

KIX Data, Data Systems and Data Use Scoping Study

April 2023

Prepared by

Angela Arnott (GESCI Team Leader)

George Bester

Alpha Bah

Luis Crouch

Fofana Mohamed



Table of Contents

1. Introduction	3
2. EMIS 2.0	3
3. Methodology	4
4. Findings	4
5. The Critical Research Topics	8
5.1 Research Question: What are Best Practices and Cost Efficiencies of Transitioning EMIS from school counts to individual learner records ?	8
5.2 Research Question: What are the current reforms that are being implemented in different contexts to integrate relevant and externally produced data into EMIS and use that information to inform practices?	9
5.3 Research Question: How can data for community involvement, school improvement and district planning be democratized for social engagement and accountability including innovations such as social media, Artificial Intelligence (AI) among others as they apply to Education	11

1. Introduction

Global Partnership for Education (GPE) and the International Development Research Centre (IDRC) are collaborating in a joint endeavor, known as the Knowledge and Innovation Exchange (KIX) to promote expertise, innovation and knowledge to help developing countries build stronger education systems and accelerate progress toward the Sustainable Development Goal on education (SDG 4).

Launched in 2019, and just extended in 2022, KIX is now an 8-year, CAD \$216 million initiative that currently funds 40 applied research projects focused on key challenges facing education systems across the Global South, as identified through GPE partner countries expressed priorities. Five of these projects focus on data systems and are related to improved management of data use, particularly with respect to how learning results data can drive more effective management of education resources and better practices in the classroom. KIX intends to synthesize the findings that have emerged from the 5 KIX-funded projects. This will be the focus of the second phase of this consultancy.

Additionally, KIX is seeking to deepen its work by identifying new research topics that specifically address the knowledge gaps of best practices in improving data, data systems and data use. These gaps are linked to the challenges of availability of data, use of data for decision making, and national capacity to manage and leverage data (GPE, 2019b). The research needs to address the challenges facing GPE partner countries in improving the quality and timeliness of the education data collected, ensuring the architecture requirements for sector wide and accessible data systems are established and sustainable and the promotion of evidenced-based organizational culture of data use by public sector management and administration as well in schools and communities.

This Scoping Study identifies key knowledge gaps and research needs on data, data systems, and data use for education systems to inform a call for new KIX research projects in 2023 in some of the emerging areas underway that are pertinent to the GPE partner countries in the KIX 19 and 21 Hubs.

2. EMIS 2.0

Addressing the education data challenge requires an EMIS shift from rigid production of statistics to dynamic analytics and early warning mechanisms (World Bank, 2020). Strengthening of national Education Management Information Systems (EMISs)¹ is key to mitigating the education data challenge. The learning crisis of 617 million children and adolescents not achieving the minimum proficiency levels in reading and writing (UNESCO, 2022), particularly in low-income countries, most of whom are GPE partners, is a key factor driving a re-conceptualization of EMIS and a new EMIS 2.0 paradigm. EMIS 2.0. is being advocated as a user- and service-oriented system, mobilizing new stakeholders (communities and school boards) and supporting the existing needs of managers by providing timely data in the right format for action. It is also linked to a radical configuration of a sector wide digital infrastructure for data use innovation and the integration of data sources, traditionally not used by EMIS units². “The shift from counting educational inputs to measuring educational outputs has been a driver for the evolution of EMIS in recent years.

GPE partner countries in general faces a range of issues that hamper the potential realization of EMIS 2.0, including a lack of resources and technical capacity, difficulties in competing with private organizations for technical staff, low data literacy and fragmented data sources, as well as low trust in the quality and timeliness of data, resulting in inconsistent use of information at all levels of the education system (UNESCO/GPE, 2020). Many efforts to build sector-wide web-based system systems offering all the expected functionalities of EMIS 2.0 have proven unsustainable, meaning new approaches are needed (GPE, 2019a; van Wyk and Crouch, 2020). Further, the ongoing shift in education data priorities raises the bar and the need for creative and frequent

¹ An EMIS is “a system 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” (Cassidy, 2006, p. 27).

² University of Oslo. (2023)

dialogue around new ways of collecting, analyzing, disseminating and using education data should be at the center of the KIX community of practice on knowledge exchanges on innovation in data, data systems and data use.

3. Methodology

A phased approach to determining which knowledge gaps and research topics were valued as the most critical by KIX 19 and 21 member countries and stakeholders was adopted. The team of consultants located in different geographical regions, 4 African and one American, drawing on their expertise and experience, and literature research produced a list of topics related to the thematic areas of Data, Data Systems and Data Use. This list was shared with the KIX Focal Points of Hubs 19 and 21 and further refined. Concurrently, key informants were approached, including the GPE Data team, KIX East Asian Pacific Data consultant, for views and additional critical topics that may have been missed by the team were added.

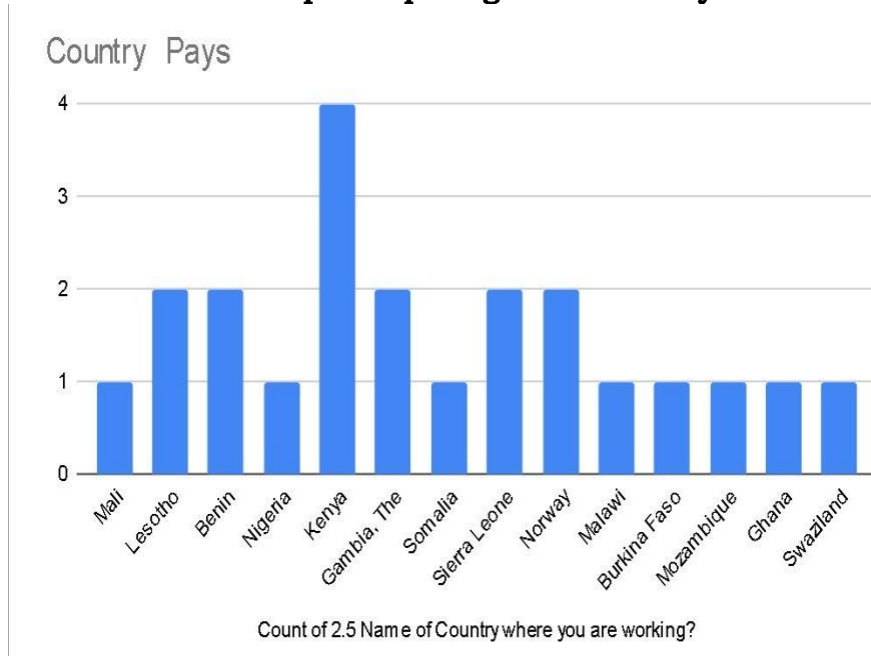
A google survey form was created targeting data providers, data users and data producers asking them to rank 14 research topics on a 10-point scale, with a 10 score indicating a very critical topic and zero as not useful. Respondents were also given the chance to suggest new research topics. The survey was made available in French and English and sent out to 150 KIX 19 and 21 focal points, civil society, development partners and research institutions. The survey respondents were given a week with which to respond. Reminder messages were also sent via the Community of Practice KIX Whatsapp Group for participants to engage in the survey.

4. Findings

4.1 Profile of Respondents

There were 24 survey respondents drawn from 27³ countries and a selection of external stakeholders. Some 71% of respondents were from Ministries of Education, 43% of whom had regularly engaged, and 38% occasionally in KIX webinars and knowledge exchange events. Some 76% of respondents classified themselves as data producers, 48% as data users and 33% as data providers with overlaps among the categories.

Chart 1: Countries participating in the Survey



Those who saw themselves as data producers indicated that their core work was largely affected by the following knowledge gaps or absence of training on data analysis and monitoring of education sector plans (70%); lack of policy to ensure designated resources, roles and

³ The consultants were provided with the contacts of 18 GPE partner countries in KIX 19 (Anglophone) and only 9 countries in KIX 21 (Francophone)

responsibilities to monitor the disadvantaged child (58.3%); Knowledge gaps of how to integrate EMIS with other internal and external databases (eg Learning Assessment Surveys, Finance, etc) (63%); Absence of political commitment by senior management to allocate sufficient resources (staff, equipment, etc)/ (54%); Shifting EMIS from school/head counts and averages to individual unit record database systems (54%); among others that were not ranked as highly.

Among the data users, the two most mentioned challenges in using the sector's data and data systems were : “Data does not allow me to combine different data sources on the same platform” (51%) and “Data that is not up to date and reliable” (51%). On exploring the extent to which a lack of availability of data hampers their core work, some 21% of data users indicated that it impacted their work all the time and 29% indicated it impacted frequently. However, more than a third of data users lack skills on how to use data : “I have not had sufficient training to use data effectively and so tend to use other non-data strategies” (38%).

4.2 Ranking of Research Topics

Respondents had an opportunity to rank the importance of a research topic on a scale of 0-10 with 10 signifying a topic that addressed a critical knowledge gap. Research topics of **Transitioning EMIS from school counts to individual learner records** ranked highest; followed by **Integration of relevant and external data into the national EMIS**, followed by, followed by **Democratization of data for community engagement, school improvement and district planning**.



Table 1 provides the ranking based on both the popularity ranking (the cumulative scores) and those responses to the topic that were scored 8 and above. This allows a more nuanced insight into the specific knowledge gaps that a respondent thought were very useful or critical topics to research. There is close correspondence between the analysis of the popularity and the top ranked critical topics for the first three topics which are in common. Thereafter there is a divergence in the popularity of topics relative to those which only received “very useful/critical” high scores. Given the small sample size a difference of one or two responses has a significant impact on the ranking.

Table 1: Top Ranked Research Topics

Research Topic	Popularity Rank	Critical Topic Rank
4.1 Transitioning EMIS from school counts to individual learner records	84.8%	79.2%
4.2 Integration of relevant and externally produced data (refugee, health, disability) into EMIS	82.8%	71.6%
6.3 Democratization of data for community engagement, school improvement and district planning	82.4%	71.6%
6.2 Best case EMIS systems for use of evidence-based decision making in low-resourced systems	80.8%	67.6%
4.5.Critical "survive and thrive" indicators that measures the quality of ECD	78.8%	63.2%
5.3 EMIS data and evidence use on teacher management, professional development and support	77.7%	66.2%
4.4 New education variables and indicators associated with climate change	77.6%	65.6%
5.1 A comparative analysis on commonly used Open source EMIS Data Systems and EMIS Tool Box for low-income countries	77.6%	62.4%
4.6 Standardized data definitions and collection methods on disability, inclusion and gender	76.4%	61.6%
4.3 Measure process quality at scale and used within national systems for faster improvement	75.6%	54.4%
5.2 Data system requirements in order to scale EMIS to districts and schools.	74.0%	55.2%
5.5 How to balance standardization and local flexibility in the development of digital tools, education data standards, data visualization guidelines	73.8%	58.5%
5.4 Research a set of core standardized representations of education data that are useful at the education district level.	73.6%	58.0%

4.2 Other Research Topics suggested by Survey Respondents

4.2.1 Survey respondents were asked to propose other applied research topics that would benefit their country related to the **generation of education Data** and these were the suggestions:

- The Importance of having up-to-date data.
- Educational alternatives offer a second chance of learning for children outside of school
- The factors that affect schools in uploading data regularly
- Early warning systems based on education data, developing algorithms, thresholds and appropriate responses.
- A set of core standardized representations of education data that are useful at the education district level. What should districts monitor? Which indicators are useful together and how are they best represented and visualized to convey the bigger picture within and across thematic areas?
- Research on per child costs. Unit cost of educating a child from ECD level to Secondary Completion at Grade 12.
- Tracking of government inputs to school systems

4.2.2 Survey respondents were asked to propose other applied research topics that would benefit your country related to **Data systems** and these were the suggestions:

- It would be useful if the EMIS could take into account the performance of students, especially girls in relation to teacher training/ Il serait utile si le SIGE pouvait prendre en compte la performance des élèves, en particulier des filles en lien avec la formation des enseignants.
- Knowledge capacity on open source software's and skills in house assessments
- Controlling the flow of children out of school /La maitrise du flux d'enfants hors de l'école
- Language in use for disseminating EMIS Reports
- Looking at the funding into Educational Data systems
- How to balance standardization and local flexibility in the development of digital tools, education data standards, data visualization guidelines etc. so that both comparability and local relevance of data is ensured.
- The value co-creation potential associated with using and co-evolving the same digital public goods across countries with similar geographic, linguistic and cultural proximity.
- Arenas and tools for improving North-South collaboration in strengthening domestic information systems.
- Effectiveness of school grants
- How to balance the need for simplicity, resilience and sustainability with providing real benefits on a daily basis at the school level?
- Which use cases ensure local ownership with the best cost/benefit ratio? Which robust pathways can we identify from a solid foundational core system to a larger EMIS and eGov architecture?

4.2.3 Survey respondents were asked to propose other applied research topics that would benefit their country related to **Data Use** and these were the suggestions:

- How can data be used to make evidence-based decisions in development of infrastructure and provision of resources to education institutions
- Best practices, successes, challenges, and barriers to the utilization of learning assessment data at the Tertiary level
- Exploring the relationship between open source, open standards, open APIs, open data and open innovation. Unfortunately, there is currently little investment in open standards and open data initiatives are rarely demand driven. Yet open standards are needed to strengthen data sharing and accessibility, while open data is needed to enable public scrutiny and informed dialogue regarding education system performance.
- Quality of partnership in monitoring education data use

5. The Critical Research Topics

In this section of the scoping study we introduce the top three research topics and their significance. By contextualizing the research topic, we hope to help define what it is researchers would plan to investigate and provide a framework for reporting research results that would highlight the information discovered. The top three research topics are as follows:

5.1 Research Question: What are Best Practices and Cost Efficiencies of Transitioning EMIS from school counts to individual learner records ?

Challenges it addresses

Traditionally, the education sector has had to work with severe resource constraints, including limited funding, personnel, and technology. As a result, the Ministries of Education often relied on collecting and combining individual records into manageable global figures such as the number of students per class, per grade, or per school. This approach helped to simplify data management and reduce the workload of educators and administrators. However, this approach has some limitations. Summarized data can mask important details about individual learners such as their academic performance, attendance, and behaviour. Additionally, it can be difficult to track progress over time or identify trends and patterns in the data. For most of the history of education data systems in developing countries, only school-level records have been maintained in a "central" location within the Ministry of Education, a location traditionally referred to as "the EMIS." While data more granular than the school are not maintained by EMIS, they do, however, sometimes exist. For instance, child-level records can be found, often in exams or assessment databases and teacher-level records are often found in Human Resource and payroll records. However, these are often incomplete, and there is no automatic way to link them to school records. In addition, there are other child-level records, for instance regarding school transfers. But sometimes these may not be kept electronically at all. There may be other individual records such as attendance, qualification for nutritional subsidies, at the child level, or continuous professional development training, at the teacher level. Many countries are interested in moving beyond school level records, into tracking of individual children.

Because of the latest advances in open-source EMIS software platforms, it is now easier and may be more cost-effective to collect granular individual records on a per-student, per-teacher basis than was the case previously. These software platforms provide greater flexibility and customization, allowing education authorities to design EMIS systems that meet their specific needs and requirements. With individual learner records, teachers and administrators can monitor student progress more closely and identify areas where additional support may be needed. They can also track attendance, behaviour, and academic performance more accurately, which can help to improve learner outcomes.

There are many advantages that could follow, such as a) the ability to see what are true dropouts and what are transfers, and thus be able to analyze flow efficiency down to the school level, b) issues related to inclusive education and disability, which tend to be more granular than school-level, and, in both cases, be able to intervene. Several countries have started to experiment with, or actually run, child-level data systems. However, much is unknown about these approaches, and, more generally, about the issue of child-level data.

Some of the research questions are:

1. What are the most common barriers to implementing such systems? How fundamental are they (e.g., the lack of official, multi-sector identity systems that can generate ID numbers for children)? What are the less fundamental, more logistical, implementation issues?
2. What are the costs that countries have experienced, either at scale or in pilots?
3. Given that there are likely very serious costs involved, what are the most promising entry points (that is, for what specific purposes), where the value for money is highest? Is achieving teacher-level granularity a good first step?
4. Similarly, is simple integration of existing granular data, with less granular, a good first step?

5. Relatedly, how to generate data that are actually going to be used? What are the clearest use cases?
6. How realistic is it to maintain child-level records at some central place in a nation? Is it realistic for actual monitoring and intervention? (For example, it is highly unlikely -- to use an extreme example -- that daily attendance data can be useful in Pretoria for monitoring attendance in every school in South Africa). Or mostly for planning and policy (e.g., to discern attendance or absenteeism *patterns* and then set policy)? If the latter, what difference does that make to the type and frequency of data to be collected?
7. What are the pros and cons of a data-centric approach versus an action-centric approach? In the first case, gathering data that can be used for policy and planning, versus, in the second case, gathering data (e.g. by teacher coaches) that is mostly for individual and immediate action, such as providing coaching tips to a teacher, with the reporting up being only a by-product? Should one start with such use- or action-cases rather than start from the point of view of data? What are the pros and cons of either?
8. Transitioning from global to individual learner records can have significant cost efficiencies in terms of human resources, hardware, time required, and internet communications. However, there may also be some additional costs associated with the transition. According to the literature, one of the main cost efficiencies gained with individual learner records is the reduction in human resources required to manage and analyze the data. With granular data on a per-student, per-teacher basis, education authorities can automate data collection and analysis, reducing the need for manual data entry and data management. This can also free up staff time for more value-added tasks such as instructional support and professional development. However, the opposite may be true as the volume of big data generated may require more qualified data scientists, a scarce resource in GPE partner countries, to manage the analysis of this data. Which is true in GPE partner countries and what are the recommended routes to reducing costs as Ministries transition?

5.2 Research Question: What are the current reforms that are being implemented in different contexts to integrate relevant and externally produced data into EMIS and use that information to inform practices?

Challenge it is addressing:

Traditionally, EMIS data has been useful for allocation of education staff, school supplies and other resources (Wako, 2003); and policy planning and formulation (Hua & Herstein, 2003). However, many efforts to build such systems have proven unsustainable, meaning new approaches are needed (GPE, 2019a; van Wyk and Crouch, 2020). With the advent of digitalization, and the new information demands for EMIS to be more operational and more inclusive to support the real-time management and monitoring of services there has been a shift to generate more granular, detailed and linked data.

The unavailability of data, limited use of data for decision making, and inadequate national capacity to manage and leverage data (GPE, 2019b) are key challenges facing GPE partner countries. Strengthening of national Education Management Information Systems (EMISs)¹ is key to mitigating the education data challenge and when systems are equipped with timely relevant integrated data, they can elevate their performance across the board. Not only will collecting data and converting it into its final, usable format take far less time and it allows for actionable insights, agility, and real-time intelligence.

A recent Think Piece for the Africa region on monitoring SDG4 (NORRAG 2022) identifies (a) early childhood learners⁴; (b) youth/adult learners⁵ and (c) disaggregation of learners by different types of vulnerability for both in and out of school as significantly underreported data groups in the

⁴ Only 28% of appropriate learners across the African continent are registered as receiving ECD support[1]. SDG 4.2.1 on development status of early learners is collected by 26 (48%) of the 54 countries in the Africa region through Household Surveys and or Multiple Indicator Cluster Survey (MICs) on a sporadic basis. (NORRAG 2022)

⁵ Many of the 58% of African youth of secondary school age not enrolled in secondary school are likely to be not in employment or training or in the informal sector. (UIS (2019) Fact Sheet)

education sector. Additionally data gaps exist in the critical thematic areas of learning assessments (SDG 4.1); relevant skills as well as numeracy and literacy (SDG 4.4 and 4.6) as well as missing data gaps on private / non-public / non-formal education provision across multiple SDG indicators. These data gaps include the need to measure new characteristics of learners by socio-economic status, disability, inclusion, gender with deeper analytical cross referencing by age, geographic region, language among others.

This demand for more detailed data, is behind the drive to access other sources of relevant data, outside the Ministries of Education. Ministries of Social Welfare and Protection Services can provide detailed information on birth registration; access to grants; and protection against family violence and/or child abuse, substance abuse, poverty and other developmental risk factors. Government agencies on public service employment can be used to cross reference teacher records with that of the Teacher Service Commission or EMIS to ensure the absence of ghost teachers and align records with the Ministry of Finance payroll system on teachers. In most African countries, Ministries of Health collect individual and global aggregate data on gender violence, disabilities, health and nutrition of early childhood, school feeding, immunization, data which is seldom used in the education sector to inform planning. The health sector plays a critical role in early childhood development (ECD) in supporting the child's well-being, (promotive care), children at developmental risk (preventative care), and children with special needs (curative care), both overall and differentially by child age.

Learners in fragile conflict situations often go unreported in education data systems, thus leaving their needs unaddressed and aggravating their vulnerability. One in four African children live in a conflict zone⁶. In some cases, areas affected by conflict are no longer within the control of the government, making it even harder to collect data. Typically, humanitarian education data systems are established by agencies such as UNHCR and members of the Education Clusters in parallel to national systems and as a result data may not be readily harmonized or integrated between them, deepening the humanitarian-development divide and the lack of available data

This research topic addresses both knowledge gaps on missing data and data systems and associated tools for data integration, both software and coordination responses. Integration of new data sources requires collaboration between EMIS units and other departments and functions, such as planning, payroll, finance, policy, teacher training, gender, social inclusion, civil registration and health.

Some of the Research Questions

1. Describe actions to be taken by governments and civil society to scale up interventions in the education sector to promote greater data warehousing and integration and present case studies from other countries that have successfully implemented intra and cross-sectoral integration and data use for evidence-based planning and resource management.
2. What would the recommendations include on appropriate government actions; training and capacity development; sector linkages; national and local collaboration (including support of local issues and demands); and monitoring, evaluation, and research.
3. What are the best practice current data system reforms being implemented in different contexts to integrate relevant and externally produced data into EMIS (Education Management Information Systems) and use that information to inform practices. These include data interoperability, data warehousing, dashboard reporting, predictive analytics, and open data. Overall, these reforms are aimed at making it easier for educators to access and use relevant data to inform their practices and improve student outcomes. The research needs to investigate what are the preferred options and why this is the case.
4. How are promising practices for leveraging external data to improve education outcomes and promote inclusivity, particularly vulnerable learners, having an impact on the actions of policy-makers, education (Ministry of Education) practitioners, researchers, and development partners involved in education planning, monitoring, and evaluation?

⁶ African Child Policy Forum (2019).

5.3 Research Question: How can data for community involvement, school improvement and district planning be democratized for social engagement and accountability including innovations such as social media, Artificial Intelligence (AI) among others as they apply to Education

Challenge it is addressing :

Some 98 million children on the African continent are out of school⁷ and 193 million children of primary and lower secondary school age will reach their adolescent years unable to read, write or perform basic numeracy tasks⁸. These unacceptable statistics need to be understood in the context of low availability of public resources but also the inadequate accountability of the use of available resources by government, states, districts, schools and teachers. Finally, there is a growing movement towards open data, which involves making data available to the public for analysis and use. This allows for greater transparency and accountability in education systems and can help educators and policymakers make more informed decisions.

Data literacy is a huge challenge facing civil society on the continent where at least a third of people, 15 years and older are unable to read and write. Some 40% of African girls and women are illiterate. We also know almost 60% of Sub-Saharan Africa's population is under the age of 25⁹ making Africa the world's youngest continent as well as being the least educated. The majority of parents, particularly in poor communities, are focused on sustaining a livelihood for their families and those people may be unaware that the schooling provided to their child is of low quality, or they may interpret the data on their child's performance against national examination averages as a reflection of their child's cognitive abilities or choices, not the quality of resources provided and managed by government.

There are countries where school children consistently underperform and there is no reported national outcry. Malawian primary school children were the worst performers in literacy and numeracy in a group of African countries tested in 2010¹⁰ and again in 2015. Among the causal factors listed was high teacher and learner absenteeism and inequitable pupil/teacher ratios. School community engagement was suggested as a solution. By 2015, the situation had not changed and the majority of learners scored below the 40% mark despite increased government expenditure on teachers and infrastructure¹¹

Similarly, UWEZO, a citizen-led assessment movement operating in East African countries proved that a significant number of children exit primary education without having ever attained the basic competences, contrary to their school leaving certificates. Integral to the UWEZO philosophy is that information about low learning outcomes, disseminated widely, will engage stakeholders in activities and debates, ultimately leading to improvements in education quality and service delivery. UWEZO established that 3 out of 10 Ugandan Primary 7 students were unable to read and write at a Primary 2 level, with similar results in Kenya and Tanzania¹². This caused a short term furore in the public media in those countries but no citizen action on a national level against children being in school and not learning.¹³

⁷ UNESCO, Global Education Monitoring Report 2020: Inclusion and Education: All Means All (Paris: UNESCO, 2020), p. 210 <<https://unesdoc.unesco.org/ark:/48223/pf0000373718>> [accessed 8 September 2021].

⁸ Brookings. (2015) The Center for Universal Education (2013) This is Africa Learning Barometer survey <https://www.brookings.edu/opinions/too-little-access-not-enough-learning-africas-twin-deficit-in-education/> estimated 61 million primary school learners in this category. However <https://unstats.un.org/sdgs/report/2019/goal-04/> propose that non-proficiency rates are highest in sub-Saharan Africa, where 88 per cent of children (202 million) of primary and lower secondary school age were not proficient in reading, and 84 per cent (193 million) were not proficient in mathematics in 2015.

⁹<https://www.brookings.edu/blog/brookings-now/2019/01/18/charts-of-the-week-africas-changing-demographics/>

¹⁰ World Bank (2010) quoting SACMEQ 111 results on literacy and numeracy.

¹¹ Ministry of Education, Science and Technology (2015) Malawi Monitoring Learning Achievement.

¹² Mary Gorette Nakabugo (2015)

¹³ Jeremy Monk. (2020)

The use of EMIS data has therefore become increasingly important as Ministries seek to improve student outcomes and allocate resources more effectively. They themselves lack the human resources and data scientists to produce the analysis of data in ways that are meaningful and useful to local planning and dissemination of information on standards achieved.

Access to data is not always equitable or communicated against national benchmarks. Many stakeholders, including parents, students, and community members, either don't receive the data in an understandable or actionable format or lack the knowledge or skills to use data effectively. Districts and schools often do not reach out to their communities to engage them on their key education priorities, against which they can be held accountable. The context of the learning crisis adds urgency to the need for the dissemination and effective use of education data to address educational challenges and improve learning. This Research Topic is addressing what the key components of an ecosystem for democratizing data in education are, and what tools including social media, AI, and other innovative technologies can be leveraged for social engagement and accountability for improved educational outcomes both in and outside school.

Research Questions

The challenge being addressed is the lack of access to quality education and the inadequate accountability of the use of available resources by government, states, districts, schools, and teachers in Africa. This challenge can be addressed through democratizing data in education, which involves creating an ecosystem for accessible and understandable data in education, leveraging social media, AI, and other innovative technologies for social engagement and accountability.

1. What best case use examples are there for using social media for promoting greater civic engagement in education? For example, Facebook and WhatsApp can be powerful tools for improving data democratization in education. With their massive user bases, these platforms provide a way to reach a large audience quickly and easily.
2. How effective is it for parents, students, and community members from poor communities to use social media public groups to access and discuss data related to their schools and districts. How effective is it for school administrators and teachers to use these groups to communicate directly with parents and students, providing updates on school events, policies, and other important information?
3. What is the potential of using innovative tools such as the AI language model, ChatGPT among others to enable real-time data processing and analysis, support and extend the use of data scientists to support data democratization, develop natural language processing (NLP) tools that can help in improving data literacy by providing easy-to-understand explanations of complex data, among others . Where is this the case in the education or other sectors where AI is being used to support data democratization in education by providing insights, recommendations, and predictions based on the available data?
4. What value does publicizing indexed school averages or school improvement rankings ¹⁴ with all their drawbacks of not addressing uneven playing fields, as useful mechanisms for promoting civic awareness of school improvement strategies and performance? What evidence is there that when communities are provided with information on the local education situation, access, enrolment and learning outcomes improve ¹⁵ ?
5. How can education systems set simple standards and, just as importantly, communicate these standards to parents so that they may better understand their child's progress and hold schools accountable? There is a need to provide simple understandable measures that civil society can use to hold education decision makers accountable and lobby for change.
6. The education sector should invest in developing data literacy skills for school leaders, teachers, and other stakeholders, to ensure that they can make informed decisions based on data insights. What strategies could be adopted at the pre-service and in-service of teacher training curricula?

¹⁴ In Tanzania, Under Big Results Now Initiative, School Improvement Grants, issued to increased performances based on a list of criteria, gain huge attention in the public media.

¹⁵ UNICEF (2019) Data Must Speak.

7. Does data visualizations and local EMIS dashboards serve as incentives for school leaders and other stakeholders to easily share, understand and use data insights and what are their prerequisites?

Overall, democratizing access to data and making it understandable for all stakeholders requires a collaborative effort among different actors, including data producers, users, and regulators. By establishing a transparent and inclusive data governance framework, building a robust data infrastructure, developing data literacy skills, encouraging data sharing, and providing user-friendly data visualization and dashboard tools, education sector managers can ensure that data is used to inform decision-making and improve education outcomes.

References

ADEA (2018). The Gambia EMIS Peer Review Based on ECOWAS EMIS Norms and Standards Assessment Framework

ADEA (2019). How can education management information systems facilitate better planning and policy dialogue in Africa? ADEA blog, <https://www.adeanet.org/en/blogs/how-can-education-management-information-systems-facilitate-better-planning-policy-dialogue>

Donabedian, A. (1988). The quality of care: How can it be assessed?. *JAMA*, 260(12), 1743-1748.

Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. R. (2006). Quality of center child care and infant cognitive and language development. *Child Development*, 77(4), 849-866. <https://doi.org/10.1111/j.1467-8624.2006.00905.x>

Ghana's EMIS: Government of Ghana. (2010). Education strategic plan 2010-2020. Accra, Ghana:

Government of the Republic of Malawi (2019) Ministry of Education, Science, and Technology. Malawi Education Sector Analysis. Lilongwe, Malawi

GPE (2019a), Data Roundtable Outcomes Report <https://assets.globalpartnership.org/s3fs-public/document/file/2019-09-18-gpe-drt-report-web.pdf?VersionId=EJhiRG9u81MzDnKyOYbmwCiPkLZk55Ng>

GPE (2019b): Meeting the Data Challenge in Education: <https://www.globalpartnership.org/sites/default/files/2019-07-15-kix-data-final-english.pdf>

Harvey Goldstein and Sally Thomas. (1996) Using Examination Results as Indicators of School and College Performance. *Journal of the Royal Statistical Society. Series A (Statistics in Society)* Vol. 159, No. 1 (1996), pp. 149-163 (15 pages). Published By: Wiley

Jeremy Monk. (2020) Placing Blame or a Call to Action? An Analysis of Uwezo in the Kenyan Press. Education Policy Analysis Archives. Volume 28 Number 185. Teachers College, Columbia University.

National Quality Forum. (2018). Quality measurement framework. Retrieved from https://www.qualityforum.org/Publications/2018/09/Quality_Measurement_Framework.aspx

National Institute of Statistics Rwanda. (2017). Education statistics annual abstract report 2017. Kigali, Rwanda: Rwandan Ministry of Education. (2018). Education sector strategic plan 2018-2024. Kigali, Rwanda:

Ministry of Education, Ghana. (2016). Education sector performance report 2014-2016. Accra, Ghana:

Kenya's EMIS: Republic of Kenya Ministry of Education. (2018). Kenya education sector plan 2018-2022. Nairobi, Kenya:

Langley, G. J., Moen, R. D., Nolan, K. M., Nolan, T. W., Norman, C. L., & Provost, L. P. (2018). The improvement guide: A practical approach to enhancing organizational performance. John Wiley & Sons

Liberia's EMIS: Ministry of Education, Republic of Liberia. (2018). Liberia education sector plan 2017-2021. Monrovia, Liberia:

Mary Goretti Nakabugo (2015) Twaweza East Africa. Towards Equitable Quality Basic Education in Uganda: Insights from Uwezo Learning Assessment Data

PAL Network. (2015) Citizen-led Assessment: Malawi Concept Note

The Sustainable Development Goals Center for Africa and Sustainable Development Solutions Network (2020): Africa SDG Index and Dashboards Report 2020. Kigali and New York: SDG Center for Africa and Sustainable Development Solutions Network.

United Nations Development Programme (UNDP). (2018). Africa Sustainable Energy Report 2018: Tracking SDG 7 in Africa. New York: UNDP.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2021). Climate Change Education for Sustainable Development. Paris: UNESCO.

United Nations Office for Disaster Risk Reduction (UNDRR). (2019). Global Assessment Report on Disaster Risk Reduction 2019. Geneva: UNDRR.

UNESCO Institute for Statistics: <http://uis.unesco.org/>

UNICEF Multiple Indicator Cluster Surveys: <https://mics.unicef.org/>

UNESCO Institute for Statistics, Data for Sustainable Development - A Roadmap, 2017

UNESCO. (2018). Kenya education sector analysis. Paris

United Nations Children's Fund (UNICEF). (2018). Liberia education sector analysis. Monrovia, Liberia:

UNESCO/GPE (2020) The role of education management information systems in supporting progress towards SDG 4: recent trends and international experiences
<https://bangkok.unesco.org/content/more-one-half-children-and-adolescents-are-not-learning-worldwide>

UNESCO, 2021. Re-imagining the future of Education Management Information Systems “Beyond head counts: Leveraging data systems to support inclusive and effective learning for all”
<https://en.unesco.org/sites/default/files/re-imagining-future-of-emis-seminar-wp.pdf>

Van Wyk, C. and Crouch, L., 2020. Efficiency and Effectiveness in Choosing and Using an EMIS. *UNESCO Institute for Statistics, Montreal.*

Washington Group on Disability Statistics: <https://www.washingtongroup-disability.com/>

World Health Organization. (2018). Monitoring and evaluating digital health interventions: A practical guide to conducting research and assessment. Retrieved from <https://www.who.int/publications/i/item/9789241513904>