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GUIDANCE NOTE

EVIDENCE GAP MAP IN THE FOUNDATIONAL LEARNING SPACE IN SUB-SAHARAN AFRICA

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About the Unlocking Data Initiative

The Unlocking Data Initiative is a community of practice that connects African scholars, NGOs, national statistics offices, and policymakers for the purpose of improving access to and use of education data. The **Unlocking Data: Scaling Uses and Users of Education Data** project is a collaborative work led by Zizi Afrique Foundation and supported by Education sub-Saharan Africa, eBase Africa, and the University of Malawi's Centre for Education Research and Training (CERT). The latter project, which is being implemented in Cameroon, Kenya, and Malawi, aims to scale up uses and users of data to address the knowledge gap of how to adaptively scale up the effective use of existing education data by policymakers and researchers in Africa.

To find out more about us, go to https://unlockingdata.africa/. Our evidence library can be found at https://docs.unlockingdata.africa/lib/

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1. Introduction

This document presents the approach adopted by the Unlocking Data Initiative (UDI) to conduct evidence gap map exercises in the foundational learning space in three selected African countries: Cameroon, Kenya, and Malawi. The Unlocking Data Initiative is a community of practice that connects African scholars, NGOs, national statistics offices, and policymakers for the purpose of improving access to and use of education data. The initiative aims to increase the uses and users of education data by generating evidence and advocating for policies and frameworks to improve foundational learning for primary school-age children (4–10 years).

Practically, the initiative is implemented through four key components, including a situational analysis, EGMs, and the use of data to address priority research questions. This Guidance Note is intended primarily for stakeholders involved in this multi-country project, particularly policymakers and researchers in Cameroon, Kenya, and Malawi. It serves two main purposes: firstly, to guide the application of the evidence gap mapping methodology within current project activities in these three countries, and secondly, to share our EGM approach and lessons learned with other researchers and stakeholders who may wish to undertake similar evidence gap mapping tasks in the future. Familiarity with these tools and strategies is crucial for strengthening the capacity of these policymakers and researchers and building their knowledge on data collection, analysis, use, and sharing in FL, as part of the project's objectives.

1.1. Background

The foundations of a child's future learning are laid in their early years. Hence, foundational learning, the acquisition of basic literacy, numeracy, and socio-emotional skills, is essential for children's long-term educational success. Unfortunately, in Africa, recent data indicates that one in five primary school-age children on the continent is still out of school, and a quarter will never complete primary education (↑UNESCO, 2023). Addressing these issues requires data and evidence. Assessments of the foundational learning Data and Knowledge Ecosystem in Cameroon, Kenya, and Malawi ↑Moustafa & Waziri (2025) have helped identify data and research outputs generated between 2010 and 2024, revealing stakeholders' challenges not only in accessing data but also in converting it into actionable insights for evidence-based decision-making. Although the latter offers some insight into persisting data gaps, it lacks the thematic and policy depth to serve as a foundation of a research agenda designed to address current knowledge gaps, motivating this evidence gap map. This limitation motivated the creation of the EGM approach presented here, which builds upon previous methodologies developed by entities within the UDI community, such as Education Sub-Saharan Africa (ESSA) and the REAL Centre at the University of Cambridge, in collaboration with others involved in

related data and literature mapping efforts (↑Lawson et al., 2024 and ↑Selwaness et al., 2022).

This Guidance Note aims to present the tools and strategies used to assess existing research outputs for knowledge gaps. As mentioned, this is crucial for the UDI multi-country project, supporting efforts to strengthen the capacity of policymakers and researchers and build knowledge on data collection, analysis, use, and sharing in FL. The EGM process outlined herein will reveal gaps in both research output and potentially highlight gaps related to policies, providing justification and serving as a foundation for the next phase of the project, which involves co-creating a country-level FL research agenda with the stakeholders.

1.2. Purpose of this Guidance Note

This Guidance Note aims to detail the specific methodological approach, tools, and processes employed by UDI for conducting EGM exercises in Cameroon, Kenya, and Malawi. This serves a twofold purpose:

Firstly, to guide the systematic approach used in the Unlocking Data Initiative's foundational learning EGM studies in the three target countries. Undertaking these EGMs is crucial for UDI, which aims, among others, to strengthen the capacity of policymakers and researchers, as well as build knowledge on data collection, analysis, use, and sharing in foundational learning. Moreover, the EGMs help to reveal specific gaps in both research output and potentially highlight areas where policy-relevant evidence is needed. The EGM also serves to justify and provide a clear foundation for the next phase of the project, which involves co-creating country-level foundational learning research agendas based on the identified gaps and existing evidence.

Secondly, to share the UDI's EGM methodology for others aiming to undertake a similar task. By detailing the approach to searching for literature, presenting the tools and steps for the EGM, and sharing lessons learned, this document provides a transparent comprehension of the processes used to create the EGM, thereby guaranteeing the dependability and reproducibility of the results.

This document is part of the contribution of the Unlocking Data Initiative's mission to scale up the use of existing data and evidence.

1.2. Report structure

The remainder of this document is organised as follows: Section 2 outlines the approach to searching for FL research in sub-Saharan Africa, while Section 3 presents the tools and steps for the EGM. Section 4 shares lessons learned in generating and graphically

illustrating EGMs for Cameroon, Kenya, and Malawi. Finally, Section 5 presents concluding remarks.

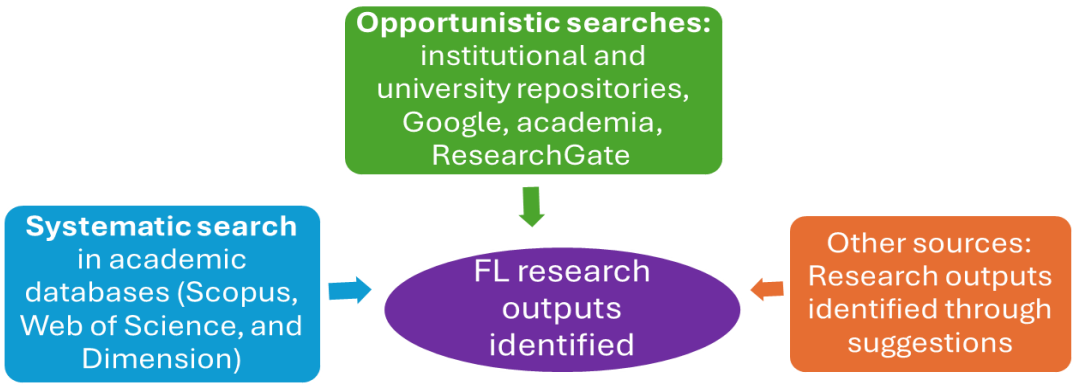
2. Searching for literature

Analysing existing literature to identify evidence gaps requires that this literature has been systematically searched, recorded, and coded. This section describes the approach used by the UDI to identify the relevant foundational learning research outputs in sub-Saharan Africa for the EGM exercise.

2.1. Searches for foundational learning research

The core strategy for identifying relevant foundational learning research in the different target countries (Cameroon, Kenya, and Malawi) is detailed in existing protocols (↑Binesse et al., 2023) and guidance notes from the initiative (↑Lawson & Iwiire, 2025). This approach involves identifying research outputs related to literacy, numeracy, and socio-emotional skills for children of primary school age in sub-Saharan Africa.

Figure 1*: Search strategy for identifying foundational learning research outputs*

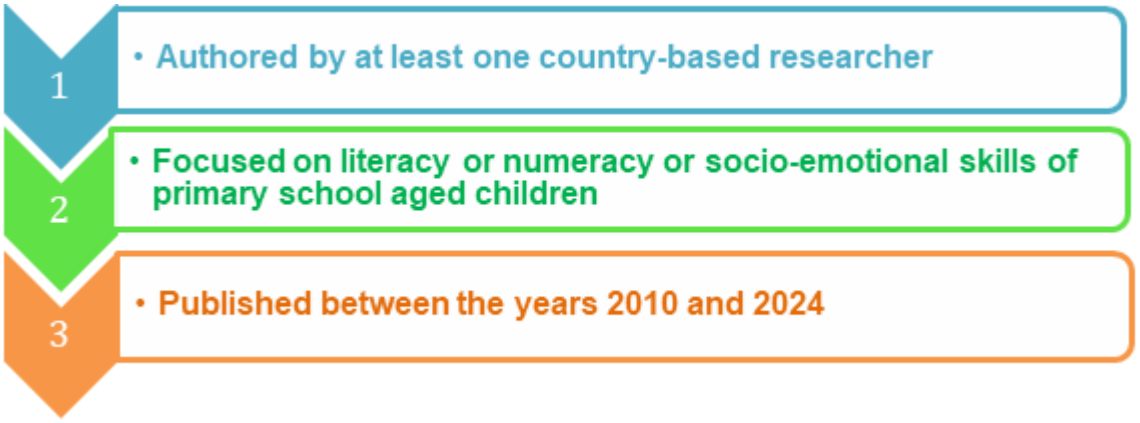


2.2. Relevance criteria

The comprehensive searches described above may yield a large volume of results, not all of which are directly relevant to the specific scope of the Foundational Learning EGM being conducted. Therefore, a crucial step after the initial search is to apply relevance criteria to select the literature that will be included in the mapping process. The same three main criteria applied during the exploration of the foundational learning data and knowledge ecosystem in Cameroon, Kenya, and Malawi (↑Pambe et al., 2025; ↑Gachoki & Arisa, 2025; ↑Kadzamira et al., 2025) are recommended for selecting relevant literature for this EGM.

For a study to be considered relevant and included in the EGM, it had to meet the following three criteria, as shown in Figure 2:

Figure 2: *Relevance criteria for inclusion in the Evidence Gap Map*



Note: Users of this guidance note are encouraged to adapt these three relevance criteria as appropriate, based on their specific context and the availability of research outputs.

3. Tools and coding for EGM

Having identified and filtered the relevant literature based on the criteria outlined in Section 2, the next crucial step is to systematically analyse and organise these research outputs to construct the EGM. This section details the specific tools and the coding process employed by the UDI for creating the foundational learning EGMs in Cameroon, Kenya, and Malawi.

3.1. Tools for EGM

An EGM serves as a visual tool that systematically illustrates the existing evidence and highlights areas where evidence is missing on a specific topic, often by connecting interventions to outcomes. Several well-established tools and platforms are available for the creation and visualisation of EGMs, particularly within the fields of international development and education policy. These tools facilitate the assessment of various interventions and their corresponding outcomes. Examples of existing tools include the 3ie Evidence Gap Map Platform[1] and EPPI-Reviewer[2] in conjunction with EPPI-Mapper.[3]

For the evidence gap maps in the Foundational Learning space in sub-Saharan Africa, we utilised EPPI-Reviewer and EPPI-Mapper. EPPI-Reviewer is primarily designed to support diverse types of literature reviews, including systematic reviews, meta-analyses, narrative reviews, and meta-ethnographies. EPPI-Mapper is then used as a visualisation tool to convert the coded data into the EGM. Using these tools requires several steps, including preparing the studies, creating the coding tools, coding studies based on interventions and outcomes, and finally exporting the interactive EGM. These practical steps are discussed in detail in the following subsection.

3.2. Coding research for EGM

Having identified and filtered the relevant literature based on the criteria outlined in Section 2, the next crucial step in constructing the EGM is to systematically analyse and organise these research outputs. This involves coding the research, detailing specific tools and processes employed by the UDI. The following steps detail the coding and visualisation process.

[1] See https://www.3ieimpact.org/evidence-hub/evidence-gap-maps. Retrieved on 26 June 2025

[2] See https://eppi.ioe.ac.uk/eppireviewer-web/home. Retrieved on 26 June 2025.

[3] See https://eppimapper.digitalsolutionfoundry.co.za/. Retrieved on 26 June 2025.

3.2.1. Preparing and importing studies into the software

The initial step in the mapping process is to ensure access to EPPI-Reviewer and create a new review within the platform. The relevant studies identified through the systematic and opportunistic search strategies (as described in Section 2.1) and filtered using the defined relevance criteria (Section 2.2) are then prepared for import. In the three implementing countries (Cameroon, Kenya, and Malawi), relevant studies identified were added to a Zotero Library. From Zotero, the studies were then exported as a RIS file, which is a standard format for bibliographic data. This RIS file was subsequently uploaded into EPPI-Reviewer, making all relevant studies visible under the Reference Tab, ready for the coding process.

3.2.2. Creating and structuring the interventions and outcomes

The structure of the EGM inherently connects interventions to outcomes. The coding tools used, such as those within EPPI-Reviewer, help structure the categories for these key elements. This involves defining categories and sub-categories to represent the specific interventions and outcomes that will be mapped against each other. For instance, you might define a main category for 'Interventions' and then list specific interventions, like 'Teachers Professional Development', 'Language of Instruction and multilingual education', 'School feeding and health interventions', 'Policy and system level interventions', and 'Social and Emotional Learning Intervention', as items within that category.

A similar approach applies to structuring the outcome categories and listing specific outcomes. This process defines the specific items that will form the rows (interventions) and columns (outcomes) of the final EGM visualisation. Beyond interventions and outcomes, many other coding layers can be created and structured within the framework, such as gender (male versus female), geographical location (rural versus urban), language, and study type, among others.

***Table 1**: Example of intervention coding framework for the EGM*

Level 1	Level 2
Interventions	Teachers Professional Development
	Language of Instruction and Multilingual Education
	School feeding and health interventions
	Policy and system-level interventions
	Social and Emotional Learning Intervention

3.2.3. Coding studies and exporting the interactive EGM

With the studies imported and the coding framework for interventions, outcomes, and other attributes established, the next step is to individually assess and code each study. This means assigning the correct corresponding intervention(s), outcome(s), and any other relevant coding attributes to each study based on its content. This process of coding studies is manual and time-intensive, particularly with a larger number of imported studies. While a rapid assessment of study abstracts and keywords can aid in identifying interventions and outcomes, assigning other attributes like author gender or geographic location requires a deeper assessment of the study content. Despite the effort required, this comprehensive coding step is crucial as it enables later analyses and assessments of the EGM through various lenses (e.g., filtering by study type or location).

Once the coding process is complete for all relevant studies – meaning attributes such as interventions, outcomes, and others have been defined and assigned – the coded data is exported as a JSON file. This file is then imported into EPPI-Mapper.

3.2.4 Visualising and reading the EGM

EPPI-Mapper is the visualisation tool that uses the coded data from EPPI-Reviewer to generate the visual EGM. To display the EGM, interventions are typically assigned to rows and outcomes to columns, creating a pivot table format. While this is the typical arrangement used for the map, this assignment is not automatic; it is configured within the visualisation tool, EPPI-Mapper, which offers various design elements for customising the display. The platform offers these design elements, including branding, map details, and colours. The outputs of the EGM can be visualized in different formats, such as a ‘Bubble Map’, ‘Heat Map’, and ‘Mosaic Map’, among others.

The interpretation of the EGM results is significantly influenced by the filters used. In the Bubble Map format, if studies are also coded by specific characteristics, such as the methods used (quantitative versus qualitative) or the gender of the first author (male versus female), these coded attributes can be applied as filters. In this format, the size and colour of the bubbles within each cell (which represents the intersection of a specific intervention and a specific outcome) indicate the quantity of available evidence with respect to those coded characteristics (e.g., the number of quantitative studies or studies with a male first author in that cell). Larger bubbles represent areas with substantial research, while smaller or absent bubbles highlight knowledge gaps or areas where more studies are needed.

The EGM allows for comparative readings, assessing the evidence base for a specific intervention across different outcomes, or a specific outcome across different interventions, as illustrated in Figure 3.

Figure 3: *Bubble map visualisation of interventions and outcomes in the Foundational Learning EGM*

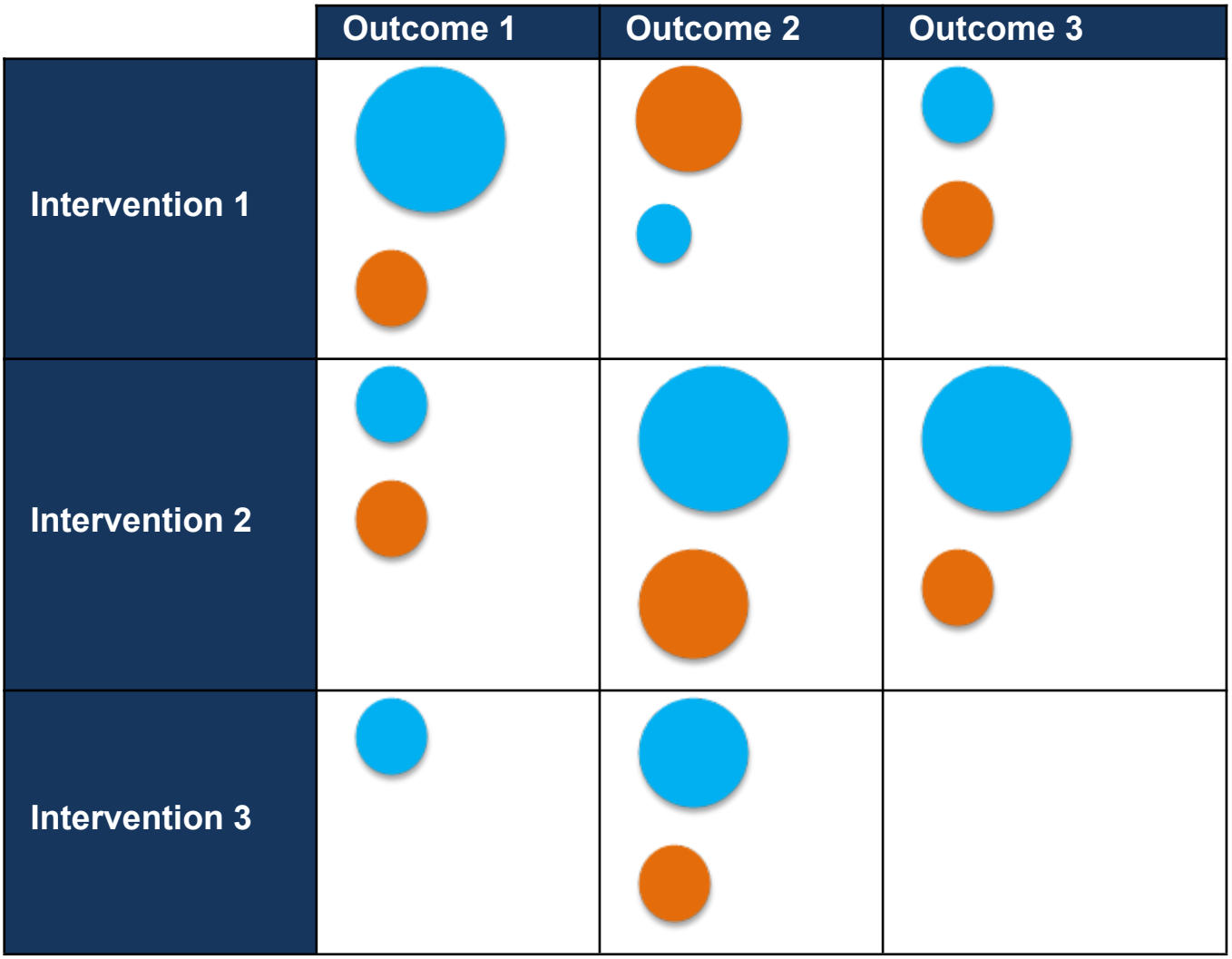


Figure 3 presents a visual bubble map summary of the distribution of available evidence across three types of interventions and three outcome areas in the FL space. Each cell represents the intersection between a specific intervention and an outcome, with bubbles indicating the volume and composition of studies identified for that pair.

How to read the EGM

- Bubble size within each cell reflects the number of available evidence with respect to the coded characteristics: larger bubbles represent areas with substantial research, while smaller or absent bubbles highlight knowledge gaps or areas where more studies are needed.
- Bubble colour distinguishes studies based on coded characteristics, such as the gender of the first author (male versus female). 🔵**Blue bubbles** represent

studies authored by male first authors, while 🟠 **Orange bubbles** represent studies authored by female first authors. These coded attributes can be applied as filters.

Example: There is a large body of evidence connecting Intervention 1 to Outcome 1, especially among studies with male first authors, as indicated by the large blue bubble. A moderate amount of evidence is linked to Outcome 2, with contributions from both male and female first authors. Evidence on Outcome 3 is limited, as shown by smaller bubbles.

The EGM allows for comparative readings, assessing the evidence base for a specific intervention across different outcomes, or a specific outcome across different interventions. From a comparative perspective, as shown in Figure 3 above, across all three interventions, relatively little evidence has been identified for Intervention 3, with no evidence on Outcome 3. A similar comparative reading is also feasible with regard to outcomes.

It is important to note that the gaps identified in the EGM (empty cells) do not necessarily imply ineffective interventions, but rather highlight areas where evaluation is lacking. These represent areas where evaluation has not been conducted or published.

4. Lessons learned from mapping evidence gaps

Conducting the EGM exercise presents a valuable opportunity to systematically assess the existing research landscape. While the process delivered results crucial for informing future steps of UDI, it also brought to light several key challenges and demonstrated the inherent usefulness of such a mapping endeavour.

4.1. Challenges encountered during mapping evidence gaps

Mapping evidence gaps is a rigorous process that involves systematic searching, recording, and coding of literature. Based on the experience of applying this methodology, several challenges were identified:

- **Manual and time-intensive process**: Each study was manually coded, revealing that EGMs are time-consuming and require a skilled team for screening and coding. Furthermore, the task becomes complex because studies often use varied terms and definitions, which can make the coding process cumbersome.
- **Complexity in defining categories:** Choosing and grouping appropriate intervention and outcome categories has been complex and potentially subjective. Assigning studies to categorise (intervention-outcome cells) requires judgment and can vary between reviewers. The mapping process, being based on the systematic search and coding of literature, revealed areas where no evaluated interventions were identified within the scope of the literature searched and included in the map in critical areas such as school feeding and health interventions, social and emotional learning interventions, teachers' professional development, and technology-enabled learning. This indicates a gap in the evaluated and published evidence base for these areas linked to foundational learning outcomes, rather than necessarily proving the complete absence of interventions on the ground.
- **Varied quality and relevance of evidence**: The literature reviewed used different methodologies, and not all studies were of equal quality or relevance. This variability requires careful consideration during the mapping and interpretation process.
- **Need for specialised tools and training:** Utilising specific EGM platforms like EPPI-Reviewer and EPPI-Mapper requires dedicated training and appropriate infrastructure.

***Box 1**: A note to others who might want to use this approach*

Based on the UDI's experience, key lessons for those undertaking a similar EGM exercise are:

- Invest in training and specialised tools like EPPI-Reviewer and EPPI-Mapper; the process is manual and time-intensive.
- Develop a robust, contextually relevant coding taxonomy in consultation with stakeholders.
- Be prepared for varied evidence quality and the need for careful interpretation.
- Rigorous data management (e.g., using Zotero) is crucial.
- Understand that 'empty cells' indicate a lack of evidence, not necessarily ineffectiveness.
- Utilise the interactive filters to reveal deeper insights and biases.
- Anchor findings in the local context and use the EGM to start conversations with stakeholders about research priorities.

4.2. Usefulness and outcomes of the EGM

Despite the challenges, the EGM exercise proved to be a rewarding activity, delivering valuable results. Its usefulness stems from its ability to systematically map the existing evidence landscape and highlight areas where more research or evaluation is needed.

The EGM exercise:

- **Delivers results for understanding the field:** It provides a structured overview that will be used to further understand the field of education, specifically foundational learning, in the countries under consideration.
- **Reveals knowledge gaps:** A key function of the EGM is to visually show where evidence exists and, crucially, what is missing on a particular topic. This involves revealing gaps in both research output and potentially highlighting areas where policy-relevant evidence is sparse. Areas with smaller or absent bubbles in the map format specifically highlight knowledge gaps.
- **Serves as a foundation for future research**: The identified gaps are critical for the next phase of the UDI, which involves co-creating a country-level foundational learning research agenda. The EGM justifies this subsequent phase by providing a clear evidence base for the need for more research in specific areas.

- **Highlights outstanding questions:** The mapping process can illuminate specific outstanding questions within the foundational learning knowledge and data ecosystem, guiding future inquiry.

In essence, the EGM provides a visual and structured summary of the evidence base, making it easier to identify areas requiring further investigation and thereby informing strategic research priorities.

5. Concluding remarks

This document outlines the EGM approach used by the Unlocking Data Initiative in Cameroon, Kenya, and Malawi. The EGM is a powerful visual tool that systematically illustrates the existing evidence base and highlights areas where evidence is missing by connecting interventions to outcomes.

This methodology is particularly helpful to those in foundational learning because it: provides a structured overview of the evidence landscape, visibly reveals knowledge gaps, highlighting where research or evaluation is needed, serves as a clear foundation for co-creating country-level research agendas based on identified needs, supports stakeholders in making evidence-informed decisions, focuses on specific country contexts, making findings directly relevant.

The EGM uses a comprehensive coding taxonomy, primarily connecting Interventions (e.g., Teacher Professional Development, Technology-Enabled Learning, Parental/Community Engagement, Policy/System-Level) to Outcomes (e.g., Literacy Skills, Numeracy Skills, Socio-Emotional & Behavioural Outcomes, Teacher Knowledge & Instructional Practices, Equity & Inclusion). Additional coding layers include attributes like gender of the first author (male vs. female), geographical location (rural vs. urban), language of publication, and study type (e.g., experimental, qualitative). These layers allow for deeper analysis and filtering of the evidence.

Mapping evidence gaps in the selected countries presented challenges, including the manual and time-intensive nature of coding, the complexity of defining categories, and variations in study quality. Furthermore, the mapping process revealed specific challenges relating to foundational learning within the evidence base itself in these countries: Significant intervention gaps with no identified studies in critical areas like school feeding and health, social and emotional learning, teacher professional development, and technology-enabled learning, and in certain contexts, an imbalance in outcome areas studied, with a heavy focus on literacy and numeracy, while socio-emotional outcomes and equity are often underrepresented. Methodological gaps, such as the scarcity of rigorous experimental and longitudinal designs, systemic inequities in the evidence base, including linguistic biases (e.g., dominance of English in Cameroon), and gender disparities in authorship are also observed.

The sub-national focus on Cameroon, Kenya, and Malawi is highly relevant. It allows the project to identify country-specific evidence gaps and characteristics tailored to each nation's unique context and challenges. This contextualised analysis provides a crucial, relevant foundation for the next phase: co-creating actionable, country-level research agendas with local stakeholders.

While EGMs provide critical insights, it's important to note that identified gaps do not automatically mean interventions are ineffective; rather, they highlight areas lacking evaluation or relevant research. Research priorities should blend map findings with context and stakeholder needs.

Box 2. *Concrete findings from the Cameroon EGM*

To make concrete what has been presented on a theoretical level, let's look at findings from the Cameroon EGM Report:

Specific Intervention Gaps: The EGM revealed no identified interventions in foundational learning research in Cameroon focusing on school feeding and health interventions, social and emotional learning interventions, teachers' professional development, and technology-enabled learning. This directly highlights major areas where research is missing, despite these being crucial areas for educational outcomes.

Specific Outcome Imbalance: There is a clear imbalance in outcomes studied, with literacy skills dominating (22 studies) compared to numeracy skills (11 studies). Outcomes related to socio-emotional behaviour, engagement, participation, and teacher knowledge were also notably low (2-3 studies each).

Language Bias: Despite Cameroon being officially bilingual (French and English), the EGM found an overwhelming dominance of studies published in English (49 studies) compared to only 6 in French. This linguistic bias could affect the applicability of findings across the country's diverse linguistic contexts.

Gender Disparity: The majority of studies were led by male first authors (38 studies) compared to female first authors (17 studies). This disparity is visible across different study types and intervention areas.

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These references are available digitally in our evidence library at https://docs.edtechhub.org/lib/NDHVTAMB

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