

GPE KIX  
SYNTHESIS  
REPORT

The Global Partnership for Education Knowledge and Innovation Exchange

# EDUCATION DATA SYSTEMS AND DATA USE A RESEARCH SYNTHESIS



DATA

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The Global Partnership for Education (GPE) is the largest global fund solely dedicated to transforming education in lower-income countries, and a unique, multi-stakeholder partnership. Find out more at [globalpartnership.org](http://globalpartnership.org).

### About GPE KIX

The Global Partnership for Education Knowledge and Innovation Exchange (GPE KIX) is a joint endeavour between GPE and IDRC that aims to ensure partner countries have and use the evidence and innovation they need to accelerate access, learning outcomes and gender equality through equitable, inclusive and resilient education systems fit for the 21st century.

### About this report

This synthesis report is one of five commissioned by GPE KIX to consolidate evidence and lessons learned from applied research projects funded during the program's first phase, from 2019 to 2024. These multi-stakeholder projects focused on key challenges facing education systems across the Global South and generated evidence, strengthened capacities and mobilized knowledge into policy and practice. The reports in this series address five priority themes identified by national education stakeholders: data systems and data use; early learning; gender equality, equity and inclusion; out-of-school children and youth; and teacher professional development.

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**For more information:** [www.gpekix.org](http://www.gpekix.org)

# ABBREVIATIONS

<b>ADAPT</b>	Adapting Assessment into Policy and Learning
<b>AI</b>	artificial intelligence
<b>ALiVE</b>	Assessment of Life Skills and Values in East Africa
<b>CIES</b>	Comparative and International Education Conference
<b>CLA</b>	citizen-led assessment
<b>CoP</b>	community of practice
<b>DHIS2</b>	District Health Information System
<b>EMAP</b>	Europe, Middle East and North Africa, Asia and Pacific
<b>EMIS</b>	education management information systems
<b>FLN</b>	foundational learning and numeracy
<b>GEI</b>	gender equality, equity and inclusion
<b>GESCI</b>	Global e-Schools and Communities Initiative
<b>GPE</b>	Global Partnership for Education
<b>HISP</b>	Health Information Systems Programme
<b>ICAN</b>	International Common Assessment of Numeracy
<b>IDRC</b>	International Development Research Centre
<b>IIEP</b>	International Institute for Educational Planning
<b>LSMS</b>	Living Standard Measurement Study
<b>MICS</b>	Multiple Indicator Cluster Survey
<b>MoES</b>	Ministry of Education and Sports
<b>MOEVT</b>	Ministry of Education and Vocational Training

<b>MUSD</b>	Morongo Unified School District
<b>NCDC</b>	National Curriculum Development Centre
<b>OSS</b>	open-source software
<b>PAL</b>	People's Action for Learning
<b>PAL-ELANA</b>	People's Action for Learning – Early Language & Literacy and Numeracy Assessment
<b>PD</b>	positive deviance
<b>RELI</b>	Regional Education Learning Initiative
<b>SIAP</b>	Statistical Institute for Asia and the Pacific
<b>TIE</b>	Tanzania Institute of Education
<b>UKFIET</b>	Education and Development Forum in the United Kingdom
<b>UNEB</b>	Uganda National Examinations Board
<b>WCA</b>	West and Central Africa
<b>WiLL</b>	Women in Learning Leadership
<b>ZIE</b>	Zanzibar Institute of Education

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# EXECUTIVE SUMMARY

Between 2020 and 2024, the Global Partnership for Education Knowledge and Innovation Exchange (GPE KIX), a joint endeavour with Canada's International Development Research Centre (IDRC), supported five research projects to test, assess and develop strategies to scale data systems and data use in education to improve learning outcomes, equity and evidence-based decision-making. The projects involved 11 partners and 44 countries in total. They were:

- [Data Must Speak About Positive Deviance Approaches to Learning](#) (Data Must Speak)
- [Using Data for Improving Education Equity and Inclusion](#) (MICS-EAGLE)
- [Common-Scale Assessment of Early and Foundational Math Learning Across the Global South](#) (Common-Scale Assessment)
- [Adapting Assessment into Policy and Learning: Adolescent 21st Century Skills](#) (ADAPT)
- [Data Use Innovations for Education Management Information Systems in The Gambia, Uganda and Togo](#) (Data Use Innovations for EMIS)

These projects assessed innovations designed to improve data generation, strengthen the use of data and leverage data for better decision-making and evidence-based policymaking, while enhancing gender equality, equity and inclusion (GEI).

This report synthesizes the findings from the five projects and identifies both generalizable lessons and more particular points of interest, situating the specific contributions of grounded research in broader bodies of knowledge. It informs regional and global education debates by highlighting lessons learned and recommendations that can help future efforts to scale data-related innovations.

## Key themes and findings on data systems and data use to improve equitable quality education

### 1. Dataset integration and use of multi-source data to inform policy and planning:

One of the central themes of the report is the integration and use of multiple source data, including learning assessment data, to inform policy and decision-making. Internationally, the education sector has increasingly moved toward evidence-based decision-making — that is, using data to help shape policies and guide interventions. However, while much data is readily available through national assessments and other sources, many countries are not using this information effectively.

Understanding how to integrate datasets and create institutional cultures and tools to facilitate the use of data in the policy and planning processes was a central focus of the GPE KIX research. The projects produced and analyzed data for decision-making and/or supported the integration of data from multiple sources, including administrative data, learning assessments and other education system data, as well as data from other sectors and household surveys. The research explored challenges and opportunities for continuing to do this on an ongoing basis

For example, the Common-Scale Assessment and ADAPT projects pioneered the use of citizen-led assessments (CLAs) to provide simple, actionable data on children’s foundational learning. These projects empowered communities and governments to make informed decisions based on real-time learning data that will help address gaps in foundational literacy and numeracy. However, translating assessment data into national policies that directly affect classroom practices has its challenges.

## **2. Capacity-strengthening to analyze, interpret and use data for decision-making:**

Another central theme of this report is the capacity within ministries of Education to analyze and use data effectively. Many ministries struggle because of a lack of trained personnel, underfunded data departments and competing priorities. As a result, even when valuable data is available, it is often either not used to its full potential or not used at all.

All five projects discussed in this report offered multiple types of capacity-strengthening in a variety of areas, including the design, implementation and application of the evidence. They addressed capacities to adapt approaches to national contexts and priorities, supported the development of technical capacities among national stakeholders, and involved decision-makers in co-creating aspects of the research and investigating opportunities to integrate the work into existing national systems. The project teams collaborated with a variety of experts, brought national stakeholders into peer support networks and facilitated intersectoral collaboration within countries.

The Data Must Speak project, for example, offers an innovative approach to capacity-strengthening by identifying high-performing schools in low-resource settings and analyzing the factors that contribute to their success. This approach helps ministries and education stakeholders understand the importance of data-driven policies and supports internal capacity-strengthening for data analysis.

## **3. Use of data to promote gender equality, equity and inclusion:**

Data systems play a critical role in promoting GEI in education, particularly for marginalized groups such as girls, children with disabilities and children in conflict zones. This report highlights how the lack of detailed, disaggregated data often renders the most vulnerable children invisible in policy discussions. It underscores the importance of



working with external data sources – for example, ministries of Health and Social Welfare – to gain a fuller understanding of the socio-economic factors affecting educational outcomes.

Projects such as MICS-EAGLE provide new insights into the intersection of gender, disability and education by integrating data from household surveys. The MICS-EAGLE project allowed governments to track critical SDG 4 indicators and has provided tools to help education stakeholders better understand and address inequalities in education.

**4. Sustainability and scaling of data systems and data use:** Scaling up data systems effectively requires adaptable, modular solutions that can be maintained with local expertise. A major challenge in GPE partner countries has been the sustainability of education management information systems (EMIS) that entail costly, vendor-dependent solutions that only people with specialized technical skills can maintain. The five GPE KIX projects discussed in this report used a variety of strategies to scale data systems innovations. For example, the Data Use Innovations for EMIS project provided an open-source, customizable platform that allows countries to build scalable data systems. This model has been successfully deployed in The Gambia, Togo and Uganda and is an example of how decentralized, real-time data systems can be adapted to local contexts and integrated into national education strategies. The success of these systems underscores the importance of building and strengthening in-house technical capacity and ensuring that data systems are adaptable to changing educational needs.

The GPE KIX projects found the following strategies useful and impactful for scaling and sustaining data innovations :

- Foster stakeholder alignment and engagement.
- Tailor innovations to countries' specific educational requirements and ensure adaptability of data systems and assessment tools for replication in different countries.
- Communicate the credibility of the research practice, its data and the proven practices.
- Facilitate local and national stakeholder capacity-strengthening to implement data systems and analyze, interpret and use data.
- Mobilize knowledge about the data innovations.
- Establish partnerships with universities and other reputable organizations to expand the collective knowledge and offer master's and doctoral training programs.

## Recommendations for effective data systems and data use

The following recommendations emerged from across the five research projects:

**1. Facilitate dataset integration and use of multi-source data to inform policy and planning:** Confirming that data systems can integrate easily with internal data systems, providing ministries with clear guidelines and methodologies for using multi-source data in policymaking and embedding data use in national planning are key to ensuring data informs decision-making. In addition, encouraging ministries to develop and use school typologies based on research findings can help identify factors that contribute to school effectiveness, thus allowing for targeted interventions to improve educational outcomes. Promoting the adoption of standardized assessment tools developed by CLA approaches among ministries can enhance the reliability and comparability of educational assessments across countries.

**2. Strengthen capacity across all levels:** Capacity-strengthening should be a priority at all levels, from technical data department staff to senior management. Ministries need dedicated training programs and ongoing technical support to improve data literacy, analysis skills and the ability to integrate data into strategic decision-making. Key capacity-strengthening strategies include fostering collaboration between different sectors, such as education, health and social welfare, to provide more comprehensive, multidimensional insights into student needs.

**3. Focus on gender equality, equity and inclusion:** GEI should be at the heart of all data collection efforts. Stakeholders should therefore place a deliberate focus on disaggregating data by gender, disability status, socio-economic status and geographic location to ensure that no child is left behind. It is necessary to expand data collection efforts to include more granular information about marginalized groups and to use a data system that keeps individual records about students as well as records of school counts. Governments must make better use of household surveys, external public databases and innovative assessment tools to identify and address disparities in education access and quality.

**4. Adopt scalable, open-source data systems:** If data-related innovations are to be adopted and scaled, ministries of Education must be engaged from the earliest stages of their development. They must see the value of these systems not only as technological tools but also as integral aspects of their policymaking processes. To overcome the challenges of costly, vendor-dependent data systems, governments should adopt open-source, modular platforms such as DHIS2 for Education, which can be customized and scaled to meet national needs. Such systems enable governments to collect and use data in real time, making them more responsive to emerging challenges. Local capacity-strengthening initiatives are essential to ensure the maintenance and scaling of these systems over time.

Sustaining progress in education data systems requires patience, flexibility and quick wins. Stakeholders who are promoting innovation in data systems often face resistance or political or institutional barriers, but fostering shared ownership, trust and understanding of the broader ecosystem can help overcome these challenges. It is essential to support ministries through change-management strategies and focus on achieving short-term successes to maintain momentum for long-term policy evolution.

This synthesis report on GPE KIX projects illustrates the significant potential of improved data systems to transform educational outcomes. By strengthening the capacity to collect, analyze and use data, countries can create more equitable, inclusive and high-performing education systems that are better equipped to meet the challenges of the twenty-first century. These innovations require sustained investment in both technology and human resources, as well as strong collaboration between governments, development partners and local communities. The lessons learned from these projects offer a pathway for scaling successful models of data use and ensuring that education systems are resilient, inclusive and evidence-driven.

# 1. INTRODUCTION

The Global Partnership for Education Knowledge and Innovation Exchange (GPE KIX) is a joint endeavour between the Global Partnership for Education (GPE) and Canada's International Development Research Centre (IDRC) to ensure partner countries have and use the evidence and innovation they need to accelerate access, learning outcomes and gender equality through equitable, inclusive and resilient education systems fit for the twenty-first century.

From 2020 to 2024, GPE KIX funded 41 applied research projects focused on key challenges facing education systems across the Global South. These projects generated demand-driven and contextually relevant evidence on a wide range of innovative education programs, strengthened capacities of education stakeholders and mobilized knowledge into policy and practice. The research projects were engaged and applied, involving research users – communities and parents or caregivers, teachers and school leaders, district to national education officials and other stakeholders as relevant – throughout the entire process. They were undertaken by a range of universities, think tanks, networks and NGOs.

This document is one of five synthesis reports commissioned by GPE KIX to consolidate evidence and lessons learned across these projects in relation to priority themes identified by national education stakeholders: data systems and data use; early learning; gender equality, equity and inclusion (GEI); teacher professional development; and out-of-school children and youth.

## 1.1 The global shift in education management information systems

The ability to collect data and use it to monitor systems and make decisions based on robust insights more quickly has benefited a wide variety of sectors around the world. In the education sector, for example, data can help educators take more timely action to adjust programs according to needs or preferences as indicated by the data, help students in need and allocate more resources to systems that are making a difference. Internationally, there is growing support for a review of the existing education management information systems (EMIS) – “system[s] for the collection, integration, processing, maintenance and dissemination of data and information to support decision-making, policy-analysis and formulation, planning, monitoring and management at all levels of an education system.”<sup>1</sup> Changes to such systems would not only aid practical decision-making but also support national governments' efforts

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<sup>1</sup> UNESCO, 2008.

to improve access, equity and quality strategies for measuring student learning.<sup>2</sup> Essentially, the proposed changes aim to transform the current systems, which provide a static, one-time snapshot of education input statistics, into a more dynamic system that is based on learning assessment data and focused on data analytics and early-warning mechanisms.

The new model, driven by private sector information-management models and referred to as EMIS 2.0, would promote user- and service-oriented systems. It would mobilize both new stakeholders – for example, communities, school boards, district officials – and existing ones to use data provided in a usable format in near-real-time to support evidence-based decision-making.

GPE partner countries face a range of issues that could prevent them from adopting this new type of EMIS – for example, a lack of resources and technical capacity, difficulties in competing with private organizations for technical staff, low data literacy and fragmented data sources. A significant barrier is low levels of trust in the quality and timeliness of data; this leads to inconsistent use of information at all levels of the education system.<sup>3</sup> Many efforts to build sector-wide, Web-based systems offering all the expected functionalities of the EMIS 2.0 model have proven unsustainable. This suggests a need to rethink new components and processes of the EMIS 2.0.<sup>4</sup> Furthermore, the ongoing global shift in education data priorities, driven by the United Nations Sustainable Development Goal 4 (SDG 4) indicators, increases the need to have creative and frequent discussions about new ways of collecting, analyzing, disseminating and using education data. This need is central to discussions among the communities of practice (CoPs) on knowledge exchange concerning innovation in data, data systems and data use.

## 1.2 About the projects

This synthesis analyzes five GPE KIX research projects that were implemented between 2020 and 2024 and focused on data systems and data use innovations. The projects involved 11 partners and 44 countries in total.

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<sup>2</sup> The shift from counting educational inputs to measuring educational outputs has been a driver for the evolution of EMIS in recent years.

<sup>3</sup> UNESCO, 2022.

<sup>4</sup> UNESCO, 2020a.

The projects (and their short-form titles) were:

- [Data Must Speak About Positive Deviance Approaches to Learning](#) (Data Must Speak)
- [Using Data for Improving Education Equity and Inclusion](#) (MICS-EAGLE)
- [Common-Scale Assessment of Early and Foundational Math Learning Across the Global South](#) (Common-Scale Assessment)
- [Adapting Assessment into Policy and Learning: Adolescent 21st Century Skills](#) (ADAPT)
- [Data Use Innovations for Education Management Information Systems in The Gambia, Uganda and Togo](#) (Data Use Innovations for EMIS)

Table 1 shows the names of the implementing organizations and focus countries and each project’s primary objective and the innovations it tested or assessed. More detail on the projects’ aims and strategies can be found in Appendix.

**Table 1.** Overview of five GPE KIX data systems and data use projects

Project short form (as used in this report) and countries	Implementing organizations	Project’s primary objective and innovations tested or assessed
<b>Data Must Speak</b> Burkina Faso, Ethiopia, Ghana, Lao PDR, Madagascar, Nepal, Niger, Togo, Zambia	UNICEF Office of Research – Innocenti	<p>This project aimed to support the production, analysis and use of enhanced educational data and positive deviance (PD) approaches to learning in GPE partner countries and for the broader international community of education stakeholders.</p> <p>It sought to adapt and scale Data Must Speak, a UNICEF-led proven innovation on data use in the education sector. The research incorporated the concept of PD – that is, how some schools achieve better results than others, even when their contexts are similar – and how PD can be leveraged to advance learning outcomes across the board by using available data within a specific education system.</p>

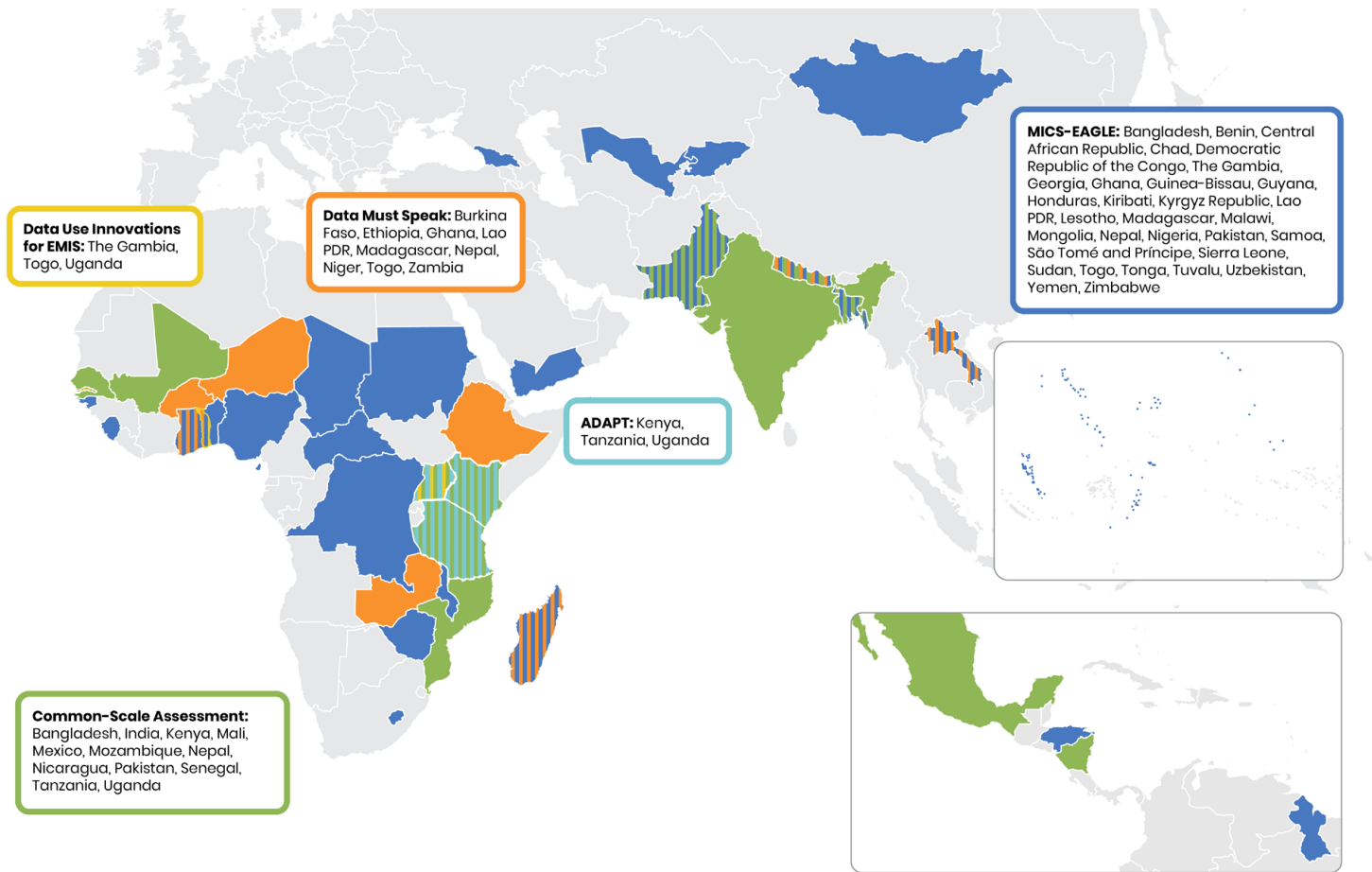
Project short form (as used in this report) and countries	Implementing organizations	Project's primary objective and innovations tested or assessed
<p><b>MICS-EAGLE</b></p> <p>Bangladesh, Benin, Central African Republic, Chad, Democratic Republic of the Congo, The Gambia, Georgia, Ghana, Guinea-Bissau, Guyana, Honduras, Kiribati, Kyrgyz Republic, Lao PDR, Lesotho, Madagascar, Malawi, Mongolia, Nepal, Nigeria, Pakistan, Samoa, São Tomé and Príncipe, Sierra Leone, Sudan, Togo, Tonga, Tuvalu, Uzbekistan, Yemen, Zimbabwe</p>	UNICEF	<p>This project built on a proven initiative called the Multiple Indicator Cluster Survey Education Analysis for Global Learning and Equity (MICS-EAGLE), which was piloted in Laos, Sierra Leone and Suriname in 2018.</p> <p>The objective was to determine whether an adapted version of the MICS-EAGLE could improve equity and quality analysis in 31 developing countries, and to what extent the marginalization of specific groups affects their access to education, learning outcomes and progression through education nationally, regionally and globally.</p> <p>The project aimed to generate new knowledge by using MICS 6 survey data and engaging key education sector stakeholders in the analysis for the practical purpose of creating effective policies that will improve equity and expand educational opportunities.</p>

Project short form (as used in this report) and countries	Implementing organizations	Project's primary objective and innovations tested or assessed
<p><b>Common-Scale Assessment</b></p> <p>Bangladesh, India, Kenya, Mali, Mexico, Mozambique, Nepal, Nicaragua, Pakistan, Senegal Tanzania, Uganda</p>	<p>The People's Action for Learning (PAL) Network</p> <p>Pratham</p> <p>Australian Council for Educational Research</p>	<p>This project developed the PAL Early Language &amp; Literacy and Numeracy Assessment (ELANA) tool. The ELANA built on the PAL Network's International Common Assessment of Numeracy (ICAN) tool, which is tailored for assessing, reporting and providing community- and school-relevant data that parents or caregivers and communities can easily understand. ICAN was implemented in one rural district in 12 countries in 2019. The Common-Scale Assessment project supported the expansion of the tool from one district to three districts in 12 countries in Africa and Asia. It also expanded the tool to include foundational math skills with the goal of producing data on early math skills among a marginalized population that could be both understood at a community level and used as internationally comparable data.</p>
<p><b>ADAPT</b></p> <p>Kenya, Tanzania, Uganda</p>	<p>Global e-Schools and Communities Initiative (GESCI)</p> <p>Makerere University's College of Education and External Studies</p> <p>University of Notre Dame</p>	<p>This project built on the lessons learned from a learning assessment model called the Assessment of Life Skills and Values in East Africa (ALiVE). This model focuses on the long-term goal of helping education systems assess critical 21st-century skills and use assessment data to improve curricula. ALiVE is a simple, rigorous and easy-to-use affordable tool that can be used on a national scale in both formal and non-formal education settings.</p> <p>The project aimed to build a robust knowledge management system to embed the ALiVE measures of 21st-century skills within national efforts to develop/improve education and training programs and practices in Kenya, Tanzania and Uganda.</p>



Project short form (as used in this report) and countries	Implementing organizations	Project’s primary objective and innovations tested or assessed
<p><b>Data Use Innovations for EMIS</b></p> <p>The Gambia, Togo, Uganda</p>	<p>University of Oslo partnering with its regional technical organizations, under the name Health Information Systems Programme (HISP)</p> <p>UNESCO Institute of Statistics</p> <p>Save the Children Uganda</p>	<p>This project draws on decades of work with a successful and innovative digital platform called the District Health Information System (DHIS2) carried out in the health sector by the University of Oslo’s Health Information Systems Programme (HISP). With the support of GPE KIX, the University of Oslo sought to adapt DHIS2 to improve EMIS in The Gambia, Togo and Uganda to address the lack of turnkey EMIS that can be used sustainably and at scale. Building on lessons learned in those three countries, the project is responding to new demands from Eswatini, Mozambique, Senegal and Sierra Leone to enhance data-driven decision-making, including operationalization of indicators relating to GEI at district and school levels in all seven countries.</p>

**Figure 1.** Countries in which GPE KIX research projects were conducted



### 1.3 About this report

This report presents findings from the five research projects in terms of four key themes drawn from the literature on datasets integration and use of multi-source data to inform policy and planning; capacity-strengthening to analyze, interpret and use data for decision-making; use of data for improving education gender equality, equity and inclusion; and scaling of data systems and data use. Detailed evidence from the individual projects can be found in the primary research outputs listed in the bibliography.

The authors of this report used a participatory approach to allow them to assess the findings and outcomes of the projects in terms of broad themes related to education data systems and use.

They initially conducted online surveys with the GPE KIX grantees. They then conducted virtual focus group meetings and interviews with beneficiaries, reviewed documents and reports produced by the project teams and drew on insights provided by IDRC.

The first step in the synthesis process was to summarize the innovations in terms of their specific impacts (see Appendix: Project summaries). These project summaries were written in close collaboration with the GPE KIX grantees. Subsequently, the preliminary findings were shared with country policymakers and professionals in various forums. The main audience included GPE KIX regional Hubs' national delegates and education groups, and the main platforms on which the findings were shared and discussed were webinars and online forums. Occasionally the GPE KIX grantees and the research team showcased the innovations and findings together. These showcasing events included the KIX Continental Research Symposium and African Union meetings in 2023, as well as multiple KIX Africa 19 Hub and KIX Europe, Middle East and North Africa, Asia and Pacific (EMAP) Hub webinars. Overall, events such as these increased exposure for the projects and expanded the project team's ability to gather feedback.

## 2. LITERATURE REVIEW OF KEY CHALLENGES AND PRIORITIES RELATING TO DATA SYSTEMS AND DATA USE

This literature review covers the four thematic areas relating to the key challenges and priorities around data, data use and data systems in the majority of GPE partner countries. It provides context for the contributions of the findings from the GPE KIX projects, as described in section 3.

### 2.1 Theme 1: Dataset integration and use of multi-source data to inform policy and planning

Data is an essential component of equitable and inclusive quality education, but the literature shows that in many countries, it is either lacking or not fully integrated across the education system. For example, data, including from learning assessments, is not always linked in the broader EMIS, which limits a user's ability to harness the EMIS to inform policy and planning in education. Integrating externally produced data with an EMIS can ultimately help improve learning outcomes for all. In addition to facilitating effective data management, sharing and use, when data sources are intergrated, EMIS units and other departments and functions, such as planning, policy, teacher training, gender, social inclusion, civil registration, and health, must collaborate, which fosters a more holistic approach and comprehensive outcome.

Governments all over the world have relied for decades on national end-of-school-cycle examinations to measure how well their education system is performing. Some countries – for example, Kenya – compare schools' or regions' performance on examinations relative to each other, but this is not common practice. In most instances, individual students obtain their results, although sometimes school examination averages are published.

The UN's 2030 Agenda for Sustainable Development includes a commitment to provide inclusive and equitable quality education at all levels. Since that agenda was launched, the practice of comparing learning achievements between countries has become more common. Countries are now encouraged to undertake sample-based learning assessments in accordance with SDG 4 Indicator 4.1.1, which emphasizes the importance of tracking the proficiency levels of children and young people in reading and mathematics, thus ensuring that progress is measured against and aligned with global education targets. Robust measuring tools, including national, regional and international assessments, are crucial for evaluating national education systems' achievements and allowing countries to compare how well their systems are performing in terms of producing numerate and literate students.

However, even in GPE partner countries that have adopted such assessment tools, some of which analyze learner performance by type of school, location and gender, and sometimes by teacher profiles, the data is seldom used to inform either approaches to classroom teaching and learning or changes in the curriculum or teacher professional development strategies and opportunities.

Overall, learning data is scarce, and where it exists, governments do not exploit its full potential in evidence-based decision-making. For example, less than one third of the 76 GPE partner countries reported data for any specific learning metric, by level and year within the five most recent years up to 2021; less than half had data that tracked primary grade reading in 2016–2021; and only 10 had data on reading and mathematics proficiency at the end of lower-secondary education.<sup>5</sup>

Despite learning being at the heart of global education agendas, less than one quarter of countries in Africa have provided SDG 4.1 data since 2014. That data shows that only one third of students in those countries achieve the minimum proficiency levels in early-grade reading. This issue is more pronounced by the end of primary education: only one out of every four children has basic skills in reading or mathematics by that point.<sup>6</sup>

The scarcity of data in many ministries stems from the understaffing and underfunding of data departments and is compounded by a reliance on systems geared toward reporting on enrolment figures and inputs rather than on the more complex task of measuring educational quality and learner results. Most systems track data only at the aggregate level, not at the child level; they focus on the “average child.”<sup>7</sup> This makes it difficult to assess whether the education sector is paying attention to the most vulnerable children or using the appropriate interventions to reach them. The COVID-19 pandemic further underscored enduring challenges in educational assessment, highlighting the slow evolution of practices that have essentially remained the same for a century, despite calls for change to reflect new practices in assessment. However, there has been a slight shift. The focus now is less on assessment *of* learning and more on assessment *for* learning, using broader tools that are more directly relevant to the twenty-first century and assessing life skills such as communication, creativity and critical thinking, the latter of which aligns with the growing need for more inclusive and comprehensive measures of student learning outcomes. Researchers therefore began to turn to household surveys or citizen-led learning assessments (CLAs) to assess the educational landscape. Many students may not reach the end-of-cycle national

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<sup>5</sup> Global Partnership for Education (GPE), 2023b.

<sup>6</sup> GPE, 2023b.

<sup>7</sup> Crouch, 2019.

examination stage or have the basic literacy, numeracy and life skills they need to survive and maintain their well-being. Household surveys and CLAs rely on civil society to put political pressure on the government to improve learner outcomes at the basic and foundational levels, and data from both have emerged as pivotal tools in education management (see the findings section for more detail). By focusing on key areas such as literacy, numeracy and essential twenty-first-century skills, these methods aim to ensure that no learner is left behind – the overarching goal of SDG 4.

## **2.2 Theme 2: Capacity-strengthening to analyze, interpret and use data for decision-making**

The literature shows that even when education data is available in ministries of Education, governments often lack the internal capacity to analyze, interpret and use it for decision-making. Knowledge about the purpose of the data and how it can generate insights for policy changes is minimal. In some countries, even within data departments, governments have inadequate understanding of international standard definitions of indicators and why they are monitored.<sup>8</sup>

In general, analyses show that government data departments are severely underfunded and lack adequate software, equipment and qualified staff. Senior management has little understanding of the need to have such technical resources in-house. Staff in understaffed data departments are expected to focus on other data-related roles, usually data collection and reporting on inputs for financial planning or releases, and they seldom have the statistical skills to identify factors that affect student learning and assess whether those factors are causal or incidental. In addition, they are likely to find it difficult to acquire the statistical methodology knowledge they need to undertake this level of analysis.

Ministries of Education seldom place priority on equipping staff with the knowledge and skills that are required to analyze and interpret data that could be used in decision-making at both the operational and strategic-management levels. The resulting skills gaps hamper ministries' efforts to use data to deploy teachers equitably by district, type of school and subject specialization; this in turn severely limits the government's capacity to manage the education sector effectively. Furthermore, a general lack of digital literacy in civil society means that most people cannot use indicators to hold their governments accountable for performance and so cannot place political pressure on them to perform better.

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<sup>8</sup> UNESCO, 2021.

Only 38 percent of GPE partner countries reported on the 10 key indicators of SDG 4 in 2022, which indicates that collecting and using education-related data is not a shared priority among them. Only 3.9 percent reported that they assessed the availability and use of data and evidence, and a similarly low percentage evaluated the status of gender-responsive planning and monitoring. These figures highlight a critical gap in how data is being collected and used for informed decision-making in education and underscore the need for enhanced capacity and commitment to data-driven planning and policy development.<sup>9</sup>

### **2.3 Theme 3: Use of data to improve gender equality, equity and inclusion**

Equity is at the heart of SDG 4.<sup>10</sup> In the 2030 Agenda, governments affirm that “all people, irrespective of sex, age, race, ethnicity and persons with disabilities, migrants, indigenous peoples, children and youth, especially those in vulnerable situations, should have access to life-long learning opportunities,” and underline the need for “particular attention and targeted strategies” for vulnerable groups to fulfill this commitment.

Children from disadvantaged backgrounds are more likely to receive lower-quality education in schools with less qualified teachers and fewer overall resources, including teaching staff, and to leave school earlier than children from other backgrounds. There are no quick and easy solutions to inequality; it is a result of complex interactions between multiple factors that may be difficult to separate out and identify.<sup>11</sup> Data is a crucial tool for uncovering injustices and informing evidence-based solutions. However, when only limited quantitative data is available, there is a risk that reasons for inequities will be simplified, and this in turn increases the risk that children who are “invisible” in data will be overlooked.

A recent think piece about the Africa region<sup>12</sup> that assessed the monitoring of SDG 4 indicators noted that data was significantly underreported for early childhood learners,<sup>13</sup> youth and adult learners,<sup>14</sup> and learners, both in- and out-of-school, disaggregated by type of vulnerability. Typically, out-of-school children and youths are ignored by national education systems, which report them only as the proportion of students who are not in school and rarely conduct in-depth analyses to identify

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<sup>9</sup> GPE, 2023b.

<sup>10</sup> See [https://sdgs.un.org/goals/goal4#targets\\_and\\_indicators](https://sdgs.un.org/goals/goal4#targets_and_indicators)

<sup>11</sup> Arnott, 2024.

<sup>12</sup> Arnott, 2024.

<sup>13</sup> Only 28 percent of appropriately aged learners across the African continent are registered as receiving Early Child Development support. Data relating to SDG 4.2.1, on the development status of early learners, is collected by 26 (48 percent) of the 54 countries in the Africa region through sporadic household surveys, multiple indicator cluster surveys (MICS) or both (Arnott, 2024).

<sup>14</sup> Of the 58 percent of African youth of secondary-school age not enrolled in secondary school, many are also not in training or employment in either the formal or informal sector (UIS Institute for Statistics, 2019).

barriers to their access to education or learning. Accurately assessing learner skills and discerning what skills affect learning outcomes is challenging, and so there are generally no analyses of why vulnerable groups within the education system are either learning or failing to learn (SDG 4.1, 4.4 and 4.6).

Furthermore, children who are vulnerable because they are living in conflict situations often go unreported in education data systems, which means their needs are left unaddressed and their vulnerability unresolved. One in four African children lives in a conflict zone, a significant number by any standard.<sup>15</sup> Some conflict zones are no longer within the control of the government, which makes it even more difficult to collect data. Typically, in these circumstances, humanitarian agencies such as UNHCR and members of the Education Clusters, as well as national governments, will collect data. However, because the data may not be readily available to all stakeholders, these initiatives often deepen the data divide.

The demand for more detailed data is behind the drive to access relevant data from other sources, in addition to ministries of Education. External public databases offer significant potential to improve education planning. For example, ministries of Social Welfare and Protection Services can provide not only detailed information about birth registrations and families' access to social grants but also data that could be used to protect against family violence – including child abuse – substance abuse, poverty and other developmental risk factors. Data from government agencies that deal with public service employees can be used to cross-reference teacher employment records with those of the local teacher service commission's digital records, the EMIS and the local payroll system to eliminate ghost teachers and strengthen teacher management. When data collected by ministries of Health on child nutrition, health, gender-based violence, disabilities and immunizations is consolidated, stakeholders can use it to improve education planning. The health sector plays a critical role in early childhood development – for example, by supporting the child's well-being (promotive care), identifying children at developmental risk (preventive care) and helping children with special needs (curative care) – both overall and differentially by age group. Consolidating data sources would make it possible to monitor and assess learners by socio-economic status, disability status and gender, for example, and to conduct deeper analytical cross-referencing by age, geographic region and language, etc.

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<sup>15</sup> African Child Policy Forum, 2020.



## 2.4 Theme 4: Sustainability and scaling of data systems and data use

Hosting an EMIS on a data platform frequently requires costly investments tied to specific vendors, with the added drawback of having to depend on those vendors when there are changes in data use and system updates are needed. Many countries have become trapped in vendor data-system solutions that require a high level of expertise to develop and maintain. Educational systems lack modular, adaptable turnkey EMIS solutions that can be maintained and scaled in-country using local expertise.<sup>16</sup> This is unfortunate for low-resource countries and countries in conflict or fragile situations in particular, because turnkey systems can be rapidly deployed without ground-up development. However, some turnkey EMIS have been developed – EMIS in a box, as it were – and now form the backbone of several countries' data systems.

The current turnkey data systems vary in flexibility and cost. For example:

- The Program Management System in Education for Everyone, Everywhere (PROMISE) is an app-based system that allows schools and EMIS to track student enrolment, retention, attendance and learning outcomes in near-real-time – and without having to be constantly online.
- The Global ED\*ASSIST data system is an off-the-shelf system that uses cloud-based systems, mobile solutions, biometric identification (ID) systems, business intelligence software and dashboards and is applied in several GPE partner countries, including Sierra Leone, South Sudan and Tanzania.<sup>17</sup>
- The StatEduc data system, used in multiple West African countries including Ghana and Togo, is open-source but requires a high level of programming skills for customization.
- OpenEMIS has been implemented in several countries including Lesotho, Namibia and South Africa and requires sophisticated programming skills to operate and customize it.<sup>18</sup>
- DHIS2 was developed for the health sector and is now being used in education. It is an open-source, licence-free, customizable data system that produces individualized data and school counts (e.g., enrolment rates, number of inputs) in near-real-time in The Gambia, Togo and Uganda.

Several countries have developed their own EMIS data systems. Some – for example, Kenya and Somalia – have adequate in-house technical skills to successfully adapt and scale their systems to meet changing educational goals and priorities.<sup>19</sup> Others –

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<sup>16</sup> Crouch, 2019.

<sup>17</sup> Global Learning, 2018.

<sup>18</sup> See the OpenEMIS website at <https://www.openemis.org>

<sup>19</sup> GPE KIX, 2021.

for example, Lesotho, Papua New Guinea and Uganda – are struggling to adapt their data systems because of a lack of skills in-house and the cost of vendor services. High configuration costs and high technical capacity requirements can reduce the effectiveness of these systems.<sup>20</sup> For example, even when data systems are promoted as open-source with no licensing fee, crucial features may be available only as part of a paid service. Building local or internal capacity to develop and adapt a data system is critical to facilitating the sustainability of any of these systems.

A recent Harvard Business School study<sup>21</sup> on the value of open-source software (OSS) found that software whose source code is publicly available for inspection, use and modification and is often created in a decentralized manner and distributed for free appears in 96 percent of codebases. The study notes that although the concept of free and open software has existed since the 1950s, OSS took off in the 1990s after Linus Torvalds released the Linux kernel, which is still used in many OSS operating systems. Today, OSS is considered a key building block of the digital economy and is widely used by software developers in everything, including phones, cars, refrigerators and cutting-edge artificial intelligence (AI).<sup>22</sup> The study authors estimated the supply-side value by calculating the cost of recreating the most widely used OSS once and then calculated the demand-side value based on a replacement value for each organization that uses the software and would need to build it internally if the OSS did not exist. They estimated that the supply-side value of widely used OSS is USD 4.15 billion – and the demand-side value is USD 8.8 trillion. Organizations would need to spend 3.5 times more on software than they currently do if OSS did not exist. Research innovations that seek to address the current knowledge gap for resource-poor governments are therefore greatly appreciated.

Increasing government interest in understanding patterns of inequity in resources such as classrooms, textbooks and teacher allocations and disparities across gender and inclusivity lines (and not only input counts) is leading to data being collected more frequently and to data itself becoming more transactional. When education managers are making operational decisions, they must use data in near-real-time. Furthermore, that data must include individual learner records, as they make it possible for the managers to better understand the factors – for example, gender and inclusion – that affect student progression, dropout risks and system bottlenecks. Enhanced data systems and analytical skills will deepen insights into teaching and learning quality factors.

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<sup>20</sup> UNESCO, 2020b.

<sup>21</sup> Hoffmann et al., 2024.

<sup>22</sup> Hoffmann et al., 2024.

The challenge of collecting and using Big Data from individual student records is overwhelming for most countries, in terms of both technical capacity and how the data is used. However, a few countries have managed to overcome it. Eswatini and The Gambia, for example, have used their newly installed DHIS2 for Education data systems to transition quickly from using school counts to using individual learner records. The key to sustaining and scaling their data systems further will be to establish continuous capacity-strengthening of staff through distance education courses and annual academies that offer face-to-face intensive training sessions and to enable in-country support networks to customize the systems as required.

A modular data-system design should allow countries with fewer resources to run two systems – that is, one that uses school counts and one that uses individual records – in tandem in multiple schools. Progressing more slowly to individual records by sector or education level not only allows governments to mobilize further technical capacities, infrastructure and equipment, but also allows for smoother change management and more support for innovations in data systems.

Data systems must also enhance public service efficiency and accountability. Their design, as indicated in the description of theme 1, must lend itself to being easily integrated with various internal data systems – including those for teacher records, payroll, finances and examinations – and to making it possible to align these with external data systems – for example, those of health and social welfare departments – to gain a better understanding of the public service delivery performance in terms of equity.

## 3. FINDINGS ON DATA SYSTEMS AND DATA USE

# INNOVATIONS TO IMPROVE EQUITABLE QUALITY EDUCATION

This section provides a synthesis of the findings and lessons learned from the GPE KIX data systems and use research initiatives, categorized in accordance with the themes presented in the literature review. It focuses on the research projects' sphere of influence on the participating countries' knowledge and ability to integrate their research evidence and insights into strengthening their national education systems and taking those practices to scale.

### 3.1 Theme 1: Dataset integration and use of multi-source data to inform policy and planning

The first theme is the application and use of data to better inform policy and planning, with the goal of understanding how to create institutional cultures and tools to use in the policy and planning processes. This was a central focus of all five GPE KIX research projects. The projects referred to the importance of identifying and using multiple sources of data, going beyond the traditional government administration datasets. They produced and analyzed data for decision-making and/or supported the integration of data from multiple sources, and explored opportunities and challenges for doing so on an ongoing basis.

Despite the vast volumes of data collected through EMIS, learning assessments and examinations, data remains an underused tool for identifying why some schools outperform others with identical circumstances. The Data Must Speak research shows an innovative use of data: integrating and analyzing existing data to identify both outlier schools and characteristics of effective schools. Ministries are empowered to develop a school typology, a new approach for most ministries, to identify these characteristics and assess them on-site to determine whether they are causal or incidental to effectiveness.

The participating countries responded positively to the project and appreciated its collaborative approach and detailed analysis of educational data. Ghana, Lao PDR, Madagascar, Nepal and Togo have all made significant strides in integrating research findings into their educational strategies and planning, with a focus on areas such as gender, equity, inclusion and the use of data to enhance educational outcomes. The project's ability to quantify the impact of various educational factors has been crucial in convincing stakeholders of the value of incorporating these insights into their operations. In some countries, interviewees noted that political challenges arose when the research recommendations conflicted with government

policies. Madagascar recommends that comprehensive guidelines be provided for conducting the Data Must Speak research to help the relevant stakeholders learn to explain the quantitative methodologies involved in order to increase the use of the resulting evidence.

The MICS-EAGLE project used the national statistical office/UNICEF household surveys to add value to existing household data on education inclusion issues. It also explored the connections between education and factors such as health and gender and offered a comprehensive set of data to inform policy decisions relating to these factors. Overall, the MICS-EAGLE project empowered national statistical offices and stakeholders, promoted data-driven policy decisions and enhanced educational quality across a range of regions.<sup>23</sup> It used a holistic strategy for knowledge translation and dissemination and was notable for developing and disseminating education fact sheets and ensuring local ownership through joint creation and validation processes. The project supported the translation of global knowledge to make it applicable and relevant to local practices through rigorous analysis, training and the creation of accessible analytical manuals, all of which contributed to educational policy development.

By 2024, the project had expanded to 31 countries and significantly influenced educational policy. Seven national workshops have galvanized new policy actions, demonstrating the project's commitment to leveraging data for educational purposes.<sup>24</sup> The project team recommended countries gradually adopt the MICS-EAGLE methodology internally, especially for using household survey data for detailed planning, and advocates for its eventual full integration into EMIS data processes – that is, integrating MICS-EAGLE modules into national strategies led by national statistical offices, with the goal of both expanding the amount of data collected and enhancing the quality of the statistics.

MICS-EAGLE played a role in the removal of tuition fees for certain groups of learners in Togo, and Kiribati adapted remote learning strategies based on data drawn from the project. Malawi integrated data from the MICS-EAGLE project into national systems, where it contributed to district profiling and policy adjustments – for example, the country used MICS household data on a range of factors, including out-of-school children and literacy and numeracy assessments, to supplement annual school census data, which was traditionally its main source of education administrative data. The Gambia used MICS-EAGLE reports for its COVID-19 education strategy. There were also challenges, of course. These included debates in Malawi about the reliability of data on differing measures between administrative and

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<sup>23</sup> GPE, 2022.

<sup>24</sup> Filmer & Pritchett, 1999; UNGEG, 2023.

household data, and integration issues in other ministries. Lesotho faced challenges with the generality of the MICS-EAGLE project's data and stakeholder engagement around the dissemination of its results.

Both the Data Must Speak and MICS-EAGLE research initiatives contribute significant and novel insights into school effectiveness and the factors that affect the education landscape. Establishing a technical methodology and bringing critical data to the fore constitute substantial progress in the use of data to better inform policy and planning. Both projects strive for integration within the institutional frameworks of ministries of Education, with the aim of influencing policy and planning processes, and it is evident that the implementation approaches of both initiatives offer valuable lessons for future ventures. While Data Must Speak excels because of its alignment with ministry-driven pacing and deep engagement in the process of generating data, MICS-EAGLE underscores the importance of using adaptable frameworks and collaboration when new methodologies, etc., are being adopted into established EMIS.

The Common-Scale Assessment and ADAPT projects were both based on findings from CLAs. The CLA strategy mobilizes civic pressure to influence educational outcomes – much like campaigns for increased school access – and could be used to urge governments to prioritize not only schooling but also quality learning. The People's Action Learning – Early Learning Language & Literacy and Numeracy Assessment (PAL-ELANA) – an innovation of the Common-Scale Assessment project – represents significant strides toward more reliable and comparable education assessments with its potential breakthroughs in approaches to measuring foundational learning and numeracy (FLN). The PAL-ELANA uses a traditional CLA approach – engaging multiple partner agencies in different countries to develop culturally appropriate assessment tools.

Initial field trials in Kenya and Pakistan tested the tool's effectiveness and improved it based on feedback from implementers involved in the research design and execution. Subsequently, a comprehensive pilot across 12 countries – India and several African and Latin American nations – included extensive training for participants, whose feedback was collected and used to refine the tool further to suit specific national contexts. PAL Network members oversaw a meticulous process of creating, reviewing, translating and adapting test items, with a focus on cultural appropriateness and consistent data-gathering techniques. The development stage included three field tests for psychometric analysis and the creation of an adaptive digital tool. The final product was a multi-language digital and paper questionnaire, field-tested with 7,362 children across approximately 600 households in each participating country. The time from the initial field trials to delivery of the final product was less than two-and-a-half years.

The successful development of a standardized customized assessment tool through the collaborative efforts of stakeholders across multiple countries was a key accomplishment. It also provided valuable lessons on best practices for successfully coordinating participants in multiple countries to create complex, multi-language standardized assessments. Furthermore, the Common-Scale Assessment project team has been sharing its unique approach globally through the PAL Network. At the UN's Transforming Education Summit in September 2022, the team highlighted their work on language and numeracy for transient children. Additionally, in Maputo, Mozambique, they facilitated discussions about FLN with local partners. Their insights have been featured in international education forums, piquing global interest in the data that emerged from their assessments.

However, while the Common-Scale Assessment initiative created an effective early-learning assessment tool, the tool's influence on community and governmental actions is still evolving. Initial findings highlight the importance of early stakeholder collaboration for translating knowledge into policy, particularly within a conducive policy environment, and government officials were invited to participate in the research process in hopes of securing government endorsement and improving the integration of the assessment results.

Despite all efforts, though, ministries of Education were often reluctant to accept the findings, often because of political concerns about revealing their underperformance and limited technical ability to assess the relevance and quality of data. To address this challenge, the Common-Scale Assessment initiative aimed to empower national authorities to either devise their own assessments or use standards such as those established by PAL. At the 2023 AU EMIS Champions Meeting in Nairobi, ministries of Education expressed an interest in customizing the tool for Grades 2 and 3 and contributing to a universally accessible assessment item pool.

The ADAPT project took a different approach. It used the Assessment of Life Skills and Values in East Africa (ALiVE) initiative's assessment of twenty-first-century skills to advocate for the incorporation of values and life skills in school curricula. ADAPT conducted several knowledge mobilization and sharing activities at a national level, but the degree of uptake and involvement among the participating ministries of Education varied according to the receptivity of the national policy environment. In Kenya, for example, the Directorate of Policy and Partnerships endorsed the project and was considering integrating the ALiVE tool into Kenya's competency-based curriculum to assess values and life skills. In Uganda, which was undergoing curriculum reform at the time, the Ministry of Education welcomed ADAPT's input, and life skills have subsequently been integrated into secondary curriculum and assessment tools. The National Examinations Board is adding life skills evaluation to learner assessments, while curriculum workshops are acknowledging the importance of these essential skills, and subsequently adopting them, supported by media efforts to raise public awareness about their importance. In Tanzania, ADAPT has

influenced vocational pathways and life skills education through partnerships with key educational institutions. The Zanzibar Ministry of Education has been notably proactive, using the ADAPT insights to enhance policy dialogue and develop educational guidelines. Zanzibar's commitment to incorporate twenty-first-century skills into the education system is also reflected in the Ministry of Youth's efforts to assess existing life skills initiatives.

The ADAPT initiative provides insight into the importance of governments' willingness to acquire new knowledge. In regions where policy review cycles were already active, such as Uganda and Zanzibar, the integration of life skills into school curricula was welcomed enthusiastically. It is likely that advocacy for the uptake and scaling of ADAPT in those countries will contribute to policy change. The generic finding is that the integration of the research findings into policy differed by country, with some interviewees advocating for a more systemic approach and a cost-effective model with future phases prioritizing school communities' and parents'/caregivers' participation. Another valuable lesson learned is that integrating community mobilization into advocacy strategies within models could potentially generate greater sustained interest.

Toward the end of the ADAPT project, significant numbers of stakeholders in all four participating ministries of Education and associated agencies at a national level had favourable opinions about the value of life skills. The project also made some inroads in terms of the international discourse about using data from learner assessments – particularly assessments of life skills – through household surveys (i.e., the CLA approach). Subsequent developments indicate that ADAPT explored the option of adapting the CLA approach to create teacher guidelines and to use as an in-school class assessment instrument, for example. This positive response to the project will play a crucial role in future strategies to improve the design, delivery and assessment of curricula, aligning them with twenty-first-century skills.

Data Use Innovations for EMIS was implemented in The Gambia, Togo and Uganda and showcased diverse applications of the DHIS2 system, transforming the education sector through digitization and data-driven decision-making. The Gambia leads with a comprehensive, sector-wide EMIS solution that tracks approximately 350,000 learners and teachers and is being expanded to include the higher education sector. The new model emphasizes decentralization and collaboration across education directorates in The Gambia for an integrated information system.

In Togo, the Data Use Innovations for EMIS initiative enhanced the existing UNESCO-developed EMIS StatEduc2 by integrating DHIS2 to create a comprehensive data hub. This process included incorporating the MICS-EAGLE project data and digital school observation tools for teacher development and promoting stakeholder engagement in data portal design and district-level analysis.



Uganda emphasized cross-sectoral collaboration and decentralization and transformed a school-based health surveillance system into a district-level DHIS2 platform for integrated public service delivery. The new system supports real-time data analysis, which has improved service responsiveness and local empowerment. The Data Use Innovations for EMIS project's DHIS2 has the potential to allow ministries' data systems to both identify individual learner data and scale horizontally to integrate the existing EMIS with other public system databases to ensure all dimensions of learners are monitored.

### **3.2 Theme 2: Capacity-strengthening to analyze, interpret and use data for decision-making**

The capacity to use a tool and interpret the findings it produces is key to the successful adoption and sustainability of any innovation. All five projects discussed in this report included multiple types of capacity-strengthening in a variety of areas, including the design, implementation and application of the evidence. They addressed capacities to adapt approaches to national contexts and priorities, supported the development of technical capacities, and involved decision-makers in co-creating aspects of the research and investigating opportunities to integrate the work into existing national systems. The project teams collaborated with a variety of experts, brought national stakeholders into peer support networks and facilitated intersectoral collaboration within countries.

The Data Must Speak initiative supported ministries of Education in moving through a five-stage model, with a focus on using data for improving education and a learning-by-doing approach. Starting with a quantitative analysis of school performance data, it identified high-performing positive deviant schools – that is, schools that perform significantly better than similar schools with access to the same resources – and explored the factors behind their success. The process was largely guided by government stakeholders' needs and capacities, although the project team drew on expert analysis when local expertise was lacking. Field visits to outstanding schools facilitated the identification of key practices that contributed to their success; this in turn led to an investigation of scalable strategies and the sharing of findings with key educational stakeholders. The final stage aimed at integrating the project's insights into national policy and promoting knowledge-sharing globally. Data Must Speak explored five main areas that were deemed crucial to school effectiveness: leadership; classroom practices; community relationships; the school environment and interactions with district managers; and gender equity and inclusive education. This process was tailored to each country's context and needs and aimed to inspire ministries to adopt the identified successful practices on a broader scale to enhance educational outcomes.

In some countries, a lack of resources and technical capacity for implementing the research findings presented significant barriers to the integration of research findings into education planning and could suggest a need to re-evaluate ministries' coordination and organization and strengthen the required skills of ministry personnel. Furthermore, sociopolitical instability and frequent changes of collaborators within the ministries disrupted the continuity of efforts and impacted the system's efficiency.

The MICS-EAGLE project leveraged data to understand how multi-sectoral and socio-economic factors such as health, gender and social inclusion affect education. It relied on collaboration between local ministries, national statistical offices and UNICEF's education data specialists to improve data collection and analysis and ultimately promoted data-driven educational progress across implementing countries. The success of this approach is reflected in the project findings, which indicate that strengthening partnerships and providing training and resources are essential steps for maximizing the utility of MICS-EAGLE to improve education policy and management.

This initiative stood out for its country-driven approach to data collection, which allowed national statistical offices to adapt questionnaires to reflect their unique data needs and priorities. This approach fostered national ownership and strengthened local capacity for data management and analysis, with an emphasis on quality assurance. Ministry officials also participated in capacity-strengthening initiatives to enhance their skills in interpreting and using data, which further bolstered the project's efficacy. The projects included an online course developed with IIEP-UNESCO in Dakar, Senegal, for education officials across Africa, aimed at improving data use for policymaking. Participants from African countries enrolled in the course.

Challenges faced by MICS-EAGLE included government concerns about data reliability and integration, discrepancies in measurement values and perceptions that the project was donor-driven. To overcome these challenges, the project team offered training for national staff, provided resources as required and strengthened partnerships.

If MICS-EAGLE is to be widely adopted, Ministry of Education staff must complement their traditional EMIS data analysis skills by strengthening their capacity to use household survey data, ideally by participating in focused training on the topic. The initiative's expansion is supported by partnerships with academic and statistical institutions worldwide, reinforcing its global applicability and commitment to inclusivity. MICS-EAGLE's adaptability, strategic collaborations and focus on capacity-strengthening underline its potential to significantly influence educational policies and practices, and subsequently improve educational equity and quality globally.

The Common-Scale Assessment project team ensured that local members of the PAL consortium worked closely with technical and organizational coalitions to adapt the PAL-ELANA tool to suit their national contexts. Using the PAL's earlier tool, the International Common Assessment of Numeracy (ICAN), and a CLA approach, each local PAL partner was involved in customizing the assessment instrument, measuring common attributes while ensuring international comparability. The project implementers shared the household data with households participating in the field trials.

The ADAPT project took some innovative approaches to involving national decision-makers and focused on forming political and technical coalitions at the national level to promote the project's objectives. The project team were adept at identifying key stakeholders, including parliamentarians who could promote life skills assessments as a core aspect of curriculum standards at the secondary level. The project established frameworks and national advisory groups, which included key policymakers from Uganda and Zanzibar, to integrate assessment data into life skills education policy and practice. It then contributed to knowledge exchange by organizing national events and using various media to showcase the ALiVE tool's importance, thus engaging educational leaders, parliamentarians, NGOs and the press.<sup>25</sup> The ADAPT project involved approximately 600 stakeholders through workshops and digital engagement activities that fostered informed discussions about education policies at international forums such as Schools 2030 and the Comparative and International Education Conference (CIES), and its objectives were promoted through digital platforms – for example, Facebook, Instagram, LinkedIn and TikTok – and other media, including traditional print media. The project consistently emphasized the importance of developing coalitions to incorporate learning assessment data into life skills education across ministries and examination councils, simultaneously underlining the importance of evidence-based policy for twenty-first-century skills.

A key strategy of the Data Use Innovations for EMIS project was to co-create the system design with each participating country, with the aim of creating a customized turnkey solution for each country's existing national EMIS. This approach, referred to as the digital platform ecosystem approach, prioritizes capacity-strengthening for ministry staff in planning, management and policy implementation. It involves several phases, starting with a readiness assessment to evaluate a country's data-system infrastructure and capabilities. It also involves introducing data-system software and an education toolkit to monitor key indicators and targets. Following the software implementation, ministry staff receive capacity-

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<sup>25</sup> The Assessment of Life Skills and Values in East Africa (ALiVE) tool is a learning assessment innovation model that focuses on the long-term goal of helping education systems assess critical twenty-first-century skills and use assessment data to improve curricula.

strengthening to enhance their data planning and analysis capabilities. Depending on needs, detailed data about learners, teachers and schools is then integrated into the platform datasets as required to improve monitoring and evaluation. During the final phase, these data systems/EMIS are integrated at decentralized levels for more effective local educational management.

The Data Use Innovations for EMIS project team adopted an action research approach, so ministry staff could participate through academic contributions such as master's and doctoral research conducted as part of the project, free online training modules, an annual DHIS2 Academy for government users and the DHIS2 CoP, where they could share their knowledge with stakeholders from all over the world. The HISP at the University of Oslo, which spearheads this particular research initiative and is supported by regional entities including HISP Uganda, Saudigitus in Mozambique and HISP West and Central Africa, originally leveraged the expertise of regional HISP groups worldwide to strengthen capacities within ministries of Health in health information systems. These groups now extend their support to the education sector, using a collaborative approach to apply the learnings from the health sector more broadly.

Lessons learned on capacity-strengthening from Data Use Innovations for EMIS include the value of using a digital ecosystem approach, which capitalizes on a network of external entities, including HISPs, whose role is to create innovative tools and applications customized to meet ministry requirements and, in doing so, strengthen local capacity. This model is notable for its approach to copyright and licensing. Its source codes are shared publicly via GitHub, thus inviting a broader community of developers to refine and enhance the resources. In addition to inviting ministries of Education to join its active CoP, whose members are largely drawn from the health sector, the project has initiated a master's and doctoral training program at the University of The Gambia to extend the translation and dissemination of knowledge about using innovative data systems for improved data production and analysis capabilities. Additionally, the project provides scholarships for personnel in the participating countries at the University of Oslo in EMIS-related areas of study.

### **3.3 Theme 3: Use of data to improve gender equality, equity and inclusion**

The third theme opened up new avenues of analysis that can improve and strengthen understanding about the intersectionality of gender equality, equity and inclusion in learning. While all the projects integrated GEI into their work, this was a particularly significant area in terms of findings for the Data Must Speak, MICS-EAGLE and Common-Scale Assessment projects.

The Data Must Speak research produced significant insights, disseminated through national and international reports, into the impact of female leadership in schools, how class size affects student performance and the importance of school facilities.

Its findings indicate that schools led by women generally have lower dropout rates and better exam results. Data from Zambia supports this assessment, and UNICEF Innocenti’s Women in Learning Leadership (WiLL) initiative subsequently undertook further research into the impact of female educational leadership.<sup>26</sup> The research also identified a correlation between the presence of female school leaders and improved retention and promotion rates across genders in several countries. Additionally, larger class sizes were associated with lower academic achievements and promotion rates, which suggests that reducing class sizes can significantly improve learner outcomes. School amenities – for example, libraries and WASH facilities – were linked to better school performance in countries such as Ghana, Tanzania and Zambia. Preschool attendance was shown to enhance retention, and effective teacher supervision had a more pronounced effect on school performance than teacher demographics. The research suggests that specific school-level practices could explain a substantial portion of variations in performance, setting the stage for further investigation into these practices by Data Must Speak.

The MICS-EAGLE project provided detailed granular data on households – that is, new types of data that past EMIS did not collect – that can be used to improve understanding of the dynamics of exclusion from education. The data it collected allows countries to track at least three critical SDG 4 indicators that were previously poorly tracked. Moreover, many education policy analysts and officials are not yet familiar with how to process, analyze and interpret data to inform policy discussions and develop education sector plans. MICS-EAGLE bridges that gap to improve the availability and use of data to enhance learning outcomes and promote equality, equity and inclusion in education systems.

Comprehensive data from various domains such as gender, disability, education, early marriage and child labour from past MICS was integrated by the MICS-EAGLE project and could be compared across 31 GPE partner countries in different regions to highlight performance differences in critical educational areas such as access to education, skill development, inclusiveness and quality of early education – this is not always an option in national household surveys. One of the major benefits of using data from household surveys is that it can be broken down by both individual and household characteristics such as socio-economic background – for example, sex, ethnicity, disability and income or wealth. Databases on inequalities in education show just how useful such data can be for visualizing education gaps and for informing policy responses if ministries of Education adopt and integrate this newfound knowledge. A key strength of the MICS-EAGLE project was its ability to highlight the complex relationship between disability and education. In addition, by

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<sup>26</sup> M. Fofana (personal communication, September 2023).

focusing on gender, equity and social inclusion, the initiative provided deeper insights into educational disparities; such insights are essential for informed policymaking. Its overall approach not only identified existing educational issues but also set the stage for specific, targeted interventions.

Overall, the MICS-EAGLE initiative marked a significant step forward in educational data collection and shed light on diverse learning environments and the challenges faced by specific student groups. By including data on geographical location, language, disabilities and gender, it highlighted the unique educational needs of different populations. The initiative's ability to scale was enhanced by global and regional reports that provided crucial insights into areas such as remote learning and inclusive education. Scaling the MICS-EAGLE approach involved balancing global comparability with the need for localized solutions, which suggests that a hybrid approach might be the most effective option.

The Common-Scale Assessment project developed a culturally appropriate assessment tool, the PAL-ELANA, using a traditional CLA approach that covers pre-primary and early primary grade competencies for children aged 4–10 years. It expanded the tool to include foundational math skills, with the goal of producing data on early math skills among a marginalized population that could be both understood at a community level and used as internationally comparable data. The PAL-ELANA is one of the first early-learning literacy and numeracy assessment tools to use standardized disability measures across multiple countries, and therefore has the potential to be used to generate data that assesses these skills among learners with special educational needs.

### **3.4 Theme 4: Sustainability and scaling of data systems and data use**

The fourth theme is sustainability and scaling of data systems and data use. The GPE KIX projects discussed in this report attempted not only to scale impact in practice but also to produce evidence about and for scaling through structured research and by documenting lessons learned from the projects. A three- or four-year research project is not guaranteed to achieve optimal scaling, and the challenges encountered by the project teams offer lessons that are as valuable as lessons learned from successes. This section discusses the results of the scaling efforts, the strategies each project used to ensure uptake of the innovations, challenges encountered and lessons learned about the key factors for successful scaling.

### 3.4.1 Scaling efforts in the applied research projects, as of 2024

#### 3.4.1.1 Data Must Speak

Despite being delayed by events such as COVID-19, Data Must Speak collected valuable insights from high-performing schools that ultimately led to systemic changes and influenced policy discussions about key issues such as gender equality in educational leadership.

In Madagascar, one notable finding to date has been that EMIS databases are effective tools for conducting explanatory analyses and identifying factors affecting school performance and offer a cost-effective alternative to traditional survey methods. The Ministry of Education in Madagascar has noted its appreciation for the cost-effective nature of EMIS databases and plans to incorporate EMIS insights into its GPE funding model to enhance school performance. The analysis of data from field studies on PD schools is ongoing, but at time of writing Madagascar has identified gender, school principals' profiles and resource availability as key factors that influence positive performance.

Nepal has integrated the Data Must Speak action plan into its sectoral monitoring and evaluation and its EMIS working group, forming technical teams to develop equity indices and improve data management. This move enabled the country to identify which districts need support and to subsequently address educational disparities. Key results include the development of an Educational Equity Index at district and sub-district levels, targeted strategies for equity-based approaches and local-level equity indices for specific districts. The Data Must Speak PD research findings informed reviews of the national education plan and budget during joint sector review meetings and have been used in the development of a toolkit that helps local governments adopt the country's School Education Sector Plan targets into their local plans and budgets.<sup>27</sup> They also highlighted the fact that a significant proportion of female teachers are outperforming their male peers. Nepal is now using qualitative analysis and behavioural science to understand whether identified factors in the "outlier" high-performing schools are a cause or an effect of the female teachers' higher performance.

The Data Must Speak research has led to a significant shift in how educational data is used; its methods have been broadly adopted by ministries in several other countries, including Ghana, Lao PDR and Togo. The participating countries' enthusiasm for the Data Must Speak project is a reflection of the initiative's innovative approach to educational data analysis.

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<sup>27</sup> Ministry of Education, Science and Technology, 2022.

### **3.4.1.2 MICS-EAGLE**

The MICS-EAGLE initiative has already proven effective in several countries that successfully incorporated its analysis and recommendations into policy documents. This success highlights the initiative's tangible influence on shaping educational policies globally, in addition to the transfer of expertise to national departments, empowering them to oversee the entire survey spectrum, from conceptualization to reporting.

Malawi, for example, has seamlessly integrated MICS into its national education system. The Malawi Ministry of Education and National Statistical Office collaborated with UNICEF to devise a national MICS implementation plan and train staff in MICS-EAGLE methodologies and data analysis. Additionally, the Ministry of Education ensured the national budget included an allocation for MICS data collection and analysis, thus demonstrating a commitment to leveraging MICS-EAGLE data to improve educational outcomes for children. Officials in Malawi have been instrumental in producing MICS fact sheets that profile districts by socio-economic criteria derived from household data. The Ministry of Education leveraged MICS data to explore in depth the socio-economic dimensions of learner completion rates at district levels and consequently improved its understanding of realities on the ground and acknowledged the need to increase the number of teachers in districts with socio-economic challenges. Malawi had never previously had an EMIS that could accommodate this type of data analysis.

Policy adjustments, such as the abolition of tuition fees for certain student demographics in Togo and modifications to remote learning strategies in Kiribati, were also driven by insights drawn from MICS-EAGLE data. Moreover, specific MICS-EAGLE research products in Chad, Ghana, Kiribati, Malawi and Togo are being actively used to refine educational policy, planning and management in more than 20 countries where the initiative was implemented.

### **3.4.1.3 Common-Scale Assessment**

The Common-Scale Assessment project was a long and ambitious one. Making the ICAN item bank relevant to 12 countries involved designing new language and literacy components, ensuring translations were culturally appropriate and standardizing data collection processes across all 12 countries. The project team conducted three field trials to calculate item parameters and statistics (psychometrics) and develop the assessment tool's digital, multiple-stage adaptive design.

Gauging the uptake of the Common-Scale Assessment initiative is a complex task: it was only partially implemented and there is no recorded community feedback on children's literacy and numeracy results from the field trials. The project's rollout in 12 countries faced delays, primarily from difficulties in obtaining ministry approvals during COVID-19, especially for initial field trials in Kenya and Mozambique.



While the tool is built on a solid foundation and equipped with features conducive to scaling – it is digital, multilingual and aligned with global educational goals – challenges related to implementation, governmental cooperation and data representativeness currently hinder the full realization of its scaling potential and anticipated outcomes.

#### **3.4.1.4 ADAPT**

The ADAPT research was designed to improve policy discussions about curriculum, assessment and teacher professional development in specific countries, and it has unarguably advanced recognition of the value of life skills learning assessments. However, translating that recognition into concrete policy changes has been a challenge. The integration of the research findings into policy varied across the project countries and policy stages, the latter of which ranged from agenda setting to policy evaluation.

This project attracted significant interest from some educational authorities. In Kenya, the Directorate of Policy and Partnerships endorsed the project and collaborated with the ADAPT team. Their collaboration resulted in a request for a new collaboration to enhance the assessment of twenty-first-century skills as part of Kenya's new competency-based curriculum. In Uganda, the Ministry of Education and Sports (MoES) and Uganda National Examinations Board (UNEBC) worked with the ADAPT team. This collaboration focused on the assessment of twenty-first-century skills as Uganda's MoES transitions to a new curriculum. In Zanzibar, the Ministry of Education and Vocational Training (MOEVT) was eager to expand its involvement and collaborate more on the ADAPT project with the Global e-Schools and Communities Initiative (GESCI). MOEVT's goals were to use the research findings to improve dialogue and policy relating to the integration of life skills into the curriculum and to develop guidelines that support the use of learning assessment data to improve educational outcomes.

Furthermore, ADAPT's influence has extended beyond national borders. The project has contributed to global discussions about sustainably scaling inclusive and equitable life skills assessment practices, including curriculum changes, assessment methods and teacher training.

#### **3.4.1.5 Data Use Innovation for EMIS**

This project was designed to accommodate three distinct adaptation models, all of which have been used by the project countries. The Gambia has undertaken a comprehensive sector data-system migration, Togo has implemented a partial system integration alongside an established data system, and Uganda has adopted a decentralized, integrated approach, harmonizing education data systems with those of health. The goal of scaling DHIS2 is to expand its use not only in education but also potentially to other sectors such as health, labour and agriculture.

The Ministry of Education of The Gambia developed a turnkey sector-wide EMIS solution that gives all stakeholders, including schools, access to near-real-time data. The data tracks 350,000 digitally registered learners and individual teachers in addition to school performance and inputs. This innovation is being extended to the Ministry of Higher Education. It is currently in the implementation stage and will take some time to be operational.

In Uganda, the Basic Education Department is proactively seeking to expand the successful DHIS2-DEMIS pilot project to more districts. This cross-sectoral collaboration between Health and Education departments enhanced knowledge exchange and integrated data management – for example, promoting cross-sector linkages and using data to implement health programs with schools acting as community hubs. It is essentially preparing the way for a national rollout of the project. The Districts of Excellence model is a testament to the country's commitment to expand the DHIS2-DEMIS project, showcasing innovative solutions for improving data quality and service delivery that can be replicated elsewhere. For example, Gulu District Local Government was established as a model district of excellence in Uganda.

Further scaling is being considered outside of the three countries that participated in the GPE KIX research. Ghana, Lesotho, Malawi, Senegal, Sierra Leone and South Sudan were all inspired by the success of DHIS2 and at time of writing were looking at how it could help them address the challenges they have been facing in building an effective and efficient EMIS. Eswatini implemented DHIS2 in 100 schools in 2023, and the implementation process showcased the Ministry of Education's ability to quickly customize dashboards and visualize the educational trajectory of a child from early to tertiary education. The move attracted substantial government support, as evidenced by the country's new Cabinet's decision to allocate additional funding of over USD 600,000 to purchase tablets for schools in 2024.

### **3.4.2 Scaling strategies that fostered uptake and sustainability**

The five GPE KIX projects discussed in this report used a variety of strategies to scale data systems and data use innovations. The project teams found the following strategies useful and impactful for scaling and sustainability:

- Foster stakeholder alignment and engagement.
- Tailor innovations to countries' specific educational requirements and ensure adaptability of data systems and assessment tools for replication in different countries.
- Communicate the credibility of the research practice, its data and the proven practices.

- Facilitate local and national stakeholder capacity-strengthening to implement data systems and analyze, interpret and use data.
- Mobilize knowledge about the data innovations.
- Establish partnerships with universities and other reputable organizations to expand the collective knowledge and offer master's and doctoral training programs.

A central aspect of the Data Must Speak PD approach was collaboration with all the relevant stakeholders at a country level through a consultative working group and a technical working group from the outset. This collaboration ensured the research would be contextualized and have buy-in from ministries of Education; it would also increase the uptake of findings. Data Must Speak engaged partners at the global and regional level to disseminate both research findings and the approach to co-creation and learning by doing. Researchers offered their technical know-how on data systems, methodologies and scaling techniques. The collaborative efforts behind the project ensured that its findings would translate into real-world enhancements in educational practice and policy. Data Must Speak highlighted the need for context-sensitive scaling, stakeholder engagement and continuous knowledge exchange, and its approach to using existing data to improve education offered a promising route for systemic enhancements in education quality and accessibility, especially in challenging settings. One of its unique features is that it helped countries identify the specific combination of factors in their schools that correlated with high learner performance in low-resource settings. Countries could then use that knowledge to scale up their inputs and encourage the specific behaviours associated with high learner achievement in a more cost-effective manner across the whole schooling system.

Country-level adaptation and national ownership were viewed by MICS-EAGLE's research implementers as core to their research initiative. MICS in general are tailored by national entities, predominantly national statistical offices, in response to individual country data needs. The MICS-EAGLE's scaling strategy involved collaborations with both local and national entities, including relevant ministries, departments and agencies, national statistical offices, and international partners. Capacity-strengthening was another significant component of the strategy. By strategically disseminating findings, the initiative can be adapted and successfully implemented in various contexts, thereby enhancing educational planning and outcomes globally. Global scaling offers comparability and leverages existing frameworks, but it can also be a resource-intensive process. Conversely, independent adoption allows for tailored solutions and more efficient use of resources, although it may be difficult to maintain standardization and strengthen capacity. A hybrid approach that combines elements of both scaling and adoption could be advantageous if tailored to each country's unique needs. The initiative's ability to grow is shown by its work in partnership with reputable institutions such as Kobe University in Japan, the United

Nations Statistical Institute for Asia and the Pacific (SIAP) and Statistics Korea. These partnerships expand the collective knowledge base and create opportunities to work with even more groups and increase the global reach of the project.

Some interviewees raised the issue that unexpected survey or learning assessment results might provoke defensive reactions from ministries of Education and unfavourable responses from governments. To mitigate this risk, the Common-Scale Assessment network also ensured that ministries were actively involved in fieldwork operations, albeit at the local government level. Communicating the credibility of the research practice, its data and even the proven practices of the organizations involved is being increasingly recognized as an important way to gain recognition for the value and validity of CLA findings. Some PAL members who were interviewed argued that some ministries do not have the required technical expertise to recognize whether an assessment is fit for purpose, or how the different learning measurement products are made and how they correspond to their specific needs. To counter questions about the representativeness of the results, PAL created a scale-up of its earlier initiative, the ICAN. With the ICAN, PAL produced representative data from one district in each participating country. In the case of the Common-Scale Assessment, the plan was to provide representative data from three districts in each country. A key feature that enhances the scalability of the Common-Scale Assessment is an open-source, digital, multilingual assessment tool that facilitates adaptation of the assessment across different regions and languages. The assessment will be replicated in different countries, with the same methodology, training processes, data analysis and approach. The only differences will be the country partner and use of the local language.<sup>28</sup>

ADAPT's design deliberately incorporated knowledge translation and dissemination strategies. A key aspect of the project's approach was having critical stakeholders participate in a series of workshops that focused on strengthening their capacity in general, with a particular focus on their capacity to use the ALiVE assessment tool. The workshops highlighted the significance of using the tool to integrate twenty-first-century skills into educational curricula and understanding its impact on learner outcomes. Using a comprehensive mapping and identification process, the project pinpointed civil society organizations (CSOs) under the aegis of the Regional Education and Learning Initiative (RELI) as key stakeholders for engagement. Concurrently, the project team identified key government representatives affiliated with the Ministry of Education, curriculum framers and examination authorities and formed them into a national advisory group that was kept up to date with the project's progress through workshops and learning sessions. The aim of engaging

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<sup>28</sup> The latter difference will have only minor implications for the language and literacy component.

key stakeholders was manifold: enhance research uptake, propagate continued learning, instigate systematic modifications and activate institutionalization and scalability of the project’s findings. The dissemination strategy leveraged media and parliamentarians, with positive results. The project consistently secured coverage in mainstream media, especially during its launches and other pivotal activities.

The Data Use Innovations for EMIS project exemplified a demand-driven engagement model through its digital platform ecosystem approach, which emphasized government-led design and strengthening in-country capacities. The DHIS2 model for scalable data systems has two particularly notable features: it takes a modular approach to system scaling, which allows countries to upscale as they develop their capacity, and it shares its source code in a public GitHub space so that developers can customize it as required. The technical architecture of the DHIS model, a turnkey model, is open-source, which makes it affordable and exceptionally adaptable – it can address the key challenges arising from partner countries’ need to establish a comprehensive yet flexible data system that is suitable for their specific context and priorities. Data Use Innovations for EMIS demonstrates cross-sectoral collaboration, particularly in Uganda, and innovative applications of DHIS2 in both the health and education sectors, as showcased in the 2023 DHIS2 App Competition.<sup>29</sup> This comprehensive and multifaceted initiative showed how health information systems expertise can be applied to the education sector, thus fostering a collaborative, capacity-strengthening approach to improving data-driven decision-making across sectors and permitting homogeneous comparisons across and between countries.

DHIS2’s scalability was a key focus of the Data Use Innovations for EMIS project, with the findings providing valuable insights for ministries of Education that are considering various adoption scenarios. The project outlined trade-offs and necessary adaptations for different scaling dimensions such as data-system coverage, decentralization, dataset integration and data protection. Specifically, it distinguished between wide scope and stepwise implementation<sup>30</sup> and identified the infrastructure and training requirements for decentralization, the need for harmonization in integrating datasets and the need for finding a balance between data granularity and privacy.

In The Gambia, Togo and Uganda, the implementation of DHIS2 demonstrated its adaptability, as it was tailored in accordance with each country’s specific educational requirements. For example, The Gambia advanced its EMIS through strategic

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<sup>29</sup> See <https://developers.dhis2.org/blog/2023/06/app-competition-results/>

<sup>30</sup> For example, in The Gambia, the project was implemented system-wide; in Togo and Uganda, specific areas of data system development were targeted. In Togo, DHIS2 was merged with the existing data system. In Uganda, it is currently used only for district-level data systems.

collaborations with universities, which ensured sustainability and integration of feedback for future changes, Togo focused on upgrading its existing EMIS for better policy evaluation and data-driven governance, and Uganda promoted cross-sectoral collaboration for a broader national rollout. Overall, the system's multi-language support, ease of access and user-friendliness have been pivotal to its rapid uptake.

### **3.4.3 Key challenges to scaling**

The GPE KIX projects encountered various institutional and structural challenges that impeded efforts to scale. These include:

- Staff turnover among government bodies working with the project and/or insufficient commitment to quality and implementation fidelity.
- Use of complex methodologies that ministry staff were not familiar with or trained in and insufficient in-house capacity to fully adopt the innovations.
- Resistance to change from data users in ministries due to organizational and institutional culture.
- Limited infrastructure and connectivity issues in some areas.
- Cost of data innovations and limited financial resources.

The Data Must Speak project encountered implementation challenges such as delays because of staff turnover among government bodies working on it, the use of complex methodologies that ministry staff were not familiar with or trained in and limited financial and other resources. These obstacles underscored the need for clearer guidance, stronger advocacy and better skills development within ministries.

Similarly, during the MICS-EAGLE project, some ministries of Education reported challenges in triangulating their data with MICS education data for a number of reasons, including differences in definitions – for example, MICS measures participation in school rather than enrolment – the use of different denominators and the timing of the surveys, which are undertaken in different years or months in a year. In Lesotho, the Ministry of Education raised concerns about the MICS-EAGLE fact sheet on foundational literacy and numeracy (FLN). Ministry staff considered it to be too general and lacking in detailed information about the differences in learning outcomes between out-of-school and in-school children. They also had concerns about the findings. It was felt that key staff who worked in areas relating to the curriculum and examinations were not involved in co-creating the findings. Furthermore, they felt the findings were presented more as an afterthought and were presented through a UNICEF forum rather than being provided directly to the Ministry of Education.

Challenges in the Common-Scale Assessment project included limited fieldwork capacity and connectivity issues in some areas, along with the extended time needed to adapt the tool across different curricula, languages and standardized test items. Some participating countries expressed concerns that the implementation

of innovative data systems was venturing into unexplored territory for them and could have unforeseen consequences for planning and organizational dynamics. In other words, even when countries have access to new data from the learning assessments, they may not be ready to action it. Efforts to scale the use of learning assessments should, therefore, not underestimate the potential challenges arising from organizational and system capacity and institutional culture. The transition that the Common-Scale Assessment project embodies necessitates a cultural shift within institutions toward a reliance on data tools for informed policymaking, planning and management. On a technical level, the shift to a digital tool with a paper back-up is progressive, but concerns were raised not only about its efficacy in remote areas with poor Internet connectivity, but also about the costs of the tablets and fieldworkers' digital skills. These factors could impede wider implementation of the tool.

The ADAPT project's limitations were primarily rooted in its duration, with its growing momentum among key stakeholders being cut short. Designing the research based on a systems approach led by national actors would have prioritized evidence-informed strategies for districts and schools. Concerns were also raised about the cost of the ADAPT model, which suggests a need for a more budget-friendly version to encourage governmental adoption and scaling.

In the Data Use Innovation for EMIS project, challenges including financial constraints, limited technical capacity – in terms of both infrastructure and staff's technical knowledge and skills – and resistance to change remain significant barriers to DHIS2's widespread adoption. The project advocates for a strategic approach to scaling educational data systems globally. It suggests rebranding DHIS2 to emphasize its relevance to the education sector and leveraging innovative financing methods to address adoption challenges.

Innovation adoption necessitates institutional and organizational cultural shifts. Increased access to data, particularly near-real-time data, for decision-making has created a cultural shift within institutions, increasing their reliance on data collection tools for informed policymaking, planning and management. Users within ministries of Education may resist the adoption of data systems such as DHIS2, which provides customizable dashboards for critical data such as daily teacher attendance, thus making that data visible and more accessible. Such resistance typically stems from the system's transformative impact, which imposes new roles and expectations on school and district administrators. To address these challenges and garner widespread support, it is crucial to formulate a thorough EMIS policy that acknowledges the systemic changes introduced and engages all relevant parties, including teachers' unions, in change management to increase the likelihood of their endorsement and collaboration.

### 3.4.4 Lessons learned for effectively scaling data systems

The GPE KIX projects generated new insights and lessons that can inform future efforts to develop, test and scale data innovations, ensuring they are sustainable and contextually relevant and can make a meaningful impact on education systems worldwide. Some of the more pertinent lessons learned are that:

- Scaling is more feasible when a data innovation is flexible and can be adapted based on research, needs and opportunities in different contexts.
- A long-term commitment to capacity-strengthening in statistical and data use skills for ministries of Education is crucial to ensure sustainability and use of data.
- Any scaling effort must take into account costs and cost-effectiveness. Scaling teams must leverage innovative financing methods to address adoption challenges.
- The policy environment must be supportive to facilitate uptake of research findings. Institutional and organizational cultural shifts are an unavoidable part of innovation adoption.
- Implementing peer-to-peer networking technologies and offline capabilities could mitigate data charges and go some way toward addressing the connectivity issue.
- Effective scaling of educational innovations calls for a comprehensive approach and requires the engagement of all relevant parties, including teachers' unions, in change management to ensure their endorsement and collaboration.

An important lesson learned from Data Must Speak is that ministries seeking to adopt the approach without the funding and technical support offered by the project will require a long-term commitment to capacity-strengthening in statistical and data use skills. While government stakeholders recognized that Data Must Speak's influence was clearly reflected through its widespread adoption and impact on educational policy discussions, ministries may not have sufficient in-house capacity to fully adopt the innovation.

To effectively implement and scale MICS-EAGLE, national staff need both training and development and access to essential resources and tools. In particular, they need training that will improve their understanding of and ability to use household survey data. Training people to use and share MICS-EAGLE methods will help the initiative continue and grow, as will adopting MICS-EAGLE methodologies aligned with national statistics development strategies and integrating MICS-EAGLE modules into regular surveys. It is also essential to establish and strengthen partnerships with relevant stakeholders, which involves creating national MICS-EAGLE implementation plans and forming technical working groups, to develop strategies for communication and knowledge/research dissemination and to actively participate in regional and global MICS-EAGLE networks and obtain support from international partners.



In addition, any scaling effort must be realistic about costs and cost-effectiveness. When it comes to cross-national learning assessments, some ministries perceive the cost of participation as neither transparent nor uniform.<sup>31</sup> They would like more clarity and comparability of information about what fees are paid to the international assessment organization to undertake such an assessment, the opportunity costs of the technical knowledge required within national agencies, the financial costs of field deployment and the opportunity costs of field deployment if existing staff are used. Although CLAs tend to cost less than other internationally comparable learner assessments, assessment costs are another barrier to adoption or scaling for poorer countries that might need subsidies and international grants for equitable access.<sup>32</sup>

The main lesson learned from both the Common-Scale Assessment and ADAPT projects is that the policy environment must be supportive if there is going to be uptake of research findings. Mainland Tanzania was not at the same stage of curriculum review as Zanzibar at the time of the research and so was less interested in reviewing and acting on the ADAPT findings. Where the policy environment was supportive – for example, in Uganda and Zanzibar – it could be argued that ADAPT was instrumental in deepening understanding of the significance of integrating and measuring life skills in curricula among key entities, such as curriculum and examination centres within ministries, parliamentarians and major civil society groups. This progress, anchored in the ALiVE tool designed for the East African context, has positioned the education community to make meaningful improvements in the region's education systems.

When the Common-Scale Assessment and ADAPT innovations were showcased at an African Union ministerial meeting, ministries called for the ability to adapt or incorporate these innovative assessment items or methodologies into a school-based tool that teachers can use. This highlights a need for greater access to the Common-Scale Assessment initiative's resources and methods so that they can be seamlessly integrated into the fabric of school-based assessment practices. The overarching lesson is clear: for such innovative assessment tools to be adopted and scaled effectively, they must be demystified and aligned with the government's existing operational systems and educational ethos. Implementing peer-to-peer networking technologies and offline capabilities could mitigate data charges and go some way toward addressing the connectivity issue that the Common-Scale Assessment project team encountered.

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<sup>31</sup> Central Square Foundation (2019).

<sup>32</sup> Central Square Foundation (2019).

Finally, effective scaling of educational innovations calls for a comprehensive approach. In the context of the Data Use Innovation for EMIS project, this took the form of enhancing e-learning for ministry staff and promoting sustained training through collaborations with higher education institutions to overcome adoption barriers and better leverage the potential of DHIS2. Local ownership and stakeholder engagement are key to the successful expansion of DHIS2. Involving local officials and district stakeholders from the outset of any project reduces resistance to system changes and cultivates a sense of investment. Capacity-strengthening and infrastructure are also critical factors. With this in mind, it is necessary to ensure there is adequate technological support, especially Internet connectivity, in regions that are adopting DHIS2 for the first time. It is also necessary to address data management challenges – for example, standardization of data definitions and ongoing capacity-strengthening of staff arising from staff turnover – to protect the integrity of the data; and to develop a diversified financing plan, including public-private partnerships and donor funding, to ensure the long-term viability of the system. Many teachers use their personal devices and data plans to use DHIS2, and so implementing peer-to-peer networking technologies and offline capabilities such as Mobile SQLite would also help mitigate data charges and expand the tool’s accessibility.

## 4. RECOMMENDATIONS FOR EFFECTIVE DATA SYSTEMS AND DATA USE

Effective data systems and data use are vital for the successful transformation of education governance and management for improved education quality, gender equality, equity and inclusion. If change is to be sustainable and transformational, interventions involving data systems must include dataset integration within and across sectors, capacity-strengthening in effective evidenced-based policymaking and the scaling of innovations that enhance data reporting on all children, including marginalized learners. The following recommendations, grouped by theme, emerged from across the five research projects and can be used by project teams embarking on similar initiatives:

### Dataset integration and data use of multi-source data to inform policy and planning

- **Design data systems that allow for easy integration of data from both within and outside of the education system:** Confirm that data systems allow the integration of administrative data with, for example, teacher records, payroll, finance and learning assessments.
- **Adopt school typologies for targeted interventions:** Encourage ministries to develop and use school typologies, based on research findings from GPE KIX projects, to help identify factors that contribute to school effectiveness, allowing for targeted interventions to improve educational outcomes.
- **Standardize assessments across countries:** Promote the adoption of standardized assessment tools developed using CLA approaches among ministries to enhance the reliability and comparability of educational assessments across countries, particularly for learners with special needs.
- **Develop comprehensive guidelines and policy:** Provide ministries with clear guidelines and methodologies for using data in policymaking.
- **Embed data use in national planning:** Integrate the use of assessment data into national education planning processes to ensure it informs decisions about curriculum design, resource allocation and teacher professional development.

### Capacity-strengthening to analyze, interpret and use data for decision-making

- **Invest in capacity-strengthening:** Provide targeted training programs for ministry staff to enhance their ability to analyze, interpret and use data. This includes developing the statistical and data literacy skills essential for informed decision-making at all levels of the education system.

- **Institutionalize data literacy:** Establish data literacy as a core competency within ministries of Education by integrating it into ongoing professional development programs.
- **Engage government stakeholders in co-creating data tools, methodologies and systems:** Involve government stakeholders to ensure that all aspects of an initiative are tailored to meet their specific needs. This will increase the effectiveness and scalability of an intervention.
- **Foster capacity-strengthening and collaboration opportunities between sectors** such as education, health and social welfare to provide more comprehensive, multidimensional insights into students' needs.
- **Develop strategies to address political and organizational challenges and strengthen coordination:** Collaborate with ministries to sustain data-driven initiatives, as increased transparency on performance data can lead to stakeholder resistance.

### **Use of data to improve gender equality, equity and inclusion**

- **Enhance data collection:** Expand data collection efforts to include more granular information about marginalized groups and ensure that equity and inclusion are prioritized in education policies by using a data system that keeps individual records about students as well as records of school counts.
- **Integrate education data with data from other sectors:** Use data from other sectors – for example, the health sector – and promote cross-sectoral data and analysis collaboration to improve understanding of the myriad factors affecting education access, quality and outcomes and enhance the impact of data-driven decision-making.
- **Leverage household survey data:** Use data from household surveys to inform educational strategies at the household level, particularly for out-of-school children. This will facilitate more effective targeting of interventions to address the needs of these children and improve educational equity.

### **Sustainability and scaling of data systems and data use**

- **Engage ministries early and ensure ownership:** Increase the likelihood of data-related innovations being adopted and scaled by engaging ministries of Education from the earliest stages of their development. Ministries must see the value of these systems not only as technological tools but also as integral aspects of their policymaking processes. If innovative learning assessment tools are to be adopted and scaled effectively, they must be demystified and aligned with the government's operational systems and educational ethos.

- **Encourage the customization of data tools:** Ensure data tools are fit for local contexts. Involve local stakeholders in the process to build ownership and ensure the successful implementation of the tools.
- **Ensure long-term sustainability:** Design data systems with long-term sustainability in mind, including strategies for maintaining and updating systems without relying on external vendors or funding.
- **Avoid investing in off-the-shelf data systems:** Adopt open-source, modular platforms such as DHIS2 for Education, which can be customized and scaled to meet national needs, to overcome the challenges associated with expensive, vendor-dependent data systems. Systems such as DHIS2 for Education enable governments to collect and use data in real time, making them more responsive to emerging challenges.
- **Develop a strategic scaling framework:** Create a framework that supports the scaling of data systems, focusing on sustainability, local capacity-strengthening and adaptability to different country contexts. A modular data-system design allows countries with fewer resources to run systems in parallel – both school counts and individual records – in only a few schools at first. Governments can expand their use of their systems at their own pace in accordance with the available resources and capacities.
- **Develop a comprehensive EMIS policy that addresses new data accountabilities and systemic changes and actively involves all stakeholders, including teacher unions:** Involve stakeholders to gain support for new data systems, facilitate their successful implementation and minimize stakeholder resistance.
- **Be patient and flexible:** Recognize that sustaining progress in education data systems requires patience, flexibility and quick wins. Stakeholders who are promoting innovation in data systems often face resistance or political or institutional barriers, but fostering shared ownership, trust and understanding of the broader ecosystem can help overcome these challenges. Support ministries through change-management strategies and focus on achieving short-term successes to maintain momentum for long-term policy evolution.

## 5. CONCLUSION

The five GPE KIX research projects discussed in this report offer innovative approaches to data use in education that significantly enhance users' understanding of educational dynamics. They capture the current complexities of the shift from EMIS 1.0 to EMIS 2.0, moving from descriptive data systems to more analytical and qualitative ones. Data Must Speak highlights factors affecting school effectiveness; MICS-EAGLE focuses on the intersectoral and socio-economic factors influencing learner participation, retention and achievement; Common-Scale Assessment provides a methodology for multi-country collaboration in generating low-cost comparative multi-language assessments in literacy and numeracy; ADAPT offers insights into the research on policy action advocacy strategies and the receptivity of the role of the policy environment; and Data Use Innovations for EMIS provides an open-source, highly adaptable turnkey data system and tools. The degree to which the projects have succeeded in knowledge transfer in terms of both their methodologies and the utility of their findings seems to be context-specific. Those that provide multiple avenues for effective skills development and transfer of knowledge to ministry officials – for example, Data Use Innovations for EMIS – seem to have the best prospects for scaling.

In the development arena, initiatives frequently originate from a supply-push perspective rather than a demand-led one, the latter of which is considered a fundamental tenet for sustainable growth. The requirement for governmental “permission” for initiatives suggests a dynamic whereby donor-driven agendas predominate. Although bureaucratic frameworks inherently necessitate some degree of supply imposition for scalability and comparability, the transformation process is neither linear nor unidirectional; it is a cyclical, multi-layered evolution that must integrate contextual specificity. The role of development partners extends to demonstrating feasible and sustainable educational models and mitigating government apprehension about adopting new challenges.

Accordingly, the GPE KIX projects attempted to develop systems that governments can emulate post-intervention. Engaging stakeholders from the outset cultivates an organic development of capabilities, enhancing the likelihood that an intervention will be sustainable. The challenges often encountered in scaling up initiatives – for example, insufficient government commitment to quality and implementation fidelity – underscore the need for more assertive and quality-focused government action.

The visibility of an innovation within a bureaucratic framework does not inherently or automatically translate to tangible impact. It merely ensures comprehensibility within the bureaucracy rather than actual influence in the wider educational landscape. To bridge the disconnect, it is essential to practise capacity-strengthening of national stakeholders and disseminating knowledge and findings among existing

professional networks, rather than attempting to cultivate new CoPs (which often lack sustainability and substantive impact). Outlets such as the CIES annual conference in the United States of America, The Education and Development Forum (UKFIET) in the United Kingdom, or similar forums in Africa, along with established EMIS and learning assessment CoPs, particularly those aligned with UIS's SDGs and learning measurement mandate, could be prioritized. These professional networks offer robust pathways for genuine, sustained engagement and impact.

The application and use of the research findings discussed in this report in shaping policy and planning have been uneven across countries. For sustainability and greater impact, it is crucial to equip a wider range of stakeholders with the required skills and incorporate the findings into educational sectors' data processes and planning. National statistical offices and UNICEF could play a pivotal role in this process. Ministries of Education are advised to include the data innovations in their EMIS and adopt the various analysis methodologies offered by the research projects. GPE KIX projects demonstrate that designing strategies that are financially sustainable and can be supported by governments without long-term external support is the key to successful scaling. This means keeping interventions simple yet impactful.

The findings from the GPE KIX research indicated that, to increase the likelihood of success, project teams that are trying to implement EMIS 2.0 with a view to adopting data-related innovations must engage ministries of Education from the conception stage of a project and ensure that ministry needs are met. Furthermore, the adoption and implementation of innovative data analysis approaches must be systematically integrated into ministries' operational frameworks, and ministries themselves must foster institutional cultures for data use in their policymaking processes. Strengthening in-house capabilities, implementing deliberate change-management strategies and ensuring the continuity and application of these methodologies in policymaking are crucial steps for realizing the full potential of the research initiatives discussed in this report. Project teams must also manage setbacks – for example, the slow pace of implementation by government, or gaps in learning opportunities because of staff turnover or political changes – and overcome resistance to change to keep a project on track and maximize its impact.

The latter challenge, resistance to change, commonly arises because of fear, but it can be mitigated by sharing ownership of an initiative and understanding the broader ecosystem. Trust and equity are crucial; encouraging stakeholders to collaborate in the design and implementation of an initiative will lead to lasting change. Project teams and other stakeholders should accept that patience is essential in policy evolution, although quick wins are important for maintaining momentum.

These insights collectively underline the importance of taking a collaborative, informed approach to systemic change that increases the visibility and influence of Southern perspectives and realities in regional and global discussions about evidence of data systems' ability and potential to strengthen and improve learning assessment.

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## 6. APPENDIX: PROJECT SUMMARIES

### 6.1 Data Must Speak About Positive Deviance Approaches to Learning

#### Knowledge gap

In low-income countries, learning poverty is now estimated at 70 percent. However, performance levels in learning, retention and equity vary across schools. While data on education is widely collected by tools such as educational management information systems (EMIS), learning assessments and examinations, it remains vastly underused in efforts to understand why certain schools perform better than others, even if they operate in the same context with equivalent resources.

#### Innovation

Data Must Speak About Positive Deviance Approaches to Learning (Data Must Speak), a global UNICEF initiative first implemented in 2014, aims to address the evidence gaps to mitigate the learning crisis by using existing data. In collaboration with a coalition of partners including the Global Partnership for Education Knowledge Innovation Exchange (GPE KIX), Jacobs Foundation, Hewlett Foundation, NORAD, Schools2030 and internal UNICEF resources, in 2020 Data Must Speak adopted a more systemic approach to advocating for the use of existing datasets to help ministries understand how to implement the strategies used by effective schools.

The Data Must Speak research used mixed-methods and positive deviance (PD) methodologies at the country level, combining multivariate data analysis with qualitative research to understand the factors underlying exceptional school performance. The PD approach – understanding variation, measuring outcomes and making the work problem-specific and user-centred – offers a real opportunity to break quick-fix adoption cycles that are not based on evidence by looking for a “learning-by-doing” approach to uncover successful local strategies and improve schools’ performance.

The Data Must Speak framework comprises five main domains that have been identified as critical to school effectiveness: school leadership, classroom practices, the school’s external relationships with the community, the school environment and interactions between middle-tier officials (or district managers) and schools. These domains were identified via prior research that highlighted their impact on school performance. In addition to these domains, the Data Must Speak research

incorporates gender equity and inclusive education into its analysis. This aspect includes a focus on both the factors that influence the success of learners from marginalized groups and the factors that prompt learners to drop out of school.

Using a comprehensive and collaborative approach, the Data Must Speak research aimed to make a systemic impact on education by identifying and scaling up the practices of schools that serve as beacons of success in challenging environments.

### **Engagement of principal stakeholders**

The studies were co-designed with ministries of Education to ensure that the themes and pace of implementation aligned with the capacities and needs of the primary beneficiaries – that is, the Ministry of Education and, by extension, the students.

A consultative working group and a technical working group, comprising relevant stakeholders, were formed at the outset of the project. This decision was motivated by the need for the research to be contextualized and for ministries of Education to support the project. The project team also recognized that it would increase the uptake of findings. Project partners at both the global and regional levels disseminated research findings and researchers shared their technical knowledge about data systems, methodologies and scaling techniques. The project's collaborative approach ensured that its findings would translate into real-world positive changes in educational practice and policy.

### **Take-up and scaling of the innovation and research findings**

The research unarguably influenced the global dialogue about gender equity in school leadership, particularly the role of female principals. UNICEF Innocenti, IIEP-UNESCO Dakar and the Gender at the Centre Initiative, for example, leveraged PASEC findings and Data Must Speak observable trends and launched the Women in Learning Leadership (WILL) research project. The aim of this research is to explore the impact of female school leaders on education outcomes and understand the barriers they face in accessing leadership roles.

In Madagascar, one notable finding to date has been that EMIS databases are effective tools for conducting explanatory analyses and identifying factors affecting school performance. The representative from Madagascar suggested several strategies for leveraging Data Must Speak research findings, including facilitating international exchanges between countries engaged in Data Must Speak research, creating bilingual, or multilingual, materials to distribute to stakeholders and disseminating the findings across regions within the country. Additionally, they



emphasized that there is a desire for training in EMIS data analysis methodologies to increase researchers' autonomy – this desire can be traced directly to the Data Must Speak project.

In Togo, Data Must Speak integrated gender, equity and inclusion into its research tools and uncovered socio-economic disparities and challenges in girls' education access. Next steps in Togo include the dissemination of the various levers found to optimally scale PD behaviours and practices throughout the country.

Nepal has integrated the Data Must Speak action plan into its sectoral monitoring and evaluation and its EMIS working group, and has formed technical teams to develop equity indices and improve data management. The Data Must Speak PD research findings informed reviews of the national education plan and budget during the joint review meetings and have been used in the development of a toolkit that helps local governments adopt the School Education Sector Plan targets into their local plans and budgets. The country is now using qualitative analysis and behavioural science to understand the characteristics of “outlier” high-performing schools and their cause/effect relationship.

Initiatives are underway under the auspices of the Jacobs Foundation-supported EdLab initiative to incorporate PD methodologies into education labs in other countries, including Côte d'Ivoire and Ghana. The various beneficiary countries have indicated that they would like to participate in knowledge-sharing and collaborations with other beneficiary countries to better understand how the Data Must Speak project has been successfully implemented.

Data Must Speak has the potential to synergize effectively with various GPE KIX projects and could be used as an analytical framework to leverage the outputs from other initiatives. Possible scenarios include integrating data from sources such as MICS-EAGLE and learning assessment data from projects such as Common-Scale Assessment and ADAPT. MICS-EAGLE could provide valuable input for Data Must Speak's analytical processes. Additionally, learning assessment surveys, which are a critical aspect of Data Must Speak's analysis of high-performing schools, could be used to good effect in Common-Scale Assessment and ADAPT projects. Moreover, the Data Use Innovations for EMIS project focuses on individual learner data, and its integration with health and other national datasets, and this could further enhance Data Must Speak's analytical potential.

## 6.2 Using Data for Improving Education Equity and Inclusion

### Knowledge gap

The Using Data for Improving Education Equity and Inclusion (MICS-EAGLE) initiative represents a significant step forward in efforts to address critical gaps in education-related data, particularly efforts to understand diverse challenges across multiple critical areas such as accessibility, gender equality, inclusivity and quality of education. MICS-EAGLE is an innovative approach that uses detailed household survey data to develop a deeper, more nuanced understanding of the educational landscape. This level of understanding is essential for formulating effective policies, but often datasets are not detailed enough to be used in this way.

### Innovation

The Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS) and Living Standard Measurement Study (LSMS) are three important international household survey programs. The Global Partnership for Sustainable Development Data recommends that such surveys be conducted every two or three years to accurately track progress toward the achievement of the Sustainable Development Goals (SDGs).

The MICS-EAGLE initiative used existing UNICEF MICS household survey datasets, which contain data on a range of pertinent indicators, including education and health. MICS-EAGLE is offered to countries with MICS data on a number of topics, including gender, disability, education, early marriage and child labour. The initiative uses this information to offer a multifaceted view of the factors that affect access to and quality of education.

MICS-EAGLE focuses on eight critical areas related to education –access and completion, skills, inclusive education, early learning, out-of-school children, repetition and dropouts, child protection and remote learning – and makes it possible to compare the education experience of children from diverse groups and backgrounds. An integral feature of MICS-EAGLE is its ability to collect data, including socio-economic data at local levels, that will allow stakeholders to analyze the educational experiences of disadvantaged children. Historically, ministries of Education have not accessed this type of data for policymaking. Therefore, the main aim of the initiative was to encourage these ministries to use household survey data, and similar sources of information, to complement their administrative data to improve access to education.

## Engagement of principal stakeholders

MICS are tailored by national entities, usually national statistical offices, to make them relevant to individual country data needs. UNICEF’s Global MICS Team created a standard questionnaire that countries can customize as required, with guidance from UNICEF’s MICS experts. The MICS process prioritizes national ownership and capacity-strengthening to ensure both the relevancy of the data and cross-sector collaboration.

The MICS-EAGLE’s implementation strategy involved collaborations with both local and national entities, including relevant departments within each country or region, and international partners. Capacity-strengthening was a significant component of the implementation strategy. For example, the MICS-EAGLE team collaborated with IIEP-UNESCO in Dakar to create an online course for education officials, mainly from African nations, to improve their ability to use MICS data for formulating educational policies. The project’s outputs included country fact sheets and several workshops, both of which reflected a commitment to creating data-driven educational enhancements. A stringent review mechanism ensured the accuracy of information in the fact sheets, and the Ministry of Education and national statistical office in each country approved the contents before the fact sheets were published. Details about the analytical techniques used in the creation of the fact sheets are explained in *MICS: Toward Achieving Inclusive and Equitable Quality Education for All*.<sup>33</sup>

## Take-up of the innovation and research findings

Prior to the initiative discussed in this report, several countries had already successfully incorporated recommendations from MICS-EAGLE into policy documents. This, in addition to the successes of the most recent MICS-EAGLE project, highlights the initiative’s ability to shape educational policies globally and influence the transfer of expertise to national departments, empowering them to oversee the entire survey spectrum, from conceptualization to reporting.

For example, policy adjustments, such as the abolition of tuition fees for certain student demographics in Togo and modifications to remote learning strategies in Kiribati, were driven by insights drawn from MICS-EAGLE data.

The Ministry of Education in Malawi leveraged MICS data to explore in depth the socio-economic dimensions of learner completion rates at district levels and consequently acknowledged the reality of the state of the education system and the need to increase the number of teachers in districts with socio-economic challenges.

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<sup>33</sup> UNICEF, n.d.

In The Gambia, the MICS report played a crucial role in shaping and informing the national COVID-19 Education Response Strategy. Notably, MICS emerged as the sole source of data to measure the readiness-to-learn indicator and provide extensive insights into barriers experienced by learners with a disability. These critical indicators are crucial for understanding the educational landscape, but they were never collected by the EMIS. Therefore, MICS not only filled a significant data void during the pandemic but also proved invaluable in offering a more comprehensive and nuanced perspective on education-related challenges, particularly in the context of readiness to learn and disability.

Moreover, specific MICS-EAGLE research products in Chad, Ghana, Kiribati, Malawi and Togo are actively being used to refine educational policy, planning and management in more than 20 countries where the initiative was implemented.

The initiative's partnerships with reputable institutions such as Kobe University in Japan, the United Nations Statistical Institute for Asia and the Pacific (SIAP) and Statistics Korea, which expand both the collective knowledge base and global reach of the project, are testament to its ability to grow and adapt. The UNESCO-IIEP collaboration in Dakar, Senegal, for example, is a prime example of how MICS-EAGLE can be adapted to meet local needs, including language requirements.

## 6.3 Common-Scale Assessment of Early and Foundational Numeracy Across the Global South

### Knowledge gap

Evidence from citizen-led assessments (CLAs) implemented by the People’s Action for Learning (PAL) Network<sup>34</sup> member organizations since 2005 has demonstrated that many children in the Global South do not have foundational literacy and numeracy (FLN) skills, even after multiple years of schooling. During the COVID-19 pandemic, the education of schoolchildren in poorer countries was particularly compromised, which exacerbated the problem.

Despite the ongoing learning crisis, there are few comparative assessment tools available for monitoring FLN skills. Out of 76 GPE partner countries, only 33 have data on early-grade reading levels from the most recent five years leading up to 2021; only 10 have similar data for both reading and mathematics levels at the end of lower-secondary schooling.<sup>35</sup>

### Innovation

The Common-Scale Assessment of Early and Foundational Numeracy Across the Global South (Common-Scale Assessment) project developed the PAL Early Language & Literacy and Numeracy Assessment (ELANA) tool. The ELANA built on the PAL Network’s International Common Assessment of Numeracy (ICAN) tool. The ICAN assesses foundational numeracy and was designed as a pilot and tested as proof of concept in 2019 and 2022. It received the World Innovation Summit for Education (WISE) Award 2023 in recognition of its reliability and value in international circles.

The ELANA has two components: a numeracy assessment that builds on ICAN by expanding the number of items that form the item bank, and a literacy component that evaluates skills in the subdomains of oral language, decoding and reading comprehension. It investigates gaps in children’s acquisition of key pre-numeracy and early-numeracy skills by following their progress from age 4 – that is, before they enter school – to age 10 – that is, the first few years of primary school. It is one of the few citizen-led surveys to provide data disaggregated by disability across countries.<sup>36</sup>

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<sup>34</sup> See <https://palnetwork.org/>

<sup>35</sup> GPE, 2023.

<sup>36</sup> Citizen-led assessments have the potential to provide data disaggregated by disability in Bangladesh, Kenya, Mali, Mozambique, Nepal, Nicaragua, Nigeria, Pakistan, Senegal, Tanzania and Uganda, as well as in other countries as the PAL Network grows.

The Common-Scale Assessment project undertook large-scale data collection across 12 countries using the ELANA translated into nine languages. The project team collected data in three districts in each of the 12 countries simultaneously for international comparability.

### **Engagement of principal stakeholders**

The principal actors in the Common-Scale Assessment project were the PAL Network (based in Kenya), Pratham and Australian Centre for Educational Research (ACER), who largely design, analyze and refine assessment tools, and 12 PAL Network members who coordinated the in-country data collection and the translation of assessment tools into local languages.

Ministries of Education officials were involved in the field trials at a district level. Participating households had an opportunity to understand their children's foundational numeracy knowledge and to answer questions about their child, their family context and their family's (caregiver's) available resources.

### **Take-up and scaling of the innovation and research findings**

The Common-Scale Assessment is specifically designed to be scaled and used in different countries – it will be translated into the local language, but the methodology and approach, training processes and data analysis will remain the same. The ELANA was developed as an open-source, digital, multilingual assessment tool and will contribute to scalability and facilitate adaptation of the project across different regions and languages. The ability to use the ELANA data to look at each country as an individual entity and also compare countries to each other will make it easier to properly understand the progress being made toward achieving the SDGs, the extent to which gaps are or are not being closed, and what actions need to be taken.

To make the ICAN item bank linguistically and culturally relevant and appropriate to each of the participating countries, it was translated into local languages and some new language and literacy components were designed. In addition, the data collection processes were standardized across all the participating countries. The project team conducted three field trials to calculate item parameters and statistics (psychometrics) and develop the assessment tool's digital, multiple-stage adaptive design.

The potential for synergistic collaborations with various data sources – for example, ministries of Education data, Multiple Indicator Cluster Surveys (MICS) household data, other learner assessment data and data on positive deviance (PD) in school performance – could significantly enhance the project's contextual relevance and effectiveness in policymaking and educational interventions.

Integrating household data from MICS can add an extra, and very beneficial, dimension to the project. A MICS provides detailed information about the socio-economic, health and environmental conditions of families, all of which can improve understanding of the broader context affecting children’s learning outcomes. By correlating educational data with data on these factors, stakeholders can gain a holistic view of the challenges and opportunities in early education. Moreover, incorporating learner assessment data from other sources can offer comparative insights, which can in turn be used to validate and refine the ELANA tool. A comparative analysis would ensure robust results and could lead to adjustments in methodologies to align them with established benchmarks.

Finally, analyzing data on PD in school performance can uncover effective practices in schools or districts that outperform others in similar challenging situations. An analysis of this type is key to identifying replicable strategies and success factors that can be applied in different contexts and subsequently provide a deeper understanding of variances in learning outcomes.

## 6.4 Adapting Assessment into Policy and Learning: Adolescent 21st Century Skills

### Knowledge gap

The Adapting Assessment into Policy and Learning: Adolescent 21st Century Skills (ADAPT) project was designed to address a significant knowledge gap in how to integrate twenty-first-century skills and competencies for adolescents, especially those in school, into the curriculum in Kenya, Tanzania and Uganda, and how to assess these skills and competencies. Prior to the project, learning assessment data was used at a very minimal level – if at all – to guide curriculum development, evaluation strategies and specific interventions proposed by the ministries of Education in the project countries. Previous efforts to assimilate twenty-first-century skills – also known as life skills – into national education systems have been hampered by challenges in both defining and assessing these skills across different education levels.

### Innovation

ADAPT took an internationally benchmarked learner assessment approach to the teaching and learning of twenty-first-century skills, which encompass practical, digital and soft skills, in Africa. Academics continue to debate not only the best way to integrate these skills into curricula, teacher training, lesson planning and assessments but also the value of doing so.

The ADAPT project drew heavily on lessons learned from the Life Skills and Values in East Africa (ALiVE) initiative.<sup>37</sup> The ALiVE initiative involved conducting a survey of 17,000 adolescents across three countries, and then developing an easy-to-use tool to measure skill competencies such as problem-solving and self-awareness. ALiVE's findings shaped ADAPT's framework, objectives and strategies and ultimately equipped civil society and governments with the knowledge they need to design modern curricula and create relevant policies and data-driven interventions.

### Engagement of principal stakeholders

The project's primary stakeholders were government agencies responsible for curriculum and assessment frameworks and examination boards. Champions, such as journalists and parliamentarians, were encouraged to advocate for the integration of life skills and values into education.

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<sup>37</sup> See <https://reliafrica.org/alive/>



In Kenya, the project team established partnerships with the Ministry of Education directorates and agencies responsible for policy formulation and the implementation of education and training policies, standards, curricula and examinations. In particular, the team successfully sought to engage the Kenya National Examinations Council, Kenya Institute of Curriculum Development and Teachers Service Commission.

In Tanzania, the team collaborated with the Tanzania Institute of Education (TIE) and Zanzibar Institute of Education (ZIE), both of which are responsible for curriculum design, and examination boards. The Zanzibar Ministry of Information, Youth, Culture and Sports had input into how to integrate and assess twenty-first-century skills efficiently and effectively, and Morongo Unified School District (MUSD) focused on helping both local educators and the community better understand what life skills are, and why it is important to teach them to children and adolescents.

In Uganda, the ADAPT project team established partnerships with the National Curriculum Development Centre (NCDC) and the Uganda Examination Board (UNEB).

### **Take-up and scaling of the innovation and research findings**

The project attracted significant interest from educational authorities.

In Kenya, the Directorate of Policy and Partnerships endorsed the project and ultimately asked for a new collaboration to enhance the assessment of twenty-first-century skills as part of Kenya's new competency-based curriculum.

In Tanzania, responses were mixed. Senior policymakers in Zanzibar, which was in a relatively advanced stage of curriculum reforms, were receptive, but authorities on the mainland, which was still in the planning stages, were less interested. However, after ADAPT shared its findings, mainland authorities became more interested in its recommendations. The variation in responses in Tanzania underscore the importance of understanding regional policy timelines and educational needs, approaches and priorities.

In Uganda, the collaboration with the Ministry of Education and Sports (MoES), including the NCDC and UNEB, focused on the assessment of twenty-first-century skills as Uganda's MoES transitions to a new curriculum.

ADAPT enriched over 25 education-centric civil organizations, university colleges, policymakers, media personnel and members of parliament by strengthening their capacity to use and interpret assessment data; this enrichment enabled these stakeholders to actively participate in curriculum reform discussions. However, because the project's focus was policy-oriented, team members had limited engagement with school communities and parents/caregivers, and so they missed out on understanding the end-user perspective.

## 6.5 Data Use Innovations for Education Management Information Systems in The Gambia, Uganda and Togo

### Knowledge gap

The Data Use Innovations for Education Management Information Systems in The Gambia, Uganda and Togo project (Data Use Innovations for EMIS) sought to fill a critical knowledge gap in the education sector, particularly as there is no accessible and sustainable turnkey management information system tailored for effective use in low-income countries.

### Innovation

This project aimed to adapt the District Health Information System (DHIS2),<sup>38</sup> an open-source (cost-free) data system that is used in the health sector in over 70 countries, for the education sector. The DHIS2 data platform has a modular structure, is versatile and can be customized to facilitate the development and management of education information systems. Its comprehensive tracking capabilities make it possible to monitor data efficiently across various datasets and systems – potentially in real time – at both the institutional and individual levels.

The platform's flexible design means it can be adapted as required and used in a variety of contexts. One of its unique characteristics is that it supports both aggregate data – for example, school counts – and individual data tracking and analysis – involving learners and teachers. This characteristic is a key component of its versatility.

By using DHIS2 and integrating an Android app to enhance accessibility, the project enabled users to manage a wide array of data functions on mobile devices, both online and offline.

### Engagement of principal stakeholders

The University of Oslo's Health Information Systems Programme (HISP) regional bodies – HISP Uganda, Saudigitus in Mozambique and HISP West and Central Africa (WCA) – acted as the technical arms of this GPE KIX research initiative to support the design and implementation of a modified DHIS2 in the three project countries. Local grassroots organizations acted as intermediaries between ministries and external parties and received capacity-building support throughout the project.

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<sup>38</sup> See <https://dhis2.org/>

In The Gambia, multiple directorates within the Ministry of Basic and Secondary Education – including Planning, Standards and Quality Assurance, EMIS and ICT, Gender, Early Childhood and Inclusive Education, and Human Resources – collaborated with the Ministry of Higher Education’s EMIS unit on this project to digitize and synchronize information.

In Togo, the plan was to develop an add-on to the existing EMIS, StatEduc2, created by UNESCO. The Ministry of Education’s Planning and EMIS Unit, which includes statisticians, planners and IT experts, oversaw the DHIS2 implementation to ensure it did not disrupt current workflows.

Uganda HISP is coordinating the implementation of DHIS2 in Uganda, where there has been cross-sectoral collaboration at the district level with limited integration within the national EMIS. Key stakeholders included the Department of Basic Education, Ministry of Health, local governments and international partners such as UNICEF, UNHCR, WHO and Save the Children Uganda.

### **Take-up and scaling of the innovation and research findings**

In The Gambia, the introduction of the DHIS2 platform entailed a complete shift from a static, descriptive system to a sector-wide, decentralized, dynamic system that includes more information to support timely decision-making. The Ministry of Education developed a turnkey sector-wide EMIS solution that gives all stakeholders, including schools, access to near-real-time data on 350,000 digitally registered learners and individual teachers as well as school performance and inputs. At time of writing, the innovation was being extended to the Ministry of Higher Education, although it will take some time to be operational. The Gambia is also leveraging the findings from the Data Use Innovations for EMIS project to bolster its EMIS through strategic partnerships with local universities. This symbiotic relationship ensures a continuous feedback loop in which student interns contribute to the EMIS, particularly through the master’s and doctorate in EMIS programs at the University of The Gambia, thus driving DHIS2’s application and growth.

In Togo, the new DHIS2 for Education will continue to serve as a Web-based data integration hub; MICS-EAGLE data and digitized school observation tools have been integrated into it. Capacity-strengthening initiatives are in progress to encourage stakeholder involvement in the data portal design and to support districts as they begin to use the new systems to conduct data analysis. School inspectors in Togo are using DHIS2 to support teacher professional development.

In Uganda, the Basic Education Department is proactively seeking to expand the successful DHIS2-DEMIS pilot project to more districts.<sup>39</sup> This cross-sectoral collaboration between Health and Education departments enhanced knowledge exchange and integrated data management – for example, promoting cross-sector linkages and using data to implement health programs with schools acting as community hubs. It is essentially preparing the way for a national rollout of the project. The Districts of Excellence model encapsulates the country’s commitment to expand the DHIS2-DEMIS project, showcasing innovative solutions for improving data quality and service delivery that can be replicated elsewhere.<sup>40</sup>

Eswatini implemented DHIS2 in 100 schools in 2023. The implementation process highlighted the Ministry of Education’s ability to quickly customize dashboards and visualize the educational trajectory of a child from early to tertiary education. The government subsequently allocated over USD 600,000 to purchase tablets for schools in 2024.

The success of the DHIS2 for Education model has inspired other countries to look closely at it. The ministries of Education, along with their development partners, in several countries – for example, Ghana, Lesotho, Malawi, Sierra Leone and South Sudan – are exploring its adoption. The model is particularly attractive because it has already been successfully implemented in the health sector and it has the potential to be equally successful in other sectors, such as water and sanitation, nutrition, agriculture and e-governance.

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<sup>39</sup> See <https://education.dhis2.org/implementation/uganda/>

<sup>40</sup> See, for example, DHIS2 for Education, 2023.



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