An Edo SUBEB Initiative

Measuring the Continued Progress of the EdoBEST Programme in Primary-Model Schools

Evidence from Primary schools in Edo State at the end of the 2023-24 school year after 7 years of programme implementation

Dr Amen Uyigue, Sylvester Mchihi, Daniel Rodriguez-Segura, Keuna Cho, Priscilla Lu, Mohammad Usama Khawar, and Marlee Mullane


Edo BEST
BASIC
EDUCATION
SECTOR
TRANSFORMATION

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June 2025

Visual Design and Creative Direction: Baishakhee Sengupta
Proofreading and Editing: Vasudha Mathur

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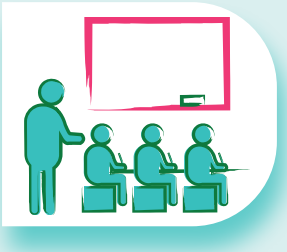
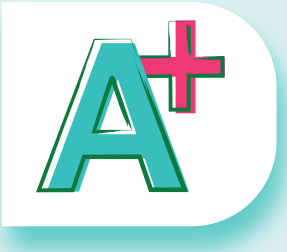
Executive Summary



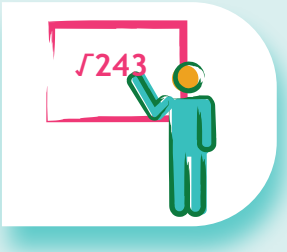
Since the EdoBEST programme was introduced in 2018, enrolment rates have increased substantially.

In 2018, the average EdoBEST school in a representative sample had 216 pupils enrolled. After over 6 years, those same schools now average 438 pupils enrolled per school.



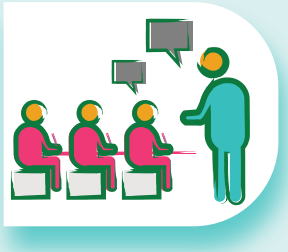
After 7 years of the EdoBEST programme, both literacy and reading comprehension rates have improved considerably.

On a curriculum-aligned literacy test, Primary 3 pupil scores were 20% (7 percentage points) higher in July 2024 than what they were scoring before the programme. Reading comprehension scores have increased by an even greater 24% (9 percentage points).



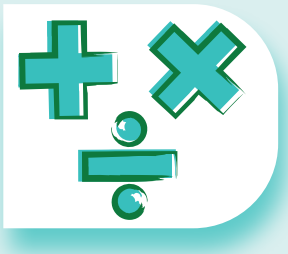
With the EdoBEST programme, Primary pupils' math levels have reached pre-pandemic levels.

Despite the widespread, long term impact that the COVID-19 pandemic had on education systems worldwide, maths proficiency levels among EdoBEST Primary pupils as of July 2024 are nearly the same as they were in 2018.



From July 2023 to July 2024, both reading fluency and reading comprehension outcomes in EdoBEST Primary-model schools have increased on average.

The average reading fluency rate in EdoBEST schools has increased by 5 cwpm, and reading comprehension assessment scores have improved by approximately 25% (5 percentage points).



While maths scores have improved overall since the programme's launch, proficiency in fundamental maths skills such as addition and subtraction has not increased in the last full year of the EdoBEST programme.

In July of 2023, 54% of pupils in EdoBEST schools could solve a double-digit addition problem such as '29+25'; one year later, that percentage dropped to 50%.

Both annual teacher attendance and lesson completion rates have improved by 13% on average.

From the 2022-23 school year to the 2023-24 school year, lesson completion rates improved by 7 percentage points, and teacher attendance rates increased by 10 percentage points from 79% to 89%.

EdoBEST Primary, In Numbers:

50% increase in EdoBEST P1 enrolment from 2018 to 2024

25% increase in literacy scores since EdoBEST was launched

30% more pupils able to solve a maths word problem

13% increase in lesson completion rates from the 2022-23 school year to the 2023-24 school year

Report Glossary

Key Terms

absenteeism	When a pupil or teacher fails to report for or remain at school as scheduled, regardless of reason.
automatic decoding	The ability to rapidly, effortlessly and accurately recognise a written word upon seeing it (Pikulski & Chard, 2005).
baseline	The conditions existing prior to an intervention or at the beginning of a period of time, against which changes can be measured, monitored, and evaluated (OECD, 2022).
benchmark	A reference point or standard against which outcomes can be assessed, established based on comparable data, or what can be reasonably inferred to have been achieved under a similar set of circumstances (OECD, 2022).
chronic absenteeism	When a pupil repeatedly fails to report for or remain at school as scheduled, leading to a significant negative impact on academic performance relative to their peers. The threshold for "chronic" absenteeism is not always clearly defined. In some high-income countries such as the US, a pupil is deemed to be 'chronically absent' when they miss 10% or more of the school year (Lara et al., 2018). However, this definition does not necessarily extend to other systems. Given that attendance rates and expectations are highly context dependent, working definitions for what classifies as chronic absenteeism should be determined on a case-by-case basis.
cohort	A group of pupils who are in the same grade and attend a school implementing the EdoBEST programme. (ex. All Primary 2 pupils attending all EdoBEST Progressive schools in the 2023-24 school year.)
comparison group	A group of schools which do not receive the EdoBEST programme. These schools act as a point of comparison to schools which do receive the programme (labelled as the treatment group), so that the impact of the programme can be assessed.
correct words per minute 'cwpm'	A metric used to measure oral reading fluency by the number of words read correctly, out loud, from a given passage.
curriculum	A planned sequence of lessons, designed to foster pupils' proficiency in content and/or skills. A curriculum typically includes instructional content, activities, and processes for assessing learners' achievements (UNESCO, 2024). A curriculum may be developed at the national, state, or institutional level, with considerable overlap often occurring among these tiers; typically, broader curricula at the national or state level significantly influence the development of more localised educational programmes.
differentiation	The modification of instruction and curricula to better suit the learning levels and educational needs of pupils.
empirical (research/data)	Derived from observed evidence, rather than theory or anecdotal evidence.
enrolment	An individual's registration for an educational programme, public, private, or otherwise. The phrase "rate of enrolment" therefore refers to the proportion of a given population that is enrolled in an educational institution (UNESCO, 2011).
foundational learning	Basic literacy, numeracy, and transferable skills such as social-emotional skills which are required for more complex learning to take place (UNICEF, 2022).

<table>
<tr><td>foundational literacy</td><td>Key fundamental skills that are prerequisites for the ability to comprehend written text, including but not limited to: phonemic awareness, print orientation, oral fluency, etc.</td></tr>
<tr><td>foundational numeracy</td><td>The ability to perform arithmetic operations and apply them to day-to-day life, including but not limited to: number recognition, addition, subtraction, multiplication, and division, as well as word problems involving these operations (World Bank, 2024; UNESCO, 2024).</td></tr>
<tr><td>heterogeneity</td><td>The state of being diverse in content, characterised by the presence of distinct and varied components.

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

Heterogeneity is determined relative to that of comparable data sets through standard deviations (National Center of Education Statistics, 2024).</td></tr>
<tr><td>high-income countries</td><td>This report uses the World Bank’s classification of high-income countries: “[Countries] with a gross national income per capita, calculated using the World Bank Atlas method, of $13,846 or more in 2022” (World Bank, 2024).</td></tr>
<tr><td>Junior Secondary School</td><td>A level of education that requires the completion of Primary education, and lays the foundation for lifelong learning and human development upon which education systems may then expand further educational opportunities. Programmes at this level are usually organised around a more subject-oriented curriculum, introducing theoretical concepts across a broad range of subjects (UNESCO, 2011).</td></tr>
<tr><td>literacy</td><td>Leading organisations in international education reform offer disparate definitions of literacy:

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

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

low- and middle-income country/countries 'LMIC'	This report uses the World Bank's classifications of low- and middle-income countries: Countries with a gross national income per capita, calculated using the World Bank Atlas method, of $13,846 or less in 2022 (World Bank, 2024).
median	The middle data point in a sequentially ordered data set, or the average of the two middle data points in the set. Ex. If the data set [2, 4, 7, 1, 2] is ordered sequentially, it becomes [1, 2, 2, 4, 7] the middle value being 2. The median of this data set is therefore 2.
non-qualified teachers	Teachers who have not received formal training or education to meet regional standards (UNESCO, 2024).
non-reader	A pupil who, when presented with a passage, is unable to correctly read a single word aloud within a minute.
numeracy	Major organisations offer varying definitions of numeracy: **External Definitions of Numeracy** **World Bank**: The ability to make simple arithmetic calculations (World Bank, 2024). **UNESCO**: The capacity of a person to engage in all those activities in which numeracy is required for effective function of his or her group and community (UNESCO, 2024). Because this report refers to both numeracy and mathematics, it is important to note that researchers often distinguish numeracy from mathematics by associating numeracy with skills involving numbers which are commonly utilised in day-to-day life (as opposed to higher level mathematics such as calculus) to a greater extent than mathematics (Dion, 2014; Ginsburg et al., 2006; HRSDC & Statistics Canada, 2005; Karaali et al., 2016). This report uses the terms numeracy and mathematics synonymously. Given existing international definitions, the goal of the EdoBEST programme is for pupils to be proficient in grade-level mathematics skills, as determined by SUBEB.
oral reading fluency	The rate at which a pupil can read a written text aloud (measured in the number of correct words read aloud from a passage within a minute, or 'cwpm').
phase	A portion of a programme's duration, usually as part of an expansion plan as the programme is rolled out to more schools across a territory, when a group of schools implements the EdoBEST programme on the same timeline. For example, if a programme is rolled out through a country in two phases, one group of schools will participate during the first phase, then these schools will continue their participation during the second phase as a second group will begin their participation.
phonemic awareness	The ability to understand that spoken words are made up of individual sounds or phonemes.
phonics	The process of learning to read an alphabetic language by correlating letters or groups of letters with sounds.
Primary education	A level of education that occurs after early childhood education and prior to JSS; it provides learning and educational activities typically designed to provide pupils with fundamental skills in literacy and numeracy, and establish a solid foundation for learning and understanding core areas of knowledge and personal development, with little, if any, specialisation (UNESCO, 2011).

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

Abbreviations

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

Table of Contents

I. Preamble

Foreword by Managing Director of EdoBEST, Enoh Ugbona

EdoBEST: Transforming education for a brighter future in Edo State

Education is the cornerstone of development for a productive, fulfilled citizenry. Specifically, Primary school is a critically important period in children's lives. In Primary school, children learn the core concepts and skills that are the foundation of future academic success. A high-quality Primary education provides children with the foundation they need to prosper in their families, communities, and beyond by allowing them to develop the viewpoints that allow them to grow as engaged citizens. Therefore, providing children with a high-quality Primary education is of the utmost importance. It is the duty of all teachers, school leaders, and decision makers in the State to ensure pupils in Edo receive the learning support they need in order to be successful.

Edo State's commitment to delivering powerful educational opportunities has been steadfast, remaining strong through multiple government administrations. After the launch of the Edo Basic Education Sector Transformation (EdoBEST) programme in 2018, I am pleased to report that the EdoBEST programme has expanded to include over 1,200 schools as of September 2024. As a result, over 388,000 children in Edo State are bolstered by a superior learning-focused environment and ample resources. The EdoBEST programme equips teachers and head teachers with motivating professional development, skillfully crafted lessons, and sophisticated technology so they are equipped to have a profound positive impact on pupils.

After seven years of operation, it is clear that these innovations have led to tremendous results. The following report — which tracks outcomes in schools implementing the Primary model from before EdoBEST until the end of the 2023-24 school year — details the achievements of the programme at each stage of its development. I am filled with gratification in seeing that pupils in these schools have been improving in foundational literacy and numeracy since the programme was launched in 2018. Across all grades, these pupils are now better positioned to build on their successes and better their futures.

For the spirit of excellence that surrounds the programme, I would like to commend and thank Edo State for its great resolve to institute all that is required to usher in the most radical changes to Edo State's education system in a generation. In partnership with NewGlobe, Edo State has devoted its time and resources to uplift our schools while demonstrating a tireless faith in our vision. My final thanks go to all the teachers, children, and parents of the EdoBEST schools network for their trust in us. I commend their willingness to work with the EdoBEST team.

After more than half a decade of providing essential educational services via the EdoBEST initiative, we have celebrated many successes and worked through a number of challenges. Rigorous monitoring of the EdoBEST programme requires a continued commitment to identifying strengths and areas for improvement. Overall, it is our key responsibility to ensure that this highly beneficial approach is sustainable for the coming generations of pupils. I am confident that the programme will continue to support exemplary learning and build upon its core pillars for the fulfilment of Edo State's potential.

Enoh Ugbona
Managing Director, EdoBEST

Acknowledgements

The successful completion of this study is due to the support and hard work of many people. First, we would like to thank the Edo State Government Administration for their commitment to transforming public education in Edo State, and for facilitating the completion of this study. We sincerely appreciate the government for the partnership and guidance they provide throughout the planning and execution of these studies. Many thanks to the EdoBEST team led by Michael Basanya, Oluwadare Adebisi, Faith Igbokwe and Jessy Efosa for the field support and coordination. We would also like to thank all head teachers, teachers, and pupils who welcomed the study teams into their schools and classrooms.

Finally, we owe our deepest gratitude to the team of enumerators who collected the data used to write this report, the backbone of this project. We wish to thank Abigail Stanley Ashuman, Ejemhen Usiado, Adesuwa Imafidon, Osahenoma Osayuware, Beauty Agbonmhere Odogun, Benedicta Shirley Jimoh, Blessing Aimuaenmwosa Osakpolor, Chioma Harriet Bazuaye, Christabel Oghogho, Christiana Onosholema Eshemokhai, Confidence Ojale, Bruno Abu, Cornelius Erohubie, Adedoyin Adetunji, Damodu Clement Tawab, Ebenezer Udukhagene Akharamhe, Faridah Abubakar, Eki Uwaifo, Emmanuel Williams idjogbe, Endurance Afeiyodion, Endurance Aluede, Endurance Aro, Grace Obih, Francis Friday Ogieneni, Gloria Ikhazuagbe, Itohan Idah-Omorodion, Iyoha Ikponmwosa, Jacob Umosekhaime, Jessica Asemota Osayi, Johnbosco Uzogu, Laura Otiti, Joy Ibhabe, Marian Ifaroumhe, Juliet Ajayi, Loveth Omogiate, Morgan Akinyele, Lucky Osahon, Morgan Ebele, Mabel Obamila, Maimunat Ibrahim, Prince Nwaogu, Mary Iwegim, Samuel Omoregie, Maureen Ekiuwa Igbinoba, Mercy Onozome Ajayi, Nasamu Victor, Nnedu Deborah, Ogboko Anthony Edugie, Olaiya-Samuel Osayi, Gift Ifada, Oluwakemi Esther Adeyemi, Omosimua Clementina Ekpe, Osariemen Okungbowa, Osarenmwinda Joy, Osarumwense Erhunmwunse, Akinyemi Philip Yaboame, Momoh Prsicilla, Osemwonyenmwen Aghahowa, Osose Hebrewess Ebosetale, Liberty Osahenoma, Priscilla Aigbogun, Endurance aluede, Ranmi Isreal Agbetuyi, Rosemary Akhigbe, Rosemary Umoize, Ruth Chama, Ruth Onosholema Asuquo, Kelly Osahon, Safuratu Sadiq Abubakar, Amenaghawon Ikpanmwosa, Sandra Emiulimhe Eghele, Shade Kayode Adeniyi, Nelson Audu, Shadrach Ogiriga, Solomon Iyare, Victor John Okologo, Hope Emihian, Victoria Ibhafidon, Victoria Atsekeigbe Imonigie, Victoria Ladi Osawe, Violet Elomese Iyoha, Sharon Major, and Edward Amrerhoro for their outstanding commitment and work in data collection.

II. The EdoBEST Primary Programme

Overview of the Programme

The Edo State Government has 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 2018, the Edo Basic Education Sector Transformation (EdoBEST) programme was launched. EdoBEST is a comprehensive, coherently designed programme that strengthens all aspects of public-Primary education. It establishes a framework for effective management of the education system, improves teachers' pedagogical skills and professionalism, and raises pupils' learning levels across all subjects through adaptive approaches and a focus on foundational learning. The programme has since expanded, now reaching all Primary schools throughout Edo State. The following report exclusively details the impact of the EdoBEST programme in Primary-model, Primary schools. Results are not representative of EdoBEST Junior Secondary Schools or EdoBEST Primary schools implementing the Progressive-model.

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

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

The 5 Pillars of the EdoBEST Programme

1. Teaching and learning materials

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

Detailed teacher guides

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

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

Pupil materials

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

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

Assessments

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

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

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

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

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

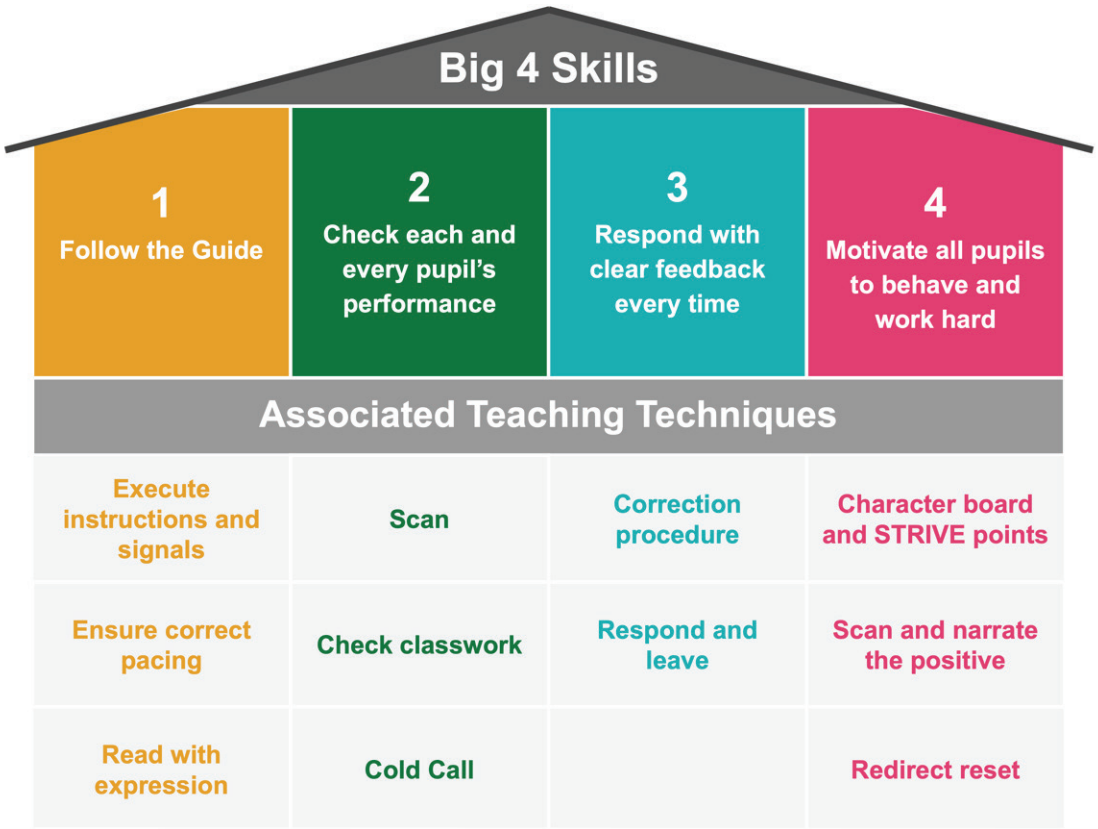
Teacher training

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

Induction training based on the "Big Four" pedagogical framework

Every teacher in EdoBEST schools undergoes an intensive induction training programme that serves as the foundation for implementing the structured pedagogy approach. The 80-hour, in-person training, conducted over 10 days, is designed to help train all teachers on the use of the new teaching and learning materials (like the lesson plans) and effective foundational learning methodologies. The training programme is informed by scientific research on the teaching practices and habits of top decile teachers who have a proven track record of delivering large learning gains, and is centred around EdoBEST's core pedagogical framework, "**The Big Four Teaching Skills**":

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



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

Ongoing support and coaching for teachers

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

Support for school leaders and regional officials

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

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

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

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

3. Technology integration

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

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

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

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

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

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

4. Community engagement

Creating and implementing a comprehensive community engagement strategy

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

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

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

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

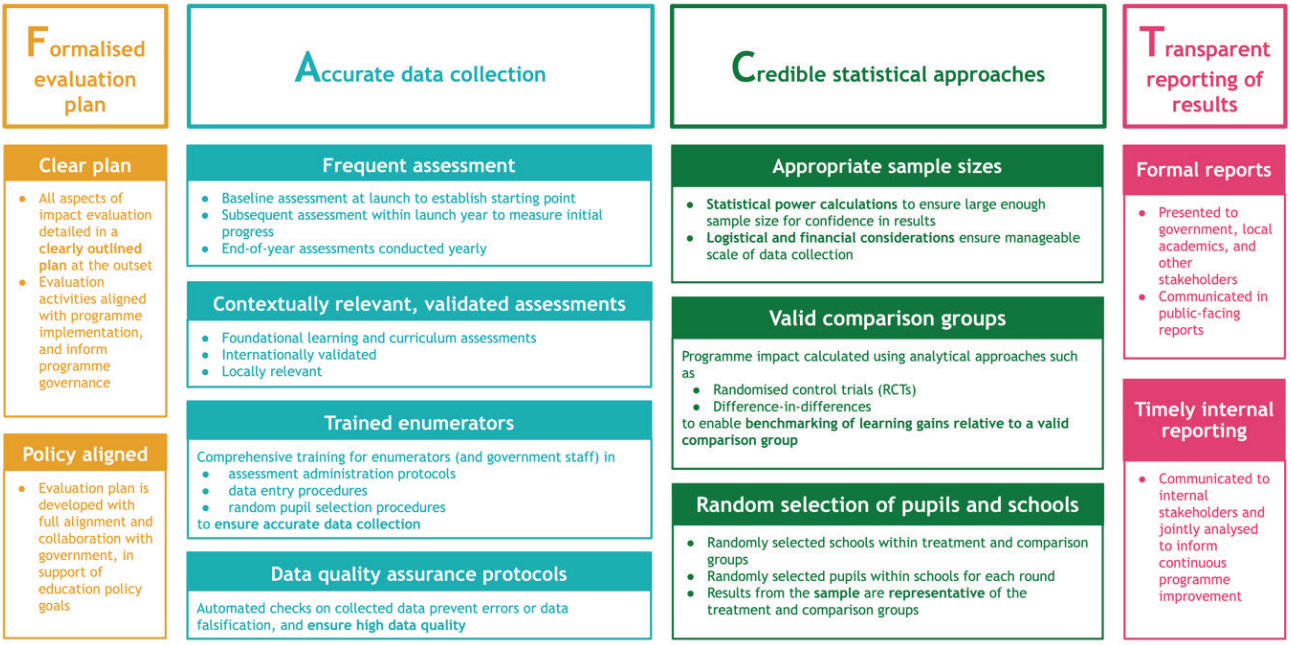
5. Rigorous methodologies for measuring programme effectiveness and identifying areas for improvement

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

Impact evaluation

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

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



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

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

Ongoing monitoring of learning outcomes

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

Ongoing monitoring of other key performance indicators

EdoBEST learning – such as **pupil and teacher attendance**, **lesson completion**, **school leader coverage**, and more. Digital tools capture these data automatically and in a decentralised manner, and a **Data Analytics Team** collaborates closely with programme leadership to analyse data trends and leverage insights to inform strategic programme improvements.

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

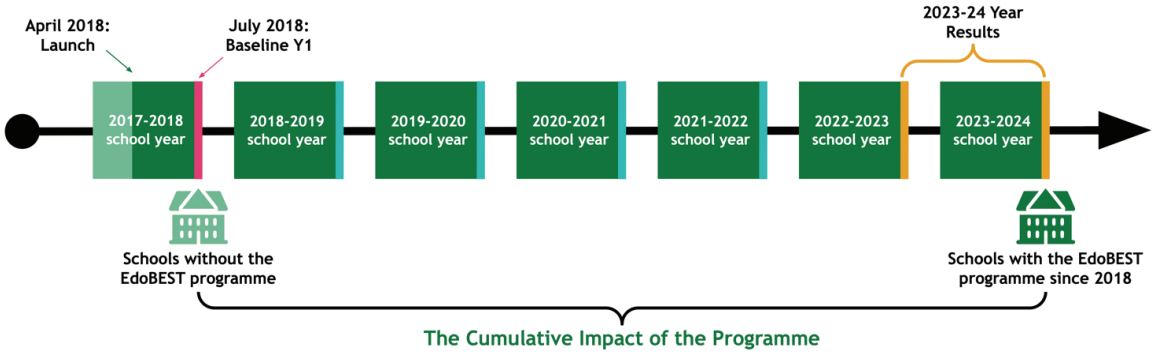
III. Cumulative Impact Methodology

Descriptive Analysis

Because EdoBEST has been implemented in all public-Primary schools within Edo State, there is no comparison group that would allow for the use of an empirical strategy such as the difference-in-differences method or a randomised control trial. Instead, descriptive analysis was utilised for the following study, assessing learning outcomes at various points during the programme's implementation and monitoring the changes in pupil performance over time. While using descriptive analysis effectively showcases how EdoBEST schools have evolved since the programme was implemented, any changes that occur in learning outcomes and school-level characteristics cannot be solely attributed to the EdoBEST programme, as confounding factors, such as increased enrolment, are not taken into account.

Data collection timeline

The EdoBEST programme was first introduced to schools in April 2018. As such, this study includes seven rounds of end-of-year data collection. The first round occurred at the end of the 2017-18 school year, assessing the programme after it had been launched in April 2018. All subsequent rounds of data collection each occur after a full school year of EdoBEST education through July 2024. Data were collected at the end of subsequent school years when possible.



Evaluating the Cumulative Impact of the Programme

In order to determine how learning outcomes have changed since the implementation of the EdoBEST programme, a baseline of pupil performance was established. Baseline data were collected in 2018 from Primary 3 pupils in schools that had yet to receive the programme. In order to estimate how learning outcomes among pupils have changed over time, these data are compared to Primary 3 learning outcomes as of July 2024, after six years of the EdoBEST programme being implemented in their schools. Because data were only collected from Primary 3 pupils in a representative set of schools before the programme began, the following study focuses exclusively on the cumulative impact on Primary 3 pupils.

Sampling schools and pupils

When the programme was launched, a total of 60 schools were sampled: 30 schools that would receive the EdoBEST programme ("treatment" schools), and 30 that would not ("comparison" schools). The treatment schools were randomly sampled, making them representative of the broader pool of Primary schools across Edo State; comparison schools were then chosen based on their similarities to the treatment schools. An algorithm was used to find matched schools, based on observable characteristics such as enrolment and academic performance. No differences between the two groups other than their participation in the programme were found, ensuring that any differences in outcomes measured could be attributed to the programme.

For the current study, the same schools assigned to the inaugural comparison and treatment groups have been selected again for analysis during the 2023–24 school year, with some modifications. Firstly, 8 schools are not included in the sample, due to a variety of reasons — closures, inaccessibility, and an inadequate number of pupils in attendance — leading to an overall sample size of 52 schools. Secondly, since the original comparison schools did begin receiving EdoBEST instruction following the programme's pilot, the comparison group's outcomes reflect pupil assessment performance conducted at the end of the 2017–18 school year, while the treatment group's outcomes reflect pupil performance on assessments that were administered at the end of the 2023–24 school year. This approach offers the dual benefit of visibility into how pupils in the treatment group are performing at this stage in the programme's tenure and where these pupils' learning levels would be had the programme not been implemented.

Cumulative impact learning assessments

Multiple choice literacy assessment

English literacy is a lifelong skill that pupils must possess to achieve mastery in all core subjects, to fulfil their potential throughout their academic careers, and to lead productive lives beyond school completion. Multiple, cumulative subskills comprise this foundational skill, all of which are essential for children to learn in order to emerge as proficient readers. Given the need for the programme to understand pupil proficiency in this domain, learners in EdoBEST and status-quo schools completed a 36-item multiple choice literacy assessment, segmented into 19 "revision" questions and 14 "at-level" questions. The revision portion of the assessment tests pupil understanding of fundamental topics required to demonstrate basic listening and reading subskills. These include letter and word identification, reading comprehension, and initial, final, and letter sounds. The at-level portion is composed of comparatively more advanced reading comprehension and phonics questions. Their total score on the assessment is reflective of their performance in both areas. This multiple choice literacy assessment was developed and used for Primary 3 pupil data collection back in 2018. In order to accurately assess how literacy rates have changed since the programme was implemented, the same assessment was given to Primary 3 pupils in the most recent round of data collection in July 2024.

Multiple choice mathematics assessment

Similarly, pupils were assessed using a 36-item multiple-choice mathematics assessment, designed and utilised back in 2018 baseline data collection, exclusively with Primary 3 pupils. This multiple choice maths assessment was therefore also given to Primary 3 pupils in the most recent round of data collection. This assessment is made up of 13 questions in the "revision" section and 23 questions in the "at-level" section. Revision section questions include preparatory numeracy concepts, such as counting, quantity discrimination, inequalities, addition, and subtraction. Grade-appropriate concepts, such as reading time on a clock, the days in a month, time facts, lines of symmetry, three-dimensional shapes, estimation, reading data on pictograms, and computation with units of weight comprise the at-level questions. Importantly, pupil performance on these sub-tasks is informative of their ability to not only solve mathematical problems in operational form, but also to apply computational thinking to real-life situations. Ultimately, pupils will need to be comprehensively numerate, in this sense, to benefit from mathematics instruction throughout their lives.

IV. Cumulative Results of the EdoBEST Programme

Foundational Literacy

Literacy rates have improved since the programme was implemented in 2018

Over the last seven years, Primary 3 literacy rates have improved. In 2024, the average Primary 3 pupil scored 3 percentage points higher on the NERDC curriculum-aligned literacy assessment than the average Primary 3 pupil did in 2018. This increase in average test scores is primarily driven by questions testing grade-level skills such as decoding and reading comprehension. On grade-level questions, scores were 20% (7 percentage points) higher in 2024 than they were in 2018. This means that pupils in EdoBEST schools are now more adept at engaging with Primary 3-level text, such as those found in their textbooks and workbooks. These findings are incredibly promising, considering that high pupil literacy rates are often characteristic of an efficient and high-performing education system.

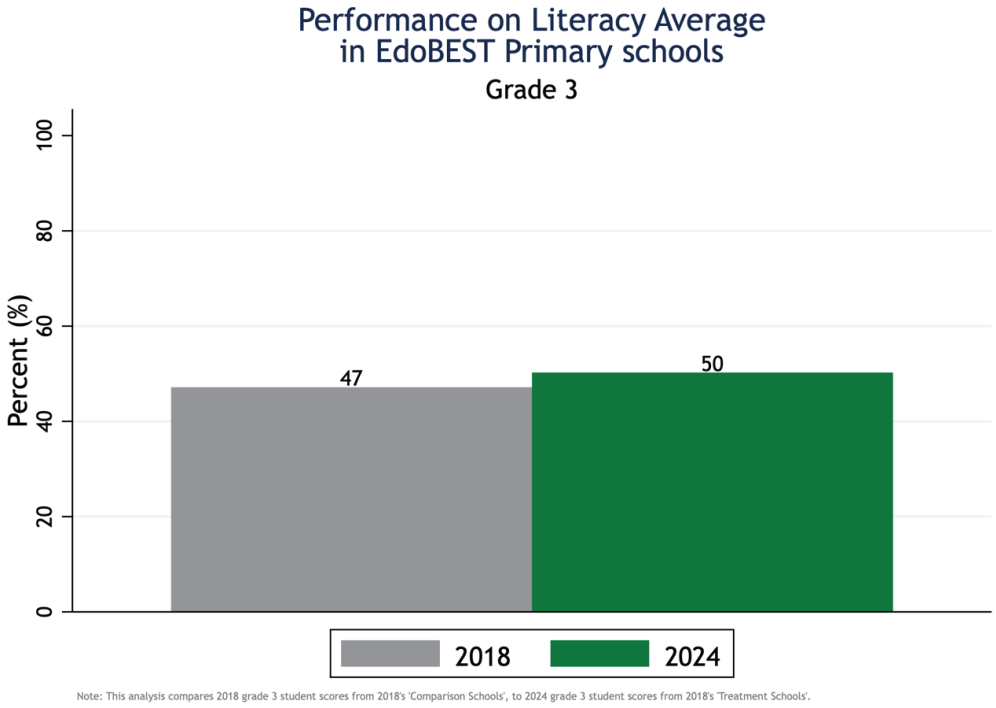


Figure 4.1

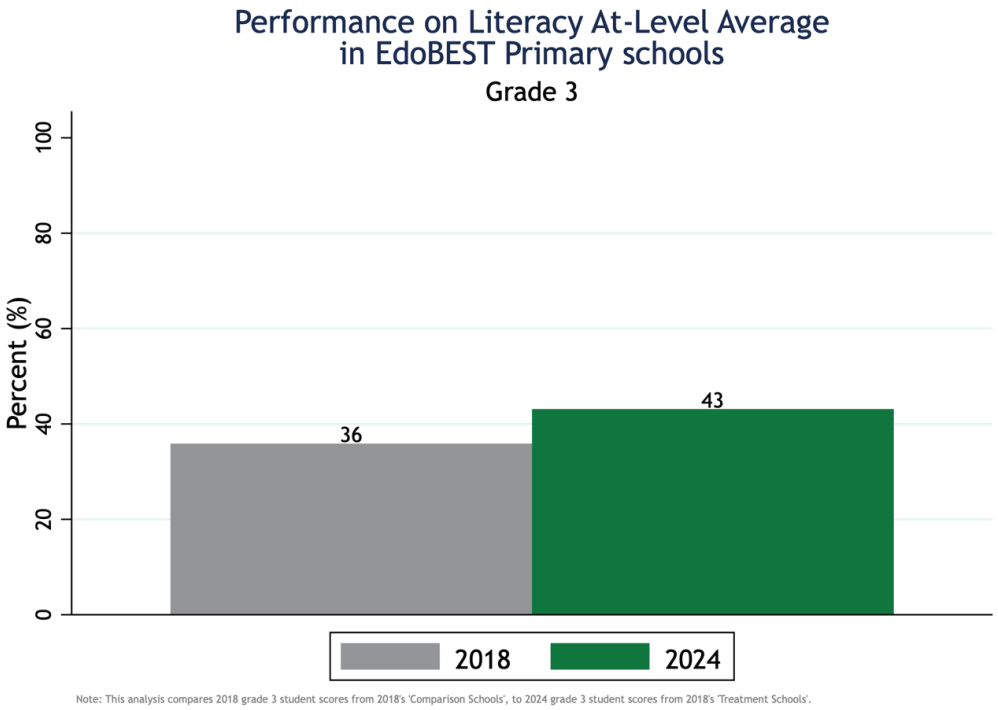

Performance on Literacy At-Level Average
in EdoBEST Primary schools
Grade 3
Percent (%)
0
20
40
60
80
100
36
43
2018
2024
Note: This analysis compares 2018 grade 3 student scores from 2018's 'Comparison Schools', to 2024 grade 3 student scores from 2018's 'Treatment Schools'.

Figure 4.2

Reading comprehension scores are substantially higher in 2024 than in 2018

Pupils' ability to understand the explicit and implicit meaning embedded within a text is a determining factor in their ability to apply their literacy skills towards success in their academic careers and beyond. In this essential subskill, pupils in EdoBEST demonstrated much greater proficiency than they did before receiving programme instruction. Compared to 2018, reading comprehension scores among Primary 3 pupils have increased by 24 percent (9 percentage points) from 37% to 46%. Unlike overall literacy levels, improvements in reading comprehension were observed across both revision and grade-level reading comprehension levels. The average score on both at-level and revision reading comprehension questions increased by 9 and 8 percentage points respectively; in other words, reading comprehension levels did not become more heterogeneous. Therefore, the EdoBEST programme was able to effectively target and support both the most and least proficient readers.

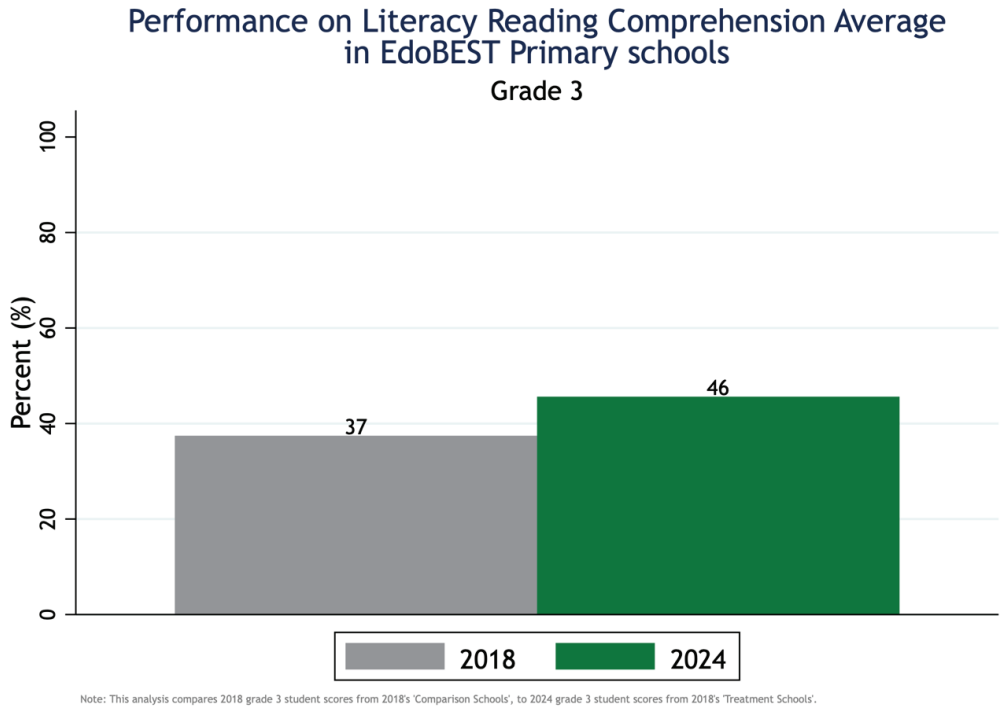


Figure 4.3

These findings are very promising, considering the importance of reading comprehension. The ability to understand grade-level text is fundamental to academic and future success. Pupils need to be able to understand written instructions, content, homework, etc. in order to participate fully in all their classes. The consequences of lacking foundational reading skills at the individual level extends beyond academics. Research has repeatedly found that individuals with foundational literacy skills earn more than those without (Hanushek et al., 2013; Valerio et al., 2016). Therefore, the improved reading comprehension levels of EdoBEST Primary pupils as of 2024 indicate that they are more likely to be academically and financially successful than they would have been before the programme's implementation.

Foundational Numeracy

Maths outcomes have changed minimally overall

As of July 2024, the average Primary 3 pupil's score on the curriculum-aligned numeracy assessment is 1 percentage point lower than in 2018. While there was some difference in revision and at-level numeracy scores, these were also minimal. On grade-level questions, the average score among Primary 3 pupils decreased by 2 percentage points from 2018 to 2024. On revision questions, the average score increased by 2 percentage points. While small, the increase in revision numeracy scores is indicative of the EdoBEST programme having a positive impact on pupil achievement. Given the low numeracy levels that existed prior to the EdoBEST programme, it is important that the general pupil population masters basic maths skills, as they are a prerequisite to more complex, grade-level math skills. EdoBEST instruction should therefore continue to focus on basic, fundamental numeracy skills in order to maximise maths learning gains.

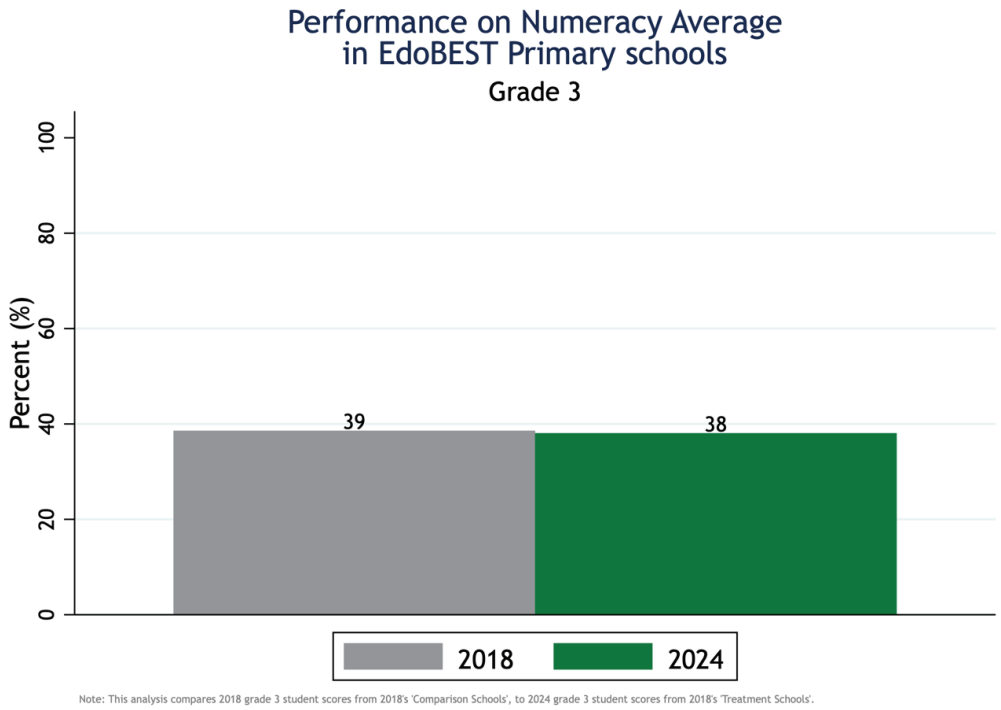


Figure 4.4

Taking external factors such as the COVID-19 pandemic into consideration, the fact that numeracy levels in 2024 remained largely consistent with those in 2018 suggests that the EdoBEST programme has helped maintain learning outcomes, despite the trying circumstances. Learning outcomes declined internationally due to the COVID-19 pandemic, particularly in low- and middle-income countries. Many education systems have yet to recover (World Bank, 2023). Despite this, numeracy outcomes have held steady with the EdoBEST programme.

EdoBEST Enrolment Rates

Enrolment rates have increased since the programme was established

In 2018, among a representative sample of 28 EdoBEST schools, the average P1 enrolment rate was 30. As of 2024, those same schools now have an average P1 enrolment rate of 45 pupils. The total enrolment across those 28 schools in both P2 and P3 has also grown (Figure 5.6). This increase in enrolment is indicative of greater faith among Edo families in the public education system. If parents perceive the education system to be ineffective, they are less likely to enrol and send their children to school. In contexts of limited resources, parents must prioritise their spending, and they are more likely to invest in education if they believe it will yield tangible benefits (Rivken et al., 2005). The increase in learning outcomes in conjunction with increased enrolment indicates that Edo families' overall perception of the Edo State public education system has improved since the EdoBEST programme was put in place.

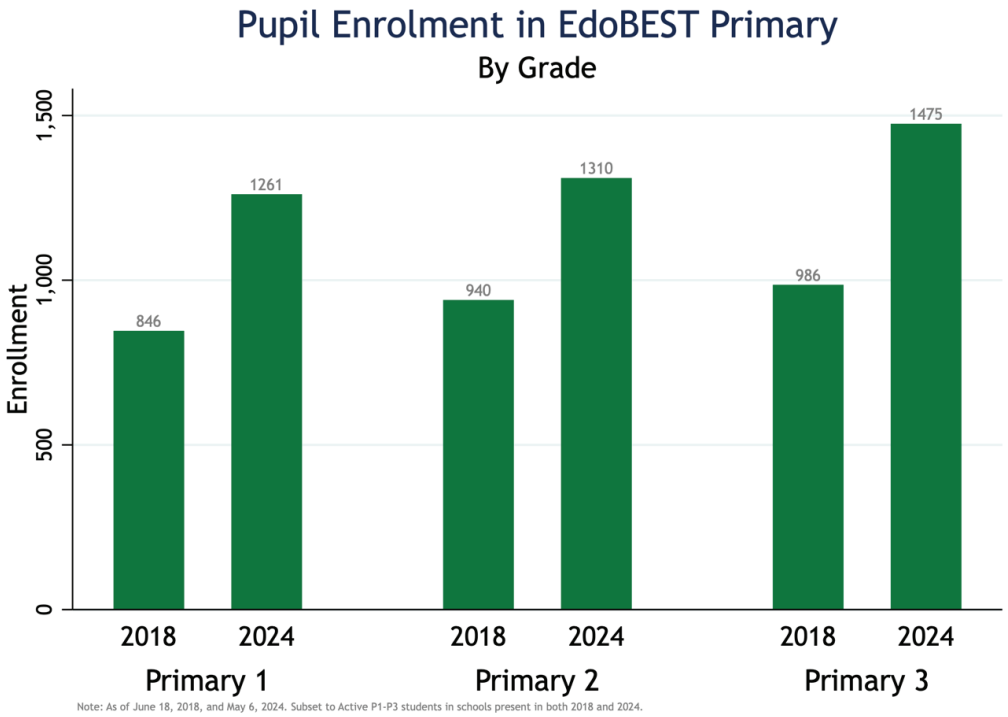


Figure 4.5

While these enrolment rates are positive indications of greater communal faith in the Edo State education system, they also inherently increase the diversity of learning needs and outcomes, placing greater strain on valuable educational resources such as instructional time.

Heterogeneity in Learning Outcomes

The range of literacy levels among EdoBEST pupils has increased

While the overall average score on the curriculum aligned literacy exam has increased since the programme was implemented, the range of scores has increased as well. Before the programme was implemented in 2018, 4% of Primary 3 pupils scored 20% or lower on the literacy exam. As of 2024, that percentage of pupils has increased to 7%. A similar trend was observed for high scores. In 2018, 5% of pupils scored 80% or higher on the literacy test. As of 2024, that percentage increased to 9%. Therefore, while literacy scores have improved overall, they have also become more heterogeneous over the last seven years of the EdoBEST programme.

This increase in heterogeneity may be linked to the rise in pupil enrolment. As more pupils enter EdoBEST schools, particularly those from diverse backgrounds, the variance in literacy levels is likely to increase. New pupils may have different levels of prior knowledge and access to resources, contributing to greater variation in their test scores. Consequently, while the programme has improved literacy outcomes overall, the growing diversity in the pupil population could explain the observed increase in score variability.

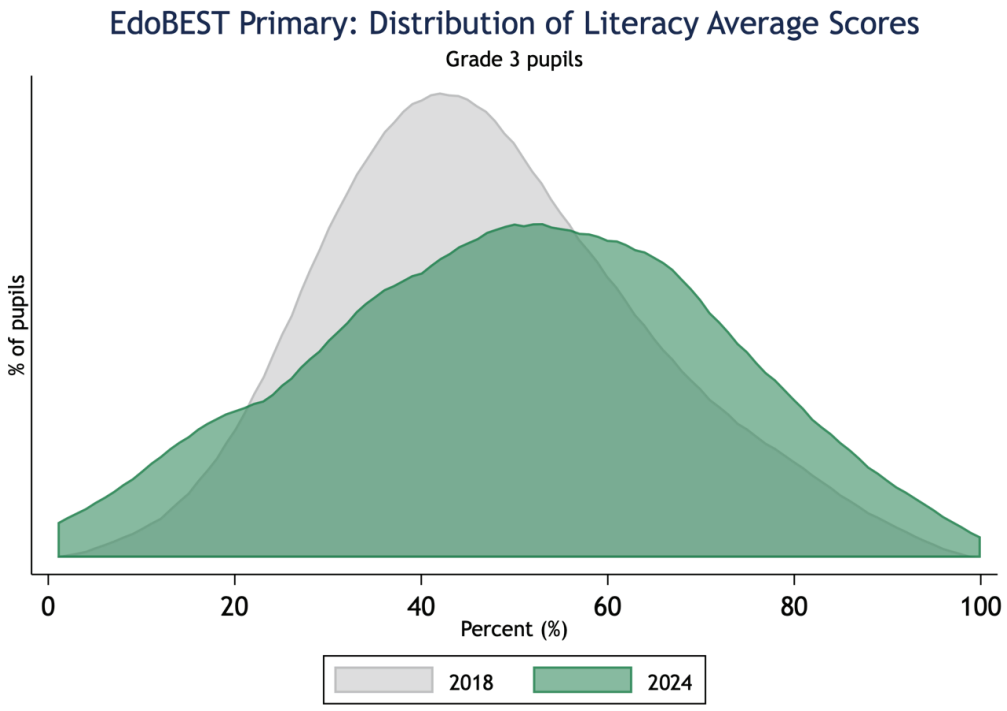
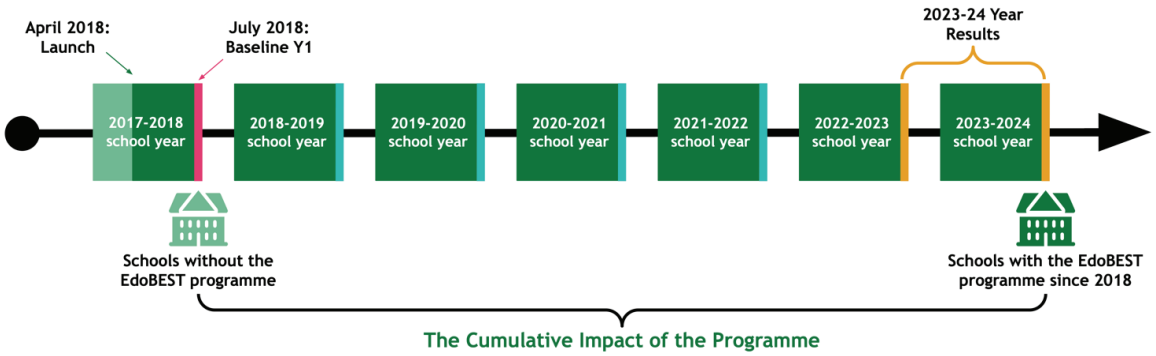


Figure 4.6

This increase in the disparity of literacy proficiency levels poses an inherent challenge for the education system: it is difficult to provide appropriately-levelled instruction system-wide to pupils with a wide range of literacy proficiency levels. For instance, if some pupils in Primary 3 struggle with a Primary 2-level passage while others can easily read a Primary 4-level passage, EdoBEST must adapt its instruction to meet the diverse needs of Primary 3 classes across Edo State. To ensure that appropriately levelled instruction is being offered across EdoBEST schools, EdoBEST pupils are consistently assessed in literacy and numeracy throughout the year in order to identify median learning levels in each classroom. Lesson guides are then designed to be appropriately-levelled for as many pupils as possible, with the goal of combating heterogeneity within grade levels.

V. Annual Impact Methodology

Descriptive analysis was used to assess both the cumulative and annual impact of the programme, due to the lack of a comparison group. For the annual impact, this means that learning outcomes were assessed at the end of the 2022-23 school year and the end of the 2023-24 school year are compared in order to assess how learning outcomes and programme implementation metrics changed over the last year. While using descriptive analysis effectively showcases how EdoBEST schools have evolved since the programme was implemented, any changes that occur in learning outcomes and school-level characteristics cannot be solely attributed to the EdoBEST programme, as confounding factors, such as increased enrolment, are not taken into account.



Evaluating the Annual Impact of the Programme

Sampling schools and pupils

In order to determine how learning outcomes and programme-wide implementation metrics have changed over the last year, the group of 28[1] randomly-selected, treatment schools from the cumulative impact sample were used to create a representative sample from which conclusions regarding the entire programme can be derived. Data were collected from these 28 schools in both July 2023 and July 2024. Within these 28 schools, an average of 6 pupils were randomly selected from each grade and assessed. Because an inadequate number of P6 pupils were present in school at the time of data collection, data are only available for Primary grades 1-5. By comparing these data from the same set of randomly-selected schools exactly one year apart, this study is able to determine the extent to which learning outcomes have changed after the most recent year of the EdoBEST Primary-model programme.

[1] This group originally consisted of 30 schools. However, because two of the 30 schools closed mid-way through the study, the group was reduced to 28 schools.

Learning assessments

Oral reading fluency assessment

Reading fluency describes the degree to which a pupil can read quickly, accurately, and with expression. If a pupil is able to read quickly and with ease, it is a strong signal that they have also mastered more fundamental subskills (e.g. letter recognition), and that they are capable of completing increasingly advanced tasks, such as reading with some degree of comprehension. Reading fluency is measured in correct words per minute (cwpm).

This study relies on two types of passages to measure English reading fluency:

1. A **Primary 2 text drawn from DIBELS**, a reliable assessment of early literacy development widely used in evaluation studies of educational interventions (University of Oregon, 2018; Vernon-Feagans et al., 2018; Cheung, A. C. K & Guo X., 2018; Kim et al., 2011). All pupils read this Primary 2-level text. The purpose of using this text to assess all pupils is to allow for comparison of performance across grade levels.

2. A **grade-level passage from NERDC-approved English textbooks**, assesses the degree to which pupils can appropriately engage with the grade-level materials.

International Common Assessment of Numeracy (ICAN)

The ICAN is an internationally validated tool that measures learning across five core maths skills: number recognition, addition, subtraction, multiplication, and division. Within each of these domains, there are 2 sub-tasks. Sub-task 1 is a simple application of the concept (for example, addition without carrying). If the pupil answers sub-task 1 correctly, they attempt sub-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 sub-task 2.

Monitoring Programme Implementation

Longitudinal metrics on teacher attendance, pupil attendance, and lesson completion

The programme's technology-based platform allows programme designers to track metrics on teacher attendance, pupil attendance, and lesson delivery in real time. More specifically, analysis of these data is completed by comparing average network-wide attendance over the course of the current school year. This sheds light on whether lesson completion, teacher attendance rates, and pupil attendance rates improve over time as the programme matures.

Qualitative Data Collection

This study also conducted interviews in Term 3 of the 2023-24 school year in order to better understand the mechanisms behind some of the quantitative results observed at the end of the school year. These in-depth interviews touched upon topics of stakeholder satisfaction with the programme, changes to pupil and school management engagement, and areas for improvement, among others. In total, 450 interviews were carried out: 35 Learning Development Officers, 35 Head teachers, 101 teachers, 90 parents, and 189 pupils. These interviews followed a structured approach outlined in Appendix D, and the results were subsequently analysed using conventional coding practices.

VI. Annual Results from the 2023-24 School Year in EdoBEST

Foundational Literacy

English reading fluency rates continue to improve overall

EdoBEST's positive impact on literacy outcomes has continued through the last full year of the programme's implementation (July 2023-July 2024). Compared to the end of the 2022-23 school year, the average fluency rate just one year later among Primary pupils is 5 cwpm higher on both a Primary 2-level and grade-level passage. These results were driven by improvements in Primary 5, with the average Primary 5 pupil reading 30% (16 cwpm) faster as of July 2024 than the average Primary 5 pupil did at the end of the previous school year. As a result, Primary 5 pupils are now more prepared for their Primary 6 school work in both literacy and all other subjects, setting them up for future academic success as they progress through school. While changes are inconsistent across grade-levels, the data support the conclusion that oral reading fluency rates among EdoBEST Primary pupils have improved over the last full year of the programme.

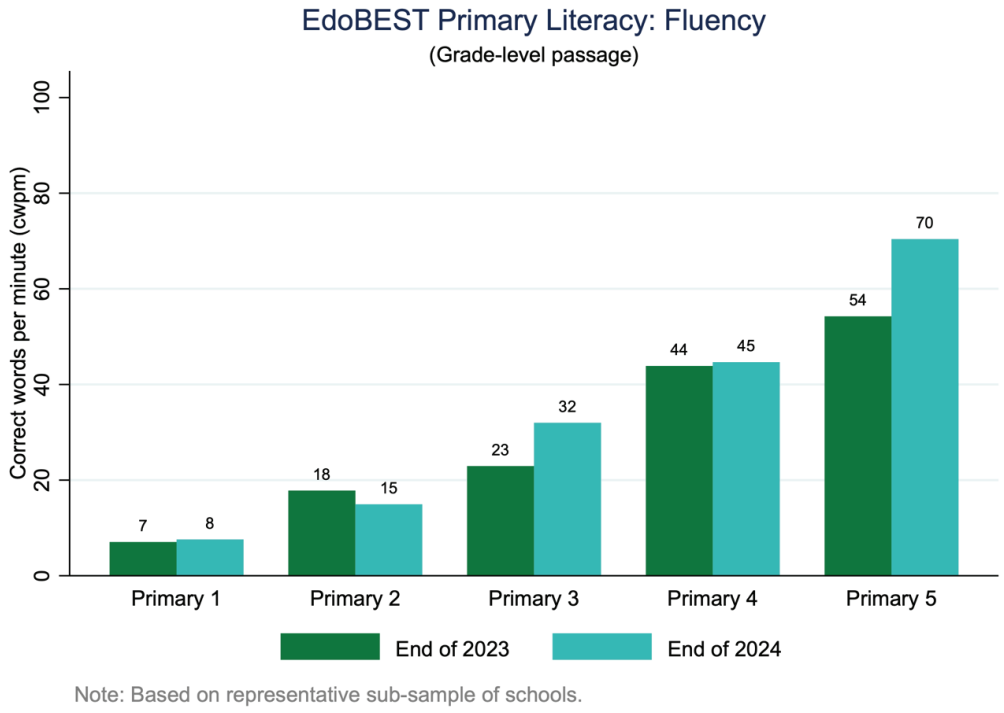


Figure 6.1

Reading comprehension rates also increased overall

The average score on reading comprehension assessments increased by 4 percentage points across all grades assessed. Consistent with the Simple View of Reading (SVR) theory, annual gains in reading comprehension typically mirror those in reading fluency, as long as children possess an adequate oral vocabulary (for more information on the Simple View of Reading, see Box 1). Reading comprehension improved the most in upper grades, with Primary 5 scores increasing by 9 percentage points across both passages (Figure 5.2). Large gains were also made in Primary 3 and 4 on the Primary 2-level and grade-level passages as well. Notably, scores for Primary 2 pupils in July 2024 are slightly lower than for Primary 2 pupils the year prior. For copies of the literacy assessments, including assessment passages and reading comprehension questions, see Appendix A.

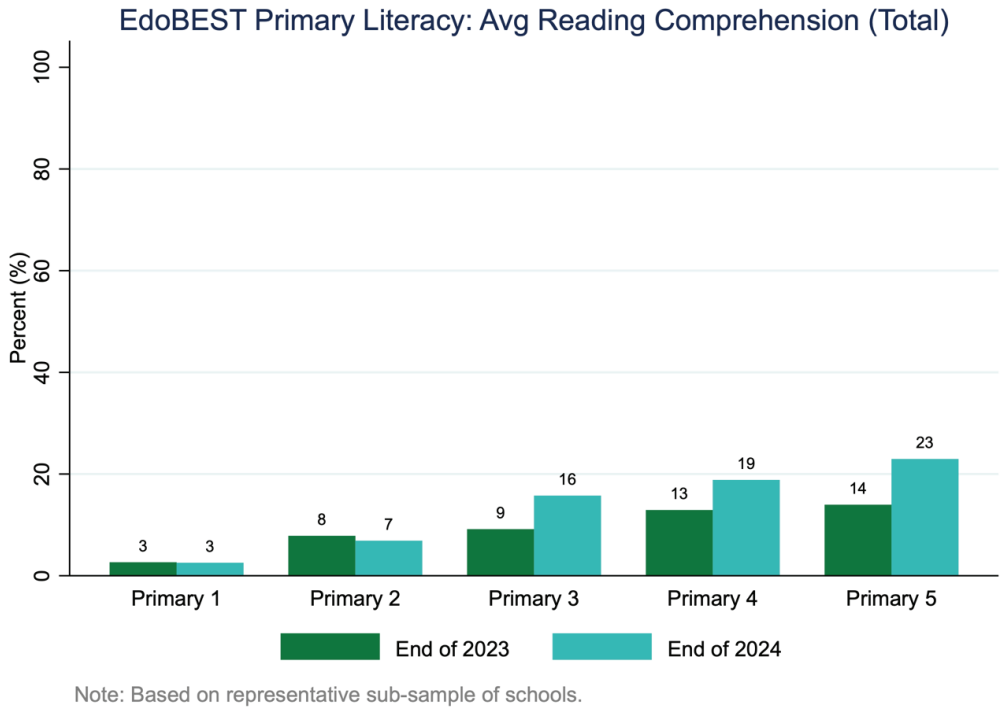


Figure 6.2

Despite these impressive gains, reading comprehension rates in Edo State Primary schools remain low in absolute terms. According to the World Bank, children should be able to read and comprehend a grade-level passage by age 10; however, the majority of Edo children have yet to meet this threshold (World Bank, 2018). The average Primary 5 pupil in an EdoBEST school is still unable to correctly answer a single comprehension question after reading a Primary 2- or grade-level passage. Therefore, while this reduction in learning deprivation is promising, foundational literacy must continue to be the focus of Primary school curricula in EdoBEST schools moving forward.

Box 1: The Role of Oral Language in Reading Comprehension and the Simple View of Reading

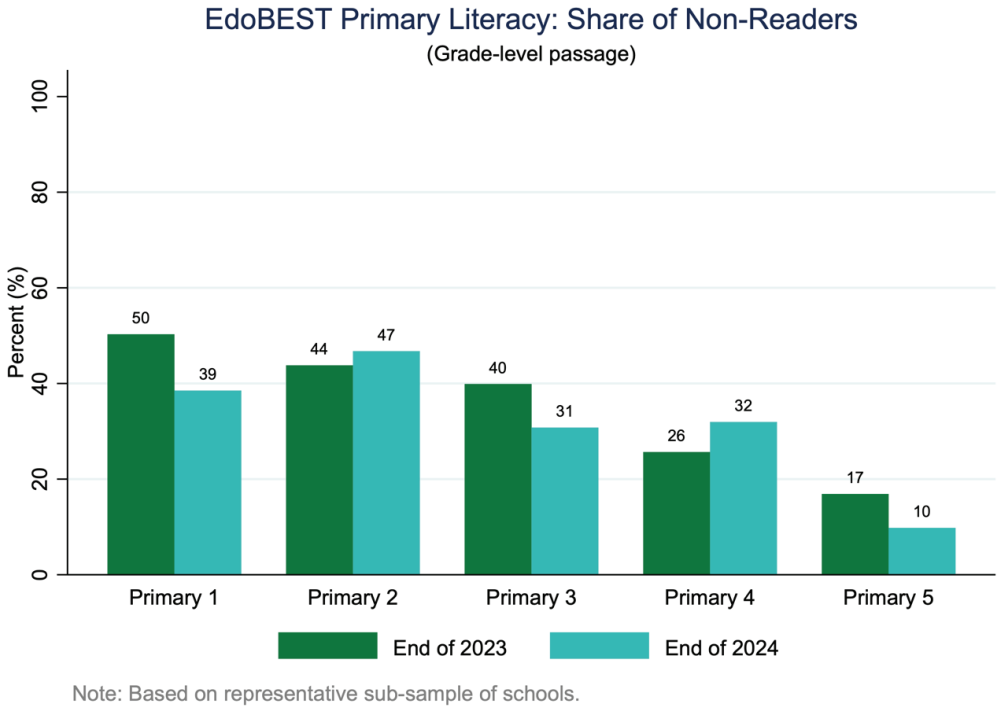
Learning to read in the early grades is an essential prerequisite for accessing more advanced portions of the curriculum as students progress in school (World Bank, 2018). In fact, full mastery of literacy skills by Primary 3 is widely acknowledged by researchers as a major threshold to ensure success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

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

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

While reading fluency and comprehension increased on average, the rate of non-readers in EdoBEST schools did not change

The percentage of pupils in EdoBEST Primary schools who cannot read a single word from a given passage has not changed from July of 2023 to July 2024, though some changes were seen at the grade-level. The rate of non-readers in Primary 1, 3, and 5 declined on both passages. Notably, the rate of non-readers in Primary 1 is now lower than that of Primary 3 just one year before (Figure 6.3). However, the rate of non-readers in Primary 2 and 4 increased over the last year with an average rise of 5 percentage points in both grades. As of July 2024, 48% of Primary 2 pupils and 29% of Primary 4 are unable to read a single word on average across both passages. The stagnation of non-reader rates in EdoBEST schools in conjunction with the increase in fluency and comprehension rates implies that literacy levels have become more heterogeneous within the last year, continuing the pattern observed when assessing the cumulative impact of the programme (Figure 4.3). Therefore, while literacy instruction continues to move all pupils forward, instructional levels will be tailored to the actual learning levels of EdoBEST classes in order to ensure that even the lowest-performing pupils acquire foundational literacy skills.



Note: Based on representative sub-sample of schools.

Figure 6.3

The Bus Ride

Today was my first day taking the bus to school. My mom put curls in my hair because I like my hair when it is curly. I felt happy walking to the bus stop.

36% of pupils (more than 1-in-3) are still **unable to read a single word** from the Primary 2-level DIBELS passage excerpt shown on the left.

Foundational Numeracy

ICAN scores on average have not changed over the last year

While there were slight variations at the grade-level, the average ICAN score in July 2024 among Primary pupils was 50%, the same as it was one year prior. The average Primary 1, 3, and 5 ICAN score increased by 2 percentage points on average, while Primary 2 and 4 scores decreased by almost the same amount. In conclusion, the overall consistency in the average ICAN score among Primary pupils from July 2023 to July 2024 suggests a stable performance across the programme.

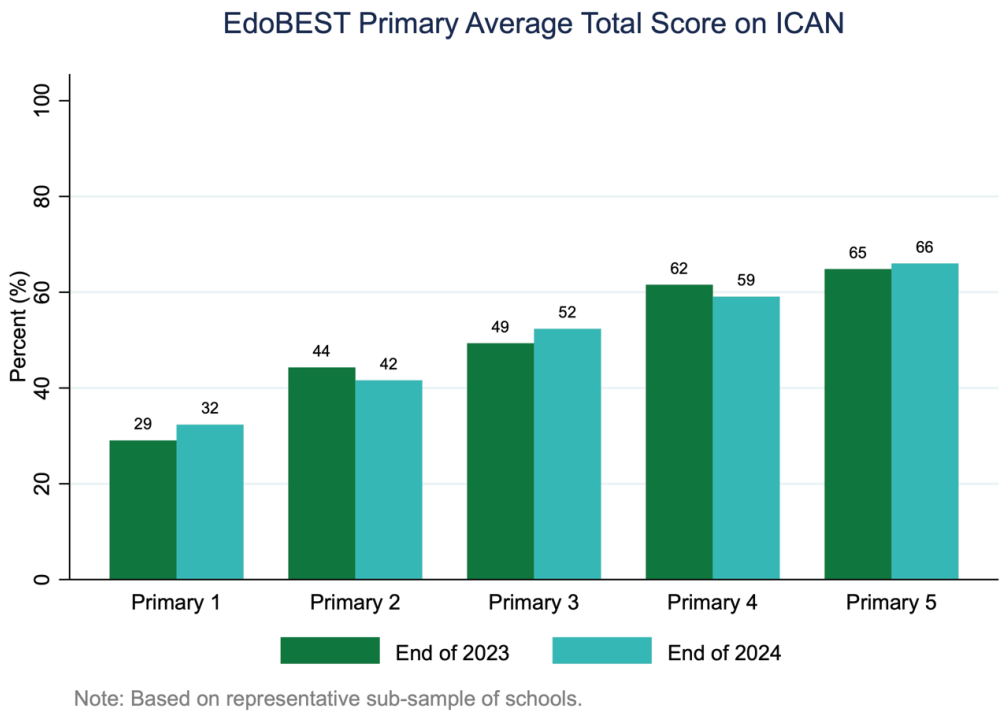
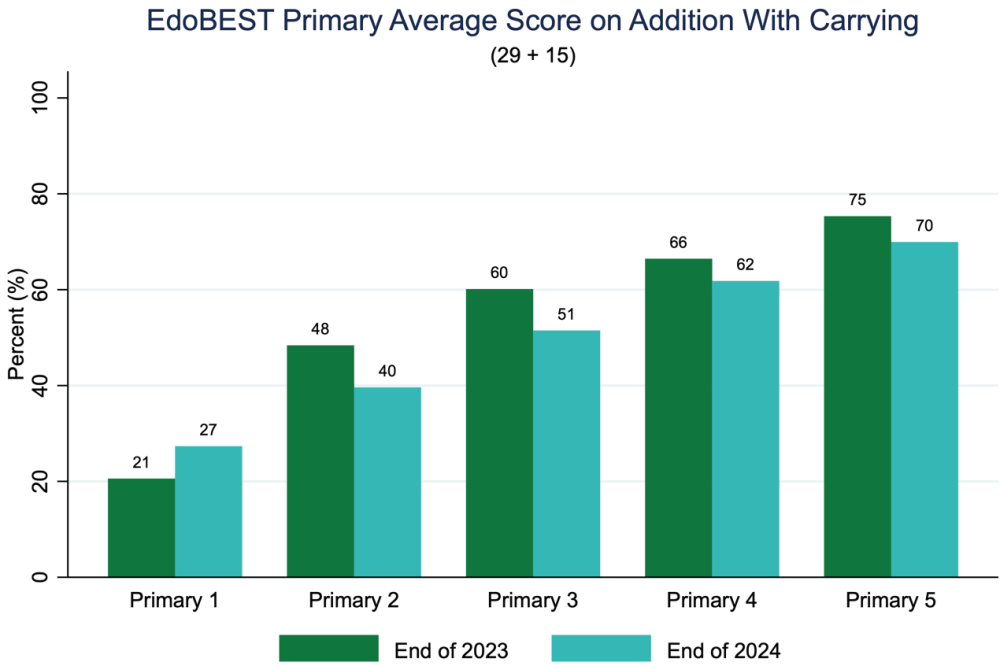


Figure 6.4

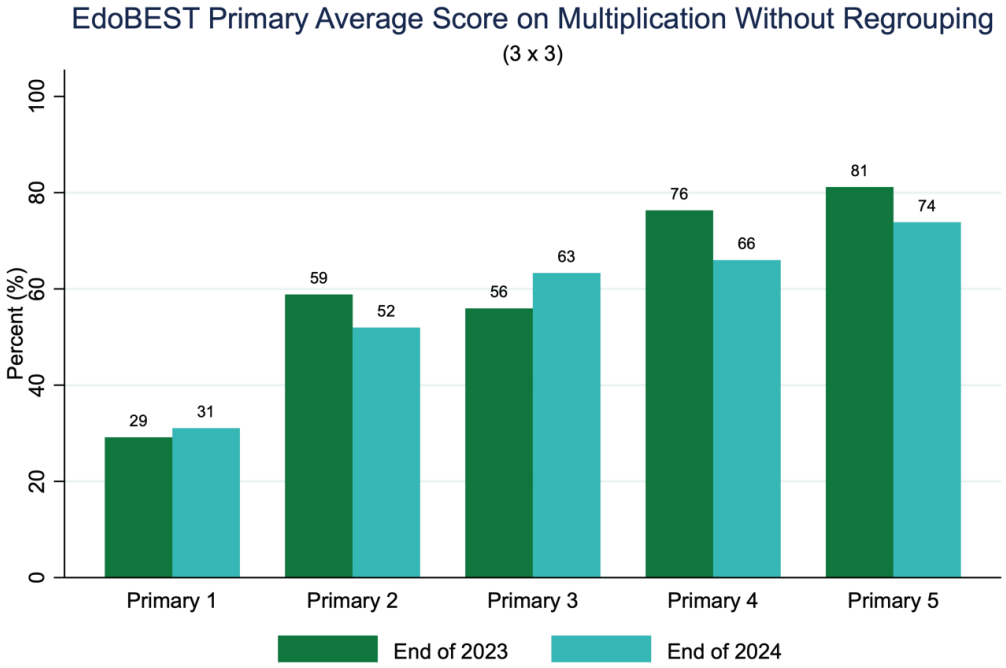
Proficiency in fundamental maths has decreased

While overall ICAN scores saw little change in the last year, these averages do not shed light on the variation in performance on individual tasks. On simple tasks such as addition and subtraction, students on average are performing worse than their peers one year prior. From 2023 to 2024, the percentage of pupils able to solve simple maths problems such as '3x3' and '29+15' declined by 3 and 5 percentage points respectively across all grades (Figures 6.5 and 6.6). The percentage of pupils able to solve simple maths problems in EdoBEST dropped in the last full year of the programme. For a copy of the ICAN assessment, see Appendix A.



Note: Based on representative sub-sample of schools.

Figure 6.5



Note: Based on representative sub-sample of schools.

Figure 6.6

Conversely, proficiency in more difficult maths problems has increased

While fewer Primary pupils are able to solve operational maths problems at the end of the 2023-24 school year than the previous, more are able to solve word problems. 20% more Primary pupils successfully solved the subtraction word problem: "There were 43 children in the park. Out of these, 25 of them have gone home. How many children are left in the park now?". 33% more pupils were able to solve the division word problem: "A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?". This promising increase in pupils' proficiency with word problems was likely driven by increased reading fluency and comprehension. Without the ability to read and comprehend a word problem, pupils do not have the opportunity to even attempt to apply their operational maths skills to the question. Because more pupils are now able to comprehend grade-level text, a subset of pupils are now able to apply their operational maths skills to real-world situations.

However, despite these impressive gains, scores on maths word problems are still low in absolute terms. Nigerian national curriculum standards classify a simple division word problem as a Primary 3-level skill. In Edo State, only 11% of Primary 3 pupils meet this standard. Even by Primary 5, only slightly more than 1-in-4 pupils meet this standard as of July 2024 (Figure 5.7). Therefore, the progress seen in the last year must continue in order to meet national academic standards.

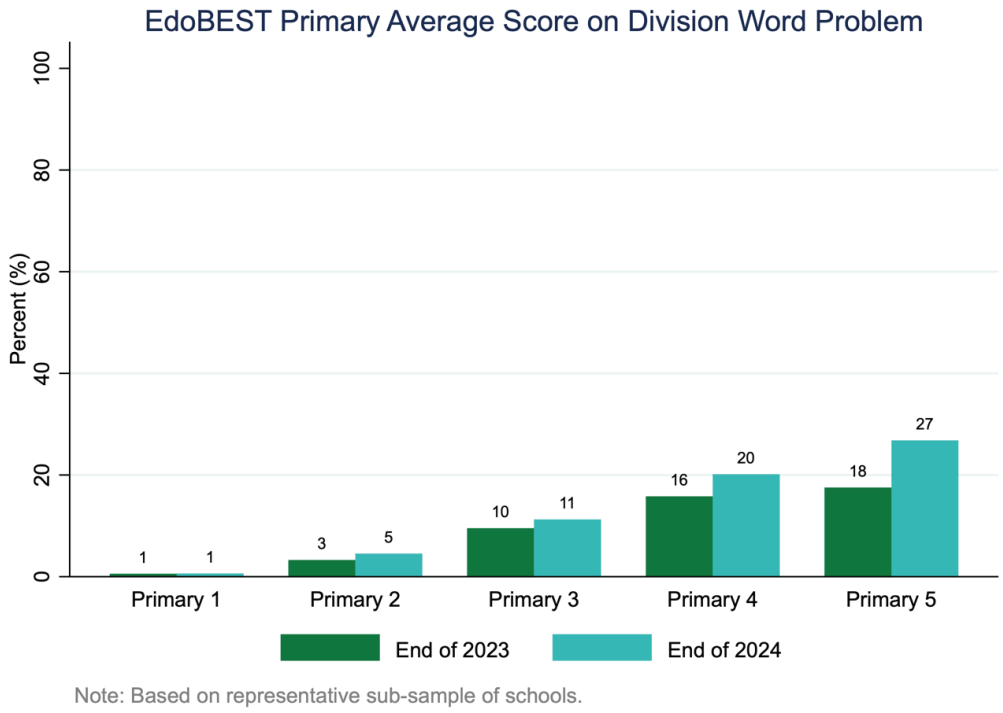


Figure 6.7

While maths scores did not change overall from the end of the 2022-23 school year to the end of the 2023-24 school year, the range of scores did increase. In the last year, the percentage of pupils able to solve fundamental maths problems such as '29+15' dropped, while the percentage able to solve complex word problems involving division increased. This indicates that lower performing pupils are not improving in maths, while higher performing pupils are improving and making progress.

Measures of Programme Fidelity

Teacher attendance and lesson completion rates are higher than the previous year

In the 2023-24 school year, both teacher attendance and lesson completion rates are higher on average than they were in the previous school year. In the 2022-23 school year, EdoBEST teachers' weekly attendance was 79% on average. By contrast, the average teacher attendance rate in the following school year was 9 percentage points higher at 88%. Not only did teachers attend class more, but they also covered more content. In the 2022-23 school year, the average lesson completion rate in EdoBEST progressive schools was 58% on average. This past school year, lesson completion rates averaged 66%. While 66% is still somewhat low (teachers only completed 2 of every 3 lessons scheduled) it still amounts to a 14% increase (8 percentage points) in just one year. These data suggest that EdoBEST is effectively maximising the amount of class time devoted to learning. For more information on the importance of teacher attendance, see Box 2.

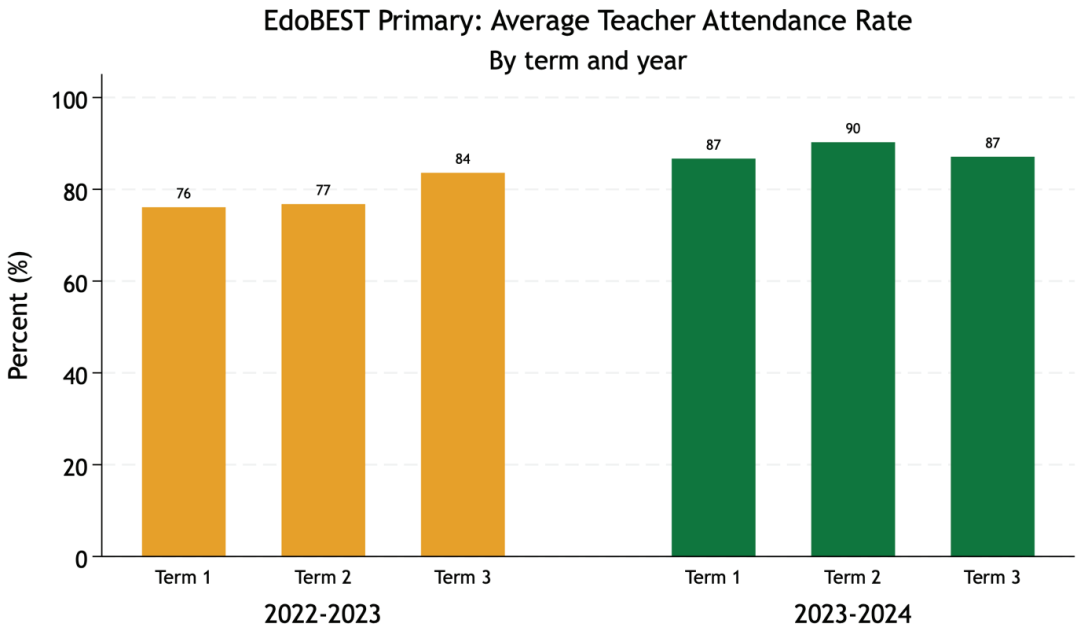


Figure 6.8

Lesson completion rates dropped consistently each term

While lesson completion was higher overall in 2023-24 than 2022-23, lesson completion rates steadily decreased from term to term throughout the school year. In Term 1, teachers were able to complete 74% of lessons, which was higher than any single term of the previous school year. However, the average lesson completion rate for Term 2 of 2023-24 was 64%: a 10 percentage point drop. By Term 3, lesson completion fell back to rates akin to that of the 2022-23 school year. Therefore, while lesson completion is improving overall from year to year, they have recently begun to decline.

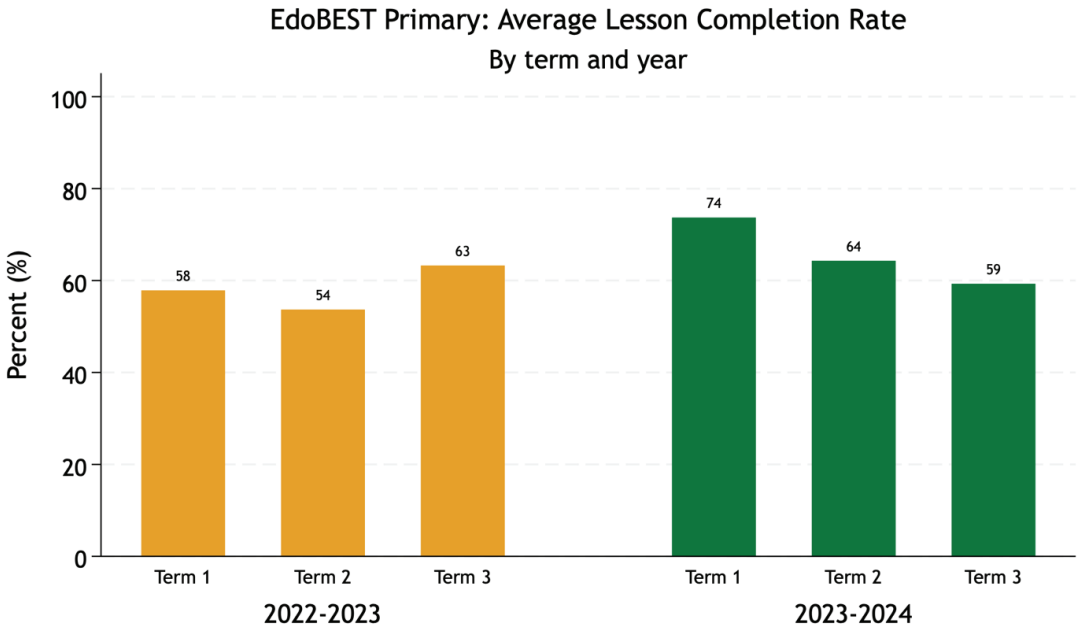


Figure 6.9

Box 2: Teacher Absenteeism in Low- and Middle-Income Countries: Challenges, Implications, and Effective Solutions

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

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

Academically, the most direct consequence of teacher absenteeism is significantly reduced instructional time, which leads to weaker learning outcomes. According to The World Bank's Service Delivery Indicators, out of 8 sSA LMIC including Nigeria, Kenya, Uganda, and Togo, an average of 2 hours and 46 minutes of instructional time was lost daily due to teacher absenteeism (World Bank, 2018). Teacher absenteeism not only detracts from total learning time, but also negatively impacts the quality of learning that takes place in school (Vargas & Patricia, 2016). When classes are combined to compensate for

inconsistent teacher attendance, students experience disruptions in their lessons. Furthermore, chronically absent teachers were found to be less productive in school compared to their peers (Utami & Vioreza, 2021). This lack of consistency and quality contributes to parents' and students' poor perceptions of the public education system, which leads to lower rates of enrolment and attendance among students (World Bank, 2018).

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

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

Pupil attendance rates have become more consistent in the last year

While both teacher attendance and lesson completion were higher in the 2023-24 school year compared to the 2022-23 school year on average, pupil attendance remained the same overall. In both the 2022-23 and 2023-24 school year, pupil attendance averaged 57%. However, attendance in 2022-23 varied between terms by 9-17 percentage points. Across the entirety of the EdoBEST programme in the 2023-24 school year, the average pupil attendance rate never varied by more than 2 percentage points. However, while rates became more consistent, there is still room for improvement. Moving forward, ensuring high levels of pupil attendance remains a priority in the ongoing implementation of the EdoBEST programme in order to maximise the programme's potential to enhance learning. To do so, sustained participation and continued buy-in from all stakeholders, including teachers, parents, and pupils, is necessary so that pupils in Edo State can continue to build stronger foundational skills and achieve greater learning outcomes.

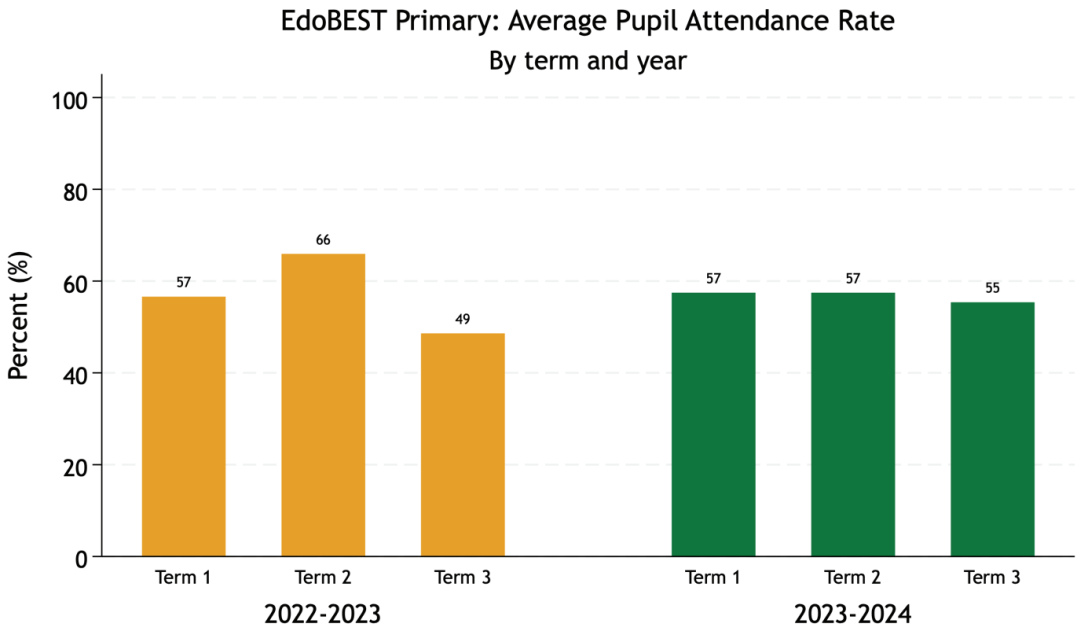


Figure 6.10

The EdoBEST programme continues to be positively received

Qualitative data show that the EdoBEST programme has been met with abundant approval from pivotal stakeholders in Edo State. After seven years of the EdoBEST programme, the vast majority of the 450 pupils, parents, teachers, head teachers, and Learning Development Officers interviewed reported having observed positive changes to the Edo State education system. Among the 101 teachers asked 'What are your general impressions of the EdoBEST programme?' 98 had positive experiences with the program, while only 3 were critical. Many teachers appreciated how technology was being actively integrated into the system and that they had ongoing support from programme staff. Similarly, 97% of parents said that their childrens' teachers were highly motivated as a result of the EdoBEST programme; emboldening families to engage with their child's education more meaningfully. In conclusion, the overwhelming positive feedback from stakeholders highlights the transformative impact of the EdoBEST programme on Edo State education.

Direct Quotes from EdoBEST Stakeholders

Pupils

"I am so excited when going to school because I am going to learn new things and meet friends and my cheering teachers."

➜ Primary 6 pupil, Owan East

"[EdoBEST] helps me to learn better how to read and write, it helps me learn how to make the right decisions when things are difficult, [and] it helps me become a better person in the community."

➜ Primary 5 pupil, Esan North East

"...I know my teacher will be in school and ready to teach me."

➜ Primary 3 pupil, Ovia North East

Teachers

"EdoBest programme is the best performing programme designed so far for the Edo child, and it is transforming lives of pupils in the classroom."

➜ Teacher, Etsako West

"...Teachers are punctual to school, more disciplined, [and] they are in school on time... EdoBEST is an amazing programme and has helped the educational system greatly."

➜ Teacher, Egor

"[EdoBEST] has helped to revive education in Edo State."

➜ Teacher, Akoko-Edo

Head Teachers

"I love the programme with passion, especially the use of character board, energiser and song. It has also made me improve on my digital skills."

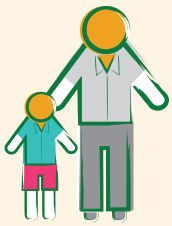
➜ Head teacher, Egor

"[EdoBEST] is fantastic and a game changer in revolutionising the education sector in Edo State."

➜ Head teacher, Etsako

"The EdoBEST programme has been of great help to everyone in the education system... The EdoBEST pattern has made teaching easy for teachers. Additionally, it has stopped lapses in teachers' performance, as teachers are now always present in school..."

➜ Head teacher, Ovia North East



Parents

"Before now my child could not read very well but now my child is happy to always read and write her assignments at home."

➜ Parent, Ualor-Oka Primary school

"... the method of teaching in EdoBEST is helping pupils to learn. The introduction of sounds, cheers, songs, etc. has motivated children..."

➜ Parent, Idumowu Primary school

VII. Lessons Learned and Recommendations for Future Improvements

After seven years, the EdoBEST programme has brought about large improvements in the educational landscape within the state, effectively adapting its approach to meet the specific needs of both pupils and school staff. In turn, the quality of instruction and pupil learning outcomes continue to improve year-on-year. During the 2023-24 school year, the sixth full year of the EdoBEST programme, both teacher attendance and lesson completion rates were higher overall than the previous school year. As a result, pupils have made tremendous strides in foundational literacy and numeracy. Since the programme was implemented in 2018, literacy scores have improved by 20%, the rate of non-readers has dropped by 25%, and maths scores stabilised after the shock of the COVID-19 pandemic. These findings, among other improvements, demonstrate the continued positive impact of the EdoBEST programme as it continues to mature.

Despite the improvements observed by the end of the 2023-24 school year, more work is required in order to sustain these positive trends — and build upon them — in the coming years of the programme. For instance, in the last year, the number of pupils able to solve simple maths problems has decreased and learning outcomes in both literacy and numeracy have become more heterogeneous. Therefore, for the 2024-25 school year and beyond, the EdoBEST programme is working to improve literacy and numeracy rates, minimise heterogeneity in learning outcomes, and improve programme implementation.

Maximising Time Spent on Foundational Skills

There has been considerable acceleration of foundational learning in English and Maths. Average reading fluency rates among EdoBEST pupils have improved significantly since the start of the programme. Within the last year alone, oral reading fluency rates have increased by 5 cwpm, and reading comprehension rates have increased by 25%. Yet, despite these achievements, large learning gaps still remain between current learning levels and grade-level standards. The majority of pupils are still reading and doing maths far below grade level. For example, only 11% of Primary 3 pupils are able to solve a Primary 3-level maths problem such as a word problem involving division. Even by Primary 5, only 1-in-4 pupils are able to solve this problem on average. As long as these gaps persist, pupils will struggle to meaningfully engage with grade-level content in their Primary school careers and beyond.

In order to ensure that all pupils are learning at grade level, EdoBEST will continue to maximise the time that each pupil spends learning in English and Maths each day. This means that each pupil will receive 10 English Reading lessons, 5 English Language lessons, and 10 Mathematics lessons each week. During these lessons, teachers will be supported to deliver high-quality instruction that builds mastery of foundational skills, offers significant opportunities for memory recall to ensure that pupils retain what they learn, and accelerates learning in order to close learning gaps. By ensuring a high frequency of English and Maths instruction over time, pupils will receive sufficient learning and practice opportunities to reverse learning deprivation and to achieve true proficiency in foundational skills. This proficiency, in turn, will unlock pupils' potential to successfully participate in more rigorous grade-level content, especially in upper grades.

Fostering Homogeneous Learning Groups

One core obstacle to future learning gains is within-classroom heterogeneity. In a typical classroom, there are pupils learning below, at, and above the median learning level. As a result, EdoBEST's targeting of English and Maths instruction materials based on pupils' median learning levels is still insufficient for many pupils — either because it is too easy or too hard. This also creates a deeply challenging instructional experience for teachers. In classrooms with a large variance in learning levels, teachers are asked to provide differentiated support and appropriate feedback across this wide distribution of learning levels. This means that some teachers are working to support learning of non-readers, grade-level readers, and everything in between!

In order to promote more homogeneous ability groups within classrooms, EdoBEST will adopt additional strategies to narrow the range of ability levels. First, a new placement test will be developed for future use. When this tool is rolled out, school leaders will be trained on how to administer this placement test to new pupils in order to assess foundational English and Maths competencies. The results of this placement test, considered alongside the newly-arriving pupil's age, will inform their optimal grade placement. This, in turn, will ensure that new pupils are not placed in grades where content is too challenging and where they have little chance of success. By placing pupils in classrooms that are both age-appropriate and also at the correct instructional level, classrooms themselves will have a narrower range of ability levels to which teachers must cater. This will allow teachers to focus their feedback and support towards this more narrow range of abilities, resulting in a far more cohesive teaching and learning experience for all.

In addition, data-driven methods will continue to inform optimal grade promotion standards. By analysing data on this year's grade promotion/retention rate, EdoBEST can better understand whether the current cut-off scores are resulting in the optimal share of pupils being retained (alongside alignment with state policies on grade promotion thresholds). This offers a dual opportunity. First, EdoBEST can ensure that pupils are not being retained in any grade level at an unacceptable rate - which is both harmful to the pupils and teachers, and also costly to the education system more widely. But more importantly, this allows EdoBEST to set the cut-off scores at a level that will promote greater within-grade homogeneity of learning levels. By preventing the lowest-performing pupils from slipping through the cracks and being promoted into the next grade before they are ready, the programme can ensure that those pupils receive a more appropriate level of instruction in their repeated grade, and also that the teacher in the subsequent grade is not forced to balance support across pupils who are ready for more challenging instruction alongside those who are not.

Strengthening Day-to-Day Programme Implementation

During this evaluation period, EdoBEST 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 to shine a light on key areas of growth at the pupil, teacher, school, or programme level. In spite of this progress, there is still significant room for improvement in terms of day-to-day programme implementation. In the 2023-24 school year, pupil attendance across the EdoBEST programme averaged 56%. In other words, the average EdoBEST pupil only attended slightly more than half of the school year. Also, throughout the 2023-24 school year, lesson completion rates dropped precipitously from term to term, resulting in a lack of consistent progress through the curriculum.

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 areas - alongside other key operational areas like ensuring textbook availability and usage - the programme can ensure more productive learning time in schools and improve the learning experience of pupils.

Looking Ahead

The impressive progress of the EdoBEST programme since its launch in 2018 has validated the ongoing investments made by Edo State in transforming its education system. The evidence in this report confirms that children who have not yet received high-quality education can quickly and significantly advance their learning when provided with the proper support. Literacy rates are 20% higher than they were in 2018, despite the negative impacts of the COVID-19 pandemic. Also, just in this past year, reading fluency rates have increased by 5 cwpm on average. The EdoBEST programme effect is predicted to increase over time, as substantiated by data from this report. Year-to-year, both lesson completion and teacher attendance rates have continued to improve. This positive trajectory is projected to persist throughout the programme's duration, signifying that the longer the programme is in effect, the more proficient teachers will become in their instructional methods. This, in turn, is expected to result in an augmentation of the EdoBEST programme's impact on pupils' learning outcomes.

Despite the improvements observed by the end of the 2023-24 school year, more work is required in order to sustain these positive trends — and build upon them — in the coming years of the programme. As a data-driven programme, EdoBEST will continue to conduct similar large-scale, rigorous evaluations for the upcoming school years as well. These rounds of data collection will give the Edo State government further insights into the impact of the programme: what is going well, and what needs to be strengthened. Continued investments to address heterogeneity and improve programme fidelity — if done correctly — will drastically improve the quality of teaching and learning across Edo State.

The EdoBEST programme is a bold, highly impactful investment, designed to provide children across Edo State with high-quality education. During its 7th year of operations, it has enabled pupils to be on faster, higher learning trajectories than what they would have experienced from non-EdoBEST education. This large-scale system-wide transformation has led to large, positive impacts on foundational literacy and numeracy outcomes. Through its EdoBEST programme, Edo State will continue to provide rich, nurturing learning environments across the Edo State, where pupils of all backgrounds will have the unprecedented opportunity to actually learn in school and thrive academically.

VIII. Appendix

Appendix A: Learning Assessments

Oral reading fluency assessments

DIBELS Primary 2-Level All Pupils Passage

Lucky Day

Bobby was on his way home from school one day. On his walk, he saw something green in the snow. He stopped and stared. He thought he was seeing things. Green in the snow? It couldn't be what it seemed to be, could it?

He bent down in the snow and quickly dug it out. It was a five-dollar bill. He carefully smoothed it flat. He wondered if it was real money or just play money. It looked real. That made him feel good. This was his lucky day.

But then he felt bad. He knew that if he ever lost five dollars he would cry and cry. Once, he had dropped a dime on the floor, and it had rolled into the heating vent. He never saw that dime again.

What was it like to lose fifty dimes at one time? Whoever lost the money was having an unlucky day. But this was Bobby's lucky day. He had no way to find the owner, so the money was his to keep.

Primary 1 Grade-Level NERDC Passage

Our House

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

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

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

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

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

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

Primary 2 Grade-Level NERDC Passage

The Ant and the Grasshopper

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

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

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

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

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

Then the grasshopper knew: it is best to prepare for the days of necessity.

Primary 3 Grade-Level NERDC Passage

The Ant and the Grasshopper

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

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

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

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

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

Then the grasshopper knew: it is best to prepare for the days of necessity.

Primary 4 Grade-Level NERDC Passage

Jabar and His Tricks

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

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

Although Jabar escaped injury, the cyclist was hurt badly.

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

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

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

Primary 5 Grade-Level NERDC Passage

Safety at Home

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

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

There are many measures to take to protect children from injury or accident in the house. In the kitchen, elders should keep all shart utensils and household cleaning products out of the reach of children.

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

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

Always buckle your child into the child safety seat every time your child rides in the car.

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

Primary 6 Grade-Level NERDC Passage

Chike and the Headmaster

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

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

'Good morning, sir,' he greeted.

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

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

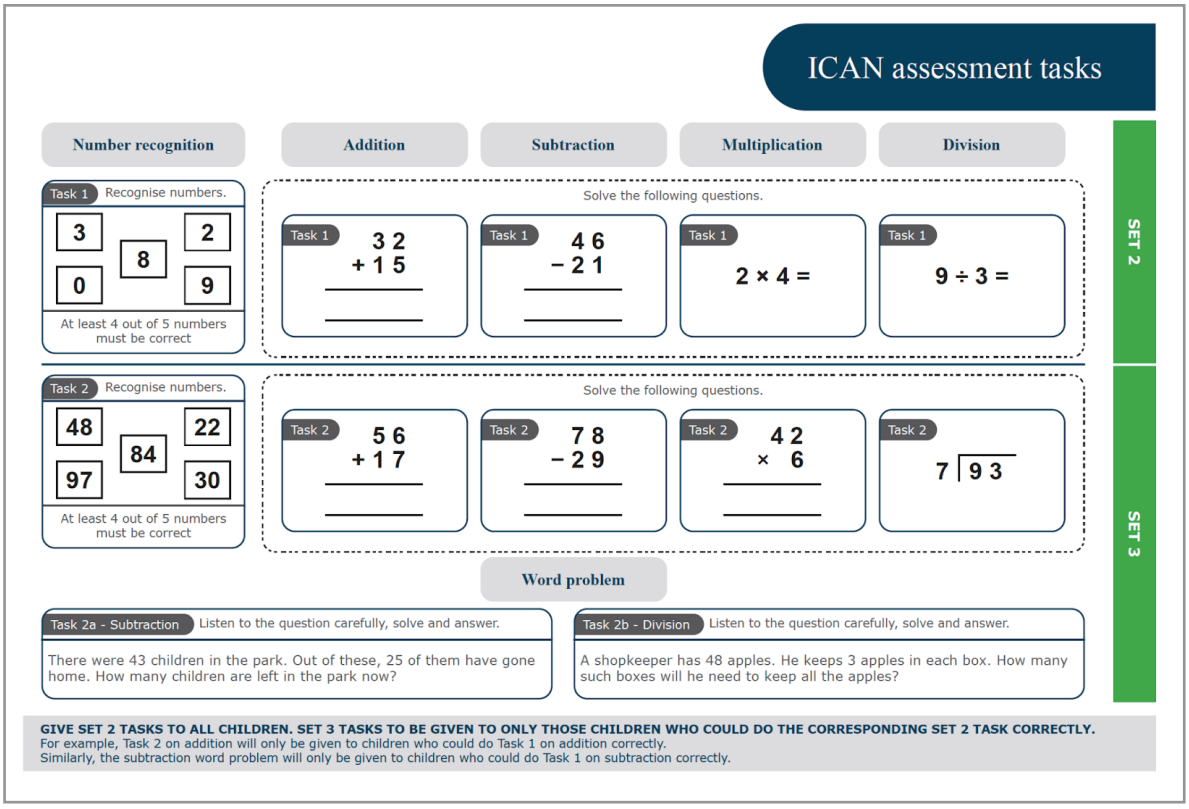
'No, sir,' replied Chike
'Do you know why you did not do as well as usual, Chike?'
'No, sir,' Chike replied, looking down at his toes.

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

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

Mathematics assessment

International Common Assessment of Numeracy (ICAN)



Appendix B: Hasbrouck-Tindal Oral Reading Fluency 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 during their Primary experience.[2] These benchmarks are developed based on data from a few different assessments, including DIBELS, 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.

Oral Reading Fluency Norms (Correct Words per Minute)				
	25th percentile	50th percentile	75th percentile	Median average weekly improvement
Primary I	34	60	91	2.0
Primary II	72	100	124	1.6
Primary III	91	112	139	0.9
Primary IV	105	133	160	1.2
Primary V	119	146	169	0.8

[2] Hasbrouck, J. & Tindal, G. (2017). *An update to compiled ORF norms* (Technical Report No.1702). Eugene, OR, Behavioral Research and Teaching, University of Oregon.

Appendix C: Mapping ICAN results onto Global Performance Standards

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

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

Given the prominence of the GPF to understand global numeracy standards, this study has created a crosswalk between each skill assessed via the International Common Assessment of Numeracy (ICAN), described in this report, and the grade in which children are expected to master that skill according to the GPF. The study team carefully identified the mathematical benchmarks in the GPF that most closely correspond with assessment items, based on both the exact problem and the skill that is assessed by each problem. The grade level at which assessed pupils should be reaching these benchmarks was then determined by referencing the grade level(s) described under the framework's "Meets Global Minimum Proficiency"[3] threshold. In the following table, the precise alignment between each assessed ICAN skill and the grade-level expectation, per the GPF, for sufficient ability to demonstrate this skill can be found:

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

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

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

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

Appendix D: EdoBEST 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 EdoBEST programme in the last five years and 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 EdoBEST programme to transform pupils' learning gains across Edo public schools while also identifying key and strategic areas for improvement.

We understand that while the gains of the programme were enormous in the last five years, 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.

Data collection methodology and sampling

Using Key Informant Interview (KII), we will interview a total of 36 Head teachers, 108 teachers, 216 students and 108 parents from a total of 36 schools randomly across the 18 LGAs of the state with each LGA having a cluster representation of 2 schools each. We will use a non-probability selection for Head teachers and parents; teachers will be selected using a systematic sampling while pupils will also be systematically sampled from their grade clusters, taking out 1 pupil from each grade.

Collaboration and next steps

The EdoBEST team will partner with School support officers of SUBEB to conduct the survey across the selected schools. The data will be collated and stored afterwards to be analysed alongside the pupil's assessment for the 7th year impact evaluation of the EdoBEST programme which will be conducted within the first three weeks of T3. Together, the EdoBEST M&E team and representatives from SUBEB will analyse the data and co-author the report for the 5th year evaluation alongside a team of independent researchers outsourced from the Department of Educational Measurement and Evaluation of the University of Lagos.

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.

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 four years of the EdoBEST 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 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 term, and the school where you work?"

Questions for teachers:

1. First, what are your general impressions about the EdoBEST 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 EdoBEST programme? If so, how helpful do you think it is to teach this 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. 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 EdoBEST methodology into your teaching? Even if you wanted to use this programme as you were trained on, what makes it hard to do so?
6. Did your school leader or your supervisor encourage you to engage with the programme? What do you think their attitudes towards the programme were?
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 to ensure that you are more effective in using these techniques?

Questions for Head teachers:

1. First, what are your general impressions about the EdoBEST Programme?
2. What do you think your teachers' general impressions about the EdoBEST Programme are?
3. Think back to your conversations with your teachers throughout the last few years: what do you think their #1 excitement and complaint about the programme was?
4. In what specific ways would you say the programme has been beneficial to the pupils?
5. Would you want more kinds to benefit from the programme?
6. 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 Learning Development Officers:

1. What are your general impressions of how the EdoBEST 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 easy and most problematic in terms of incorporating the methodology into the classroom?
5. Think back to your conversations with your teachers throughout the last semester: what do you think their #1 complaint about the programme was?
6. When you provide teachers with feedback, how receptive have they been to this feedback?
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 parents:

1. In the past five to six years, have you noticed any changes in how your pupil's teacher teaches the class? If so, what are those changes?
2. In the past three to four years, have you noticed any attitude changes from your pupil's teacher? Do they seem more or less motivated? Are they coming to class more or less often? Any changes of this type?
3. Would you say your child/ward has been learning better with the new methodology from the teachers? If yes, In what ways?
4. Would you want your child/ward and other children to continue to learn under the new Methodology?
5. What do you think can be done to make learning better in Lagos schools?

Questions for pupils:

1. In the past five to six years, have you noticed any changes in how your teacher teaches the class? If so, what are those changes?
2. In the past three to four years, have you noticed any attitude changes from your teacher? Do they seem more or less motivated? Are they coming to class more or less often? Any changes of this type?
3. Would you like your teachers to keep teaching you with the new methodology?
4. In what specific ways has the programme helped you to learn better?
5. What makes you excited about coming to school? [this question is to positively prime them for the following question, so it's not such a negative transition]
6. Would you want more children to learn under the programme as well?
7. What makes learning at school hard? What challenges do you encounter at school every day to keep learning?

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

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

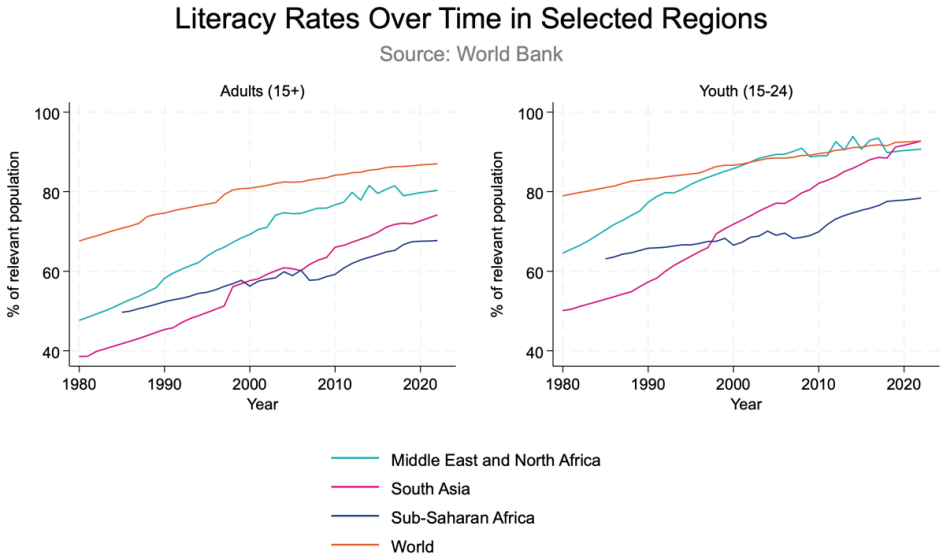
The growing global focus on broadening access to schools has led to significantly improved enrolment rates

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

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

Increased enrolment has been accompanied by growth in literacy rates

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



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

Barriers to enrolment still persist

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

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

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

Access to education must start with early childhood

While great progress has been made in recent decades towards enrolling larger numbers of school-aged children, children in many contexts enter school later than the intended age, which can profoundly impact the rate at which they master skills during their academic careers and how well they develop into adulthood. For example, in Guinea-Bissau, more than three quarters of children in Primary school are over-age (UNESCO, 2023ab), and this is largely due to late enrolment, with only 30% of children beginning school at the specified age of six (Borgen Project, 2021). In Nigeria, 1.8 million children were attending Primary school

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

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

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

Enrolment is necessary but not sufficient

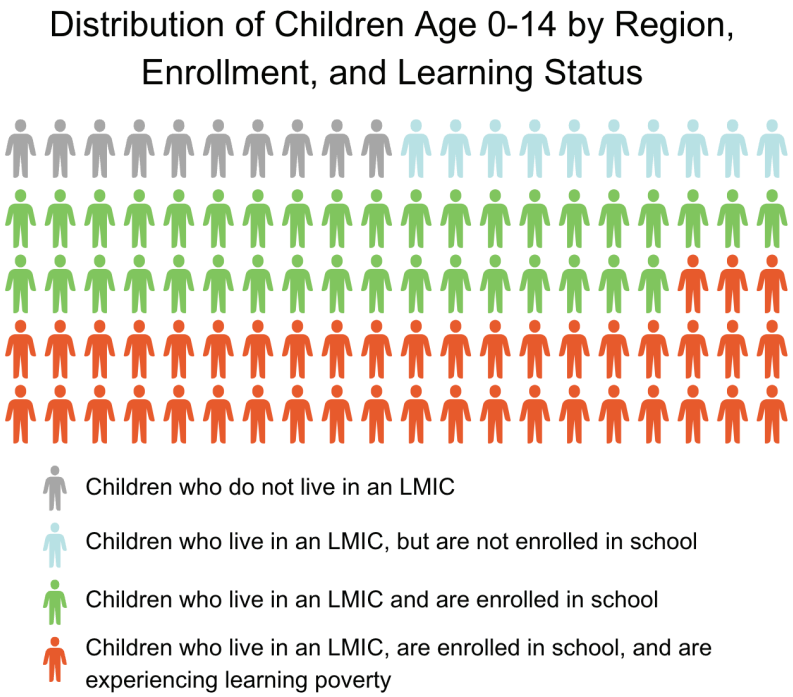
Focusing solely on enrolment is not sufficient to ensure that children are actually learning. The goal of universal education is not merely about superficially exposing children to educational institutions; it also requires that these institutions effectively equip pupils with the foundational skills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

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

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

Progress is needed on true measures of literacy

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



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

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

Learning outcomes are weak and urgently require transformative interventions

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

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

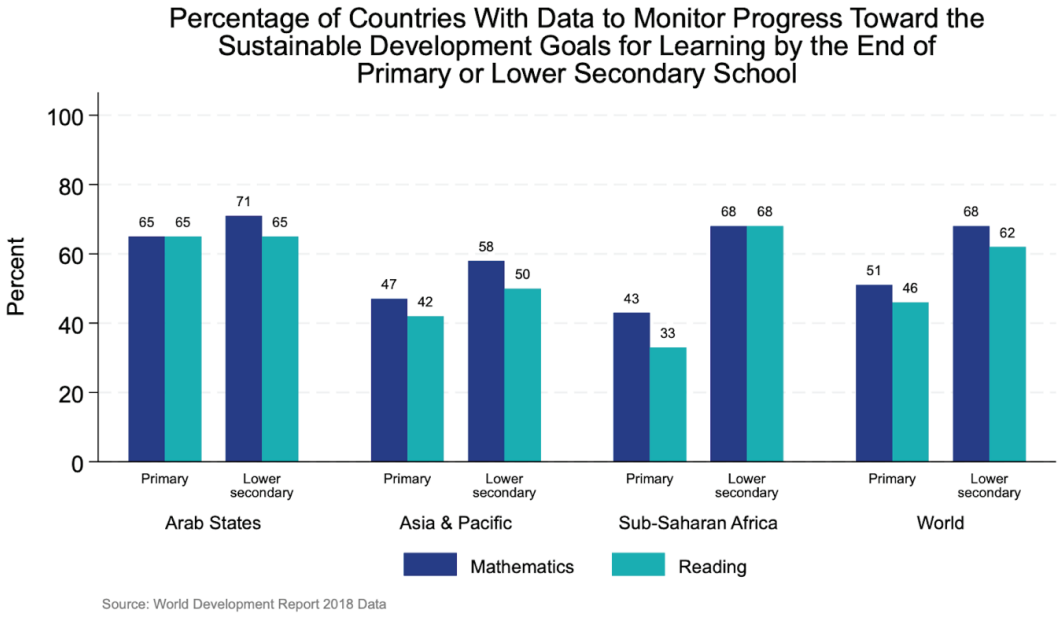
Literacy, the most extensively studied foundational skill, can also be examined among pupils in LMIC. Competency in this domain is essential for pupils to follow written instructions, engage with learning materials, participate in assessments, and gain knowledge in every core subject. However, evidence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

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

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

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

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



Source: World Development Report 2018 Data

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

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

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

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

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

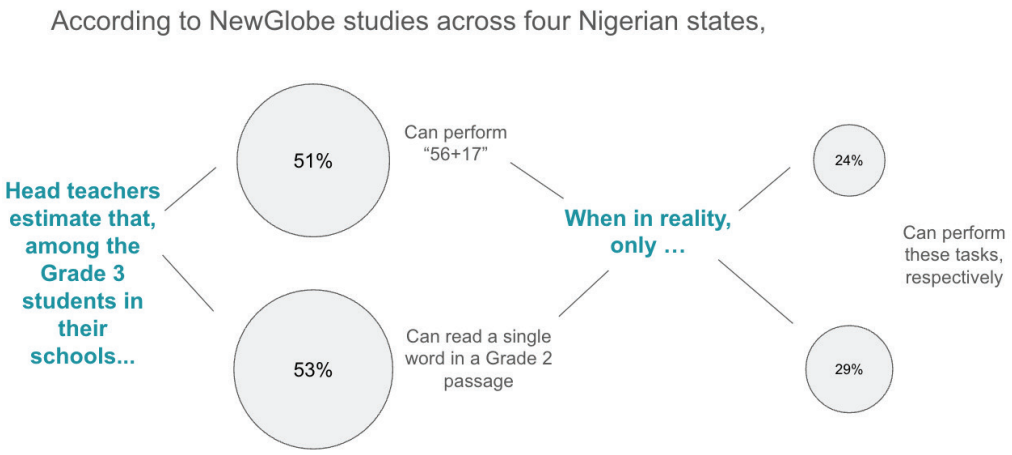
While longer school closures are correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in pupils' ability to keep pace with academic expectations. However, in nearly all low-income countries, more than half of the population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

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

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

Policymakers often underestimate the extent of the learning crisis

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



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

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

Increased heterogeneity in learning levels poses a new challenge

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

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

Providing the lowest-performing pupils with opportunities to catch up with their higher-performing peers can reduce the need for teachers to cater to a wide range of preparation levels within a classroom (Banerjee et al., 2007; Álvarez -Marinelli et al., 201921), as has remediation before or after school (Saavedra et al., 2017). Using technology to differentiate instruction – by presenting different material to pupils at different preparation levels – has had limited success; providing pupils with hardware, either by itself or pre-loaded with educational software intended for use in independent self-paced learning, has typically failed to improve learning outcomes (Cristia et al., 2017). What has been effective, however, is combining technology-based solutions with pedagogy that is responsive to pupils' current levels. Software that dynamically adjusts the content and difficulty of the material based on pupils' performance – as contrasted with pre-loaded, static content – had moderate to large impacts on achievement (Muralidharan et al., 2019).

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

The causes of weak learning outcomes are many

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

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

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

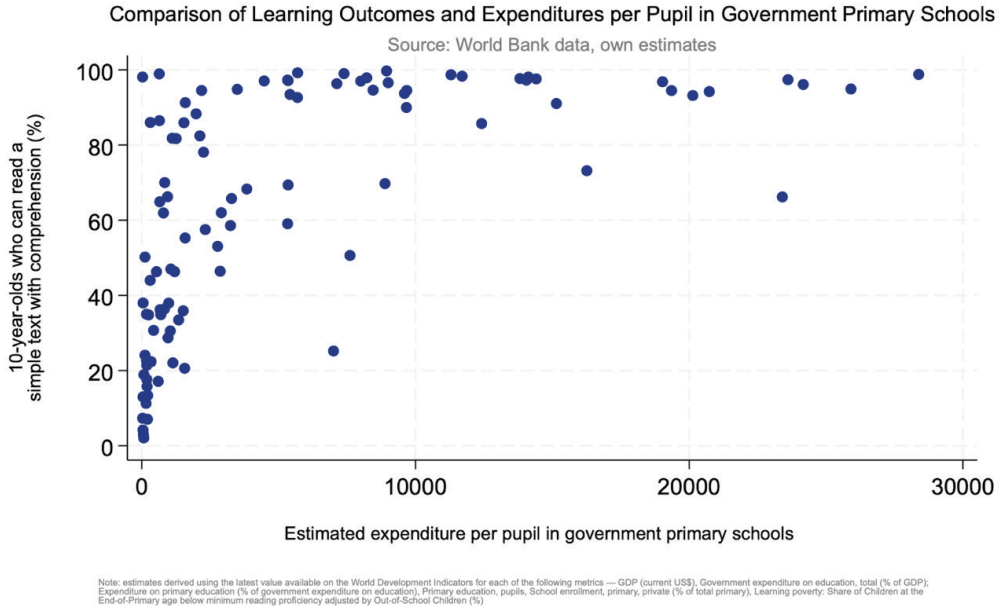
In response, it is imperative for education systems in LMIC to maintain momentum with holistic and proven-effective approaches, so that gaps in educational achievement do not widen during misdirected pursuits. Furthermore, curricular design should justify how and why material or technological inputs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

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

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

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

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



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

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

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

Low teacher content knowledge can translate into poorly executed pedagogy

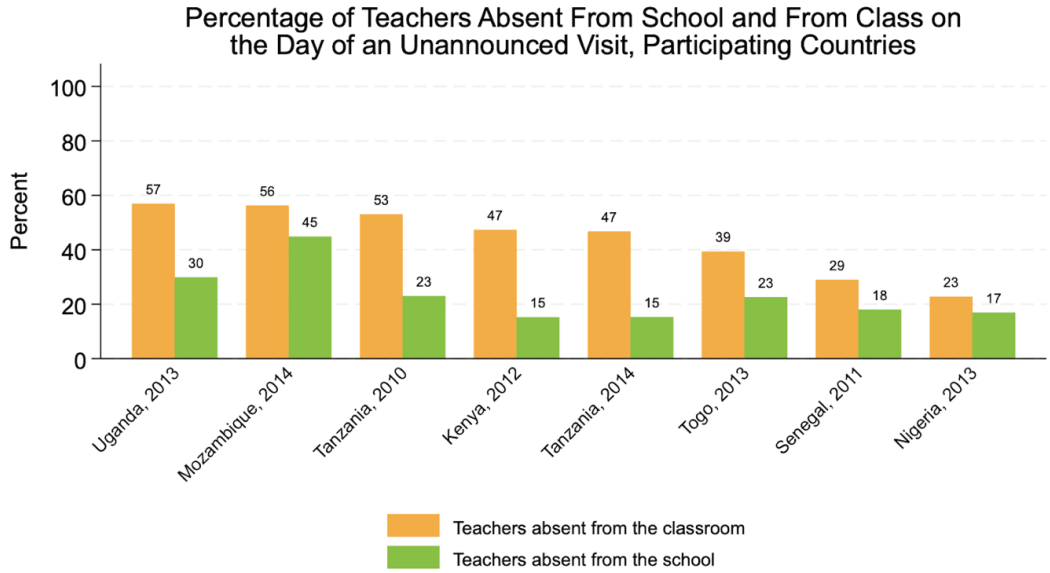
Teachers are central to what can be achieved in any classroom and are the most influential factor across all education systems (Vegas, 2020). Their professional competence and the rapport they build with pupils enables them to assess learning levels and help pupils reach their academic potential. However,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

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

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

Strong governance is essential for encouraging teacher professionalism and accountability

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



Source: World Development Report 2018 Data

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

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

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

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

Effective policymaking starts with reliable data

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

"It is essential that the decision-making process for improving education quality begin with the system-wide collection of robust, regular measurements on the state of learning."

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

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

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

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

Students with strong learning outcomes are more likely to achieve higher educational attainment and are subsequently more productive and fulfilled in the labour market. For instance, research by the World Bank in 2018, based on observations in 139 countries, found a 9% average increase in wages for every additional year of schooling (Patrinos and Psacharopoulos, 2018). The converse also holds true; pupils currently deprived of learning stand to lose a collective $10 trillion in potential labour earnings over their working lives, which will have broader detrimental effects on the economies where these former pupils live and work. These foregone earnings are equivalent to one-tenth of global GDP and are twice the global annual public expenditure on Primary and Secondary education (Azevedo, 202018). Moreover, comprehensive research shows that deficits in pupil performance could lead to a loss of $700 trillion from the global economy by 2100 (Gust et al., 2022). The failure of education systems to meet the needs of the global population could lead to large financial losses, not only by impeding individual pupils' chances for personal prosperity but also by reducing potential future investments in education for subsequent generations.

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

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

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

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

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

Elevating education quality standards drastically improves educational equity

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

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

Education systems must be improved holistically

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

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

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

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