BASIC EDUCATION SECTOR TRANSFORMATION

An Edo SUBEB Initiative

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

Evidence from Primary Progressive schools in Edo State by the end of the 2023–24 school year after 3 years of programme implementation

Dr Amen Uyigue, Sylvester Mchihi, Daniel Rodriguez-Segura, Keuna Cho, Priscilla Lu, Anchal Khandelwal, and Marlee Mullane


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July 2025

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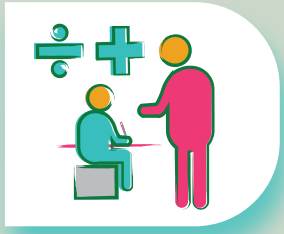
Executive Summary

Since the programme expanded to include the Progressive model in February 2022, reading fluency rates on a Primary 2-level passage in Progressive schools have increased by over 50%.

In February 2022, the average reading fluency rate across Progressive schools was 9 cwpm. As of July 2024, it has increased by 5 cwpm to 14.

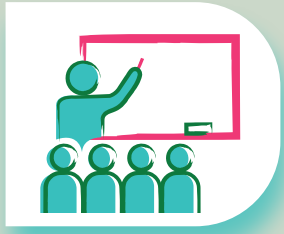
After just over 2 years of programme implementation, the rate of pupils unable to read a single word from a Primary 2-level passage dropped by 10%.

As of July 2024, 46% of pupils are non-readers; this is a 10% reduction (5 percentage points) from 51% before the programme.



Primary 1, 2, and 3 pupils have gained the equivalent of one year of maths instruction with the EdoBEST programme.

The average Primary 1 pupil in July 2024 scored higher on the ICAN than the average Primary 2 pupil did before EdoBEST. The same trend occurred with the two subsequent grade levels.



In the last year, reading fluency rates increased slightly overall; however, the rate of non-readers also increased.

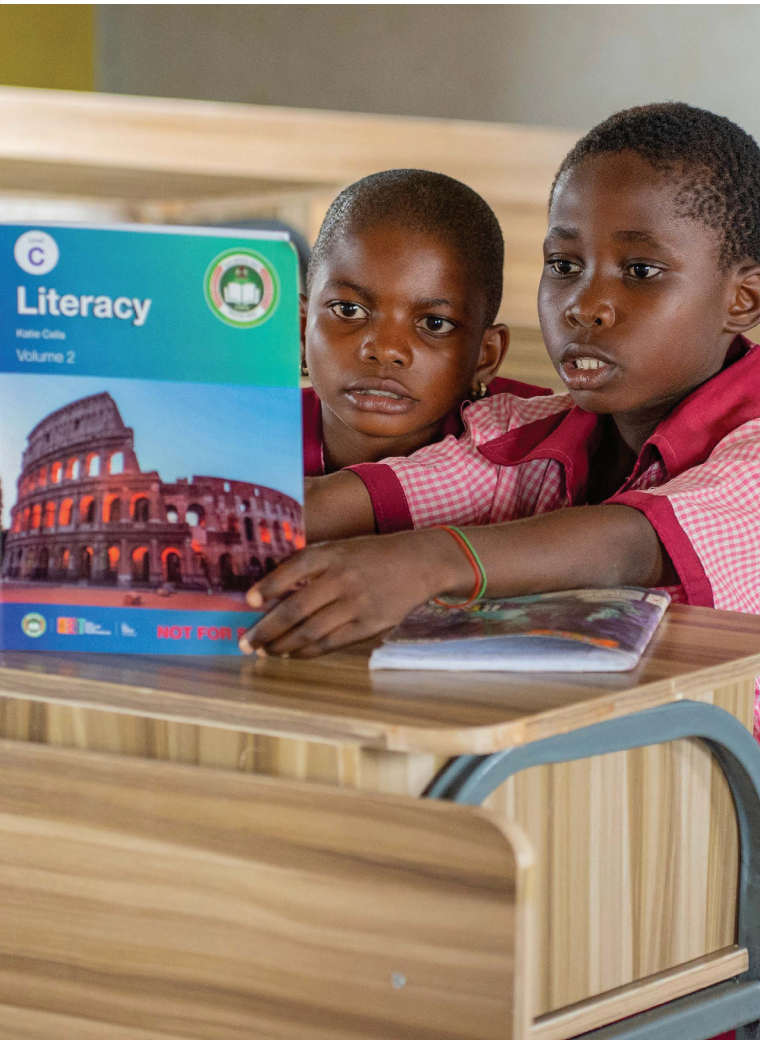
While the average reading fluency rate on a Primary 2-level passage increased by 2 cwpm in one year, the rate of non-readers in EdoBEST Progressive schools also increased slightly in the same time frame. Therefore, there is a wider range of literacy levels among pupils as of July 2024 than there was one year prior.

Maths test scores continue to improve with each year of the programme.

The average EdoBEST Progressive pupil in July 2024 scored 2% higher on the ICAN than the average pupil did one year prior.

Teacher attendance and lesson completion were both higher in the 2023-24 school year than they were in the previous year.

Teacher attendance in the 2023-24 school year was 79% on average, 5 percentage points higher than in 2022-23. Lesson completion rates also improved in that same time frame by 50%.



In Numbers:

50% increase in reading fluency rates since the programme was implemented

1 Extra Year of progress in mathematics for Primary 1-3

50% 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 over two years of operation, it is clear that these innovations have led to tremendous results. The following report — which tracks outcomes in schools implementing the Progressive model from before the expansion of 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 February 2022. 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 backbone of this project: the enumerators who collected the data used to write this report. We wish to thank Adesuwa Imafidon, Akinyemi Philip Yaboame, Ejemhen Usiado, Amenaghawon Ikponmwosa, Osahenoma Osayuware, Adedoyin Adetunji, Celia Edogun, Christiana Onosholema Eshemokhai, Cornelius Erohubie, Ebenezer Udukhagene Akharamhe, Ehifo Moses Ezomon, Gloria Ikhazuagbe, Itohan Idah-Omorodion, Endurance Afeiyodion, Faridah Abubakar, Enduarance Aluede, Endurance Aro, Excel Omoregbee, Faith Omo Okojie, Gloria Ikhazuagbe, Godwin Ehioze Aimuan, Grace Obih, Kenneth Osaghae, Henry Eruanga, Hope Emihian, Laura Otiti, Marian Ifaroumhe, Idia Friday Ohkiyaimeh, Ifunaya Onyinye, Jacob Umosekhaime, Jesuelo Ohwoka, Morgan Akinyele, Morgan Ebele, Jethro Omoragbon, Juliet Ajayi, Prince Nwaogu, Samuel Omoregie, Kelly Osagiator Osahon, Kingsley Mogbolu, Iyoha Ikponmwosa, Liberty Osahenoma, Mabel Obamila, Maimunat Ibrahim, Martin Ikuobase, Maxwell Esoehe Vekeyata, Nnedu Deborah, Ogboko Anthony Edugie, Momoh Priscilla, Nasamu Victor, Obeimhen Osoba, Atiborokor Patrick, Beauty Odogun, Ogboko Anthony Edugie, Osarobo Michael, Osarumwense Erhunmwunse, Osose Hebrewess Ebosetale, Patrick Evboumwan, Patrick Osarinwian, Prescillia Osahon, Rosemary Akhigbe, Samson Otokurin, Sandra Emiulimhe Eghele, Shadrach Ogiriga, Sharon Major, and Edward Amrerhoro for their outstanding commitment and work in data collection.

II. The EdoBEST Progressive Model

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. In February of 2022, the government then launched a carefully adapted version of the EdoBEST programme called EdoBEST Progressive.

The Progressive model was designed specifically for Primary schools in Edo State with low pupil enrolment and low teacher staffing. In these schools, there are fewer teachers than streams (groups of pupils in a classroom who would learn from one teacher, typically grouped by grade level). This means they cannot employ the typical "Primary" model in which one teacher is assigned to a classroom with pupils who are all in the same grade level. For these particular schools, classified as "Progressive" schools, the EdoBEST programme is implemented using the "Progressive" model.

While the "Primary" model follows a more traditional model of one-teacher-one-classroom with grade-level grouping of pupils, the "Progressive" model uses multigrade teaching. Multigrade teaching assigns a single teacher to two or more grade-level classrooms, thus ensuring that every pupil has a teacher delivering high-quality instruction during every lesson of the day. Multigrade instruction remains a pillar of the Progressive model, and a central strategy to continue empowering schools with fewer teachers than classrooms to deliver effective instruction for every pupil.

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

1. Scientifically-based teaching and learning materials, following the principles of structured pedagogy, that align with state curricular standards and prioritise foundational skills
2. Integrated technology in classrooms and management systems
3. Training and ongoing support for teachers, head teachers, regional officers, and government staff
4. Strategies 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 Progressive 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. 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.

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

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

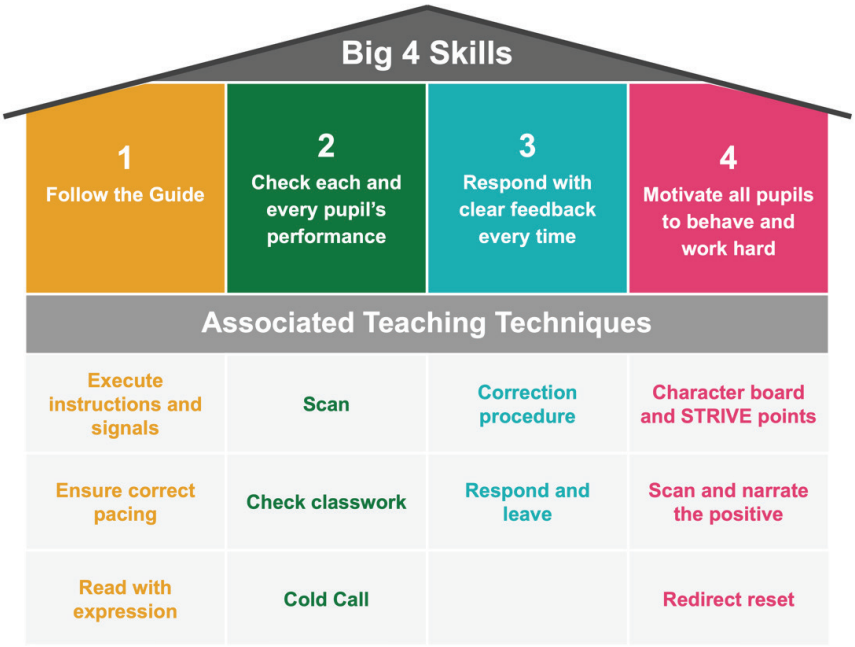
Teacher training

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 Learning and Development Officers 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.

Learning and Development Officers 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, Learning and Development Officers – 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 Learning and Development Officers 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.

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.

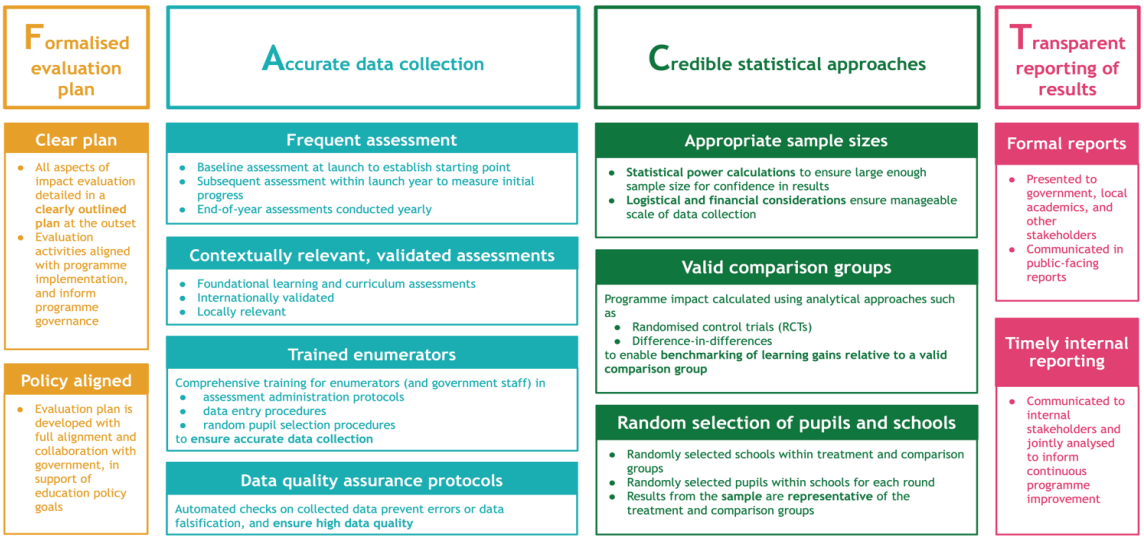
5. Rigorous methodologies for measuring programme effectiveness and identifying areas for improvement

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 (for details, see Figure below). 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 pupil- and item-level data to centralised platforms, enables ongoing analysis of performance trends that inform programmatic decision-making, while also saving teacher time and increasing the accuracy of the marking process. **"Termly assessments"** – teacher-led assessments of learning in all subjects, which are standardised across the programme – are conducted at the end of each term, enabling the identification of areas, schools, or teachers that are not performing at expected levels and require additional support. Census-level assessments of numeracy and literacy skills, conducted as part of **Foundational Literacy and Numeracy Day**, further enable the 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. Methodology

Evaluating the Impact of the Programme

Descriptive analysis

Because the EdoBEST programme has been implemented in all 148 low-enrolment 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, a descriptive study was conducted, assessing learning outcomes at various points throughout the programme's implementation and monitoring the changes in pupil performance over time.

The Progressive model of the EdoBEST programme was first introduced to schools in February of 2022. As such, this study includes three phases, the first of which is not a full school year. The first phase corresponds to the period between the launch of the programme in February 2022 and the end of the school year, encompassing 17 weeks of instruction taking place during Terms 2 and 3. The second phase encompasses the 2022–23 school year, and the third phase encompasses the 2023-24 school year. Data were collected in a total of four rounds: at the programme's launch (February 2022), the end of the 2021-22 school year, the end of the 2022–23 school year, and the end of the 2023-24 school year.

EdoBEST Progressive Data Collection Timeline

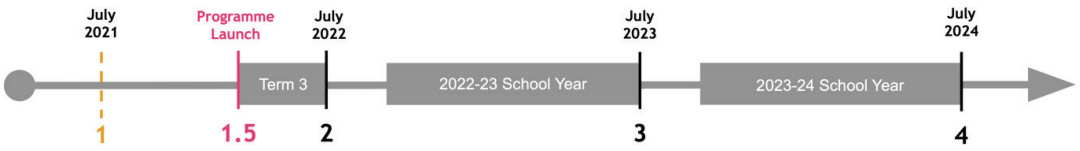


Figure 3.1

To assess the impact of the EdoBEST Progressive model, cross sectional data are collected at the end of each school year. Because the same pupils are not followed from year to year, it is important to collect data at the same point each year to enable consistent comparisons. To evaluate the programme's cumulative impact, July 2024 data are compared to estimated learning levels from before the programme's implementation. In order to estimate end-of-year levels before the programme, data collected at baseline (February 2022) were projected back to July 2021. Differences across grade levels in metrics (specifically oral reading fluency rates and ICAN scores) were calculated in order to estimate typical annual growth rates. For example, in February 2022, if pupils in Primary 1 could read 2 cwpm and those in Primary 2 could read 8 cwpm, the expected annual growth of Primary 1 pupils before the programme was **6 additional cwpm**. If these differences between grade levels were then divided in two (because baseline data were collected half way through the year) and subtracted from February 2022 Primary 2 levels, the estimated Primary 1 reading fluency rate in July 2021 would be **5 cwpm** (Figure 3.2). This method was followed for each grade using baseline data, resulting in estimated end-of-year learning outcomes for each grade level prior to the programme. Because these calculations require data for two consecutive grades, Primary 6 is excluded from most of the analyses, as there is no comparable JSS 1 data from a similar set of schools. These projected levels serve as a point of comparison for the actual levels observed at the end of subsequent school years.

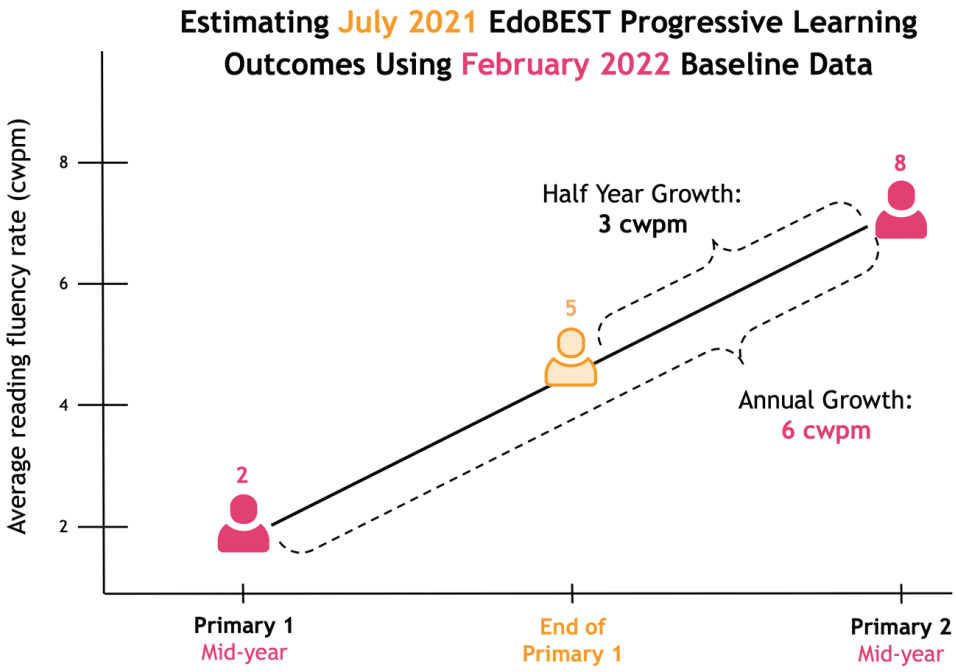


Figure 3.2

Sampling Schools and Pupils

School selection

In total, data were collected from 72 EdoBEST schools. Of those 72, 66 were selected based on strata constructed by Leadership and Development Officers' (LDOs) groups of schools. However, within this sample of 66 schools, enumerators found that some schools had fewer pupils than expected. In order to maintain an adequate sample size, 6 additional schools were also randomly selected, thus resulting in 72 total sampled schools. Because the additional schools came from a randomly selected list, their inclusion does not threaten the representativeness of the sample.

Pupil selection

Across all rounds of data collection, 1,476 pupils were assessed per round on average. Across all schools that were originally visited at baseline, some of the selected schools had fewer than 4 pupils per grade in attendance, with enrolment and attendance being inconsistent between grade levels. When possible, 4 pupils per grade were assessed. However, particularly in Primary 4, 5, and 6, there were often fewer than 4 pupils in attendance. Therefore, fewer pupils were assessed in upper-Primary grades (3 pupils per grade) compared to lower-Primary grades (4 pupils per grade). Across all grade-levels, pupils were randomly selected, meaning that the sample is representative of the entire EdoBEST Progressive population.

Learning Assessments Used

English oral reading fluency

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 grade-level materials.

Mathematics proficiency

Pupils' mathematics skills were assessed using the **International Common Assessment of Numeracy (ICAN)**, 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

Teacher attendance, pupil attendance, and lesson completion rates

The programme's technology allows the EdoBEST team to collect data on pupil attendance, teacher attendance, and lesson delivery in real-time. Tracking these metrics and comparing data over time can yield insights on longitudinal trends in instructional quantity. For more information on the importance of teacher attendance, see Box 1.

Box 1: Teacher Absenteeism in Low- and Middle-Income Countries: Challenges, Implications, and Effective Solutions

Teacher absenteeism is a deep and widespread challenge that jeopardises returns on substantial investments in pupil learning outcomes and enrolment outreach (World Bank Group, 2017). Teacher salaries in low- and middle-income countries (LMIC) often represent a significant portion of the public education budget. For instance, in Uganda, Tanzania, Nepal, and Namibia, 60–95% of the government budget that is earmarked for education is invested in teacher salaries. Yet, high rates of teacher absenteeism have been consistently recorded across many LMIC: In a global study, teachers were not in school 16% of the time in Bangladesh, 18% of the time in Togo and Senegal, and 45% of the time in Mozambique (Chaudhury et al., 2006). Even among the teachers that were present in school across 8 sub-Saharan African countries, less than half of them were found to be in their assigned classrooms during instructional time when measured by the World Bank via drop-in visits (World Bank Group, 2017). Hence, the large shares of fiscal resources spent on teacher salaries, coupled with the ingrained prevalence of teacher absenteeism, indicates that the fiscal and educational repercussions of this issue are a serious policy concern that deserve immediate governmental action.

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

For pupils, the most direct consequence of teacher absenteeism is significantly reduced instructional time, which translates into weaker learning outcomes. According to The World Bank's Service Delivery Indicators, out of the 8 LMIC that were surveyed in sub-Saharan Africa, including Nigeria, Kenya, Uganda, and Togo, an average of 2 hours and 46 minutes of instructional time was lost daily due to teacher absenteeism (World Bank Group, 2017). Teacher absenteeism not only detracts from total learning time, but also negatively impacts the quality of learning that takes place in school (Vargas & Patricia, 2016). When classes are combined to compensate for inconsistent teacher attendance, pupils experience disruptions in their lessons. Furthermore, chronically absent teachers were found to be less productive in school when compared to their peers (Utami & Vioreza, 2021). This lack of consistency and quality contributes to parents' and pupils' poor perceptions of the public education system, which leads to lower rates of enrolment and attendance among pupils, therefore permanently stunting their positive educational trajectories (World Bank Group, 2017).

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

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

IV. The State of Education Before EdoBEST Progressive

In order to adequately contextualise the findings of this report, it is essential to recall the educational landscape in participating schools prior to the implementation of the EdoBEST Progressive model. To provide a comparison for end-of-year learning outcomes, data from non-EdoBEST schools were collected at the end of 2022 and projected to reflect the end of the 2021 school year. The following section is a summary of key findings from projected July 2021 data, designed to accurately contextualise the impact of the EdoBEST Progressive model.

Pupils Struggled to Read a Simple English Text

Reading fluency rates in understaffed, low-enrolment schools were critically low across all Primary grades before the programme. For example, across Primary 1, 2, 3, and 4, the average pupil could only read 4 cwpm, meaning that it took the majority of Primary pupils at least 15 seconds to read aloud a single English word such as 'was' or 'on'. Even by Primary 5, after pupils had spent five years in the public education system, they were only able to read 26 cwpm on average from a Primary 2-level text (Figure 4.1). By contrast, according to the Hasbrouck and Tindal reading fluency norms, the median Primary 1 pupil in a high-income, English speaking country is able to read 60 cwpm by the end of the school year. Therefore, pupils in understaffed, low-enrolment Edo schools were years behind their international peers in literacy. These relatively low fluency rates likely hindered pupils' ability to learn in other classes as well.

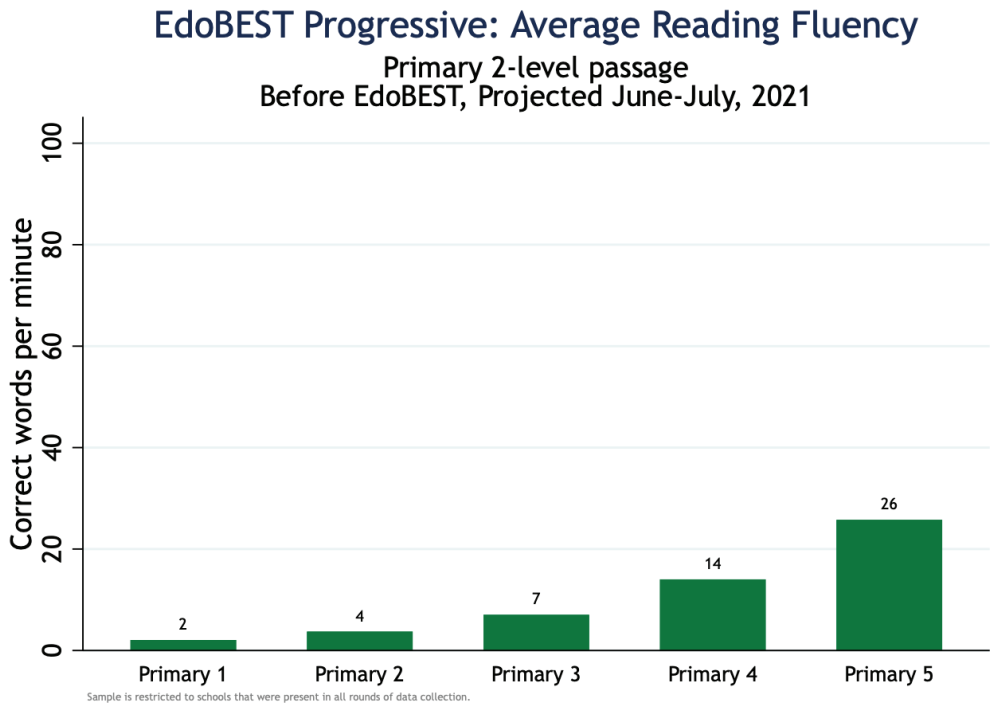


Figure 4.1

Pupils Were Far Behind National Maths Expectations

Pupils displayed low achievement levels on basic foundational skills that should be mastered in early Primary grades, according to the NERDC curriculum. For example, prior to the programme, nearly half of all Primary 5 pupils were unable to solve a simple division problem such as '9÷3' (Figure 4.2). The NERDC classifies exact division as a Primary 3-level skill. Therefore, according to the projected baseline data, over half of all Primary 5 pupils were approximately 3 years behind national maths expectations. By the same standard, 4-in-5 Primary 3 pupils failed to meet grade-level maths expectations as set by the NERDC.

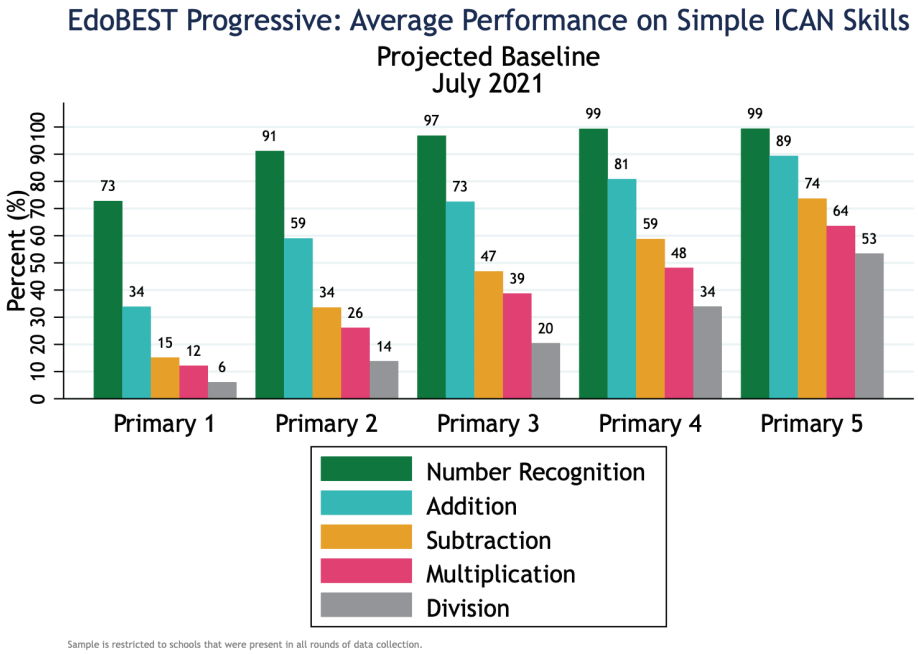
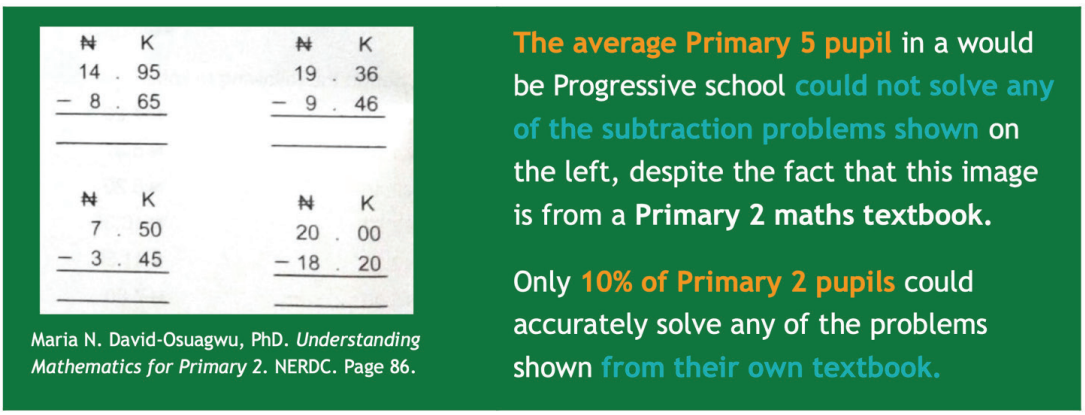


Figure 4.2

These poor results on computational maths problems translated to poor performance on word problems as well. In July 2021, it is estimated that only 1-in-3 Primary 5 pupils were able to solve a word problem involving subtraction with borrowing such as: **'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?'** A similar trend was found in regards to a word problem involving division. While 53% of Primary 5 pupils could solve a division problem without a remnant such as '9÷3', only 8% of all Primary 5 pupils could solve a word problem involving the same computation (Appendix E, Figure a.7). This level of performance was not surprising, given that these pupils' overall numeracy and literacy levels were both low, making it difficult for pupils to read, understand, and solve real world problems.



Learning Outcomes Were Disproportionately Worse in Would-Be Progressive Schools

There are multiple reasons as to why learning outcomes in would-be Progressive-model schools were lower than Primary-model schools in February 2022. Firstly, schools that would eventually implement the EdoBEST Progressive model were not a part of EdoBEST when it first launched in 2018 because they required a different version of the programme. Because of this, would-be Progressive schools received the EdoBEST programme years after the Primary-model schools. Secondly, the external factors that have led to low enrolment and staffing in would-be Progressive schools are likely to have negatively influenced learning outcomes as well.

Before the development of the EdoBEST Progressive model, learning levels in would-be Progressive schools were lower than those in schools that were already implementing EdoBEST under the Primary model. In February 2022, pupils in would-be Progressive schools were reading at only 10-25% the reading fluency rate seen in pupils in the EdoBEST Primary programme at the start of the 2021-22 school year (Figure 4.3). These results underscore the fact that would-be Progressive schools were in dire need of a programme designed to improve foundational literacy rates and improve the efficacy of the schools themselves.

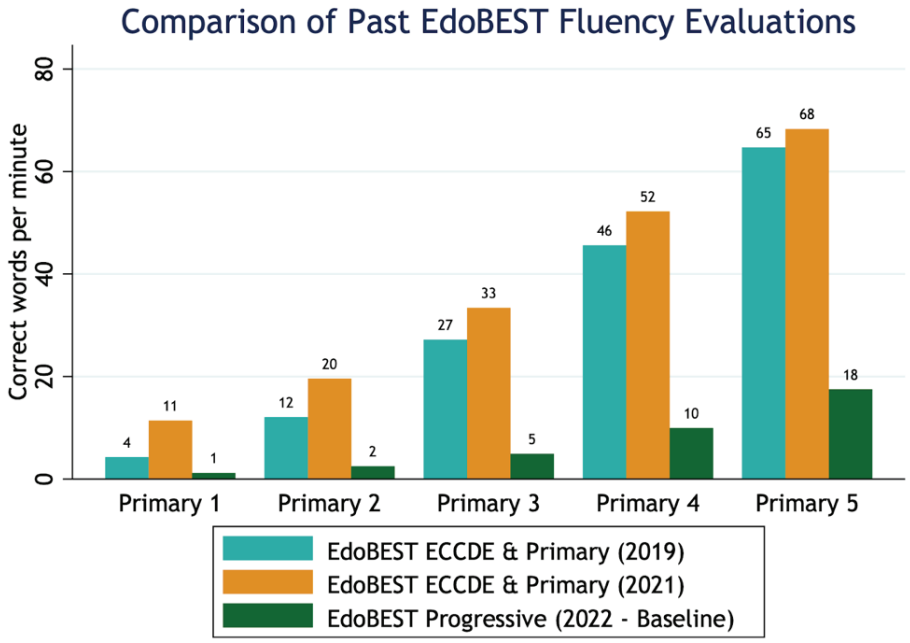


Figure 4.3

V. The Cumulative Impact of EdoBEST Progressive

Foundational Literacy Rates Have Improved Overall

Pupils are reading more fluently than pupils did before the programme was implemented

English reading fluency rates have also improved overall, with the largest gains being concentrated in upper-Primary grades. The average fluency rate in EdoBEST Progressive schools increased by over 50% (6 cwpm) after less than 3 years of the EdoBEST programme. The largest gains were seen in Primary 5, with pupils in 2024 reading 12 cwpm more from a Primary 2-level passage than pupils in 2021. Primary 3 and 4 also saw impressive gains in fluency. **In Primary 3 and 4, pupils are now almost an entire grade level ahead of where they would have been without the EdoBEST programme.** For example, prior to the programme's implementation, the average pupil could read 14 cwpm at the end of Primary 4. As of July 2024, pupils are able to read at this speed by the end of Primary 3. The same pattern holds true for the grade above; Primary 4 pupils can now read as fluently in July 2024 (25 cwpm) as a typical Primary 5 pupil could before the programme. Therefore, **the EdoBEST programme has effectively raised oral fluency levels in Progressive schools by the equivalent of one year's worth of instruction.**

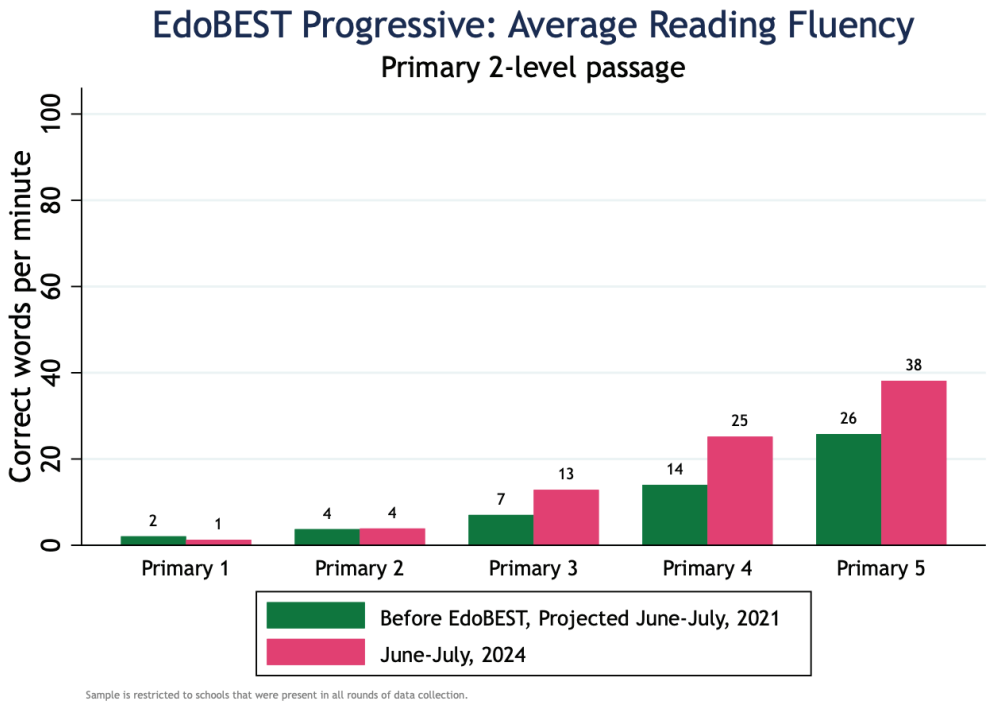


Figure 5.1

The rate of non-readers decreased in upper-Primary grades

Since EdoBEST Progressive was launched, **the percentage of pupils who cannot read a single word from a Primary 2-level English passage has decreased by 10%** (5 percentage points) on average. The most progress in this area has been made in Primary 4 and 5 (Figure 5.1). Prior to the programme's rollout in would-be Progressive schools, over 1-in-3 (34%) Primary 4 pupils could not read a simple English word such as "was" or "on". As of July 2024, that rate has dropped to less than 1-in-4 (24%). In Primary 5, less than 1-in-5 (17%) pupils are now unable to read a single word. These results are promising, as they indicate that EdoBEST Progressive schools are improving their ability to serve low-performing pupils in upper grades, who typically would be left behind by increasingly difficult curriculum.

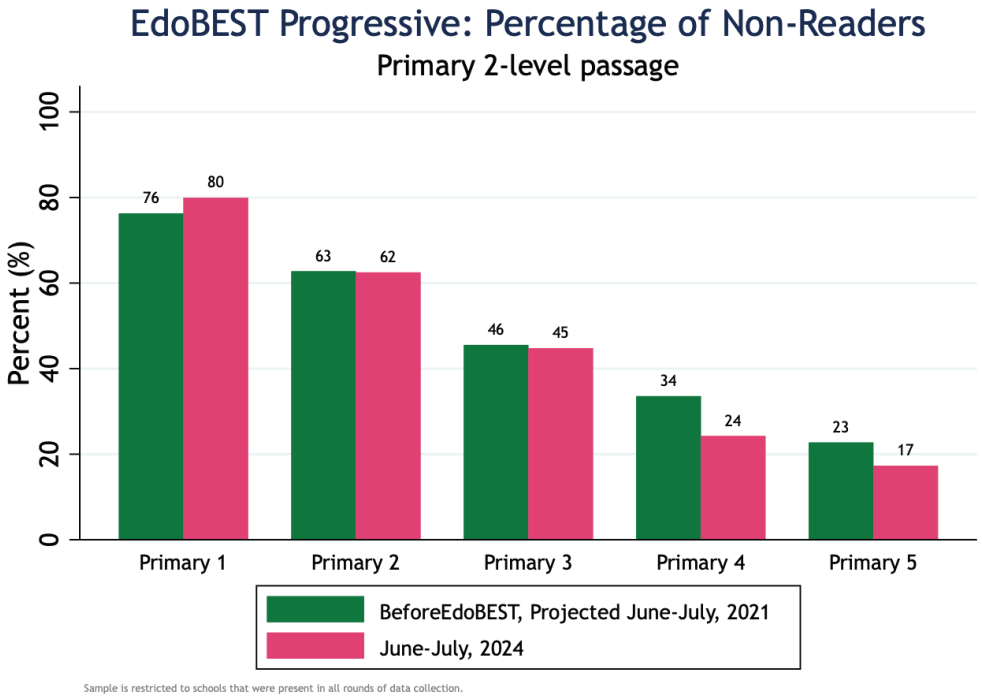


Figure 5.2

Literacy Rates Have Yet to Improve in Primary 1-2

In contrast to the growth seen in Primary 3-6, average reading fluency rates have decreased in Primary 1 and remained constant in Primary 2. The average Primary 1 reading fluency rate has dropped slightly from 2 cwpm to 1, and Primary 2 has remained consistent at 4 cwpm. The rate of non-readers followed the same trend, increasing in Primary 1 from 76% to 89%, and remaining steady around 63% in Primary 2. While these deficits are ultimately offset in later grades, they suggest that some pupils are taking slightly longer to develop reading proficiency. This delay hinders their capacity to learn, as their time in school as proficient readers is subsequently limited. For more information on the importance of foundational skills, see Box 2.

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

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

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

To increase overall learning levels, education systems must support *universal*, *early*, *conceptual*, and *procedural mastery* of *foundational skills* (Belafi et al., 2020). Universality ensures that learning progress is being made and measured for all children, regardless of socioeconomic status, gender, race or ethnic group, or whether the child is in school. Early mastery of foundational skills is critical, as learning gaps widen throughout grade progression (Belafi et al., 2020). Developing conceptual mastery – so that children understand the concepts behind what they are learning, rather than simply memorising content through rote instruction – is as important as procedural mastery – in which children become facile in the practical application of their conceptual knowledge to solve problems (Kilburn, 2020). Implementing all of these components in conjunction is necessary for an effective and equitable approach to teaching and learning.

Insufficient focus on mastery of foundational skills can lower overall levels of learning, resulting in an education system that does not yield results commensurate with the resources invested. Conversely, education systems that prioritise universal, early, conceptual, and procedural mastery of foundational skills in schools' curricula can have profound, far-reaching impact, leveraging existing resources more effectively to increase learning for a broad population. A system-wide commitment to prioritising mastery of foundational skills is a necessary step that not only lays the groundwork for greater academic success later in children's lives, but also effectively closes national and global equity gaps through more impactful educational investments.

Foundational Maths Outcomes Have Improved in Every Grade

Pupils in EdoBEST Progressive schools now score much higher on the ICAN than pupils did at the end of the 2020-21 school year. In July 2021, Primary 1-5 pupils scored 36% on the ICAN on average. Three years later, the average ICAN score is nearly 50%. **Maths proficiency has improved to such an extent that many pupils are a full year ahead of where they would have been without the programme**. For example, the average Primary 2 pupil scored 38% on the ICAN in July of 2024. This is 2 percentage points higher than the average ICAN score of a Primary 3 pupil in July of 2021. A similar pattern holds true for Primary 3 and 4 in 2024. This impact underscores the extent to which the Edo State education system has become more effective in fostering pupils' maths skills, with EdoBEST instruction accomplishing in one year what used to take two.

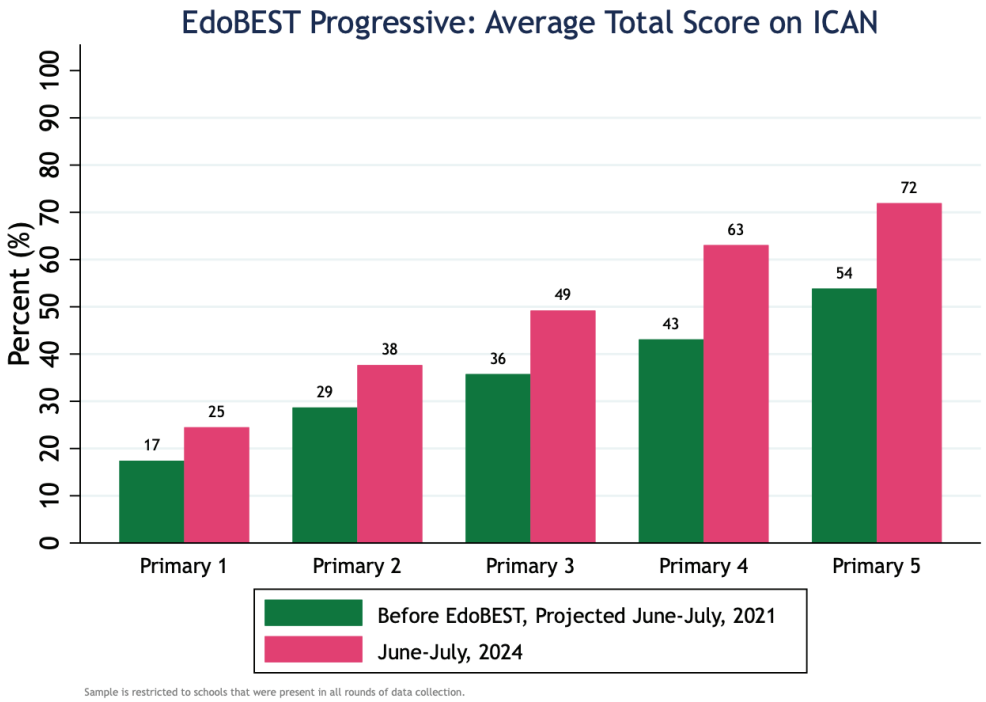


Figure 5.3

To better understand the implications of this progress, it is useful to consider the impact on specific numeracy subskills. Prior to the programme, 1-in-5 Primary 4 pupils could not solve a simple addition problem such as '32+15', despite having spent at least 4 years in school. As of July 2024, that rate has dropped to less than 1-in-10. The same is true for multiplication. Prior to the programme, only 39% of Primary 3 pupils could solve '2x4' at the end of the school year. After three years, that percentage has risen to 61%. Moreover, in 2024, more Primary 2 pupils are able to solve '2x4' than Primary 3 pupils were able to in 2021. Given that mastery of core maths operations is essential for both academic and economic success, pupils entering these schools in 2024 have a greater chance of finding success beyond Primary school than those who were in the system less than three years ago.

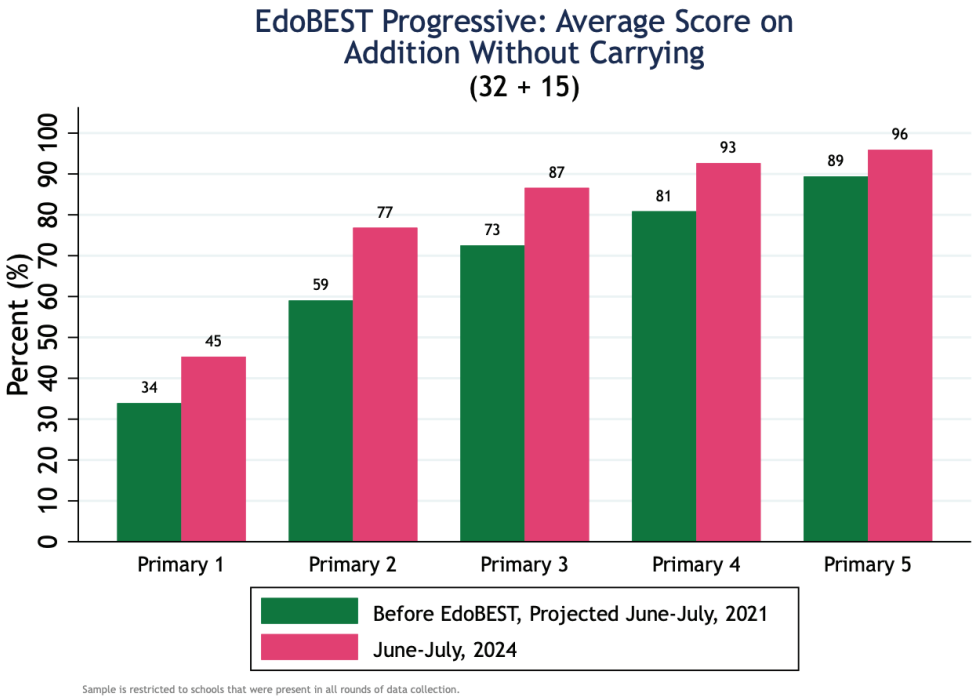


Figure 5.4

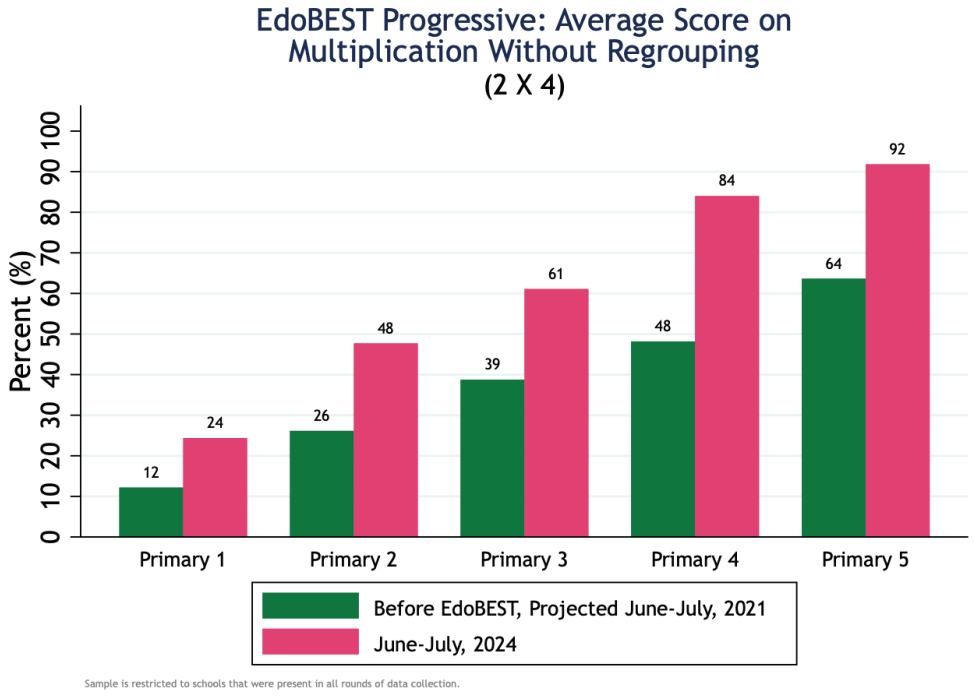


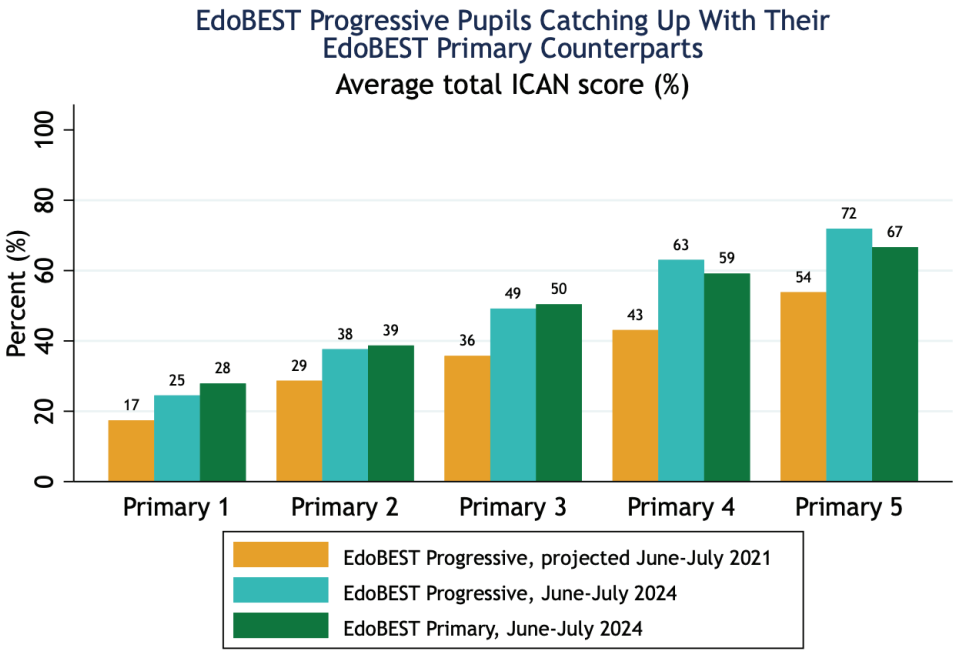
Figure 5.5

The EdoBEST Programme Continues to Close the Gap Between Primary- and Progressive-Model Schools in Maths

Schools that adopted the Progressive model of the EdoBEST programme in February 2022 were those that lacked sufficient staff to properly implement the programme across all grades when it was first introduced in 2018. These understaffed schools experienced disproportionately worse learning outcomes compared to other Primary schools in Edo State. Due to these staffing shortages, they required targeted, evidence-based staffing solutions in conjunction with the EdoBEST programme to maximise learning gains. The Progressive model was designed to support these schools through multigrade teaching, integrating the EdoBEST methodology with multigrade strategies to ensure high-quality education despite staffing challenges. After over two years, the EdoBEST Progressive model has successfully raised learning levels in these understaffed schools.

Maths levels in Progressive schools have exceeded those in Primary-model schools

The average Primary 4 and 5 pupil in an EdoBEST Progressive school now scores 4-5 percentage points higher on the ICAN than their peers in Primary-model schools. Given that Progressive-model schools had disproportionately worse outcomes than Primary-model schools before the programme's implementation, this is a deeply impressive accomplishment. By empowering these schools and teachers with this support, we see clear evidence that teachers are delivering effective instruction, providing pupils with the foundational knowledge they need to succeed in and beyond their academic careers.

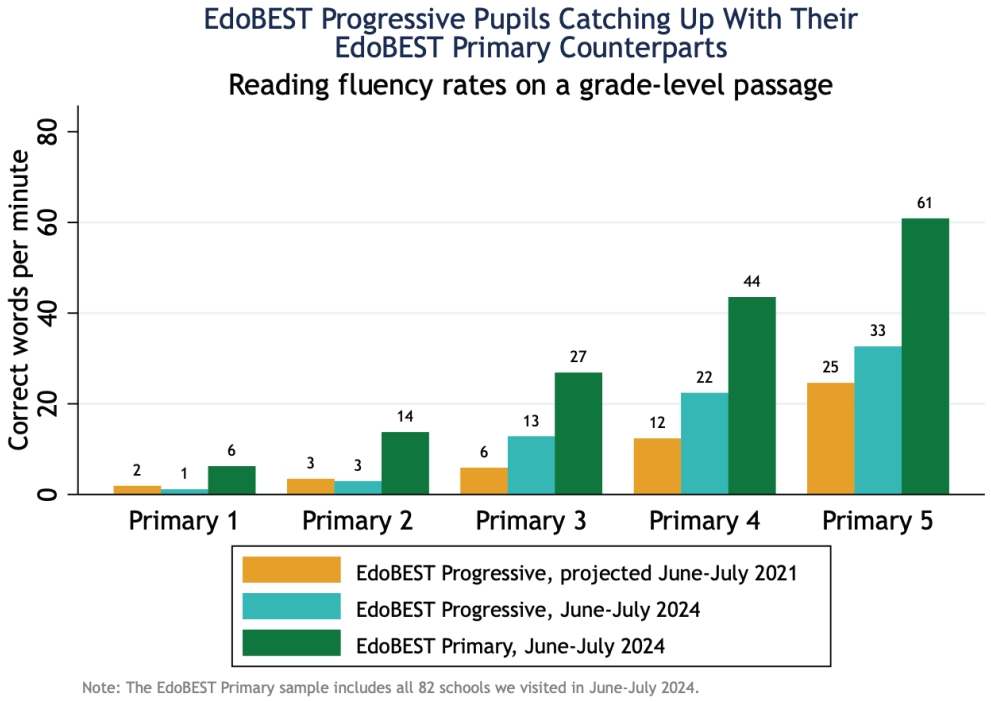


Note: The EdoBEST Primary sample includes all 82 schools we visited in June-July 2024.

Figure 5.6

Progressive schools continue to catch up to Primary schools in literacy

The gap in literacy levels between Progressive- and Primary-model schools has diminished since the EdoBEST Progressive model was introduced. For example, in July 2021, the average Primary 3 pupil in a Progressive-model school could only read 6 cwpm from a grade-level passage - 14 fewer cwpm than their Primary school counterparts. After three years of the programme, the average reading fluency has more than doubled to 13 cwpm, significantly closing the gap with Primary 3 EdoBEST Primary pupils (Figure 5.7). In every grade assessed, the gap between Progressive-model schools and Primary-model schools' fluency rates has decreased. It is important to note that, while significant progress has been made, there are still gaps in literacy outcomes between Primary- and Progressive-model schools. For example, the average pupil in an EdoBEST Primary-model school can read both a grade-level passage and a Primary 2-level passage twice as fast as the average Progressive-model school pupil. This disparity in reading fluency indicates a clear need for continued systemic, academic support in Progressive-model schools.



Note: The EdoBEST Primary sample includes all 82 schools we visited in June-July 2024.

Figure 5.7

It is important to note that EdoBEST Primary schools and EdoBEST Progressive schools are very different for multiple reasons. For one, levels shown for Primary-model schools represent achievements after seven years in the EdoBEST programme. The EdoBEST Primary programme has therefore had many more years to improve learning outcomes. Secondly, Progressive schools are operating with fewer staff members. While multigrade teaching in the Progressive model ensures that all pupils are receiving instruction for every lesson, teachers are therefore tasked with teaching multiple grades at once. This can make teaching more challenging, including catering to a wider distribution of age and developmental levels, and also navigating the demands of multiple grades' syllabi. Therefore, while it is extremely impressive that Progressive-model schools are catching up to Primary-model schools in terms of learning outcomes, it is crucial that instruction in Progressive-model schools continue to be tailored to their specific needs through appropriately levelled curricula and strategic, evidence-based staffing strategies.

VI. Annual Results as of July 2024

Foundational Literacy

Slight improvements were seen in oral reading fluency rates

As of July 2024, a typical EdoBEST Progressive pupil now reads 1-2 cwpm more than what their peers in the same grade read in July 2023. This is promising, as it is consistent with annual gains seen in previous years. This consistent growth is indicative of the continued success of the programme even after multiple years of implementation. Interestingly however, changes in reading fluency rates are inconsistent across grade levels, with gains being concentrated in Primary 3 and 4. For example, the average Primary 4 pupil in July 2024 reads over 20% faster than the average Primary 4 pupil did in July 2023. By contrast, Primary 1 and 6 reading fluency rates are lower in July 2024 than they were the year prior. Oral fluency rates among Primary 2 and 5 pupils did not change on average.

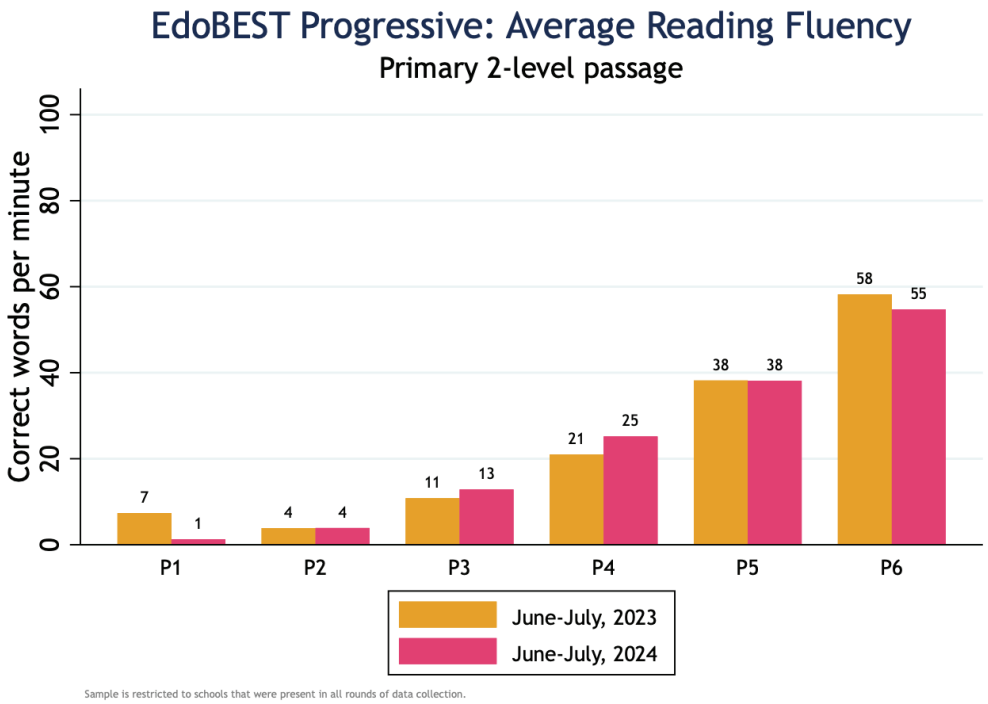


Figure 6.1

The rate of non-readers increased slightly over the last year

The rate of non-readers in EdoBEST progressive schools has increased since July 2023. At the end of the 2022-23 school year, an estimated 43% of Primary 1-5 pupils were unable to read a single word from a Primary 2-level passage. At the end of the 2023-24 school year, that percentage increased to 46%. This increase is, again, inconsistent across grades. For example, the rate of non-readers in Primary 1, 3, and 5 increased, while Primary 2 and 4 saw a decrease. This inconsistency highlights the importance of continued data-driven instruction to ensure alignment between learning materials and pupils' learning needs.

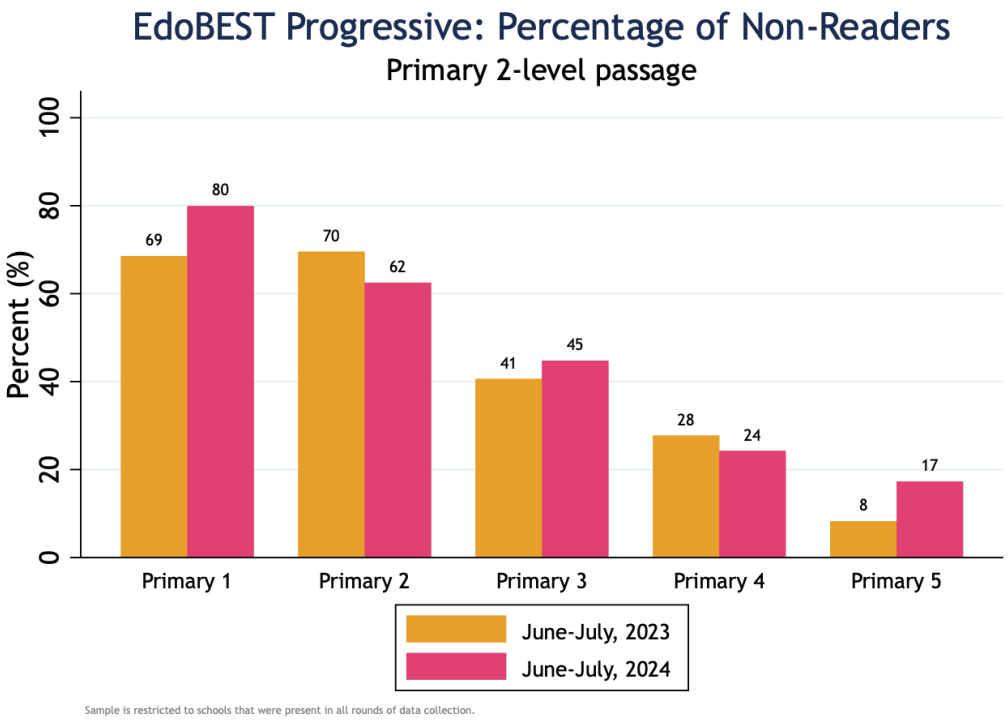


Figure 6.2

The increase in both reading fluency rates and the number of non-readers in the most recent year of the programme has led to greater variability in literacy levels. This wider range of reading abilities requires teachers to adapt their instruction to meet diverse needs. This underscores the need for data-driven levelling and differentiated instruction in EdoBEST Progressive schools in order to properly support teachers. For more information on the importance of providing appropriately levelled instruction to pupils, see Box 3.

Box 3: Meeting Children Where They Are: Designing Curricula to Target Appropriate Learning Levels

Curricula play a crucial role in educational systems, because they standardise content and instructional approaches on a system-wide scale. Ideally, curricula should align with the economic and developmental needs of pupils and the system. However, in many low- and middle-income countries (LMIC), researchers have documented a discrepancy between pupils' actual academic needs and curricular expectations, resulting in 'overambitious curricula' (Pritchett & Beatty, 2015). In other words, many education systems have curricula that fail to focus on key fundamental skills, such as literacy and numeracy (FLN), and instead expect pupils to learn at a much faster rate than what is feasible. This discrepancy has been suggested to be one of many contributors to the current learning crisis (Glewwe et al., 2009; Muralidharan et al., 2019). Importantly, poorly levelled curricula that drive low FLN outcomes are not exclusive to the early grades, due to the cumulative nature of learning. Pupils who perform poorly in early elementary school are more likely to drop out compared to their peers (World Bank, 2017). On the other hand, mastery of FLN skills is correlated with future success in Secondary school and future employment opportunities (Evans and Hares, 2021; Muralidharan and Sundararaman, 2010). Therefore, effectively implemented, large-scale curricular reform focused on FLN skills in LMIC can bridge the gap between pupils' knowledge and policymakers' educational goals and lead to improved learning outcomes and increased regional economic productivity.

Curricular changes which increase focus on FLN, either through stronger pedagogy or more instructional time, have been shown to assist low-performing pupils in achieving national standards. For example, a study in India implemented a curriculum better suited to the median pupil with scientifically tested learning materials and accessible technology. The result was improvements in Maths and Hindi after just 4.5 months (Muralidharan et al., 2019). In Tanzania, restructuring early elementary curriculum to better suit the median pupil was found to increase all participating pupils' literacy and maths proficiency in Primary 1 and 2. Pupils were twice as likely to reach minimum benchmarks in Primary 2 maths and significantly improved their language proficiency compared to pupils who did not receive the restructured curriculum (Rodriguez-Segura & Mbiti, 2022). In both studies, researchers note that a key element to the success of these programmes was the initial low learning outcomes in the education system. Aligning instruction to the median pupil's needs led to widespread benefits, as the median pupil in many LMIC tends to have similar outcomes to the lowest performing pupils. Also, in both India and Tanzania, these curricular reforms were found to be cost-effective in that they did not require expensive inputs such as increased staffing or additional classroom resources. Because curricula can be restructured and implemented on a system-wide scale with minimal cost, curricular reforms can yield high returns in LMIC.

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

Foundational Maths

Maths levels improved slightly overall in the last full year of programme operation

While changes in maths levels were inconsistent across grades, the average ICAN score among Primary 1-5 pupils in July 2024 was 49%, 3 percentage points higher overall than in July 2023. Increases in ICAN scores were concentrated in Primary 2, 4 and 5, while Primary 1 and 3 scores declined by 3-4 percentage points.

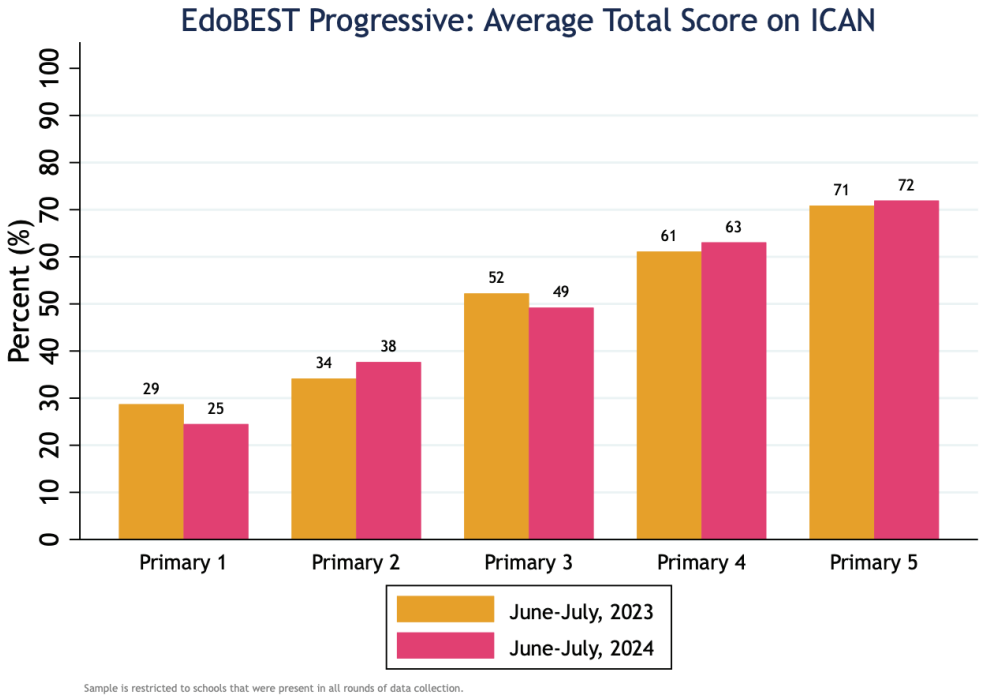


Figure 6.3

Despite these gains, overall maths levels are still relatively low compared to national standards. The most difficult problem on the ICAN is a word problem involving exact division: **'A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?'** The ability to answer this question correctly is classified by the NERDC curriculum as a Primary 3-level skill. Therefore, according to national education standards, Primary 3 pupils in Edo State should answer this — and all other questions — correctly, thus receiving a total score of 100% on the ICAN at the end of the school year. However, the average Primary 3 score as of July 2024 is only 49%. In fact, less than 1% of Primary 3 pupils are able to achieve a perfect score. Therefore, while maths outcomes are improving in EdoBEST Progressive schools, there is a great deal of work to be done before pupils are able to meet national curricular expectations.

The Range of Literacy Levels Has Increased

In the last year, the range of oral reading fluency rates among Primary pupils increased slightly, particularly in Primary 4, 5, and 6. As of July 2024, a higher proportion of Primary 5 pupils read below 10 cwpm and above 60 cwpm than did in July 2023. The implications of this increase in heterogeneity are significant, particularly in the EdoBEST Progressive context. One of the core pillars of EdoBEST's structured pedagogy is appropriately levelled instruction. With an increasing variety of literacy levels in classrooms, teachers are required to cater to a broader spectrum of abilities. This raises the importance of data-driven levelling and targeting the median pupil with differentiated instruction, enabling teachers to effectively support both higher- and lower-performing pupils within the same classroom.

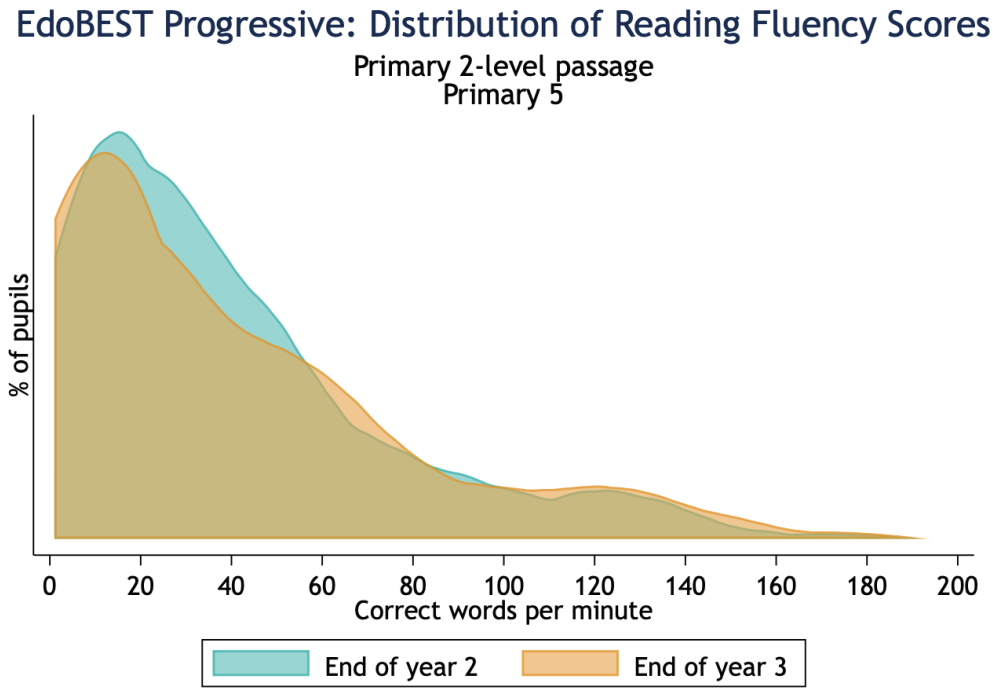
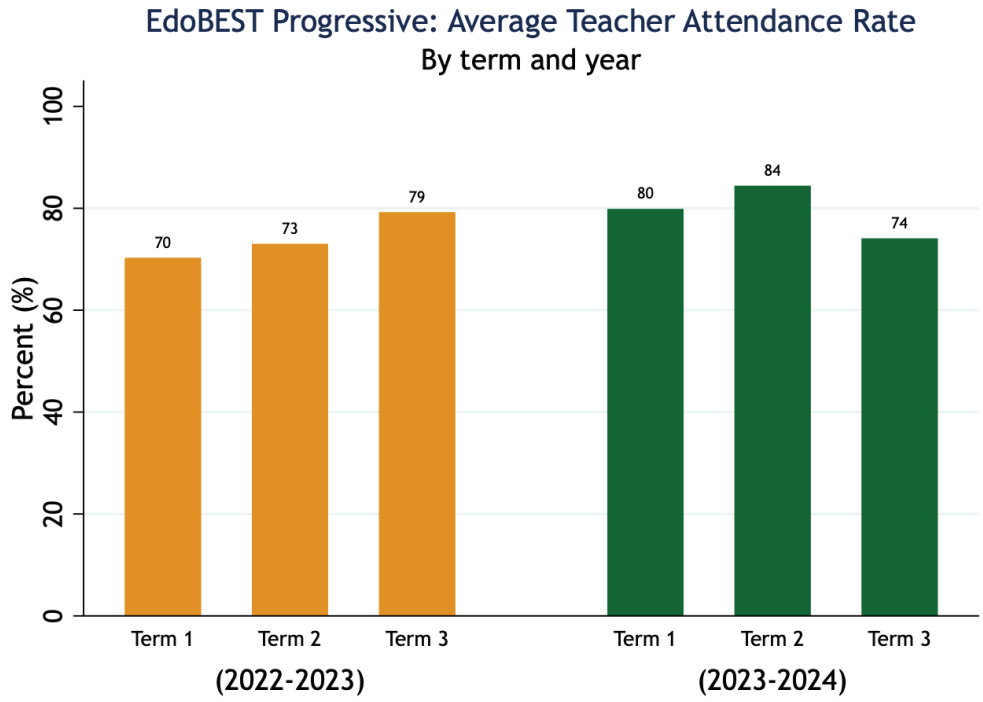


Figure 6.4

Measures of Fidelity of Programme Implementation

Pupils received more instruction in the 2023-24 school year than the year prior

In the 2023-24 school year, both teacher attendance and lesson completion rates were higher on average than they were in the previous school year. Throughout the 2022-23 school year, EdoBEST Progressive teachers' weekly attendance was 74% on average. By contrast, the average teacher attendance rate in the following school year was 5 percentage points higher, at 79%. Although 79% is still relatively low (indicating that teachers were absent one day per week on average), this positive trend means that teachers were able to provide more instruction to their pupils. 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 36%. This past school year, the lesson completion rate increased by 19 percentage points to 55%. This means that teachers were able to complete the assigned lessons 50% more of the time in 2023-24 than the previous year. These improvements in teacher attendance and lesson completion suggest that the EdoBEST programme is making progress in maximising the amount of class time devoted to learning.


EdoBEST Progressive: Average Teacher Attendance Rate
By term and year
Percent (%)
0
20
40
60
80
100
70
73
79
80
84
74
Term 1
Term 2
Term 3
Term 1
Term 2
Term 3
(2022-2023)
(2023-2024)

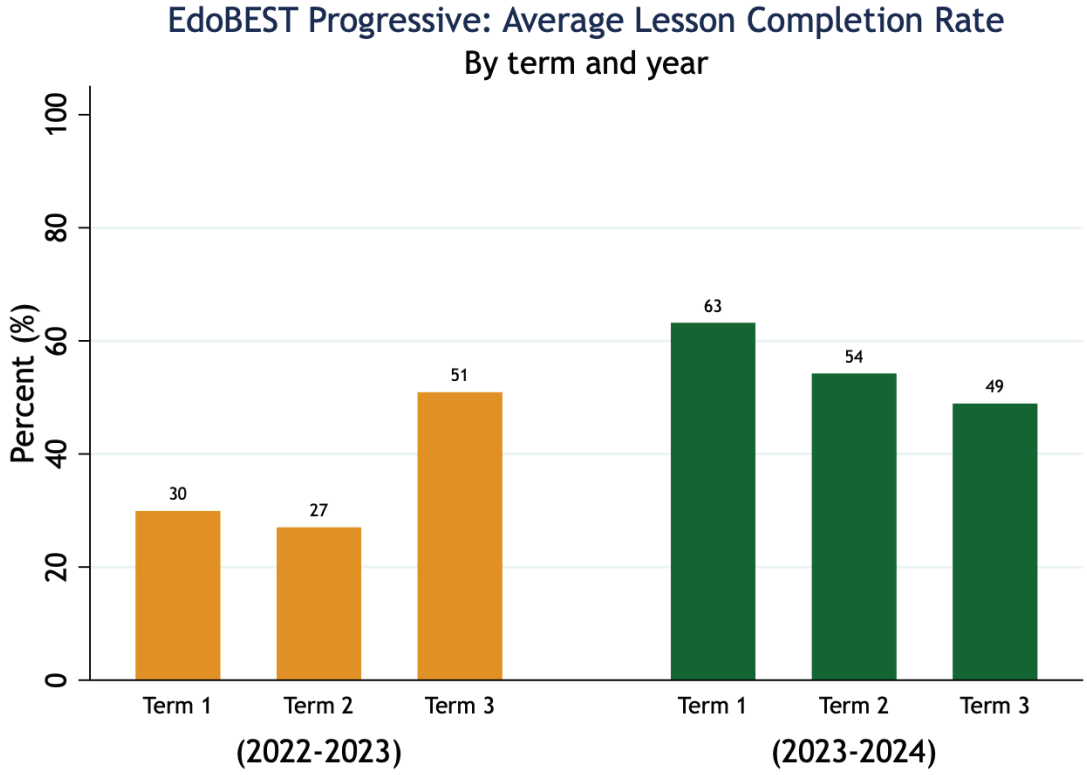

EdoBEST Progressive: Average Lesson Completion Rate
By term and year
Percent (%)
0
20
40
60
80
100
30
27
51
63
54
49
Term 1
Term 2
Term 3
Term 1
Term 2
Term 3
(2022-2023)
(2023-2024)

Figure 6.6

Pupil attendance decreased over 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 was not. Throughout the 2023-24 school year, pupils' average attendance rate was only 56%, which is 5 percentage points lower than in the 2022-23 school year. Low attendance limits pupils' opportunity to learn and benefit from their education. 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.

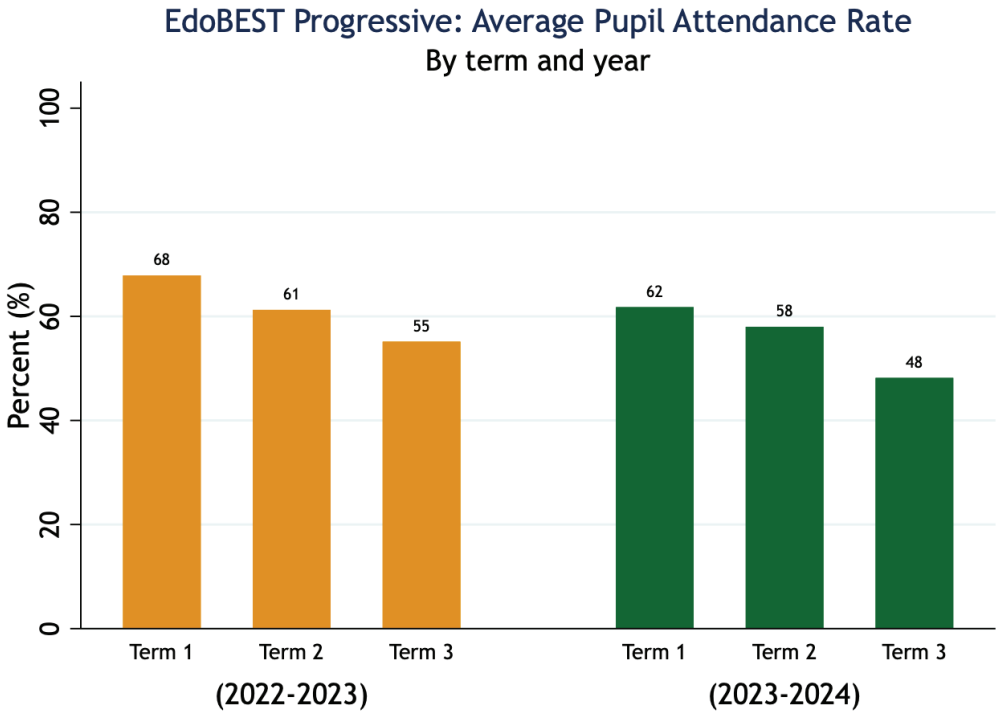


Figure 6.7

VII. Lessons Learned and Recommendations for Future Improvement

After less than three years of implementation, the EdoBEST Progressive model has gained momentum in transforming the educational landscape within Edo State, effectively adapting its approach to meet the specific needs of both pupils and school staff. During the 2023-24 school year, the second full year of EdoBEST Progressive, teacher attendance and lesson completion rates improved by 5 and 19 percentage points respectively. As a result, pupils have made tremendous strides in foundational literacy and numeracy. Since implementation, the rate of non-readers in EdoBEST Progressive schools has dropped by 10% and maths outcomes are higher in every grade assessed by this study. These positive outcomes have continued through the most recent school year, with both fluency rates and maths test scores being higher overall in July 2024 than in July 2023. These findings, among other improvements, demonstrate the positive impact of the continued educational investments.

Despite the improvements observed since the start of EdoBEST Progressive, tapering learning gains during the 2023-24 school year indicate that 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 of the programme (July 2023 through July 2024) pupil attendance rates dropped by 5 percentage points compared to the previous year, the rate of non-readers increased slightly overall, and heterogeneity in reading fluency rates also increased. Therefore, for the 2024-25 school year and beyond, EdoBEST Progressive is working to provide the lowest performing pupils with increased academic support, using data-driven methods to align instruction with the true learning needs of pupils.

Strengthening Day-to-Day Programme Implementation

During this evaluation period, EdoBEST Progressive made significant strides towards improving the operational efficiency and the implementation of the programme. More teachers were in attendance, and the percentage of lessons delivered each week has improved over time. This achievement reflects a unique combination of dedicated government field teams and school leadership driving operational excellence, and the use of dynamic and actionable data (via the Spotlight app) to shine a light on key areas of growth at the pupil, teacher, school, or programme level. However, more work remains to be done. In spite of this progress, there is still considerable room for improvement in terms of day-to-day programme implementation. In the 2023-24 school year, pupil attendance averaged 56% throughout the year, 5 percentage points lower than the year before. These low attendance rates limit the amount of instruction pupils receive, and therefore the amount that they can benefit from improved instruction.

Improving fidelity of implementation of the programme itself is a critically 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.

Aligning Instruction With Pupils' Learning Levels

While pupils have made meaningful progress narrowing the gap between learning levels and grade level standards, those gaps still exist for many pupils. In order to create learning environments that are optimised for learning outcomes, instruction must continue to be delivered at the right level for pupils. The first and most important way to achieve this is to ensure that the level of English and Maths instructional materials (including teacher guides and textbooks) are precisely aligned to median pupil learning levels, rather than simply to the grade level of the pupil (which is not necessarily an accurate predictor of learning). For example, fewer than half (49%) of Primary 5 pupils in EdoBEST Progressive schools cannot solve a word problem involving subtraction, despite such a problem being classified as a Primary 2-level skill by NERDC curriculum. For the coming year, EdoBEST Progressive will use item-level data on English and Maths performance for most pupils across the system in order to identify the appropriate level of instruction for each grade level, and to subsequently inform the instructional materials that are provided to each teacher. In this way, the programme will be able to respond dynamically to changes in learning levels over time as well as across grade levels, maximising the relevance of instruction for pupils.

In lower grade pairs, where most pupils across schools have similar learning levels (i.e. most pupils in Primary 1-2 are reading and doing Maths at a Primary 1-2 level), a single instructional level — informed by robust assessment data — can be provided to all teachers across the programme. By contrast, in upper grades, there is more variation in learning levels across schools and also within grade pairs, according to insights from this study. For example, as of July 2024, approximately 28% of P5 pupils read 10 cwpm or less, while 23% read 60 cwpm or above. In order to meet the learning needs of pupils across differently-performing schools, EdoBEST Progressive will also employ strategies to provide even more precise and responsive differentiated instruction across the system. Specifically, performance data will be used to ensure that each school and class across the programme receives its own customised learning programme with instructional levels that precisely match the unique learning profile of its pupils. Put into practice, this will ensure that higher-achieving classes are provided with more challenging content, while lower-achieving classes receive more aligned foundational instruction that meets the needs of their pupils.

Enhancing Assessment Structures and Data Collection

EdoBEST Progressive will continue to invest in the quality, validity, reliability, and relevance of assessments. Using extensive item-level data from the 2023-24 school year, analysts will explore ways to improve the design of the exams themselves. These improvements, in turn, will result in more valid and reliable assessments that produce high-quality data and actionable insights that will drive programme design during the next school year.

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

Foundational to this effort to strengthen assessments and use data towards programme design is an ability to capture item-level data at scale. To this end, the programme rolled out the Let's Mark! assessment system in Term 1 of the 2023-24 school year. Let's Mark! is designed to automatically mark multiple-choice exams, and also to upload the item-level data to the programme's central database. By providing teachers with Let's Mark! technology, EdoBEST Progressive is simultaneously making teacher's lives easier, and also creating an opportunity to use at-scale assessment data to make data-driven programme refinements in the coming years.

In Summary

The impressive progress of EdoBEST Progressive since its launch in February 2022 has validated the ongoing investments made in transforming the Edo State public education system. The evidence in this report confirms that children who have not yet received high-quality education can quickly advance their learning when provided with the proper support. Learning outcomes have improved overall since the programme was implemented, including the most recent school year. The EdoBEST programme effect is predicted to increase over time, as both teacher attendance and lesson completion rates have improved in the last two full years of the programme's implementation. Not only that, but pupils' reading fluency and maths proficiency has continued to improve as well. 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 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 and build upon these positive trends in the coming years of the programme. As a data-driven programme, EdoBEST Progressive will continue to conduct similarly large-scale, rigorous evaluations for the upcoming school years as well. Data will be collected annually from a representative sample of EdoBEST Progressive schools, to monitor year-to-year learning gains and metrics of programme implementation such as teacher and pupil attendance. These rounds of data collection will give the Edo State Government further insights on the programme: what is going well, and what needs to be strengthened. Continued investments to address low pupil attendance and provide support to low performing pupils — if done correctly — will drastically improve the quality of teaching and learning across the state.

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

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.

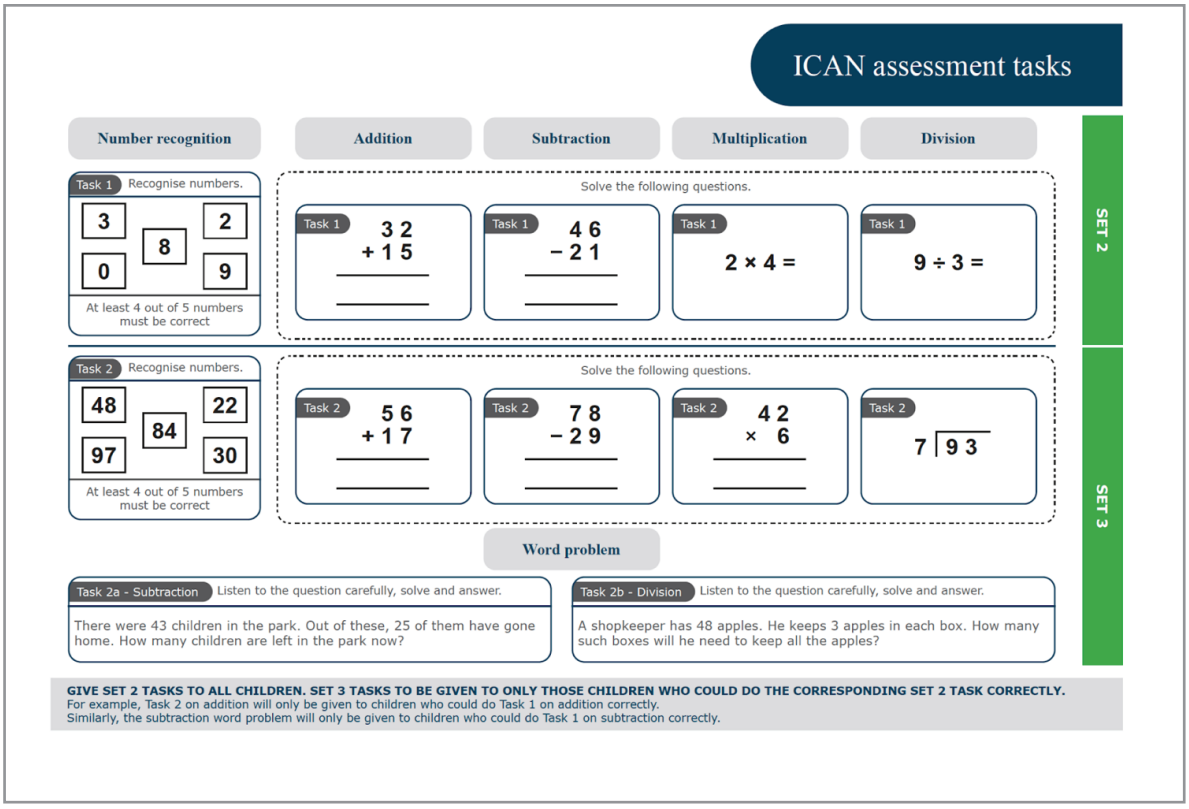
'No, sir,' replied Chike
'Do you know why you did not do as well as usual, Chike?'
'No, sir,' Chike replied, looking down at his toes.

'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.[1] 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

[1] 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"[2] 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:

[2] 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[3]
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 = __).

[3] 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: Tables

Baseline data on Primary 1-5 pupils

Literacy Outcomes	All 72 Sample Schools	Difference Between 52 Subset Schools and 72 Sample Schools
Average Number of Words Read Correctly - Primary 2-Level Passage (cwpm)	7	0
Percentage of Non-Readers on a Primary 2-Level Passage	61.6	-4.1
Average Number of Words Read Correctly - Grade-Level Passage (cwpm)	6	0
Percentage of Non-Readers on a Grade-Level Passage	59.4	-4.0

Maths Outcomes	All 72 Sample Schools	Difference Between 52 Subset Schools and 72 Sample Schools
Average ICAN Score	29.3	0.0
Simple Number Recognition	85.1	0.4
Complex Number Recognition	66.2	0.5
Simple Addition	56.0	0.6
Complex Addition	25.6	-0.4
Simple Subtraction	35.7	0.0
Complex Subtraction	14.0	-0.9
Simple Multiplication	28.6	0.4
Complex Multiplication	7.0	-0.8
Simple Division	17.9	0.8
Complex Division	2.1	-0.3
Subtraction Word Problem	11.0	0.1
Division Word Problem	2.4	-0.2

EdoBEST Progressive and Primary equity analysis

Average reading fluency rates (cwpm) by grade on a grade-level passage

Grade Level	EdoBEST Progressive		EdoBEST Primary	
	July 2023	July 2024	July 2023	July 2024
Primary 1	7	1	7	6
Primary 2	4	3	16	14
Primary 3	14	13	26	27
Primary 4	21	22	43	44
Primary 5	37	33	57	61

Appendix E: Additional Figures

Literacy outcomes

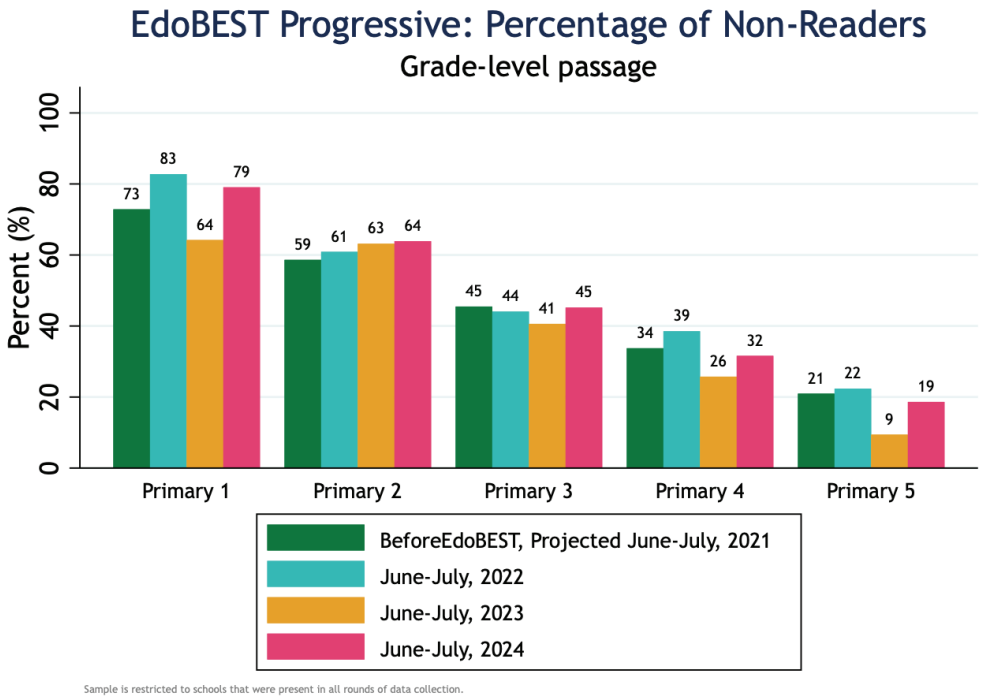


Figure 1

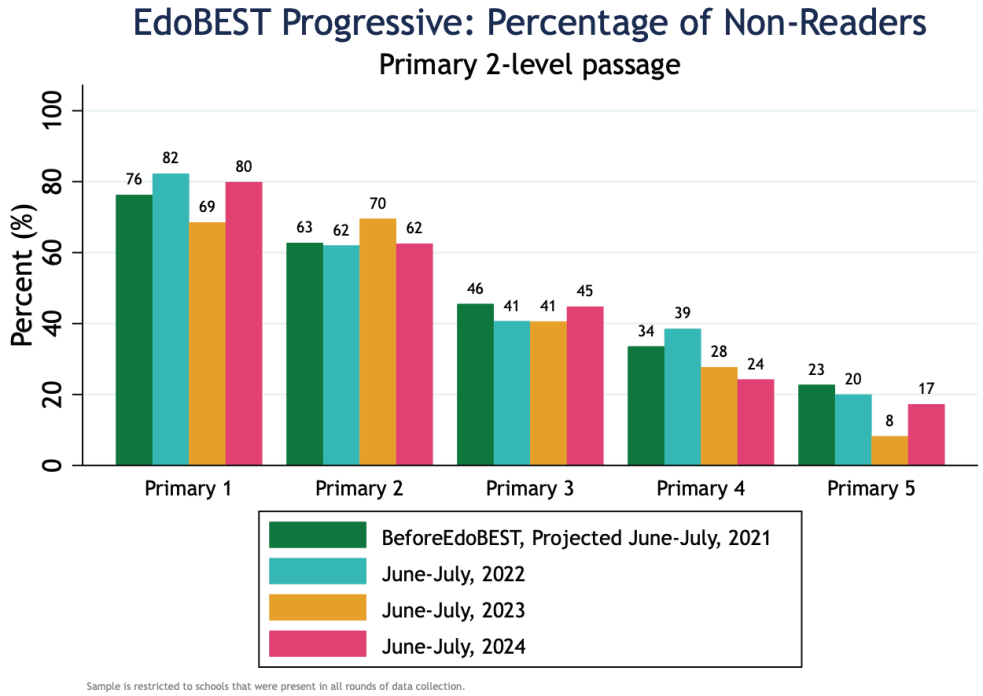


Figure 2

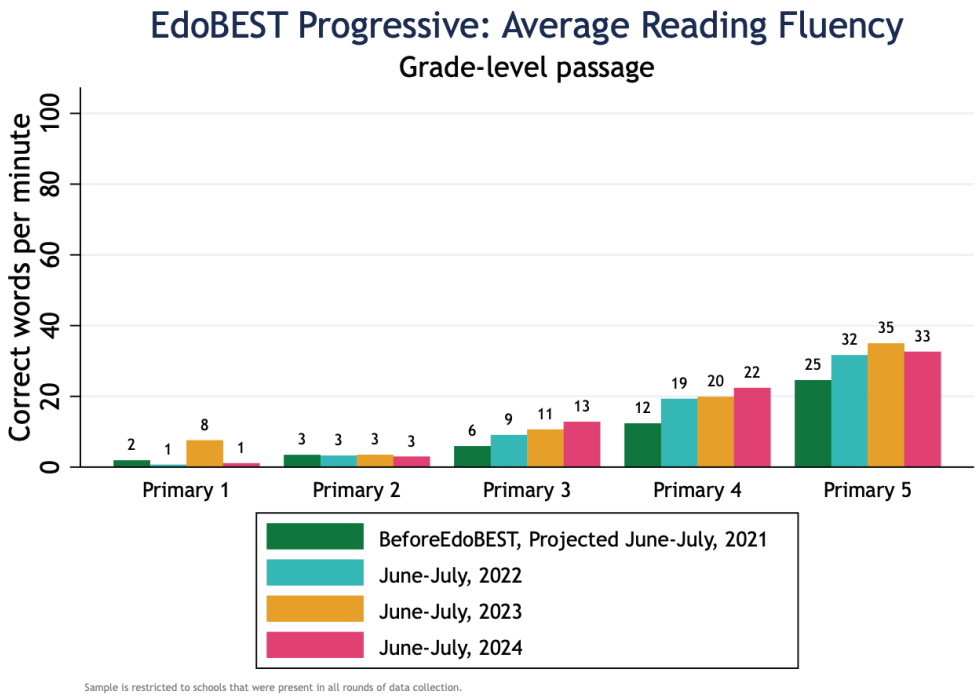


Figure 3

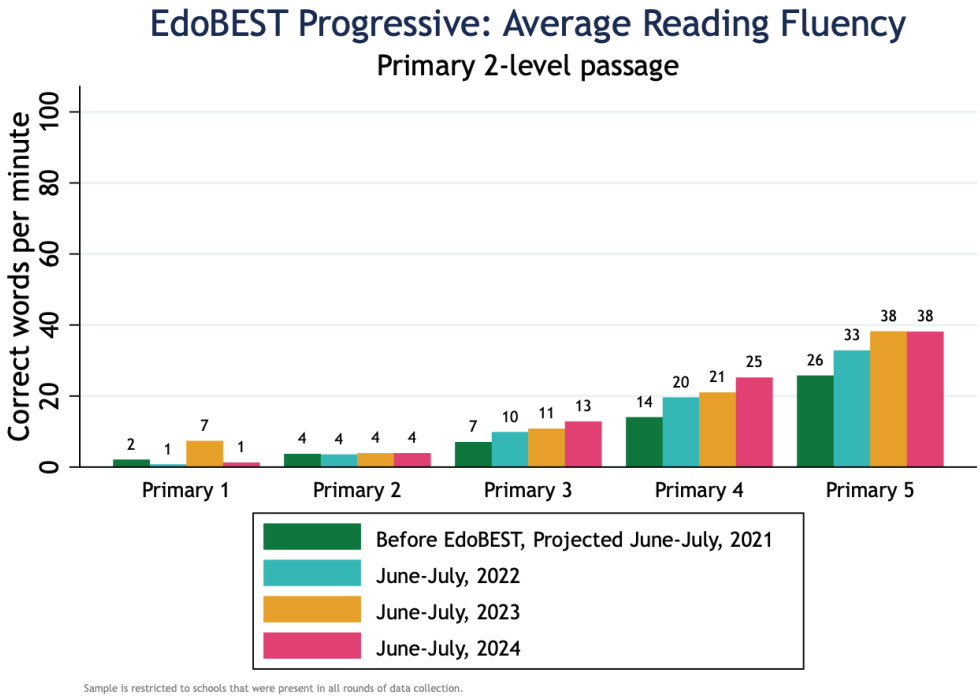


Figure 4

Numeracy outcomes

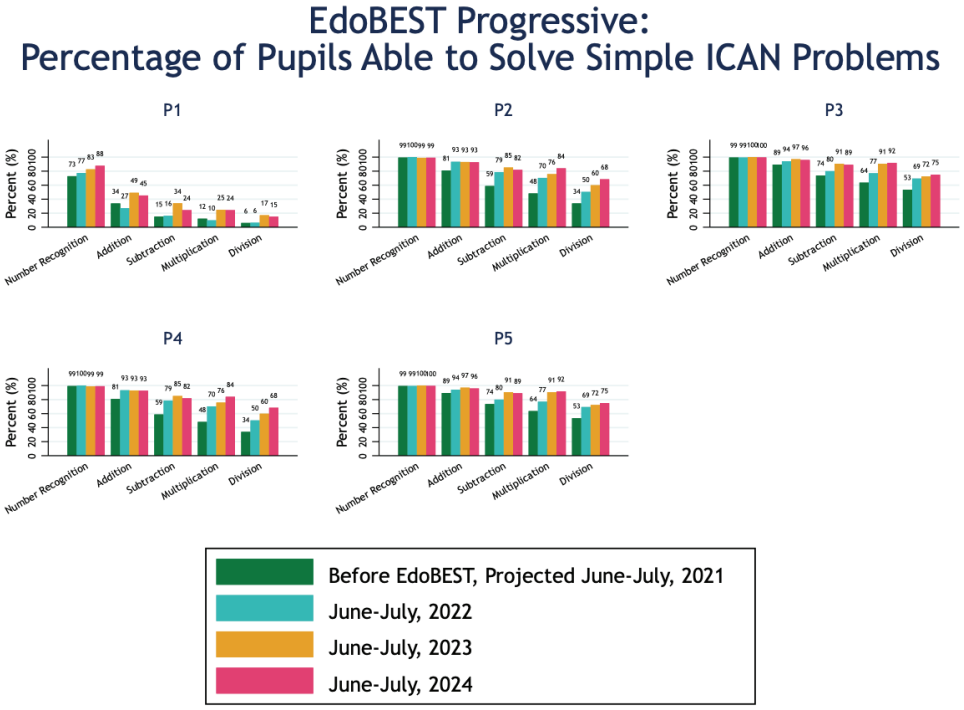


Figure 5

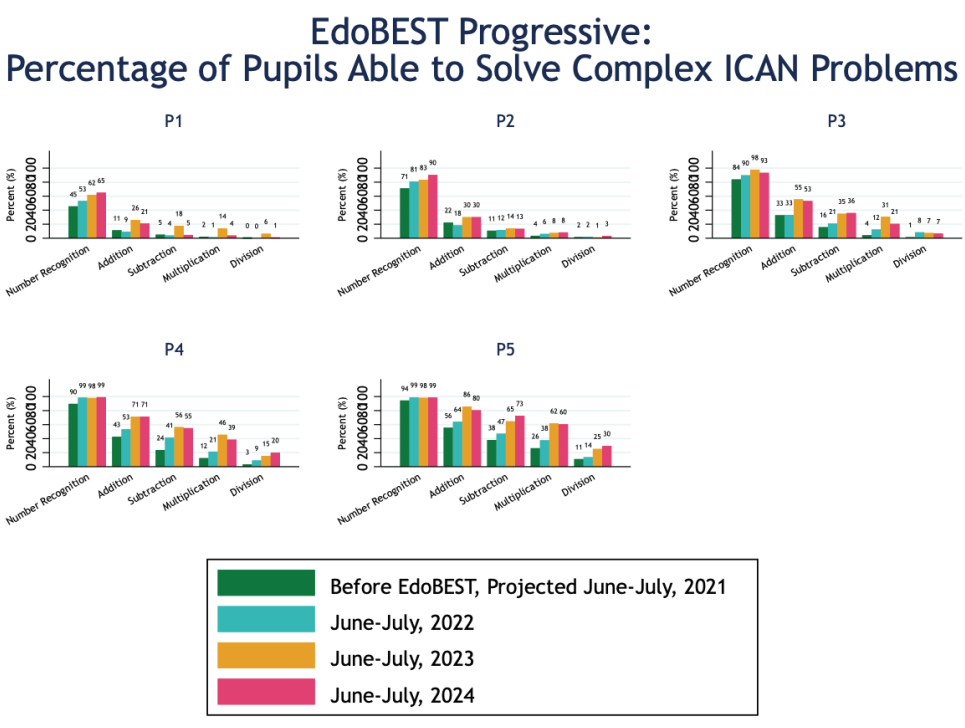


Figure 6

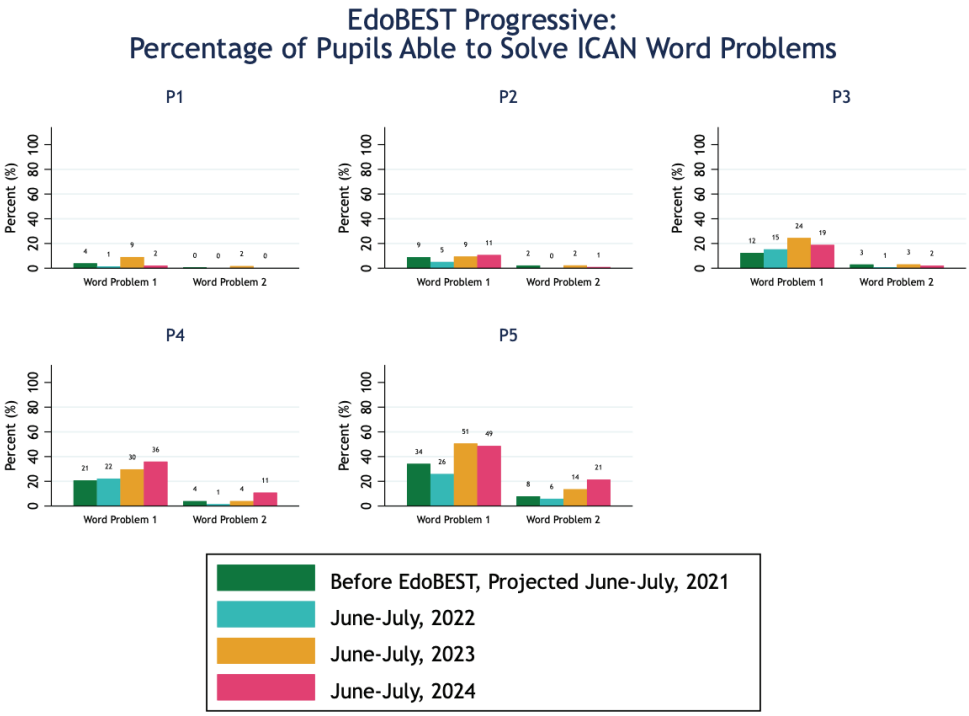

EdoBEST Progressive:
Percentage of Pupils Able to Solve ICAN Word Problems
P1
P2
P3
P4
P5
Percent (%)
0 20 40 60 80 100
4 1 9 2
0 0 2 0
9 5 9 11
2 0 2 1
12 15 24 19
3 1 3 2
21 22 30 36
4 1 4 11
34 26 51 49
8 6 14 21
Word Problem 1
Word Problem 2
Before EdoBEST, Projected June-July, 2021
June-July, 2022
June-July, 2023
June-July, 2024

Figure 7

Appendix F: A Detailed Overview of the Cross-Grade Ability Grouping Protocol for EdoBEST Progressive 2023-24

What are ability groups?

EdoBEST Progressive schools place pupils in ability groups, which allows them to learn at the right level. These ability groups help teachers provide differentiated support to pupils with similar learning levels. It also helps pupils to be more successful in their syllabus-aligned afternoon lessons through the building of fundamental competencies that prepare them for grade-appropriate material. Pupils who are struggling receive more foundational literacy and numeracy support, while pupils who are excelling are challenged with more rigorous literacy and numeracy instruction.

Schools assign pupils to 3 groups or fewer for Preparatory English and Preparatory maths lessons. Each group has a name that indicates the performance levels of pupils within that group. Head teachers, teachers, and Learning Development Officers (LDOs) are trained to always refer to groups by their name and not by "low-", "middle-", or "high-performing". Removing the stigma associated with identification by ability level is imperative for maintaining pupil morale and positive community perception.

The following are the names of each group:

Preparatory English Groups

- Lowest-performing: Aspire group
- Middle-performing: Succeed group
- Top-performing: Flourish group

Preparatory Maths Groups

- Lowest-performing: Orange group
- Middle-performing: Yellow group
- Top-performing: Green group

Teacher Assignment	Class Group	Preparatory Maths	Preparatory English
P1	Primary 1 and 2	Orange	Aspire
P3	Primary 3 and 4	Yellow	Succeed
P5	Primary 5 and 6	Green	Flourish

LDO, teacher, and head teacher training

All Learning Development Officers (LDOs) received a single-session training on how to administer a diagnostic assessment in order to group pupils. To ensure programmatic buy-in and sustainability, the LDOs provided this training to the head teachers on how to administer the diagnostic test, group pupils, create the master list, communicate this process to teachers, and determine what the daily timetable entails.

Together, the LDOs and head teachers assess pupils, sort pupils, and monitor the programme. If the LDO was unable to visit the school in person because of accessibility or security issues, the head teacher conducts the assessment and groups the pupils while the LDO supports the head teacher virtually.

The diagnostic assessment and grouping schedule

During the first weeks of school, the LDO and the head teacher implemented the grouping process over the course of two days. After the sorting process was complete, the LDO and head teacher explained the groups and assigned pupils accordingly.

Any pupil who joined an EdoBEST Progressive school after the diagnostic period during the 2023-24 school year, or who was absent on the day of the assessment, needed to take the Preparatory Maths and Preparatory English assessment to determine their level. The LDO and head teacher administered these assessments and decided which groups the pupil should be assigned to. Once this assignment was done, the Master List, Group List, and Leaving Lists were updated (see the steps taken in the sections below).

Dissemination of the master list

All LDOs were supported by Progressive schools' head teachers in creating a new Master List in Term 1, 2023-24. Each LDO shared a photo of the Master List from their schools. Photos were shared within the first two weeks of resumption of the school year. The collation of the photos were coordinated by the Progressive schools' Senior Regional Manager.

Drafting and sharing teacher assignment sheets

Also within the first two weeks of the new school year, all LDOs filled out the teacher assignment sheet for each of the schools in their cohorts. The numeracy lessons on the daily timetable were updated using the teacher assignment sheet within the third and fourth weeks of the year. The filling of the teacher assignment sheet was coordinated by the Progressive schools' Senior Regional Manager, while the Regional Academics Department was responsible for updating the daily timetable.

Support provided by field officers

Field Officers helped to ensure that teachers were teaching pupils in their assigned ability groups. LDOs and Quality Assurance Officers (QAOs) did a roll call for pupils in both the Preparatory maths and Preparatory English groups in every Progressive school they visited. They used the Master List to call on and check to ensure that pupils were in their assigned groups. LDOs and QAOs also supported the practice of ability grouping by ensuring that pupils transitioned to their various groups when expected.

Criteria for preparatory English assessment and grouping

The LDO and head teacher, or only the head teacher (if the LDO was unable to visit the school because it was hard to reach), administered a fluency assessment to each pupil to determine their Preparatory English group:

Aspire Group: ≤ 10 CWPM	Succeed Group: 11-30 CWPM	Flourish: ≥ 31 CWPM

Pupils read a passage for 1 minute while the assessor counted the correct words per minute (cwpm) each pupil read. Low cwpm scores indicated that pupils were still decoding individual sounds or lack decoding strategies altogether. High scores indicated that pupils could recognise words instantly. Automatic word recognition is a strong predictor of comprehension and indicates that assessed pupils could read at a higher level.

The fluency assessment text was an adaptation of a passage from an NERDC Primary 2 literacy textbook. If pupils could read a text from this Primary 2 book to a high-enough degree of fluency (31+ cwpm), they were placed into the group "Flourish", which utilised the NERDC Primary 2 textbook in their assigned curricula.

Pupils who score lower than 31 cwpm and therefore cannot use the Primary 2 book will be placed into either the "Aspire" or "Succeed" groups. Pupils who score 10 cwpm or lower lack basic decoding strategies and need foundational phonics support at its earlier stages, indicating their placement in the "Aspire" group is optimal. Pupils who score between 11 and 30 cwpm also need foundational phonics support, but have enough letter-sound correlation knowledge that it is not necessary to start them with this introductory skill. Instruction for all three groups will target the most critical skill sets (phonemic awareness & phonics, fluency, vocabulary, and comprehension) and generate marked improvement in each one by the end of the term.

Criteria for preparatory maths assessment and grouping

For Preparatory Maths, the LDO and head teacher administered a print-based assessment. The first assessment was the "Yellow Test" and covered topics such as counting and addition. If a pupil missed any question on the Yellow test, they were placed into the Orange group. If a pupil answered all of the questions correctly on the Yellow Test, they moved on to the "Green Test". The Green Test covered more complex counting concepts, mental maths, number words, and subtraction. If a pupil answered all the questions correctly on the Green Test, they were placed into the Green group. If a pupil missed one question, they were placed in the Yellow group.

Assessment day

On the day of assessment at each EdoBEST Progressive school, there will be one LDO working with the head teacher. The LDO is responsible for Primary 1, 2, and 3, while the head teacher is responsible for Primary 4, 5, and 6. After testing, the LDO and the head teacher will come together with their preliminary lists to finalise groups. As previously stated, the LDO will support the head teacher virtually if not physically present in the school while the head teacher finalises the groups for Primary 1 to 6 pupils.

Logistics of grouping with efficiency

In cases where some groups had disproportionately fewer pupils than others within the same school, pupils were re-sorted. For example, if the Green Preparatory maths group had 6 pupils, while the Orange Preparatory maths group had 20 pupils, and the Yellow Preparatory maths group had 50 pupils, the Green Group was sometimes dropped. The 6 Green-group pupils would move to the Orange group, while the Yellow group was divided into two, containing 25 pupils each. In this example, Yellow Group 1 would be composed of the 25 youngest pupils and assigned to the P1–2 teacher, while Yellow Group 2 would be composed of the 25 eldest pupils and assigned to the P3–4 teacher. The Orange group would be assigned to the P5–6 teacher.

In some instances, pupils may require the ability to move up a group, while in others, they may be required to move down a group. Although not ideal, this was a necessary allowance to ensure the correct balance of pupil-teacher ratio and levelling was maintained.

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

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

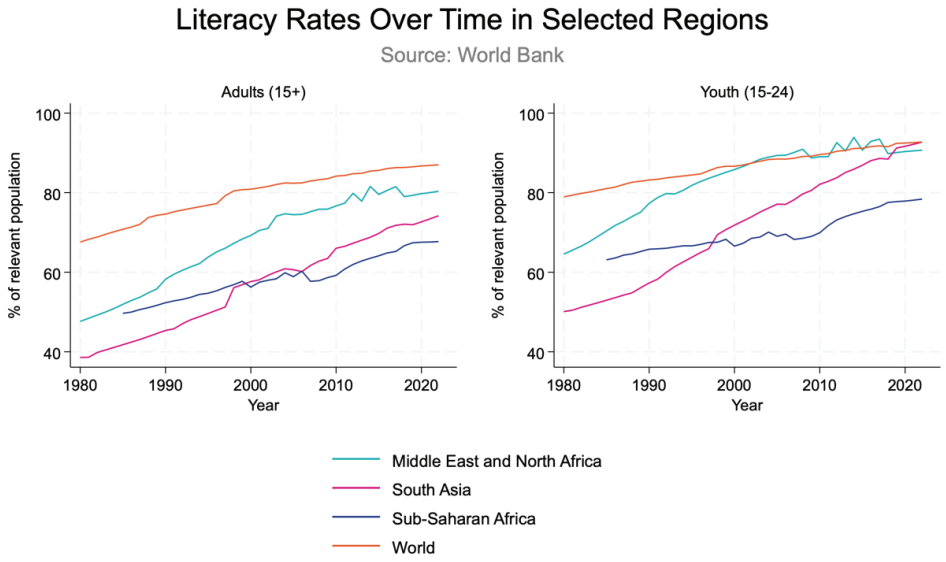
The growing global focus on broadening access to schools has led to significantly improved enrolment rates

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

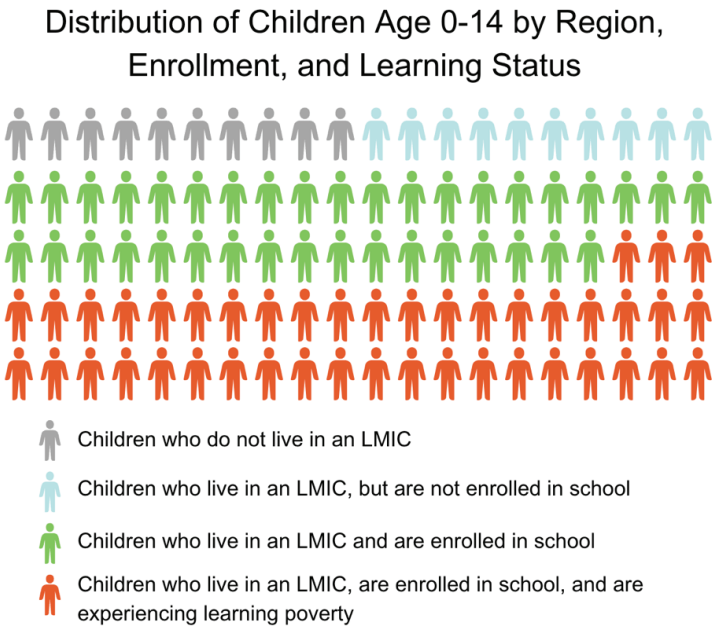
Focusing solely on enrolment is not sufficient to ensure that children are actually learning. The goal of universal education is not merely about superficially exposing children to educational institutions; it also requires that these institutions effectively equip pupils with the foundational skills 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.

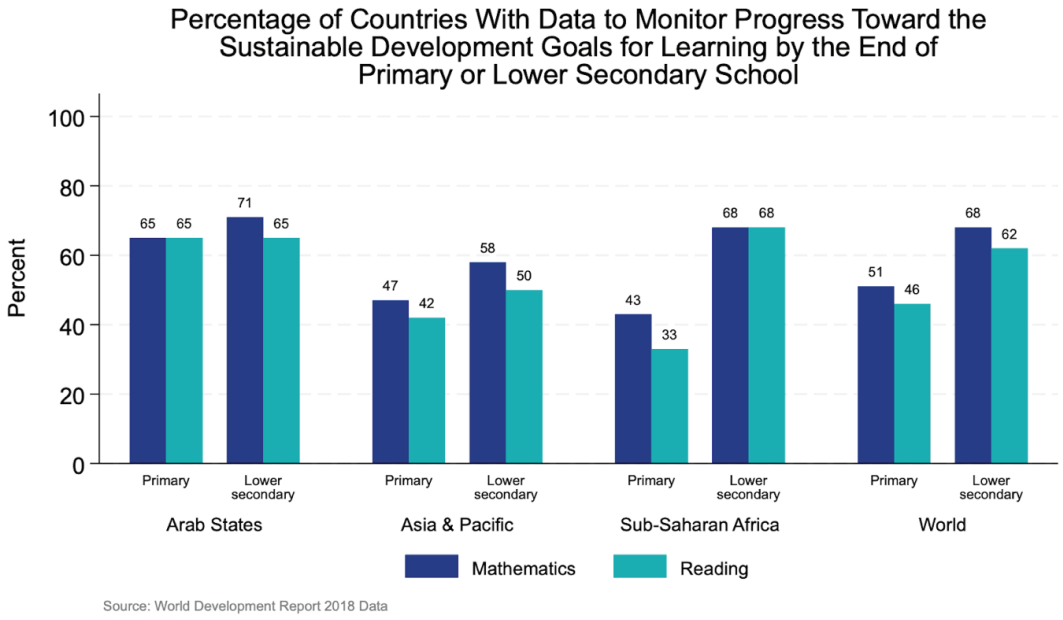
Literacy, the most extensively studied foundational skill, can also be examined among pupils in LMIC. Competency in this domain is essential for pupils to follow written instructions, engage with learning materials, participate in assessments, and gain knowledge in every core subject. However, evidence 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).

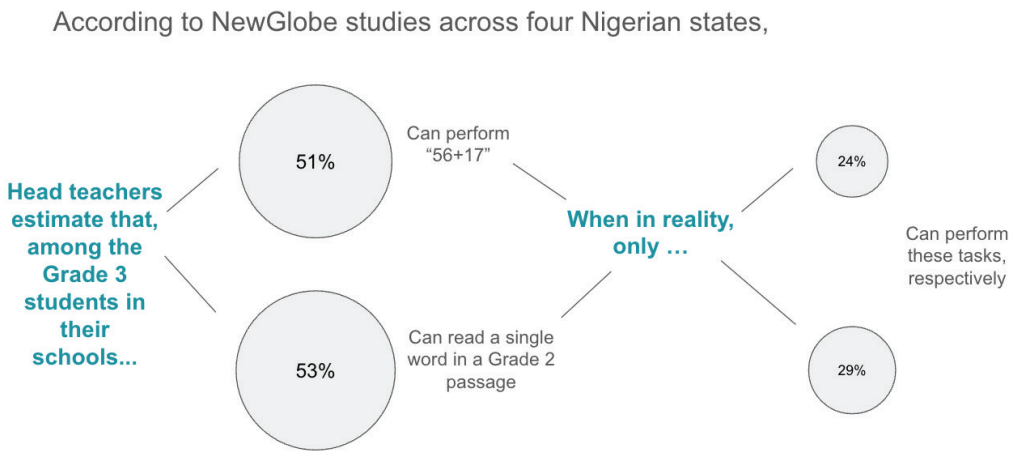
While longer school closures are correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in pupils' ability to keep pace with academic expectations. However, in nearly all low-income countries, more than half of the population 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.

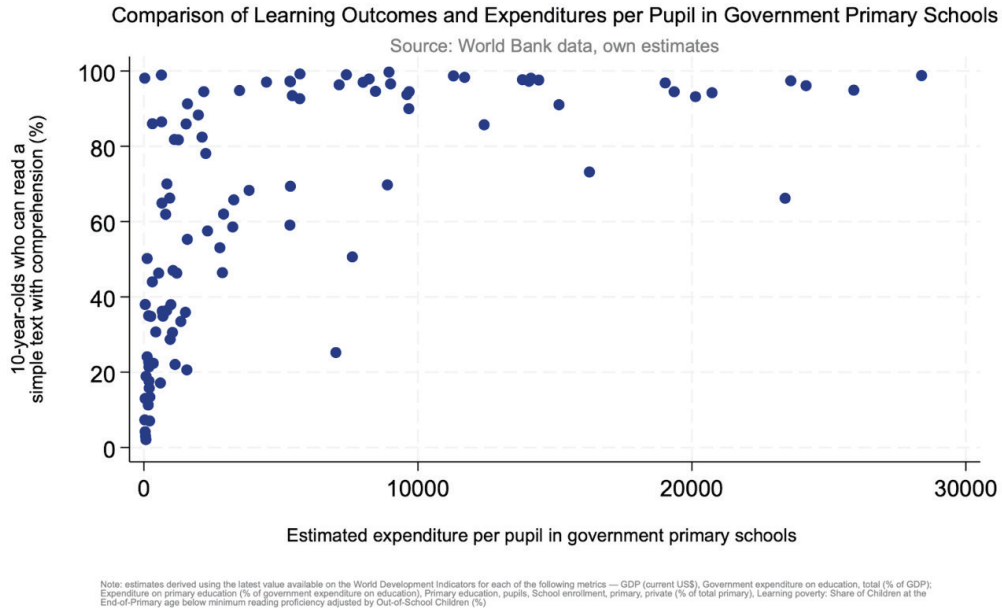
In response, it is imperative for education systems in LMIC to maintain momentum with holistic and proven-effective approaches, so that gaps in educational achievement do not widen during misdirected pursuits. Furthermore, curricular design should justify how and why material or technological inputs 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

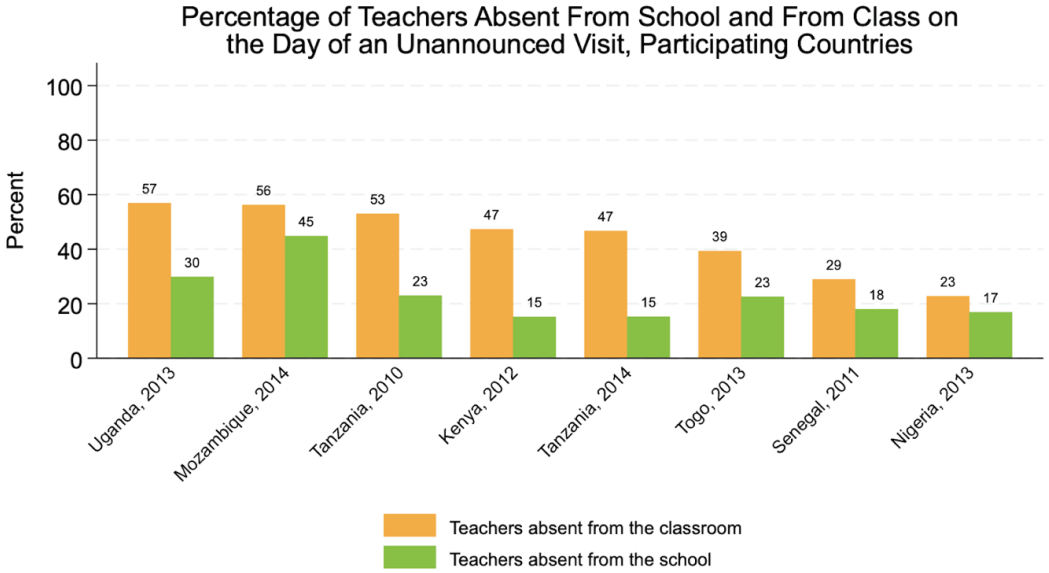
Teachers are central to what can be achieved in any classroom and are the most influential factor across all education systems (Vegas, 2020). Their professional competence and the rapport they build with pupils enables them to assess learning levels and help pupils reach their academic potential. However, 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.

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

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

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

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

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.

Appendix H: Works Cited

Abadzi, H. (2008). Efficient learning for the poor: New insights into literacy acquisition for Children. International Review of Education, 54(5-6), 581–604.

Abdul Latif Jameel Poverty Action Lab. (2019). Reducing costs to increase school participation. The Abdul Latif Jameel Poverty Action Lab (J-PAL). https://www.povertyactionlab.org/policy-insight/reducing-costs-increase-school-participation

Álvarez Marinelli, H., Berlinski, S., & Busso, M. (2019). Remedial education: Evidence from a sequence of experiments in Colombia. Journal of Human Resources, IDB-WP-1067. https://doi.org/http://dx.doi.org/10.18235/0002075

Angrist, N., Djankov, S., Goldberg, P. K., & Patrinos, H. A. (2021). Measuring human capital using global learning data. Nature, 592(7854), 403–408. https://doi.org/10.1038/s41586-021-03323-7

ASER Pakistan. (2024). Annual Status of Education: ASER-Pakistan 2023.

Asim, M. (2020). Average vs. distributional effects: Evidence from an experiment in Rwanda. International Journal of Educational Development, 79, 102274. https://doi.org/10.1016/j.ijedudev.2020.102274

Azevedo, J. P. (2020). Learning poverty measures and simulations. World Bank Group.

Azevedo, J. P., Goldemberg, D., Montoya, S., Nayar, R., Rogers, H., Saavedra, J., & Stacy, B. W. (2021). Will every child be able to read by 2030? Defining learning poverty and mapping the dimensions of the challenge. https://doi.org/10.1596/1813-9450-9588

Azevedo, J. P., Rogers, H., Ahlgren, E., Akmal, M., Cloutier, M.-H., Ding, E., Raza, A., Wong, Y. N., Montoya, S., Chakroun, B., Chang, G.-C., Guerriero, S., Dewan, P., Mizunoya, S., Reuge, N., Russell, K., Yao, H., Bronwin, R., Cohen-Mitchell, J., … Boggild-Jones, I. (2022). The state of global learning poverty: 2022 Update. World Bank, UNESCO, USAID, and UNICEF. https://thedocs.worldbank.org/en/doc/e52f55322528903b27f1b7e61238e416-0200022022/original/Learning-poverty-report-2022-06-21-final-V7-0-conferenceEdition.pdf

Banerjee, A. V., Cole, S., Duflo, E., & Linden, L. (2007). Remedying education: Evidence from two randomized experiments in India. The Quarterly Journal of Economics, 122(3), 1235–1264. https://doi.org/10.1162/qjec.122.3.1235

Bashir, S., Lockheed, M., Ninan, E., & Tan, J.-P. (2018). Facing forward: Schooling for learning in Africa. Africa Development Forum and the World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/c504e71b-b70d-57a5-9837-dc82aa256c54/content

Berlinski, S., Galiani, S., & Gertler, P. (2009). The effect of pre-primary education on primary school performance. Journal of Public Economics, 93(1–2), 219–234. https://doi.org/10.1016/j.jpubeco.2008.09.002

Black, M. M., Walker, S. P., Fernald, L. C. H., Andersen, C. T., DiGirolamo, A. M., Lu, C., McCoy, D. C., Fink, G., Shawar, Y. R., Shiffman, J., Devercelli, A. E., Wodon, Q. T., Vargas-Barón, E., & Grantham-McGregor, S. (2017). Early childhood development coming of age: Science through the life course. The Lancet, 389(10064), 77–90. https://doi.org/10.1016/S0140-6736(16)31389-7

Blimpo, M. P., Carneiro, P., Jervis, P., & Pugatch, T. (2019). Improving access and quality in early childhood development programs: Experimental evidence from The Gambia. World Bank.

Borgen Project. (2021). Challenges in education in Guinea-Bissau. https://borgenproject.org/education-in-guinea-bissau/

Bouguen, A., Filmer, D., Macours, K., & Nadeau, S. (2018). Preschool and parental response in a second best world: Evidence from a school construction experiment. Journal of Human Resources, 53(2), 474–512.

Brunetti, A., Büchel, K., Jakob, M., Jann, B., & Steffen, D. (2021). Inadequate teacher content knowledge and what to do about it: Evidence from El Salvador. University of Bern. https://repec.sowi.unibe.ch/files/wp41/Brunetti-etal-2021-CATT.pdf

Crawfurd, L., Hares, S., Minardi, A., & Sandefur, J. (2021). Understanding education policy preferences: Survey experiments with policymakers in 35 developing countries. Center for Global Development.

https://www.cgdev.org/sites/default/files/understanding-education-policy-preferences-survey-experiments-policymakers-35-developing.pdf

Cristia, J., Ibarrarán, P., Cueto, S., Santiago, A., & Severín, E. (2017). Technology and child development: Evidence from the One Laptop per Child program. American Journal: Applied Economics, 9(3), 295–320.

Crouch, L., Rolleston, C., & Gustafsson, M. (2021). Eliminating global learning poverty: The importance of equalities and equity. International Journal of Educational Development, 82, 102250. https://doi.org/10.1016/j.ijedudev.2020.102250

de Hoyos, R., Ganimian, A. J., Holland, P. A., & Djaker, S. (n.d.). Great things come to those who wait: Experimental evidence on performance management tools and training for public schools in Argentina. World Bank. 2022

DHS: Kenya National Bureau of Statistics and ICF International. (2014). Kenya Demographic and Health Survey [Dataset]. Data Extract from KEHR72DT.dta DHS Household survey.

DHS: Ministry of Health, Community Development, Gender, Elderly and Children [Tanzania], Ministry of Health [Zanzibar], National Bureau of Statistics [Tanzania], Office of the Chief Government Statistician, & ICF. (2015). Tanzania Demographic and Health Survey and Malaria Indicator Survey [Dataset]. Data Extract from TZHR7BDT.dta, DHS and ICF [Distributors].

Eble, A., & Escueta, M. (2022). When your bootstraps are not enough: How demand and supply interact to generate learning in settings of extreme poverty. National Bureau of Economic Research, 68. https://doi.org/10.3386/w31388

Evans, D. K., & Hares, S. (2021). Should Governments and Donors Prioritize Investments in Foundational Literacy and Numeracy? [Working Paper]. Center for Global Development. https://www.cgdev.org/sites/default/files/Should-governments-and-donors-prioritize-investments-FLN.pdf

Ganimian, A., & Djaker, S. (2023). How can developing countries address heterogeneity in students' preparation for school? A Review of the challenge and potential solutions. https://jacobsfoundation.org/wp-content/uploads/2023/03/Learning-Variability-in-Developing-Countries.pdf

Glewwe, P., Kremer, M., & Moulin, S. (2009). Many Children Left Behind? Textbooks and Test Scores in Kenya. American Economic Journal: Applied Economics, 1(1), 112-135. https://www.aeaweb.org/articles?id=10.1257/app.1.1.112

Gust, S., Hanushek, E. A., & Woessmann, L. (2022). Global universal basic skills: Current deficits and implications for world development. https://doi.org/10.35489/BSG-RISEWP_2022/114

Hwa, Y.-Y., & Duong, B.-H. (2021). Learning from high-performing classrooms in Vietnam-- and debunking fallacies about foundational skills. RISE. https://riseprogramme.org/blog/learning-high-performing-classrooms-vietnam

IADB: Inter-American Development Bank. (n.d.) Impact Evaluation: Resources. https://www.iadb.org/en/topics-effectiveness-improving-lives/impact-evaluation

Kaffenberger, M. (2021). Aligning education systems for learning. RISE. https://riseprogramme.org/blog/aligning-education-systems-for-learning-how-systems-shift

Karamperidou, D., Brossard, M., Peirolo, S., & Richardson, D. (2020). Time to teach: Teacher attendance and time on task in Eastern and Southern Africa. UNICEF. https://www.unicef-irc.org/publications/pdf/Time-to-Teach-Report_Teacher-attendance-and-time-on-task-in-Eastern-and-Southern-Africa.pdf

Mbiti, I. M. (2016). The need for accountability in education in developing countries. Journal of Economic Perspectives, 30(3), 109–132. https://doi.org/10.1257/jep.30.3.109

Meza-Cordero, J. A. (2017). Learn to play and play to learn: Evaluation of the One Laptop per Child Program in Costa Rica. Journal of International Development, 29(1), 3–31. https://doi.org/10.1002/jid.3267

Mighati, H. (2022). Early school dropouts in developing nations. The Borgen Project. https://borgenproject.org/early-school-dropouts/

Molina, E., Fatima, S. F., Ho, A. D., Melo, C., Wilichowski, T. M., & Pushparatnam, A. (2020). Measuring the quality of teaching practices in primary schools: Assessing the validity of the Teach observation tool in Punjab, Pakistan. Teaching and Teacher Education, 96, 103171. https://doi.org/10.1016/j.tate.2020.103171

Montoya, S. (2019). We must support our teachers. UNESCO. https://uis.unesco.org/en/blog/we-must-support-our-teachers

Muralidharan, K., Das, J., Holla, A., & Mohpal, A. (2017). The fiscal cost of weak governance: Evidence from teacher absence in India. Journal of Public Economics, 145, 116–135. https://doi.org/10.1016/j.jpubeco.2016.11.005

Muralidharan, K., & Singh, A. (2022). Improving public sector management at scale? Experimental evidence on school governance in India. National Bureau of Economic Research.

Muralidharan, K., Singh, A., & Ganimian, A. J. (2019). Disrupting education? Experimental evidence on technology-aided instruction in India. American Economic Review, 109(4), 1426–1460. https://doi.org/10.1257/aer.20171112

Muralidharan, K., & Sundararaman, V. (2010). The Impact of Diagnostic Feedback to Teachers on Student Learning: Experimental Evidence from India. The Economic Journal, 120(546), F187-F203. https://academic.oup.com/ej/article-abstract/120/546/F187/5089693

Nath, S. R., Ferris, D., Kabir, M. M., Chowdhury, T., & Hossain, A. (2017). Transition and dropout in lower income countries: Case studies of secondary education in Bangladesh and Uganda. WISE: Qatar Foundation. https://www.wise-qatar.org/app/uploads/2019/04/rr.3.2017_brac.pdf

NCERT. (2018). Math-magic Book 5: Textbook in Mathematics for Class V. National Council of Educational Research and Training.

OECD: Organisation for Economic Co-operation and Development. (2006). Outline of Principles of Impact Evaluation. https://www.oecd.org/dac/evaluation/dcdndep/37671602.pdf

OECD. (2012). Equity and quality in education: Supporting disadvantaged students and schools. Organisation for Economic Co-operation and Development. https://www.oecd-ilibrary.org/education/equity-and-quality-in-education_9789264130852-en

Oyekan, K., Ayorinde, A., & Adenuga, O. (2023). The problem of out-of-school children in Nigeria [RISE Blog]. https://riseprogramme.org/publications/problem-out-school-children-nigeria?utm_source=RISE+Mailing+List&utm_campaign=16a95a0dfe-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_a002a6f11f-16a95a0dfe-330306233

Park, K. M. (1997). School Mathematics Curriculum in Korea. School Mathematics Curriculum in Korea. Retrieved September 11, 2023, from https://tatagyes.files.wordpress.com/2007/10/115181_kurikulum-korea.pdf

Patrinos, H., & Psacharapoulos, G. (2018). Strong link between education and earnings [World Bank Blogs]. Strong Link Between Education and Earnings. https://blogs.worldbank.org/education/strong-link-between-education-and-earnings

Pritchett, L. (2013). The rebirth of education. Center for Global Development. https://www.cgdev.org/sites/default/files/rebirth-of-education-brief-lant-pritchett.pdf

Pritchett, L., & Beatty, A. (2015). Slow down, you're going too fast: Matching curricula to student skill levels. International Journal Educational Development, 40(1), 276-288. https://www.sciencedirect.com/science/article/abs/pii/S0738059314001217

Rocher, T., & Hastedt, D. (2020). International large-scale assessments in education: A Brief guide (No. 10; pp. 1–8). International Association for the Evaluation of Educational Achievement. https://www.iea.nl/sites/default/files/2020-09/2020.09.01_ISLAs%20in%20education-a%20brief%20guide%20Compass%2010.pdf

Rodriguez-Segura, D., & Mbiti, I. (2022). Back to the Basics: Curriculum Reform and Student Learning in Tanzania [Working Paper]. RISE. https://www.povertyactionlab.org/sites/default/files/research-paper/Back%20to%20the%20Basics-%20Curriculum%20Reform%20and%20Student%20Learning%20in%20Tanzania.pdf

Rodriguez-Segura, D., & Tierney, S. (2024). The prevalence and policy implications of between-school heterogeneity in learning outcomes: Evidence from six public education systems. https://doi.org/https://doi.org/10.26300/3psa-e628

Roser, M., & Ortiz-Ospina, E. (2013). Literacy. Our World in Data. https://ourworldindata.org/literacy

Saavedra, J. E., Naslund-Hadley, E., & Alfonso, M. (2017). Targeted remedial education: Experimental evidence from Peru. National Bureau of Economic Research.

Sasu, D. D. (2022). Number of children enrolled in public elementary school in Nigeria as of 2019, by age group and gender. Statista. https://www.statista.com/statistics/1128931/children-in-enrolled-in-public-elementary-school-in-nigeria/

Sosu, E. M., & Pimenta, S. M. (2023). Early childhood education attendance and school readiness in low- and middle-income countries: The moderating role of family socioeconomic status. Early Childhood Research Quarterly, 63, 410–423. https://doi.org/10.1016/j.ecresq.2023.01.005

Spaull, N., & Kotze, J. (2015). Starting behind and staying behind in South Africa: The case of insurmountable learning deficits in mathematics. International Journal of Educational Development, 41, 13–24. https://doi.org/10.1016/j.ijedudev.2015.01.002

Spivack, M. (2021). Applying systems thinking to education: The RISE systems framework. RISE. https://riseprogramme.org/publications/applying-systems-thinking-education-rise-systems-framework

UNESCO. (2019). Number of out-of-school children. https://data.uis.unesco.org/

UNESCO. (2020). Global Proficiency Framework for Mathematics. UNESCO Institute for Statistics. https://gaml.uis.unesco.org/wp-content/uploads/sites/2/2021/03/Global-Proficiency-Framework-Math.pdf

UNESCO. (2022a). Finance--Governments and households. https://www.education-progress.org/en/articles/finance

UNESCO. (2022b). Why early childhood care and education matters. https://www.unesco.org/en/articles/why-early-childhood-care-and-education-matters

UNESCO. (2023a). Education data release 2023. https://uis.unesco.org/en/news/education-data-release

UNESCO. (2023b). Out-of-school children and youth. https://uis.unesco.org/en/topic/out-school-children-and-youth

UNESCO, UNICEF, & World Bank. (2021). The state of the global education crisis: A path to recovery. https://documents1.worldbank.org/curated/en/416991638768297704/pdf/The-State-of-the-Global-Education-Crisis-A-Path-to-Recovery.pdf

UNICEF. (n.d.). Tracking early childhood development: Data and evidence are critical to understanding what young children need. https://www.unicef.org/early-childhood-development/data-evidence-tracking

UNICEF. (2019). A world ready to learn: Prioritizing quality early childhood education. https://www.unicef.org/reports/a-world-ready-to-learn-2019

UNICEF. (2023). COVID-19 scale of education loss “nearly insurmountable”, warns UNICEF. https://www.unicef.org/press-releases/covid19-scale-education-loss-nearly-insurmountable-warns-unicef

United Nations. (2020). Policy brief: Education during COVID-19 and beyond. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf

USAID. U.S. Agency for International Development. (2018). Country dashboard. https://idea.usaid.gov/cd

USAID: U.S. Agency for International Development. (2018). Guide for planning long-term impact evaluations. Utilizing the Expertise of the Expanding the Reach of Impact Evaluation (ERIE) Program Consortium. https://pdf.usaid.gov/pdf_docs/PA00T9HJ.pdf

Vegas, E. (2020). School closures, government responses, and learning inequality around the world during COVID-19. Brookings Institution. https://www.brookings.edu/articles/school-closures-government-responses-and-learning-inequality-around-the-world-during-covid-19/

Wane, W., & Rakotoarivony, R. A. (2017). Education service delivery in Madagascar. World Bank. https://documents1.worldbank.org/curated/en/979291667503883907/pdf/Education-service-delivery-in-Madagascar.pdf

World Bank. (2010-2014). Service delivery indicators: Niger, Nigeria, and Togo. https://www.worldbank.org/en/programs/service-delivery-indicators/education/interactive-results

World Bank. (2018). Learning to realize education's promise. International Bank for Reconstruction and Development. https://www.worldbank.org/en/publication/wdr2018

World Bank. (2020a). Measuring the quality of MoRA's education services. https://documents1.worldbank.org/curated/en/249751605564818092/pdf/Measuring-the-Quality-of-MoRAs-Education-Services.pdf

World Bank. (2020b). "When I grow up, I'll be a teacher" -- The new ambitions of Congolese schoolchildren now that school is free. https://www.worldbank.org/en/news/feature/2020/06/16/the-new-ambitions-of-congolese-schoolchildren-now-that-school-is-free

World Bank. (2023). Rebuilding education systems after COVID-19. https://datatopics.worldbank.org/sdgatlas/goal-4-quality-education/

World Bank. (2024). World Development Indicators. https://databank.worldbank.org/source/world-development-indicators

Yanguas, M. L. (2020). Technology and educational choices: Evidence from a one-laptop-per-child program. Economics of Education Review, 76, 101984. https://doi.org/https://doi.org/10.1016/j.econedurev.2020.101984


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