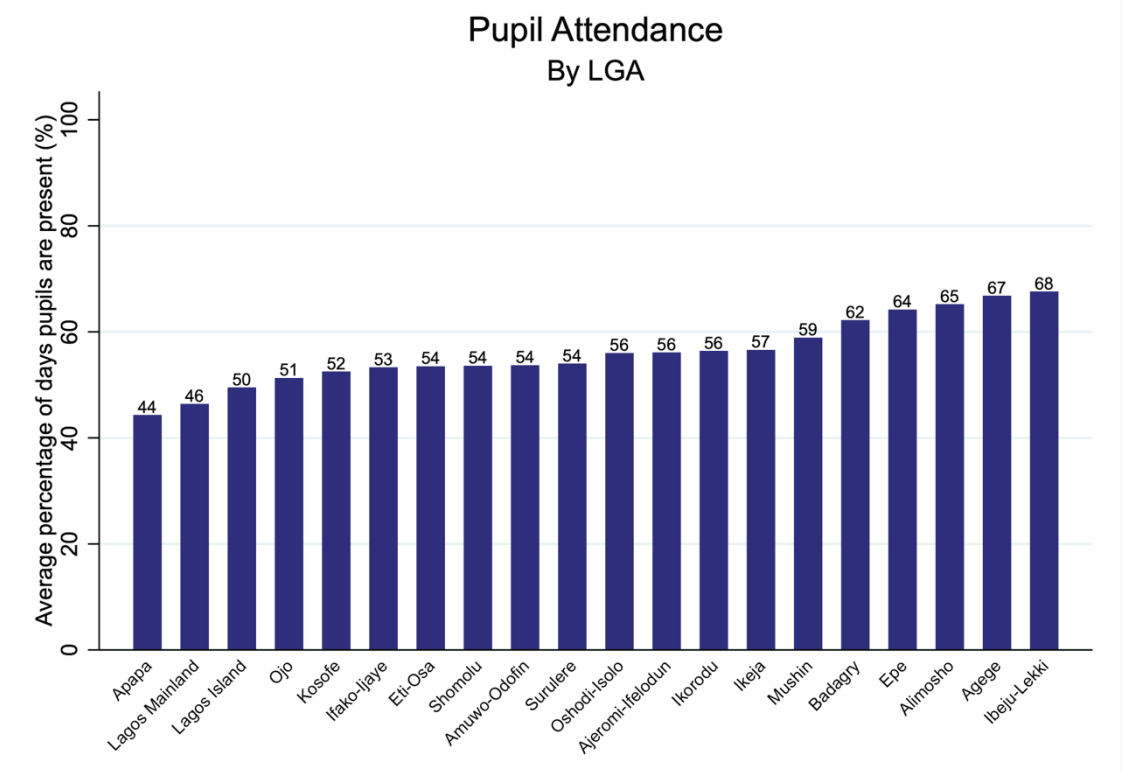


Figure 7.8

There were also significant differences across LGAs in terms of the average rate of lessons that teachers completed. For instance, schools in Ajeromi-Ifelodun completed 47% of lessons, on average, while schools in Lagos Island completed 74% of lessons on average — a 27 percentage point difference in the rate of lesson completion for the 2022-23 school year (Figure 7.9). High lesson completion rates in classrooms are important as they indicate that pupils have received the full instructional content, promoting a comprehensive understanding of the subject matter. This helps in achieving learning objectives and ensures that pupils are adequately prepared for subsequent lessons. Additionally, when teachers complete lessons at a higher rate, they are more likely to assess pupils' progress and adapt their teaching strategies effectively.

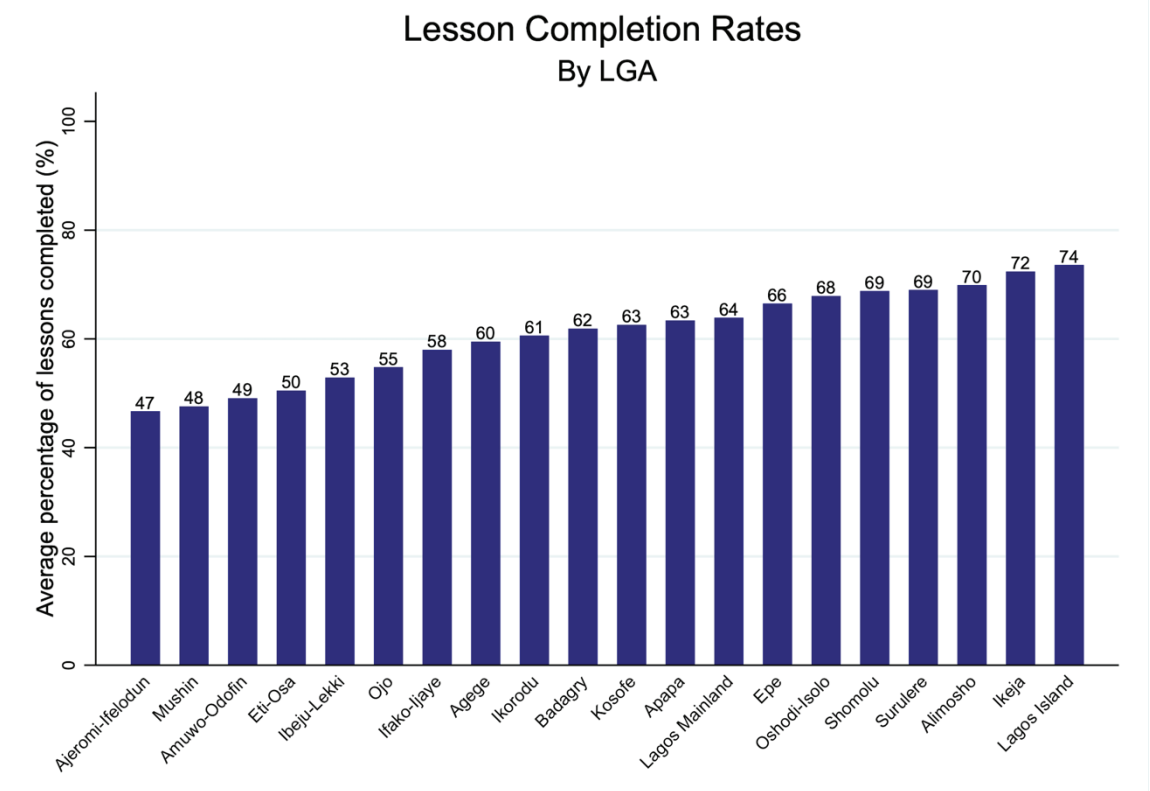


Figure 7.9

Do certain teaching behaviours explain gains in learning outcomes?

Over the 2022-23 school year, pupils across lower-Primary grades made significant strides in reading fluency and foundational numeracy, thanks to the 34 weeks of programme implementation. To reiterate, on average, pupils across Primary 1 - Primary 4 improved their reading fluency by 52%, with Primary 1 pupils reaching fluency levels that surpassed those of Primary 2 pupils at the start of the year. In numeracy, the proportion of Primary 1 pupils able to solve complex problems, such as addition and subtraction with borrowing, increased dramatically, often surpassing the proficiency levels of older peers at the beginning of the year. These improvements highlight the programme's meaningful impact on enhancing pupils' foundational skills, positioning them for continued academic success.

These gains in foundational skills may be linked to teacher quality. To examine whether teaching behaviours contributed to the differences in learning outcomes, data on select teaching quality attributes were collected within EKOEXCEL schools covered during the data collection round at the start of Term 1 of the 2022-23 school year with the help of an adapted Classroom Teaching Observation Tool[3].

The assessment of classroom teaching quality attributes can be categorised into three main areas: fostering a positive **classroom culture** (including creating a supportive learning environment and establishing positive behavioural norms), delivering **effective instruction** (such as facilitating lessons, assessing pupil comprehension, providing feedback, and critical thinking), and nurturing pupils' **socio-emotional skills** (such as promoting autonomy, perseverance, and fostering collaborative social skills).

[3] The Classroom Observation Tool also called TEACH Primary is designed by the World Bank and is used to assess and improve the teaching quality by exploring what happens in the classroom.

Based on the assessment of teaching attributes at the start of Term 1 in the 2022-23 school year and the subsequent learning gains observed over the school year within EKOEXCEL schools, all three assessed teaching attributes correlate with increased learning gains, albeit to different extents. Put simply, effective teaching practices, such as *fostering a positive classroom culture*, *delivering impactful instruction*, and *nurturing pupils' socio-emotional skills*, correlate with larger improvements in learning outcomes.

To exemplify further, when teachers within the EKOEXCEL programme fostered a classroom culture conducive to learning — as trained by the programme — their pupils' reading fluency scores increased by 15 cwpm, on average. In contrast, when EKOEXCEL teachers created little or no supportive learning classroom cultures, the improvements in reading scores was 11 cwpm, lower by 4 cwpm, a reduction of almost 25% (Figure 7.10). In other words, when EKOEXCEL teachers create a conducive classroom culture where pupils' are ready to learn, pupils in their class show bigger improvements in reading fluency. A supportive learning environment can enhance pupils' educational experience by facilitating effective learning and nurturing pupils' overall development.

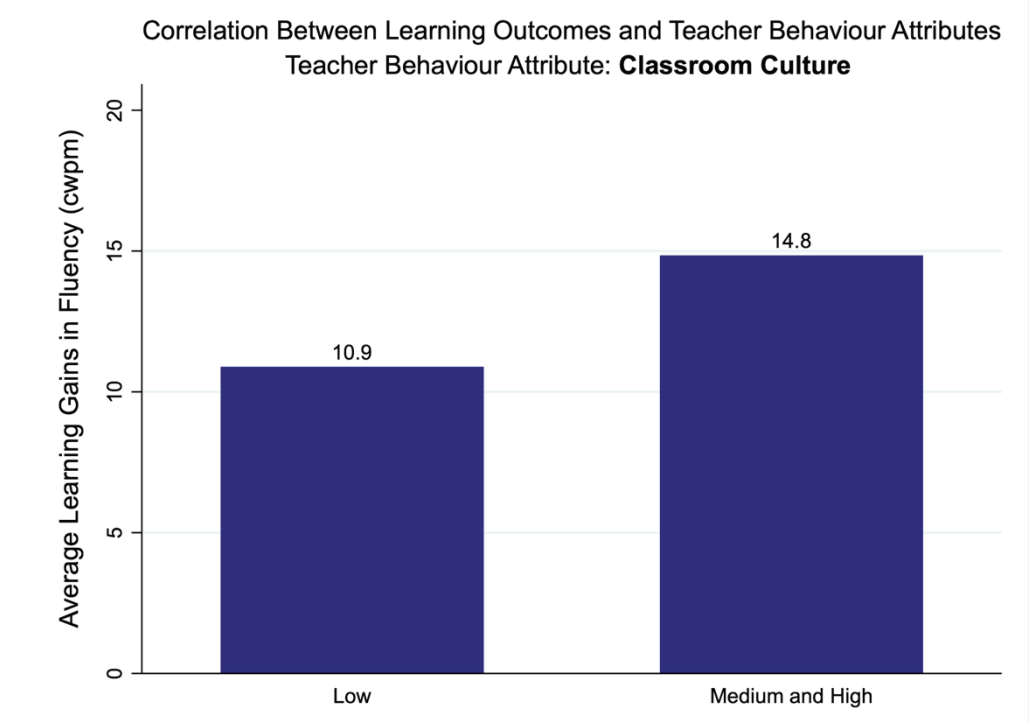


Figure 7.10

In a similar vein, differences in the implementation of effective classroom instruction strategies correlate with a notable disparity in reading fluency score increases; for instance, teachers employing effective strategies witness an average gain of ~15 correct words per minute amongst their pupils, reflecting a 49% increase over the average gain of ~10 correct words per minute observed among those teachers who do not employ such strategies. (Figure 7.11).

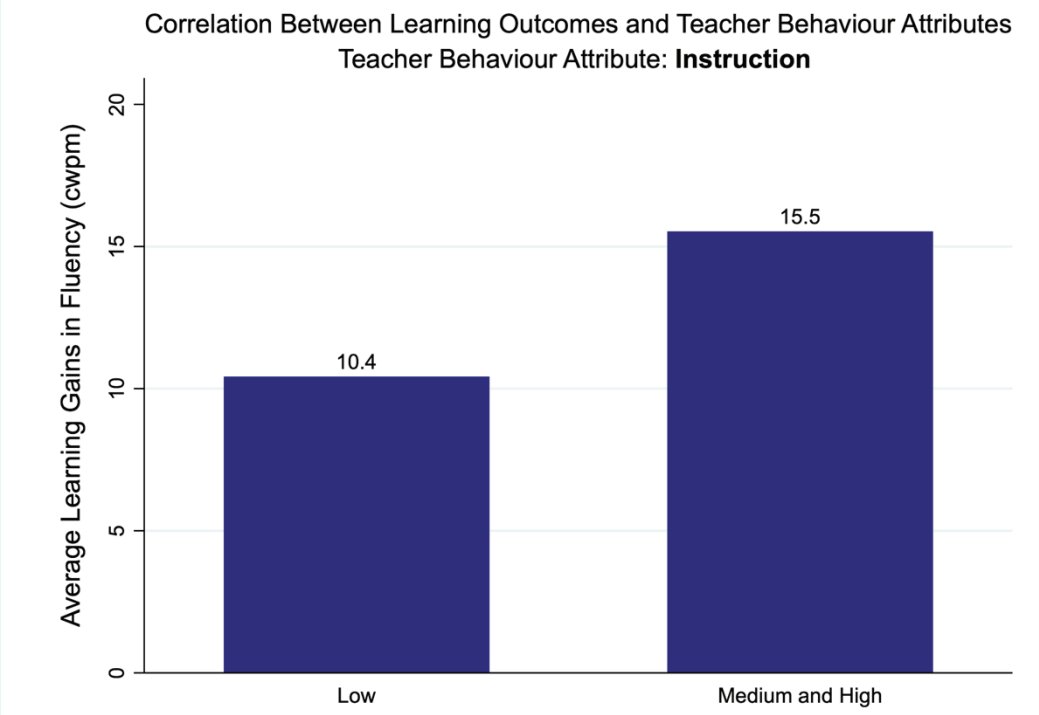


Figure 7.11

Based on the data, two such strategies that strongly correlate with improved learning outcomes are effective lesson facilitation skills and checking pupils' understanding. Effective lesson facilitation skills are important for teachers as they enhance pupil engagement, improve comprehension, and adapt to diverse learning styles. Skilled facilitation also promotes critical thinking, fosters a positive classroom environment, and responds to pupils' needs efficiently. In the context of EKOEXCEL, teachers with effective or moderate lesson facilitation skills (such as explaining the content of the chapter clearly or making connections to pupils' everyday lives) are associated with larger improvements in reading fluency. As shown in Figure 7.12 below, pupils experience more than twice the improvement in reading fluency when teachers have effective or moderate lesson facilitation skills compared to when they do not. This suggests that encouraging teachers to improve proficiency in lesson facilitation skills could contribute to increased learning gains.

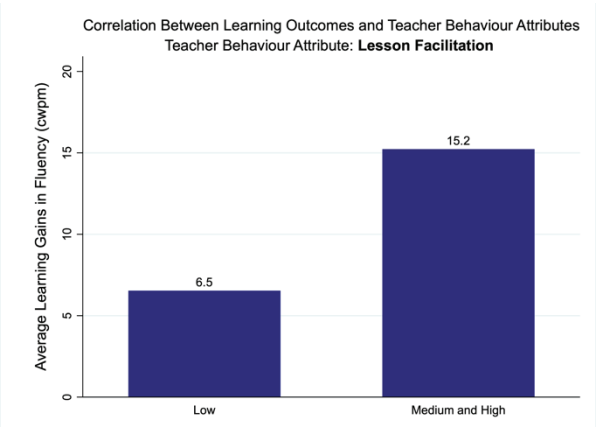


Figure 7.12

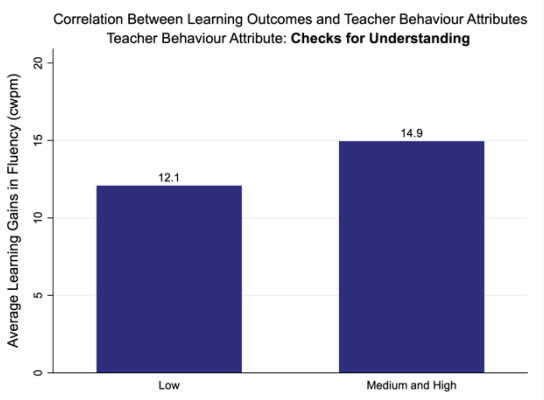


Figure 7.13

The literature on the relationship between developing socio-emotional skills and learning outcomes is still growing. However, based on the data collected in EKOEXCEL, developing a pupil's socio-emotional skills potentially contributes to bigger improvements in learning gains. For instance, one important teaching attribute contributing to improved socio-emotional learning is giving autonomy to pupils in the classroom. This includes promoting voluntary participation or giving pupils the opportunity to take different roles, as evidenced by Figure 7.14 below. In the EKOEXCEL programme, pupils whose teachers gave them more choices or autonomy showed a significant improvement in reading fluency scores; specifically, they increased their scores by 18 cwpm, which is more than double the improvement seen in pupils whose teachers gave them less autonomy.

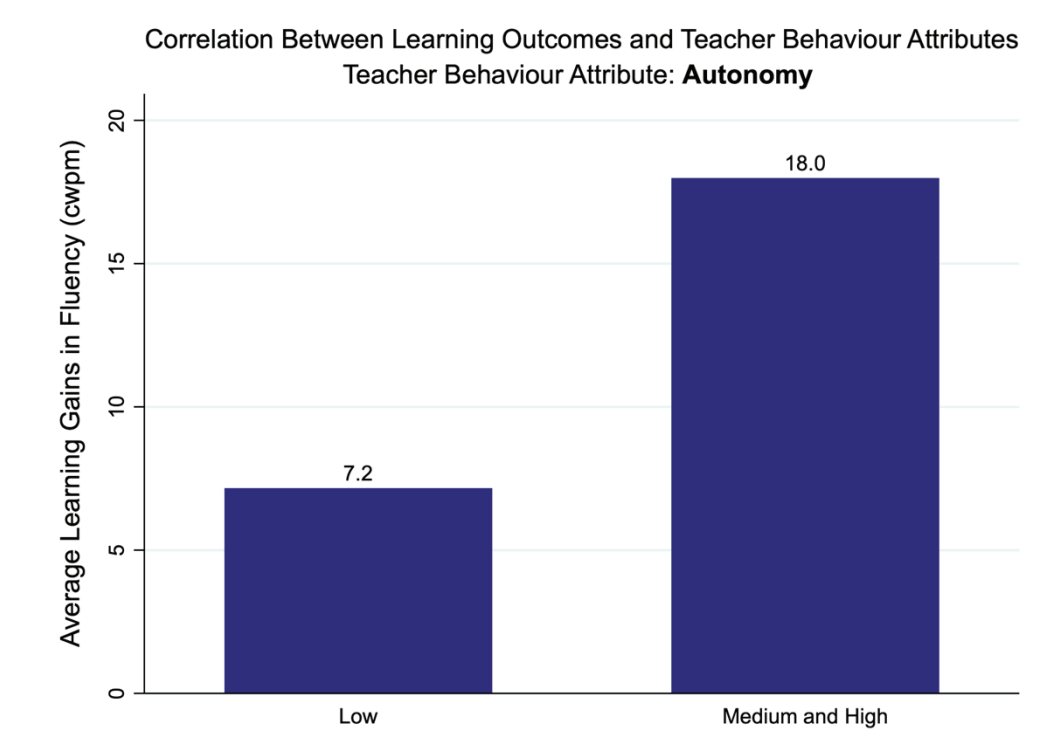


Figure 7.14

It is important to understand that although the teaching attributes mentioned above are associated with improvements in learning outcomes, the lack of correlation with other teaching attributes does not necessarily mean they are less important. The insights drawn from the TEACH data within the EKOEXCEL programme provide valuable indications of factors that might contribute to learning gains. However, it's important to remember that these insights are just one piece of the puzzle in understanding effective teaching practices. Nonetheless, the EKOEXCEL programme invests significantly in continually training and coaching teachers on these specific teaching attributes, and will continue to do so to ensure the programme maintains its high quality.

VIII. Lessons Learned and Recommendations for Programmatic Enhancements

After approximately 4 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 sub-groups made tremendous strides in foundational literacy and numeracy. In numeracy, the average pupil is now performing at least one class level ahead than the average pupil before the start of the programme, across most numeracy subskills[4]. Additionally, the share of non-readers has drastically declined from 25% to 18% in EKOEXCEL schools. The continued investment into the education sector in Lagos State has already yielded extremely positive results. Nevertheless, more work is required in order to sustain these positive trends — and build upon them — in the coming years of the programme. Specifically, the EKOEXCEL programme will work to address heterogeneity in learning outcomes across LGAs, utilise a data-driven approach to deliver better-targeted instruction, and drive high, consistent rates of attendance and lesson completion across all schools.

More precise, data-driven targeting of instructional levels will support pupils across all grades and LGAs

While pupils have made significant progress narrowing the gap between learning levels and grade-level standards, those gaps still exist for many pupils. In order to create learning environments that are optimised for learning outcomes, instruction must continue to be delivered at the right level for pupils. The first and most important way to achieve this is to ensure that the level of English and maths instructional materials (including teacher guides and textbooks) is precisely aligned to median pupil's learning levels, rather than simply to the grade level of the pupil (which is not necessarily an accurate predictor of learning). For instance, the average EKOEXCEL pupil in a Primary 4 class could read 65 cwpm by the end of the 2022-23 school year, improving their fluency by 12 cwpm over the course of the school year. In comparison, the average Primary 4 pupil in a high-income, English-speaking context is expected to read 133 cwpm by the end of the school year, improving their fluency by 39 cwpm within one school year[5]. To ensure that EKOEXCEL pupils are progressing on a positive trajectory towards foundational skill accumulation and overall academic achievement, it is important to ensure that pupils are receiving instruction that aligns with their current learning levels. Therefore, for the coming year, EKOEXCEL will use item-level data on English and maths performance for every pupil across the system in order to identify the appropriate level of instruction for each grade level, and to subsequently inform the instructional materials that are provided to each teacher. In this way, the programme can dynamically respond to changes in learning levels over time as well as across grade levels, maximising the relevance of instruction for pupils.

Targeted reinforcement is necessary for consistent programme implementation

Outlined in section 7, there exist differences across LGAs in reading fluency gains for the 2022-23 school year. Some of the differences in learning outcomes such as reading fluency can be explained by the differences in teaching inputs such as lesson completion rates, teacher attendance, and pupil attendance, especially in LGAs that experienced fewer learning gains. For instance, Lagos Island, an LGA that experienced almost no learning gains also experienced lower than average pupil attendance, close to 50%, third lowest amongst all LGAs. Similarly, the LGAs with the lowest and second lowest pupil attendance, Apapa and Lagos Mainland respectively, were classified as LGAs that needed sustained support right at the outset of the programme (LGAs with below-average baseline and below-average improvements). Focusing on the lowest-performing LGAs is crucial for

[4] Refers to "simple" subskills, including: one digit number recognition, two-digit addition without carrying, two-digit subtraction without borrowing, one-digit multiplication, and exact short division.
[5] See Appendix E for a full description of the Hasbrouck-Tindal oral reading fluency norms.

promoting equity, reducing educational disparities and maximising impact. This approach ensures that all pupils have access to quality education, aligns with broader educational goals, and strategically allocates resources to areas with the greatest need, contributing to regional and national progress.

To ensure that all Primary pupils in Lagos State have equitable access to high-quality instruction and learning materials, the EKOEXCEL programme must continue working to strengthen day-to-day programme implementation across all schools and LGAs in the State. During the 2022-23 school year, EKOEXCEL made significant strides towards improving the operational efficiency and the implementation of the programme. More teachers and pupils were in attendance, and the percentage of teachers delivering lessons each day has improved over time. This achievement reflects 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. Nonetheless, more work remains to be done. In spite of this progress, there is still significant room for improvement in terms of day-to-day programme implementation.

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.

The importance of ongoing professional development and coaching for teachers

Coaching and ongoing professional development will play a critical role in building on the successes achieved during this evaluation period. Alongside learning gains, this evaluation sheds light on several areas in which instructional quality must continue to improve. This includes ensuring that all teachers are fostering a positive classroom culture, delivering effective instruction, and nurturing pupils' socio-emotional skills — teaching attributes that were found to be correlated with increased learning gains. In order to continue supporting teachers in growing and improving in these critical areas, EKOEXCEL will continue to invest significantly in ongoing professional development for teachers across the programme. Schools Supervisors will implement a cycle of professional development aligned to these key areas of improvement, working directly with teachers and school leaders in order to introduce new systems, reinforce topics covered during induction training, and support key skill sets essential for effective instruction.

In addition to ongoing professional development provided by Schools Supervisors for teachers, ongoing coaching will play a foundational role in capacity building among teachers. In order to facilitate this more formative and ongoing support, Schools Supervisors will work to empower the school leaders to provide more consistent instructional coaching at their school. Schools Supervisors will provide monitoring and guidance to school leaders in order to ensure that they are conducting daily short and long observations for each teacher in their school, and using the results of these observations to deliver high-impact coaching sessions. And school leaders will be supported by a new and improved tool to conduct impactful observations and coaching sessions. By establishing these routines around accountability and coaching, school leaders will continue to grow as instructional leaders alongside their duties as administrative leaders. This instructional leadership role — supported by strong observation and coaching protocols — further underscores the school environment as one of continuous learning and improvement, not only for pupils but also for teachers and school leaders.

Looking Ahead

The impressive progress of the EKOEXCEL programme over the past four school years represents a powerful and encouraging step in the continued work to transform education in Lagos State. The evidence in this report confirms that children who have not yet received high-quality education can quickly and significantly advance their learning when provided with the proper support. For instance, the average Primary 2 pupil is now reading as fluently as the average Primary 3 pupil before the start of the programme. Additionally, the share of non-readers in a typical Primary 2 classroom decreased by 11 percentage points — representing nearly a one-third reduction in non-readers in Primary 2 since the start of the programme. In most numeracy subskills, pupils are now outperforming their peers at least two classes ahead from before the start of the programme. The magnitude of these gains — and the fact that they were achieved despite prolonged school closures during the COVID-19 pandemic — demonstrate the positive impact of the continued educational investments made by the Lagos State Government.

In terms of policy design, this impact report documents areas that the programme still needs to strengthen both internally and externally. In this way, EKOEXCEL does not function purely as a celebration of the gains achieved, but also as a way to take an honest and evidence-driven look at the programme and keep improving it. As a data-driven programme, EKOEXCEL will continue to conduct similarly large-scale, rigorous evaluations for the upcoming school years as well. These rounds of data collection will give the Lagos State Government further insights on the impact of the programme, such as what is going well, and what needs to be strengthened. Continued investments to address areas such as pupil attendance, programme implementation, and aligning instruction to pupil's learning needs — if done correctly — will drastically improve the quality of teaching and learning across Lagos State.

The EKOEXCEL programme is a bold initiative from the State Government of Lagos. After its fourth year of operations, it has enabled pupils to be on faster, higher learning trajectories than what they could have expected in the absence of the programme. 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 country, where pupils of all backgrounds will have the unprecedented opportunity to thrive academically.

IX. Appendix

Appendix A: Oral Reading Fluency and Comprehension Assessments

Primary 2-level English Oral Reading Passage (Primary 2-6)

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 English Oral Reading Passage (Primary 5-6)

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)**

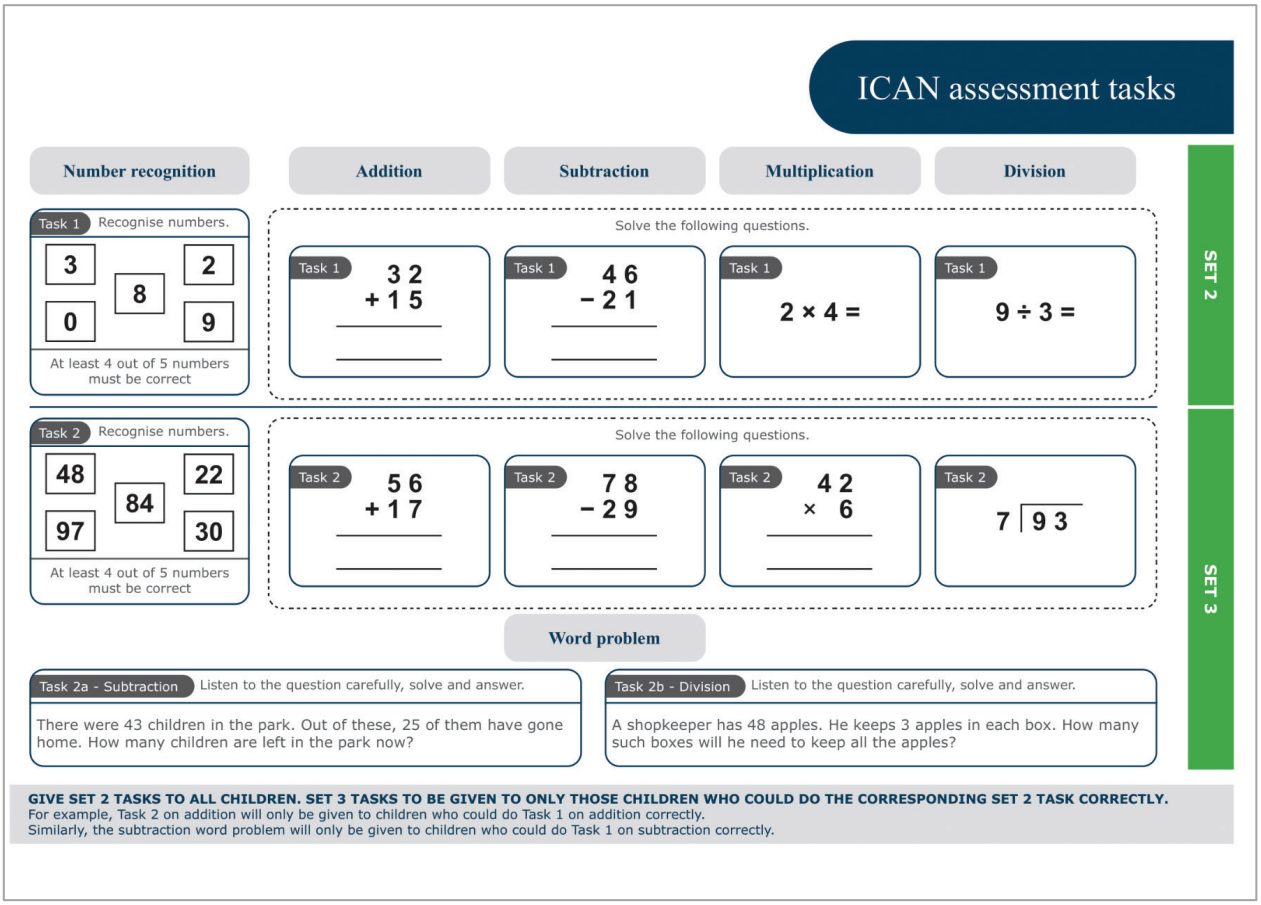
4. How do we know that lava is hot? **(Answer: It says, "the water cools the lava quickly")**

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)**

Appendix B: International Common Assessment of Numeracy

ICAN (Primary 1-6)



Appendix C: 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, 2016).

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 subtest 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 (cnwpm).
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 D: Additional Figures

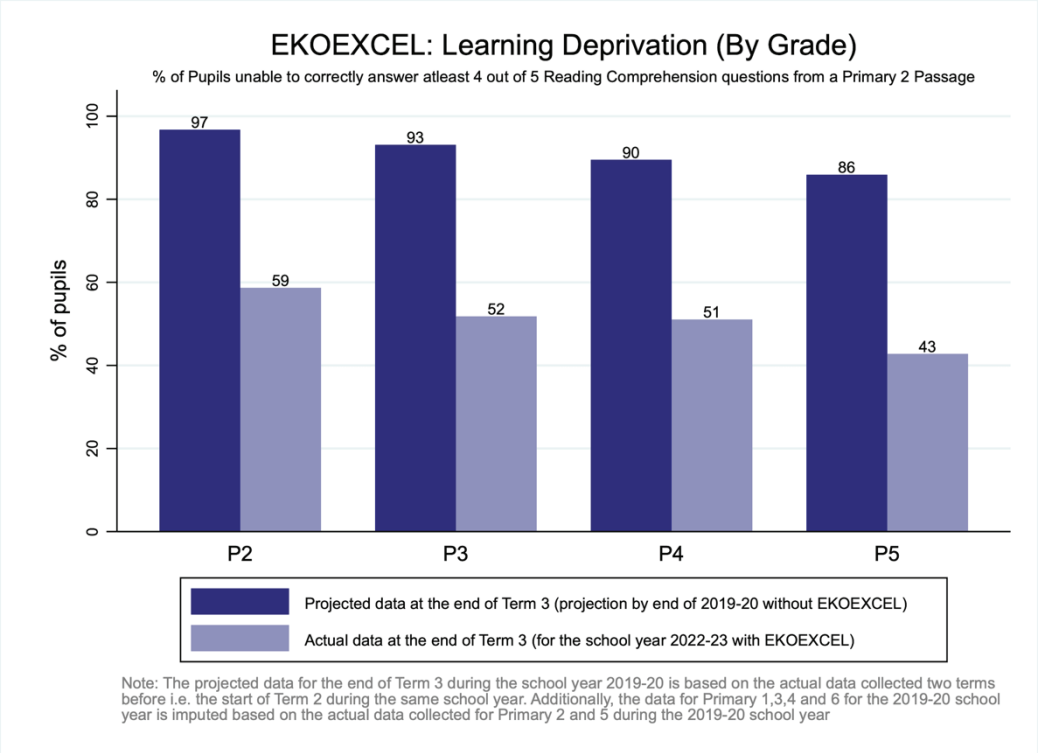


Figure1

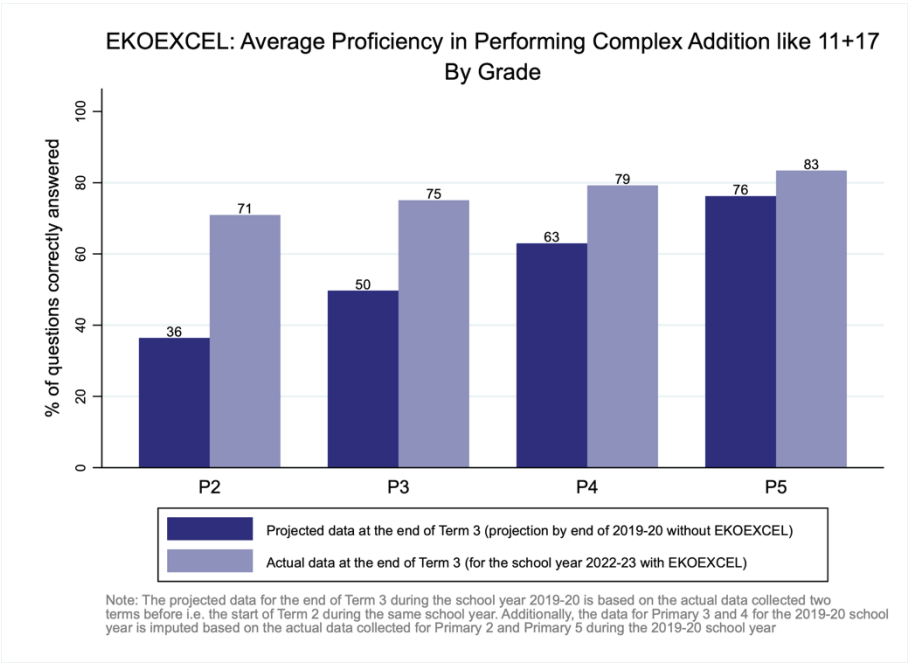


Figure 2

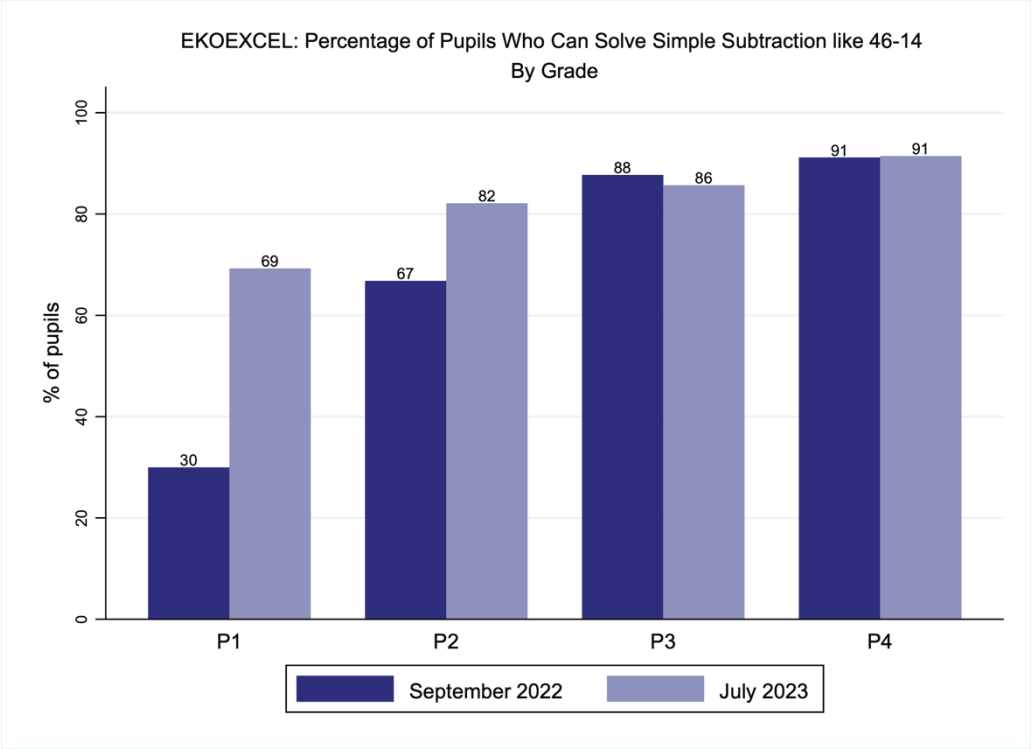


Figure 3

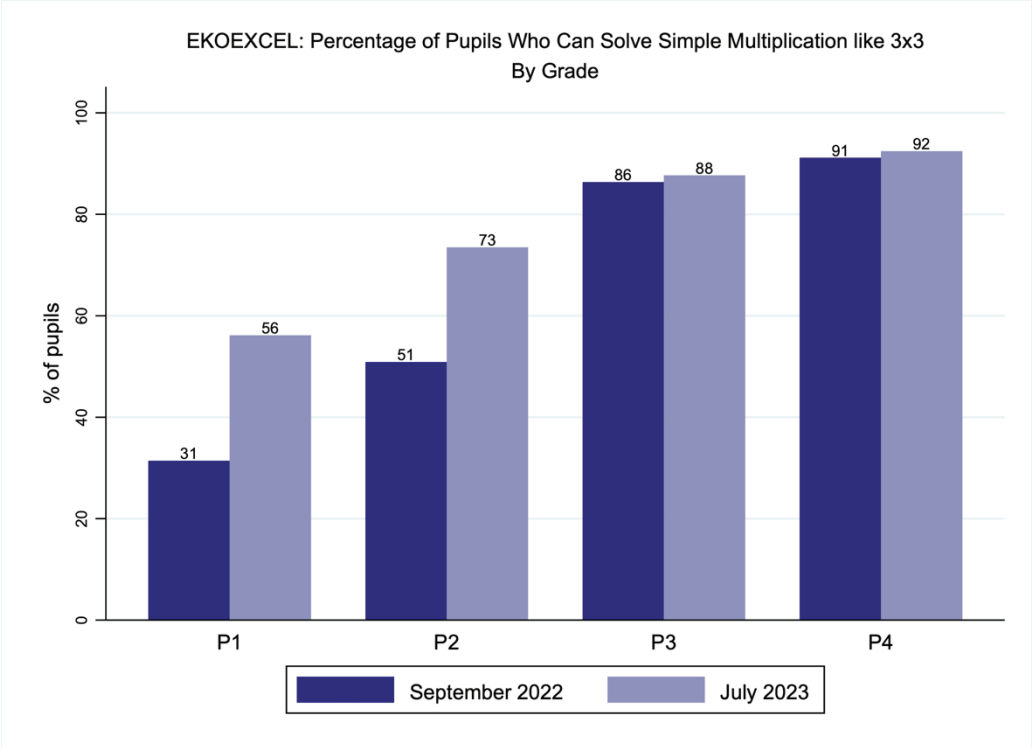


Figure 4

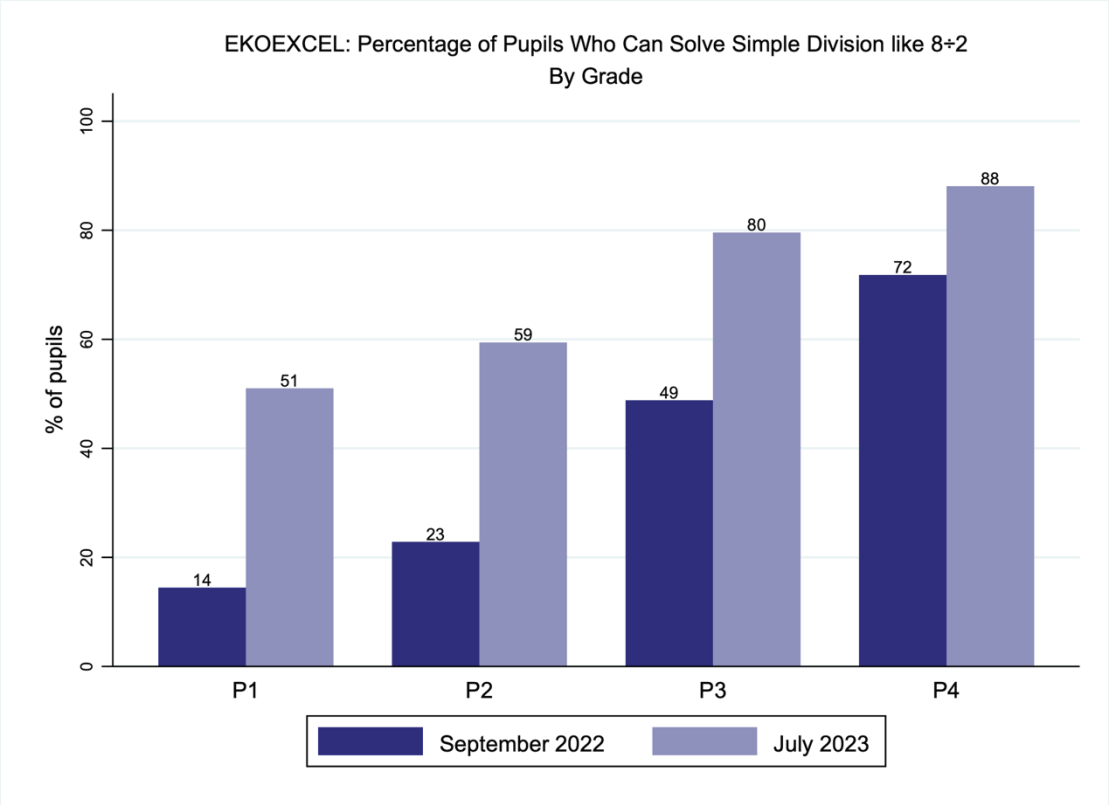


Figure 5

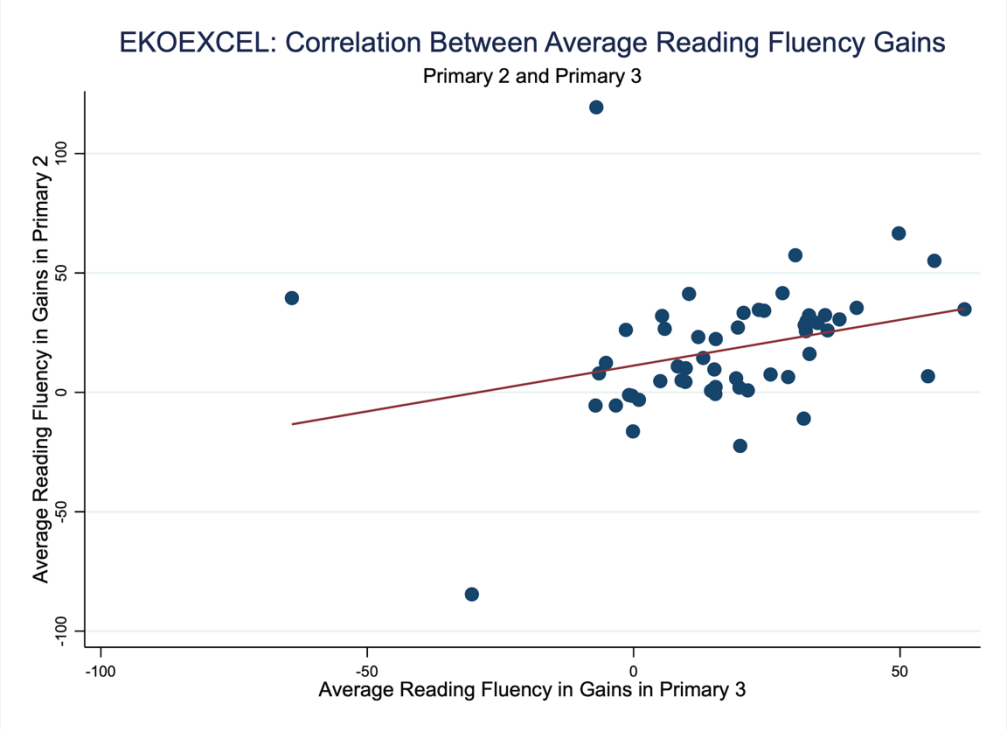


Figure 6

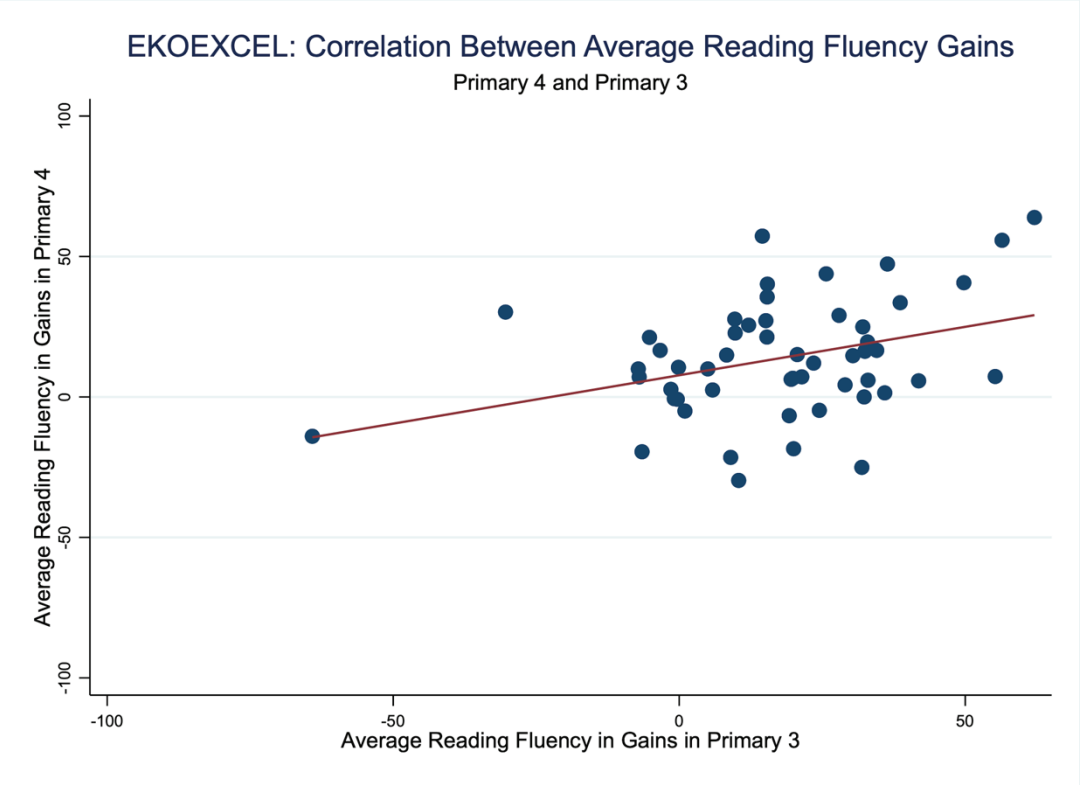

EKOEXCEL: Correlation Between Average Reading Fluency Gains
Primary 4 and Primary 3
Average Reading Fluency in Gains in Primary 4
100
50
0
-50
-100
-100
-50
0
50
Average Reading Fluency in Gains in Primary 3

Figure 7

Appendix E: 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 25th, 50th, and 75th percentiles during the Spring term, the last term of the school year. Furthermore, the chart also includes the average expected growth per week from a pupil in the 50th percentile at this point of the school year.

2017 Oral Reading Fluency Norms				
	25th percentile	50th percentile	75th percentile	Median average weekly improvement
Primary 1	34	60	91	2.0
Primary 2	72	100	124	1.6
Primary 3	91	112	139	0.9
Primary 4	105	133	160	1.2
Primary 5	119	146	169	0.8
Primary 6	122	146	173	0.3

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 F: An Overview of the Data Quality Assurance Protocol

The context surrounding the quality assurance protocol

Foundational literacy and numeracy (FLN) skills amongst children in any given education system are integral to their success, both within their academic careers and in their everyday lives. Proficiency in these two fundamental 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 programmes. 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 pupils' 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 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 the 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 G: 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 4 school years of implementation, 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 fourth 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 fourth 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 Research, Measurement and Evaluation (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.):

For teachers

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

Ideally, after each interview, we suggest that the interviewer either takes a few minutes to add all their notes to a new column, or at the very least, that they process their notes either on paper or in the spreadsheet, in such a way that they can come back to the spreadsheet later on, and have a clear memory of everything that was discussed so they can finish filling out the spreadsheet.

As shown in the example above, we do not need an answer for every question from every participant. Although we want to cover a lot of ground with each response, we also do not want to sacrifice candour and in-depth discussions for a more superficial coverage of all questions.

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

Appendix H: The Learning Crisis in Low- and Middle-income Countries: An Overview of Causes, Contributors, and Consequences

Enrolment and literacy rates in low- and middle-income countries 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 massive global shift towards the expansion of schooling infrastructure and enrolment outreach in an effort to reach a goal of universal education. As such, there are more children presently in school than at any other time in history (World Bank, 2018). Of them, 80% go through an education system in a low- to middle-income country, and in low- and middle-income countries (LMIC), in particular, enrolment rates have increased to unprecedented levels (Pritchett, 2013) as a result of groundbreaking achievements in schooling equity that deserve to be recognised. Morocco, for example, saw an impressive increase in girls' enrolment, equivalent to 54%, over the course of 11 years. By comparison, it took the United States 40 years to accomplish a similar feat. Meanwhile, in the 40-year interval between 1970 and 2010, the gross Primary enrolment rate skyrocketed from 68% in all of sub-Saharan Africa and 47% in South Asia to over 100% for both regions[6] (World Bank, 2018).

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

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

attending school for longer periods, but are still not mastering the skills they need to excel. In this regard, nearly all education systems across LMIC have areas in which they must progress.

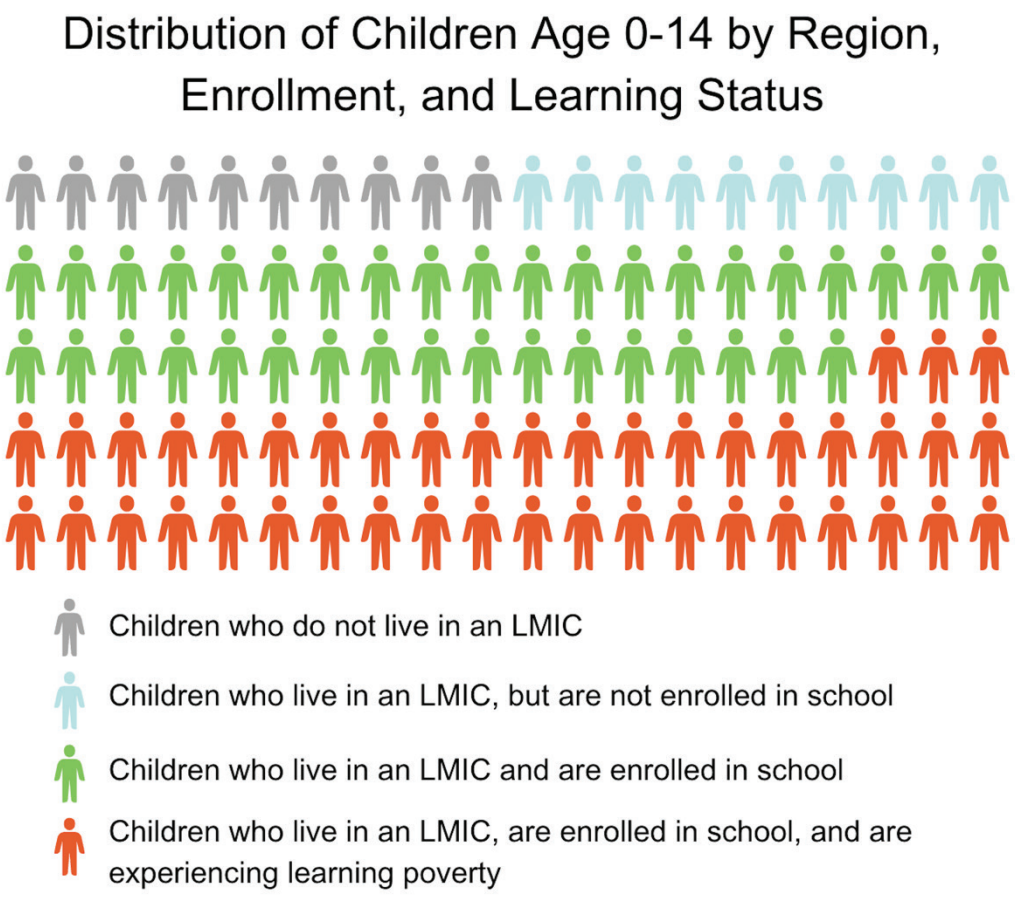


Figure 8

Barriers to enrolment still persist nonetheless

Unconditional access to schooling is a crucial prerequisite for supporting global policy attention on improving education quality and efficacy. However, while rapid worldwide increases in enrolment in recent history are cause for hope, global universal enrolment has not yet been reached, and there are myriad factors inhibiting its realisation. To better conceptualise the gravity of the situation, it may be considered that in 2018, 1 in every 6 primary and secondary school-aged children still remained out of school, which accounts for a total of 258 million children worldwide (UNESCO, 2023). The advent of the COVID-19 pandemic further exacerbated this situation: almost 1.6 billion children in more than 180 countries were kept out of school due to closures (Azevedo, 2020). Even after the prolonged period of sweeping closures ended, many pupils never returned to school. In some nations, dropout rates soared, with as many as 400,000–500,000 children in South Africa, 2 million children in Ethiopia, and 6 million children in India permanently leaving the education system between 2020 and 2021 (UNICEF, 2023; Mighati, 2022). Among them, the pupils who were disproportionately affected were those who had already been struggling academically, or whose families were facing severe financial hardships during this period (Kidman et al., 2022; UNICEF, 2023).

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

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

Often, however, the issue with enrolment is that the last mile is the hardest. Beyond physical, financial, and infrastructural barriers, the quality of education offered by school systems is a crucial factor for ensuring that children not only enter school, but also remain in and advance to the next levels of school. There is a significantly stronger likelihood that 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). However, 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 parties. 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, namely, high rates of dropout are equated with lower levels of productivity in the labour force, which is detrimental for individuals and whole societies alike (OECD, 2012; Patrinos and Psacharopoulos, 2018).

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

It is often also the case that children enter school later than the intended age, which can have a profound negative impact on the rate at which they master skills during their academic careers, and, thus, how well they develop into adulthood. According to 2019 data, for example, 1.8 million Nigerian children were attending Primary school after the age of 11 years old (Sasu, 2022), while in the Democratic Republic of the Congo, nearly half of pupils (44%) begin school later than the intended age (USAID, 2018.; Global Education Monitoring Team, 2022). In a study conducted in Uganda in 2017, pupil ages in the last year of Primary school ranged from 12 to 22 years, and most pupils were 16 years old (Nath et al., 2017). In some contexts, late entry is the product of positive systemic changes that have broadened an education system's access (World Bank, 2020). While it is an undeniable step in the right direction to make schooling available to children who were previously barred from it,

it is more advantageous, in the long term, for pupils to be equipped with school readiness by matriculating into a learner-centred environment as soon as possible — ideally via early childhood development education (Sosu and Pimenta, 2023) — which plays a critical role in ensuring that pupils are able to keep pace with curricular expectations, therefore maximising their potential throughout their academic careers and beyond.

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

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

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

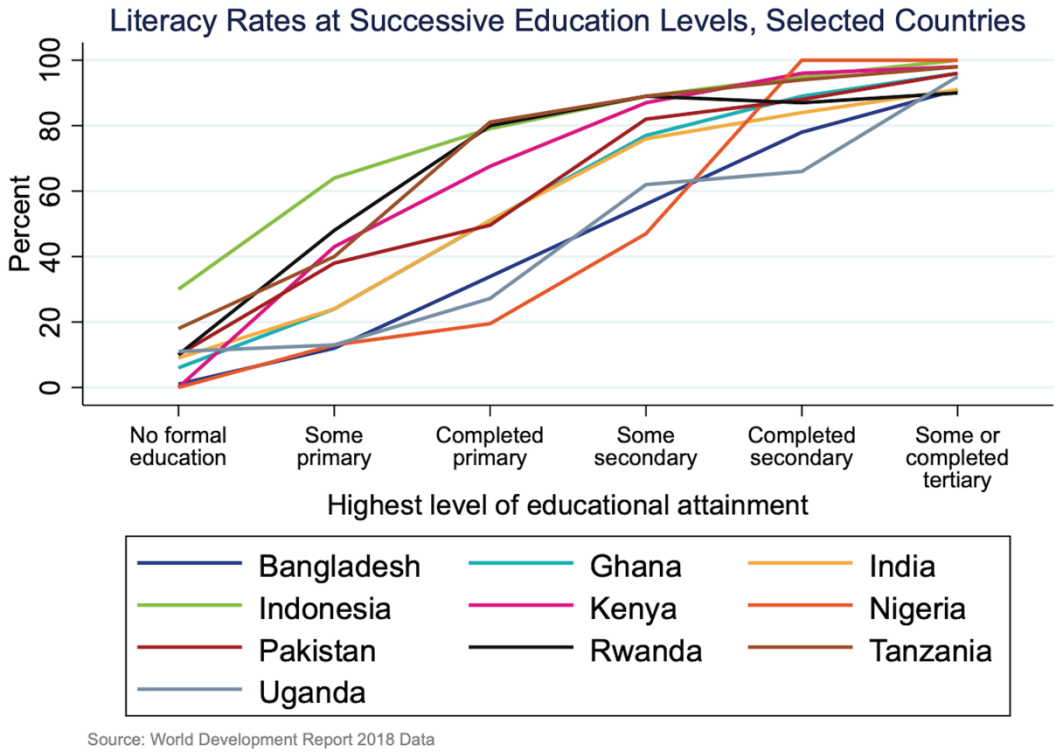
Literacy, like enrolment, is often used as a measure of education access. Because this foundational skill underpins the pupil's ability to master content in all subjects and to properly function in everyday life, it is also highly studied as a barometer of the actual learning taking place in schools.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

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

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

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

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



Source: World Development Report 2018 Data

Figure 9

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

Before the need for improvement in this particular area of learning can be addressed, its rampancy must first be properly assessed. Currently, self-reported literacy rates across a number of nations reflect a level of optimism that does not match the levels of learning poverty. For instance, in sub-Saharan Africa, the illiteracy rate is said to be 24%, but 87% of children are in learning poverty (World Bank, 2018). In India, data compiled by UNESCO from individual and household reports concluded that the youth literacy rate was 92% in 2018, though India's National Statistical Office surveyed the average overall literacy rate to be approximately 74%. Meanwhile, more than half of children in India were estimated to be in learning poverty in 2019 (World Bank, 2019). From these examples, a clear pattern of dubious accuracy emerges, which will continue to impede educational improvements as long as it remains unremediated.

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

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

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

While ensuring that children have access to school, start school at a developmentally appropriate age, and stay in school for the expected duration is a massive undertaking, succeeding in any or all of these areas does not guarantee that pupils are receiving an education that will properly equip them for their future careers and daily lives. Learning, especially when it is not measured for efficacy, is not the natural by-product of school attendance (World Bank, 2018; Pritchett, 2013). In fact, myriad examples of persistently low learning levels exist in all LMIC, where over half of all children (53%) experience learning poverty according to the World Bank[7], even while 40% of them are attending school. Furthermore, this regional average masks the extent to which learning poverty rates are especially dire, such as in sub-Saharan Africa, where it is estimated to be approximately 90%, and in the Middle East, North Africa, and South Asia, where 6 in 10 children do not approach expected minimum proficiency levels. These shortfalls in learning outcomes among enrolled pupils speak to insufficient education quality that will inhibit them from mastering increasingly complex curricular expectations, and may lead to their eventual withdrawal from school.

Literacy, the most extensively studied foundational skill, can also be examined among pupils in LMIC. Competency in this domain is essential for pupils to follow written directions, engage with learning materials, participate in assessments, and become knowledgeable in every core subject in school. However, evidence points to a widespread lack of proficiency in many of the fundamental, early-grade subskills that ultimately inform literacy. In rural India in 2016, for example, half of the pupils were unable to read sentences in their local languages that were considered appropriate for a grade 2 curriculum. In another scenario, 80% of grade 2 pupils in Ghana and Malawi were unable to read a single familiar word, such as “the” or “cat”, during assessments conducted at the end of the school year. When using a three-sentence passage for assessment and reducing the defining characteristics of literacy to a relatively lower threshold[8], 75% of pupils in Nigeria, Uganda, and Bangladesh did not qualify to be considered literate by the end of Primary school (World Bank, 2018). Therefore, despite the inherent understanding of the extensive advantages of literacy and the detrimental consequences of illiteracy, there is still a pervasive absence of proficiency in this foundational skill among pupils within and across education systems.

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

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

Problematic literacy rates are mirrored by numeracy rates that could also significantly inhibit pupils' abilities to function in their daily lives. For example, 50% of all third graders in Uganda cannot solve simple subtraction operations. An even higher percentage, 69% of third graders cannot complete double-digit subtraction in rural India. By grade 5, half of those third graders still cannot solve the same operations (World Bank, 2018). Similarly, only 60% of pupils in urban Pakistan could correctly perform double-digit subtraction by grade 3, and this percentage dropped to 40% for the same grade level in rural areas. The dearth of numeracy proficiency seen in these contexts extends to broader regions, as well. Across sub-Saharan Africa, the Middle East, and North Africa, for instance, the average share of pupils who score above the minimum proficiency level on a mathematics learning assessment is between 18 and 42% (World Bank, 2018). Therefore, while the specific interventions that must be implemented to elevate learning in foundational numeracy will vary based on an education system's independent context, the necessity to disrupt stagnating learning gains is clear.

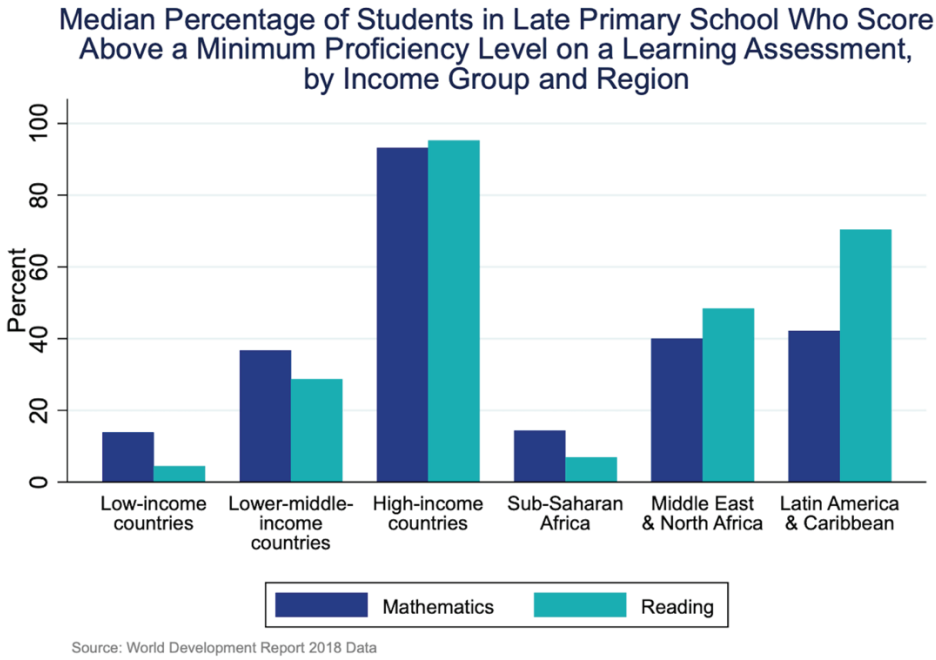

Figure 10

Furthermore, without the implementation of effective policy solutions that drive improved learning outcomes, massive amounts of educational resources will continue to be expended without a meaningful return on the investment. On a global scale, for instance, 125 million pupils who have successfully completed 4 years of schooling do not have functional literacy or numeracy skills, demonstrating a widespread lack of recompense for schooling efforts. This will require targeted, transformative approaches to prevent the ongoing scarcity of learning, and to preserve the expected output of education funding — which has little room for deviation following the economic downturn incited by COVID-19 (United Nations, 2020). To complicate the matter, one-third of 121 countries have also been found to lack the data required to report reading and mathematics proficiency levels among children (World Bank, 2018). However, it is pivotal that educational interventions operate with a data-driven core, to not only certify and track their efficacy within education systems, but to also benchmark pupil progress against international standards, thereby ensuring that pupils are prepared to become globally competitive adults.

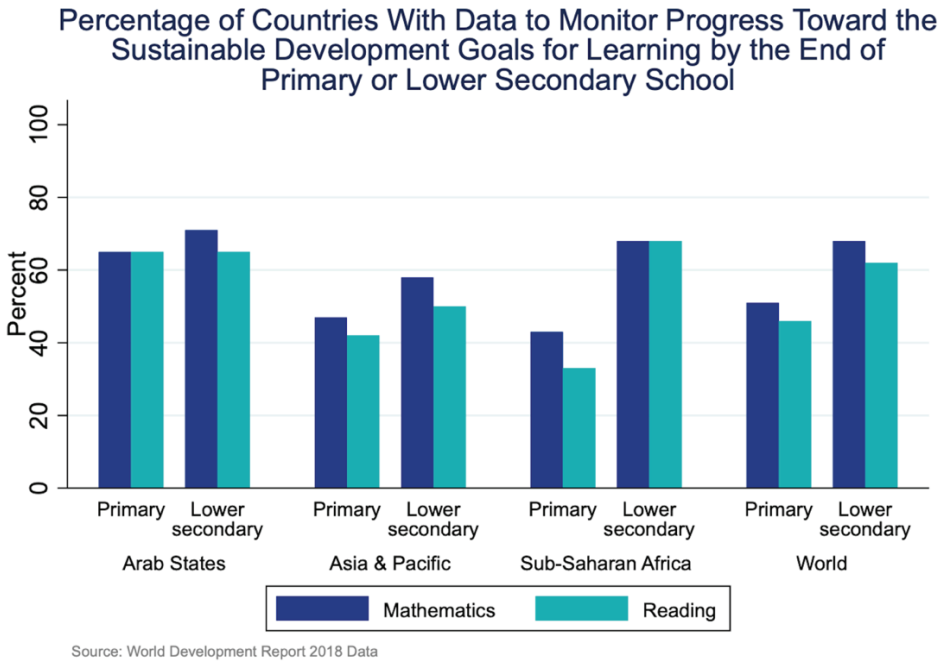

Figure 11

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

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

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

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

The onset of COVID-19 has drastically increased the prevalence of weak learning outcomes across the globe. Not only did existing deficits in learning worsen in the years during and following the pandemic, but the resultant need for specialised systems that will overturn deteriorating learning from this global event also presents another obstacle to advancement for education systems that are susceptible to low performance. According to the most recent reports provided by UNICEF and the World Bank, the average 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 increase beyond original estimates of 53% to as much as 70% — an increase that would signify three years of pandemic-related learning loss (Azevedo et al., 2022).

While longer school closures were correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in 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 (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 curriculum restructuring and small-group tutoring, among others, that aspire to reclaim a positive learning trajectory on an accelerated timeline (UNESCO et al., 2021).

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

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

In this sense, teachers need the support of impactful tools and resources, and the motivation of effective leadership, in order to implement systemic changes to education systems in their classrooms, which 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.

The causes for weak learning outcomes are many

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

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

Furthermore, while targeted, scaled investments in education are needed to improve learning outcomes, misguided efforts to enhance schooling can have the unintended consequence of exacerbating already-problematic learning levels. If the specific factors inhibiting learning gains in a school have not been identified or had resources allocated specifically to them, indiscriminate expenditures on ostensibly beneficial changes may have little effect, while existent problems persist. In other words, the mere injection of materials into sparse classrooms has not been shown to result in higher levels of academic achievement, and may even function as a detractor. In 2008, for example, textbooks distributed to Sierra Leone were discovered unused in a cupboard during a follow-up inspection. Speculations indicate a hesitancy to risk damaging a resource such as these when they are a rare classroom feature (World Bank, 2018), but a lack of use in this regard is a lack of advantageous potential for 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 a lofty aspiration to enhance learning via technology access in 42+ countries (Yanguas, 2020). One year after successful distribution, however, almost half of teachers reported rarely or never using the laptops in the classroom (World Bank, 2018). A variety of studies across parts of the developing world conveyed neutral or negative results stemming from OLPC on academic outcomes. In some cases, pupils were spending more time on their computers, but less time on independent study or other learning-based activities (Meza-Cordero, 2017). Further evidence aligns with these findings produced from the OLPC initiative, showing that the introduction of edtech hardware only has a 6% positive effect on pupil learning, while the other 94% of the effect on pupil learning is neutral or negative. In response to this, it is imperative for education systems in LMIC to parcel out and maintain momentum with proven-effective approaches, so that gaps in educational achievement do not widen during side-tracked pursuits. Furthermore, curricular design should justify how and why material or technological inputs are used. These resources must fortify pre-existing teacher-learner relationships as a complementary additive, not a substitute (World Bank, 2018).

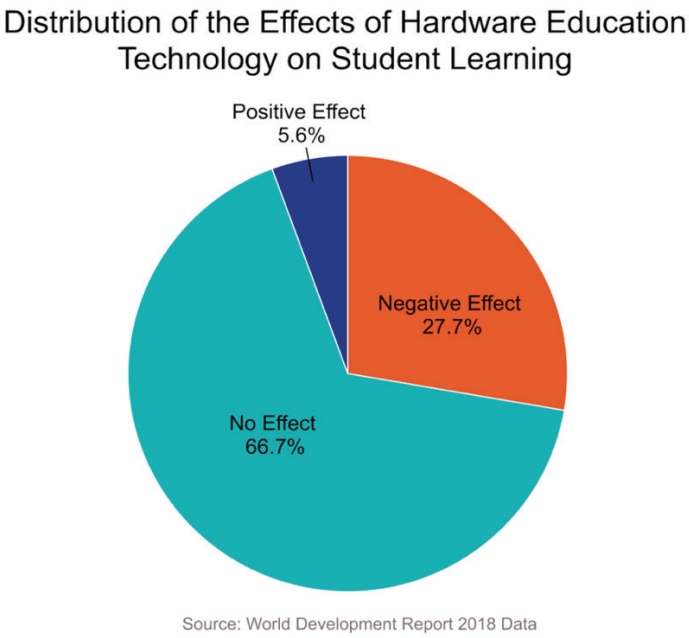

Figure 12

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

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

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

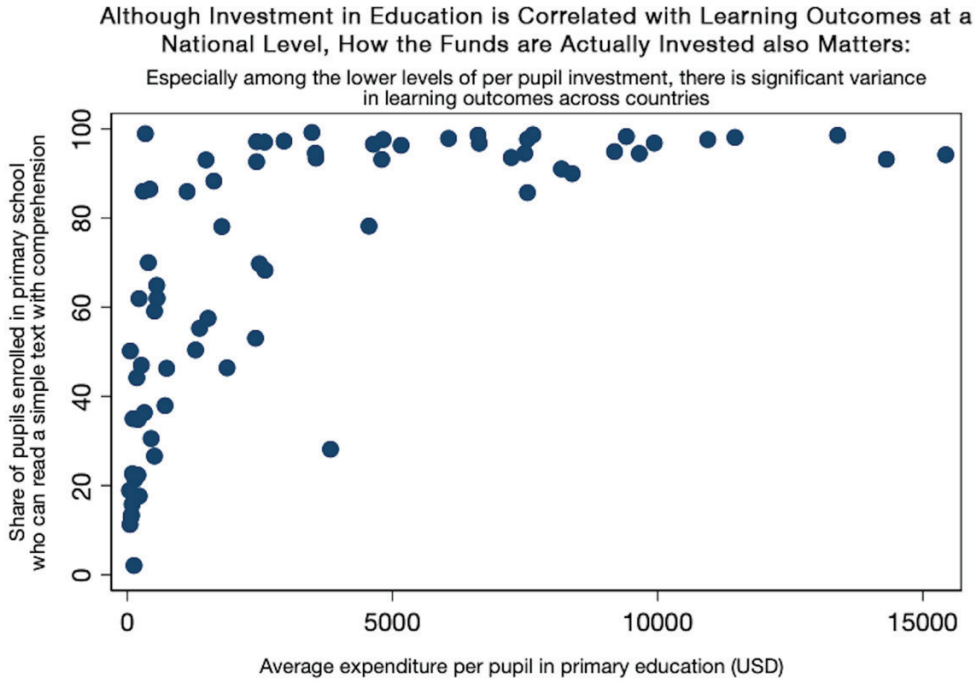

Figure 13

Low teacher content knowledge can translate into poorly executed pedagogy

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

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

However, the consequential link between poor content knowledge and unsatisfactory pedagogical performance provides policymakers with the opportunity to address both shortfalls simultaneously. Solutions like structured pedagogy can provide teachers with expertly researched lesson content that will not suffer from low levels of teacher expertise in subject matter, and include essential techniques, like scaffolding, that ensure the teacher properly paces dissemination of the lesson with 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 best practices or not, it is irrefutable that teachers must value professionalism and accountability to be effective. For that to happen, they must be bolstered by effective governance administered by informed policymakers. However, evaluative reports suggest that these crucial pieces are not always in place. Across eight African nations studied between 2010 and 2014, for example, teachers were often absent from their classrooms, or from school entirely. In Mozambique, Uganda, and Tanzania, the amount of time teachers were absent from school was close to or more than 50% (World Bank, 2018). Absenteeism to this extent reduces actual instructional time from that of a typical school day to approximately two to three hours per day, on average. Instructional time is further compromised by teachers who are present interrupting their class time to check in on other classrooms that are unsupervised due to absenteeism and a lack of substitute coverage (Bashir et al., 2018; World Bank, 2018). Teachers who must integrate these unattended 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 imparting it to those for whom it was not intended.

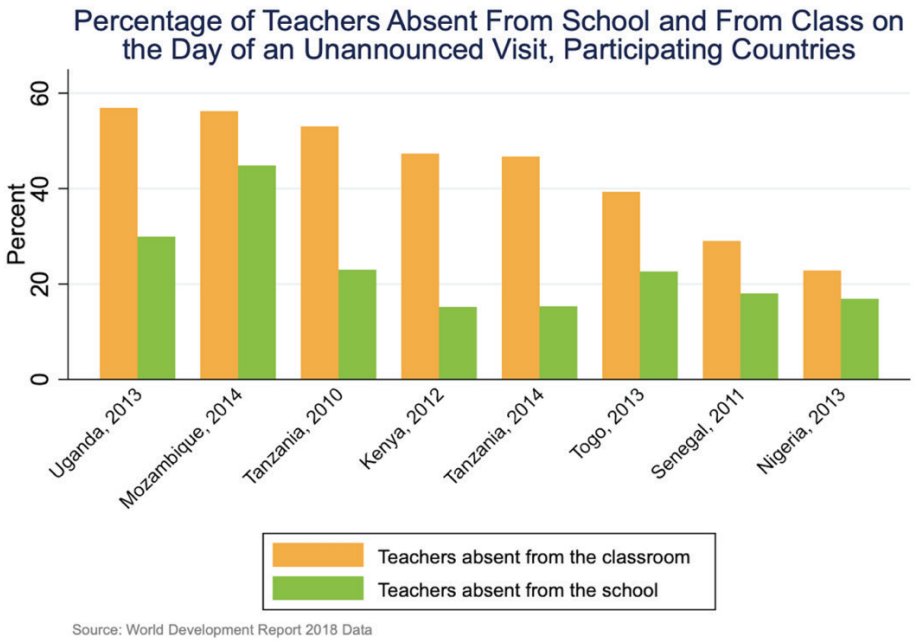

Figure 14

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

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

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

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

Important considerations for effective policymaking in developing education systems

The joint performance of all stakeholders in an education system is pivotal for fostering pupil success, and is equally capable of undermining said success. The latter is especially plausible when policymaker decisions do not properly leverage all components of the education system towards achieving a clear objective of enhanced pupil learning. Yet, policymakers seeking to enact change for learning-deprived schools can be inhibited by an absence of metrics providing necessary insight into the state of learning, and may therefore lack the context with which to make viable recommendations. This insufficiency of actionable data is widespread in the parts of the world where such data are needed most. World Bank research has attested to the fact that the vast majority of the countries that represent the global population are low- and middle-income countries, which have historically lacked assessment results that reliably compare learning outcomes on an international scale, but also have the most room for growth in terms of education quality (Angrist et al., 2021). Therefore, it is essential that the decision-making process for improving education quality begins with the system-wide collection of robust, regular measurements of the state of learning.

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

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

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

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

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

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

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

Still, it should be recognised that the current amount of funding being devoted to education quality improvement is significant. On average, 14% of worldwide government expenditures are devoted to education, according to USAID (2018), and an average of USD 5 trillion is spent on education every year across the globe. A UNESCO report calls for an additional USD 500 billion of yearly education funding from low- and middle-income countries, specifically, to reach SDG 4 by 2030 (2022). While these amounts pale in comparison to what is forecast to be lost if low learning levels and resultant high rates of school dropout continue, it is possible to achieve higher returns on these investments by ensuring that they are strategically allocated to reforms that have been proven effective in elevating 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 critical for ensuring a competent knowledge base in adulthood and facilitates improved pedagogy in classrooms

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

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

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

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 disparate socioeconomic statuses present in the classroom population, narrows gaps in academic performance — which have been attributable to differences in pupil background characteristics — by providing the appropriate substructure pupils need before becoming exposed to more rigorous concepts (Crouch et al., 2021; Asim, 2020). The implication of a narrowing learning divide, furthermore, is that a greater number of 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 necessitates the alignment of whole education systems towards the common goal of producing learning in foundational skills and beyond. Given that education systems are composed of distinct components — teachers, pupils, school infrastructure, school leaders, and so on — reform initiatives are often oriented towards adjusting the quality or performance of one of these components to better match the patterns of those observed in high-functioning education systems (Pritchett, 2013; Spivack, 2021). However, approaches like this fail to consider a critical piece of education systems, which is that their components interact in specifically defined ways. Moreover, these relationships between these systematic elements both elucidate and enforce the objective of the entire education system (Spivack, 2021).

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

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

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