Mapping foundational literacy and numeracy research in sub-Saharan Africa
Tanzania country report

REAL
Research for Equitable Access and Learning

ESSA
Education Sub Saharan Africa

Authors

The preparation of this report was led by Thierno Malick Diallo who collected all the data and wrote the first draft of the report. Laté A. Lawson analysed the quantitative data supported by Woulamé Oudjim. Samuel Asare reviewed initial drafts of the report. Pauline Essah provided oversight throughout the process, offered guidance and reviewed the final report.

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List of abbreviations

BRNEd	Big Results Now in Education
DFAT	Department of Foreign Affairs and Trade- Australia
ESSA	Education Sub Saharan Africa
FCDO	Foreign, Commonwealth & Development Office – United Kingdom
FLN	Foundational Literacy and Numeracy
ICT	Information and Communication Technology
MoEST	Ministry of Education, Science and Technology
NUFU	Norwegian University Fund
PSIPSE	Partnership to Strengthen Innovation and Practice in Secondary Education
3Rs	Reading, wRiting, and aRithmetic
REAL	Research for Equitable Access and Learning
SIDA	Swedish International Development Cooperation Agency
SSA	sub-Saharan Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

Summary

Sub-Saharan Africa-based researchers strive to produce high quality education research. However, the research outputs are often overlooked, dispersed, and difficult to access. This report presents the main findings from a mapping exercise of foundational literacy and numeracy (FLN) studies conducted by Tanzania-based researchers during the period 2010 to 2023. The findings revealed that a total of 206 relevant research outputs were identified during this period. FLN research in Tanzania has attracted increasing interest since 2010, with the highest number of outputs recorded in 2018 and 2022, at 23 and 30 research outputs respectively.

Research types covered by the mapping include journal articles (research papers mostly published in local, regional and international non-indexed academic journals), working papers, PhD theses, books (chapters), and evaluation reports. Journal articles were the most common form of research output, indicating a preference for conventional academic channels to share FLN research findings.

Less than 30 percent of identified studies provided information about funding, with 82 percent of that funding coming from international organisations. Most funding was allocated to evaluation reports (29 percent) and books (26 percent), with slightly less funding allocated to journal articles (24 percent) and PhD theses (21 percent). Literacy stood out as the most researched thematic area, receiving twice the attention compared to numeracy. Most FLN studies did not address social inequalities, with disability and poverty issues less researched than gender. Ethnicity and religion were significantly underrepresented, with only 2 percent and 1 percent of studies respectively addressing these aspects of inequality. The findings also uncovered that women were underrepresented in FLN research, with men contributing twice as much as women when all authors were considered. Lastly, most of the FLN studies were the result of collaborative efforts, despite limited collaboration with researchers in sub-Saharan Africa.

Based on these findings, the following recommendations are targeted towards all education decision makers:

- Strengthen the accessibility and visibility of FLN research.
- Promote collaboration between researchers in sub-Saharan Africa.

- Advance gender parity in FLN research.
- Increase funding for FLN research.
- Promote research about issues of inequality through targeted funding initiatives.

1. Introduction

The term foundational literacy and numeracy (FLN) refers to literacy and numeracy, and the socio-emotional skills that should be acquired during the early years of primary school (Bill & Melinda Gates Foundation, 2020; Evans & Hares, 2021). In this regard, achieving competency in reading, writing and mathematics is a significant milestone in each child's life. This is particularly important in Africa, where many regions face a learning crisis. According to UNESCO (2022), only one-fifth of students have achieved minimum proficiency in reading and mathematics in sub-Saharan Africa, indicating that many children lack basic literacy and numeracy skills.

To address the low learning outcomes, it is crucial to focus on education research that is both contextually relevant and locally driven. Researchers from sub-Saharan Africa offer a comparative advantage in terms of local knowledge, which is essential for developing policies (McLean & Sen 2019). However, the extent to which their research informs the formulation of local education policies is poorly documented. Furthermore, there is little known about the FLN research generated by sub-Saharan Africa-based researchers.

Even though researchers from sub-Saharan Africa aim to produce high quality education research (ESSA and Southern Hemisphere, 2024), their research outputs are often disregarded and difficult to access. Many of the research outputs are publications found in local and regional journals, while some are categorised as grey literature, which is often not available online (Edwards, 2023).

This report draws on a growing body of evidence that underlines the importance of locally led education research in informing policies to improve learning outcomes in sub-Saharan Africa (Asare et al., 2021; Williams, 2023; Samson et al., 2023). We have contributed to this growing body by mapping FLN studies conducted by

Tanzania-based researchers. The purpose of the mapping exercise was to provide a comprehensive overview of the FLN research developed in Tanzania, to identify the researchers and their research outputs, as well as key themes, trends, and gaps.

2.   Policy context in Tanzania

Several policy reforms have been implemented in Tanzania to enhance the accessibility and quality of education. In 2013, the government launched the Big Results Now in Education (BRNEd) initiative with the aim of improving numeracy and literacy skills in the early grades, focusing on 'Reading, wRiting, and aRithmetic' (3Rs). In 2015, the BRNEd curriculum reform implemented a shift in instructional time for Standard 1 and Standard 2. This change prioritised the 3Rs over other subjects, and Kiswahili became the main language for literacy instruction, replacing English. English is not introduced to pupils until they reach Standard 3, and in line with the country's language of instruction policy, it becomes the medium of instruction in secondary school.

In addition to the emphasis on the 3Rs in Standard 3 to 7, the curriculum reform also developed students' lifelong learning skills through a range of subjects. These included social studies, vocational skills, Kiswahili, mathematics, science and technology, civic and moral education, English, and optional languages such as French and Arabic (UNICEF, 2024; Rodriguez-Segura and Mbiti 2022). According to Rodriguez-Segura and Mbiti (2022), the implementation of the BRNEd curriculum reform resulted in a more than twofold increase in the likelihood of students achieving mathematics proficiency in Standard 2. Furthermore, the chances of students attaining Kiswahili proficiency also saw a significant improvement with a 71 percent increase.

Despite some improvements, the reading progress of Standard 2 pupils has remained modest. In 2021, the average number of words read correctly per minute was 27 (compared to 24 words per minute in 2015), which is still significantly below the desired benchmark of 45 words per minute[i] (United Republic of Tanzania, MoEST & National Examinations Council, 2022). The World Bank Capital Index for Tanzania also revealed that Tanzanian students achieved a score of 388 on a harmonised test

scale. This score was far below the advanced attainment level of 625 set by the Trends in International Mathematics and Science Study (UNESCO, 2024). These poor learning outcomes increased the likelihood of dropping out of school. Despite primary education being compulsory in Tanzania, the primary school completion rate was at 72 percent in 2020 for girls and 66 percent for boys (UNESCO, 2024).

3. Methodology

This section describes the protocol used for mapping FLN studies conducted by researchers in Tanzania. We used the definition provided by the Bill & Melinda Gates Foundation, which defines FLN as literacy and numeracy skills among primary school aged children.

Our mapping builds upon the search protocol developed by Binesse, Rose and Silva (2023), which comprehensively presents the search criteria for mapping and evaluating literature related to FLN in sub-Saharan Africa. Following the protocol developed by Williams, Iddrisu and Rose (2023), the mapping process also sought to identify research outputs that were not captured in international databases during the period 2010 to 2023. Various types of research outputs were considered, including journal articles (research papers mostly published in local/national, regional and international non-indexed academic journals), PhD theses, books (chapters), as well as evaluation and intervention reports. Research outputs were searched for in academic journals, institutional repositories, and websites of international organisations and charities implementing FLN interventions. Thorough searches were also conducted on Google Scholar to ensure comprehensive coverage of relevant research outputs (Gusenbauer, 2019).

Several search strings with FLN-related keywords were tested, as detailed in Binesse, Rose and Silva (2023). After an in-depth search, the following search string in its various lengths provided the most relevant results for identifying FLN research outputs:

> ("foundation* skills" OR "basic skills" OR "literacy" OR "reading" OR "writing" OR "vocabulary" OR "speech" OR "alphab*" OR "numeracy" OR "math*" OR "arithmetic" OR "calculation" OR "proficiency level*" OR "learning achievement"

OR "learning outcome*" OR "learning level*" OR "learning gain*" OR "learning loss*" OR "cognitive skills") AND ("basic education" OR "early grade" OR "elementary school*" OR "primary school*" OR "primary education" OR "second chance" OR "second-chance" OR "alternative education" OR "complementary basic education" OR "complementary education" OR "accelerated learning" OR "non-formal education" OR "primary-age*" OR "community-based education" OR "community education" OR "learning centres") AND "Tanzania".

Following the search, specific selection criteria were used to determine the suitability of research outputs for inclusion. These included the following:

- Research conducted/(co)-authored by at least one Tanzania-based researcher.
- Focusing on literacy or numeracy skills of primary school aged children.
- Published from 2010 to 2023.

After searching and identifying relevant FLN research outputs, we downloaded and compiled them in an excel spreadsheet. The spreadsheet included essential columns for reporting key metadata related to the research outputs (title, abstract, year), researchers (institutions, contact details, gender), information on inequality factors (ethnicity, disability, gender, poverty, religion, and location), related keywords (literacy, reading, writing, speaking skills), funding information (funders, funding types), collaboration, and other pertinent details. Appendix 1 illustrates the spreadsheet template for mapping the FLN research outputs.

We used descriptive analysis with graphic illustrations to visually represent the data patterns and trends. To ensure a thorough analysis, several indicators were used, offering a comprehensive understanding of FLN research in Tanzania. These included among others:

- *Relevance*: research outputs were categorised based on their relevance to student learning outcomes and engagement in literacy/numeracy activities.
- *Accessibility*: this examined whether the research output was open access or not. A research output was defined as open access when there were no legal or financial barriers to accessing it.

- *Funding information*: studies were categorised as to whether they disclosed their funding details or not.
- *Funding type*: this identified the sources of research funding, such as internal institutions, government bodies, external philanthropy, self-funding, local organisations, and international organisations.
- *Top funders*: funding organisations were ranked based on how frequently they were mentioned in the research outputs.
- *Research methods*: the methods used in the studies were classified into qualitative, quantitative, mixed-method, review, and action research.
- *Thematic classification*: thematic areas were developed based on keywords assigned to the studies identified as detailed in Appendix 2. Their relative importance was given by the frequency of the corresponding keywords.
- *Inequality factors*: this involved identifying FLN studies that explicitly addressed or reported data on gender, ethnicity, religion, poverty, and disability.
- *Authors' gender:* information about the gender of the researchers was inferred from the names and available biographical data in each study's author list.
- *Collaboration*: the geographical location of an author's institutional affiliation was used to analyse collaboration patterns.
- *Top research institutions*: research institutions were ranked by analysing the frequency of studies attributed to each, based on authors' affiliation data.

4. Findings

This section focuses on the trends of FLN research outputs in Tanzania over the period 2010–2023. It also highlights the types of these research outputs, their relevance and accessibility, as well as the funding landscape, including the types of research funded and the top funders of FLN research. Additionally, it examines the thematic areas and design of the FLN research, investigating existing evidence gaps, poverty and inequality factors, as well as different research settings and methodologies. Furthermore, it analyses the gender distribution and collaboration patterns of FLN research, as well as highlights the top FLN research institutions.

FLN research outputs, types and trends (2010-2023)

The number of FLN research outputs in Tanzania has fluctuated over the years, with a total of 206 research outputs identified during the period 2010-2023. From 2010 to 2013, there was a decline in the number of FLN studies identified, followed by a slight increase from 2014 to 2016. However, from 2017 onwards, there was a significant upward trend in the number of FLN studies, reaching its peak in 2022 with 30 studies. It is worth noting that in 2023, the number of FLN studies decreased slightly to 19 (Figure 1). Overall, the data suggests that there has been a growing interest in FLN research in Tanzania, particularly in recent years.

In contrast to previous years, the decline in research outputs in 2023 was due to a halt in the mapping process in the middle of the year to give room for analysis and reporting (based on timelines for the completion of the project).

Figure 1: Number of FLN research outputs identified (2010-2023)
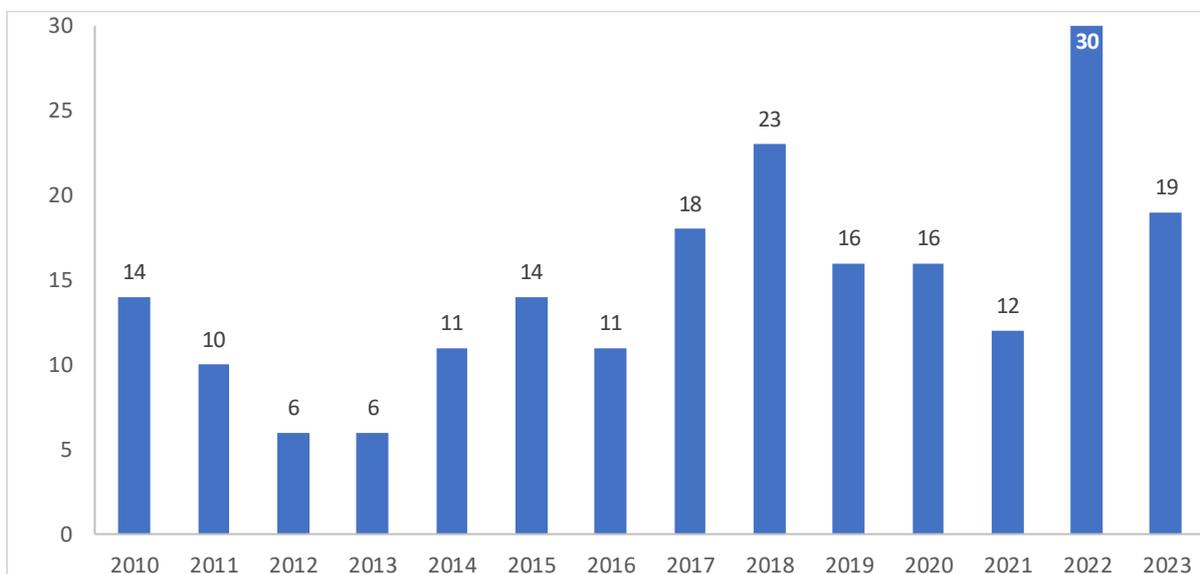
Note: Base = Total research outputs identified, 206

Figure 2: Types of research outputs

Legend:
- PhD theses
- Journal articles
- Reports
- Books (Chapters)
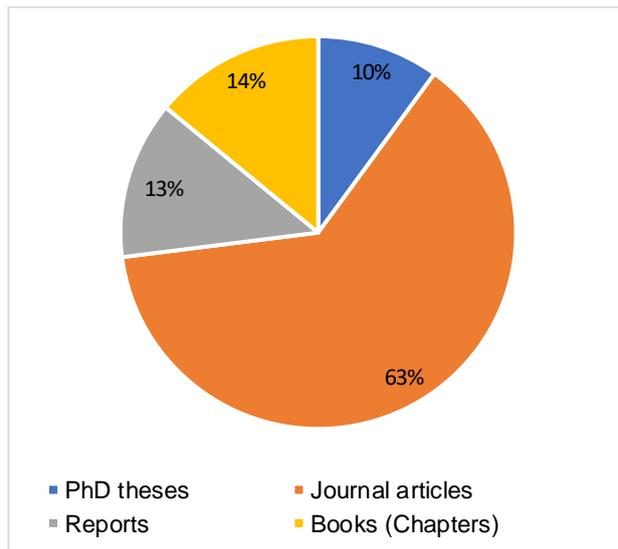
Note: Base = Total studies identified, 206.

FLN researchers disseminate their research outputs through various channels to ensure widespread accessibility and impact. Figure 2 shows the distribution of output types identified in Tanzania. The majority (131) of FLN studies were published as journal articles[ii], accounting for 63 percent of the total, followed by books, 29 (14 percent), reports, 26 (13 percent), and PhD theses, 20 (10 percent). The prevalence of journal articles among research outputs in the FLN field highlights the researchers' perceived importance of scholarly publications in advancing knowledge and understanding in this area, and potentially for advancing their own academic careers.

Relevance and accessibility of FLN research

Figure 3: Relevance of FLN research

Legend:
- Directly relevant
- Indirectly relevant
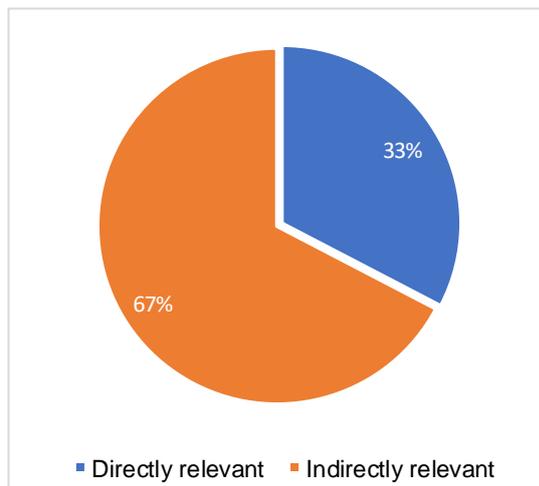
Note: Base = Total studies identified, 206.

Following the approach used by Binesse, Rose and Silva (2023), the identified research outputs were classified into two groups based on their relevance to literacy or numeracy skills. Studies that investigated teacher training, student attendance, or language of instruction, but did not specifically address student learning outcomes or children's engagement in literacy/numeracy activities, were considered indirectly relevant compared to studies that directly addressed these areas. Figure 3 illustrates the relevance of the identified research outputs. The data showed that one-third of the research outputs were directly relevant to the FLN field. Conversely, two-thirds of the identified research outputs

were indirectly relevant, suggesting that there is a broader scope of research that still offers a contribution to the overall understanding of FLN in Tanzania.

Figure 4: Access to FLN research
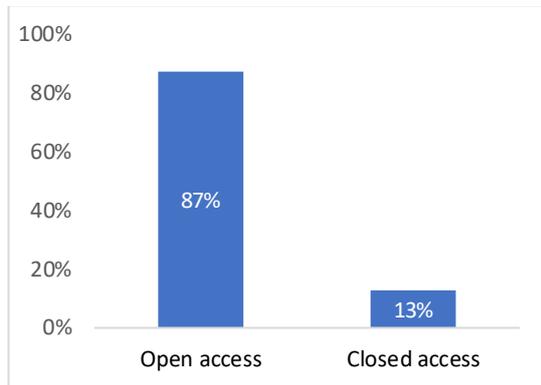
Note: Base = Total studies identified, 206.

As highlighted above, Tanzania-based researchers have made significant contributions to the FLN field in recent years. The data presented in Figure 4 illustrates that a large proportion (87 percent, corresponding to 179 studies) of FLN research outputs, including journal articles, PhD theses, reports, and books, were openly accessible, whereas only a small percentage (13 percent, corresponding to 26 studies) were classified as closed access. This indicates that most FLN studies conducted by Tanzania-based researchers are freely accessible to the public, fostering greater knowledge and wider dissemination.

A closer assessment of the type of outputs that were not accessible revealed that books and journal articles represented the majority, accounting for 34 percent and 54 percent respectively (Table 1).

Table 1: Typology of closed research outputs

Books (chapters)	Journal articles	PhD theses	Reports
9 (34 percent)	14 (54 percent)	2 (8 percent)	1 (4 percent)

Funding of FLN research

Funding education research in sub-Saharan Africa is crucial for developing evidence-based strategies to improve learning outcomes. However, researchers in this region often lacked funding, which hindered their ability to conduct impactful studies and find innovative solutions to educational challenges. In this section, we provide information about the funding aspect of FLN research in Tanzania, including the types of research outputs that were confirmed as funded, the sources of funding, and the top funders.

Figure 5: Funding of FLN research
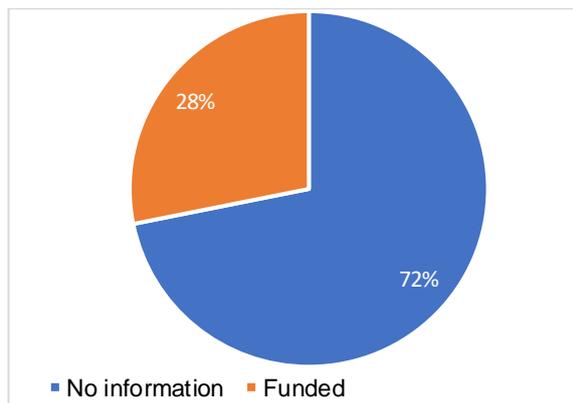
Note: Base = Total studies identified, 206.

Figure 5 shows the funding breakdown for identified FLN studies, distinguishing between studies that received funding and those that did not (i.e., those for which no funding information was provided by the authors). Among the 206 FLN studies, less than 30 percent were funded, while the remaining 72 percent were not (i.e., may or may not have been funded, but the information was not available). If these 72 percent of research outputs, or a significant proportion of them lacked funding, it could have significant implications. This is because without sufficient financial support, researchers may face difficulties in obtaining essential resources to develop comprehensive research outputs, which could ultimately impact on the development of effective educational interventions and policies.

Types of FLN research outputs funded

Figure 6 illustrates the types of FLN research funded in Tanzania. The data shows that most funding went towards reports (29 percent) and books (26 percent). PhD theses (21 percent) and journal articles (24 percent) received slightly less funding. The funding distribution suggests that there is a greater emphasis on producing reports and books, which may limit the dissemination of research findings and the exchange of knowledge within the academic community. This could potentially hinder the advancement of FLN research in Tanzania, as the funding allocation de-prioritised journal articles and PhD theses, which are crucial for contributing to the existing body of knowledge and

Figure 6: Types of FLN research funded
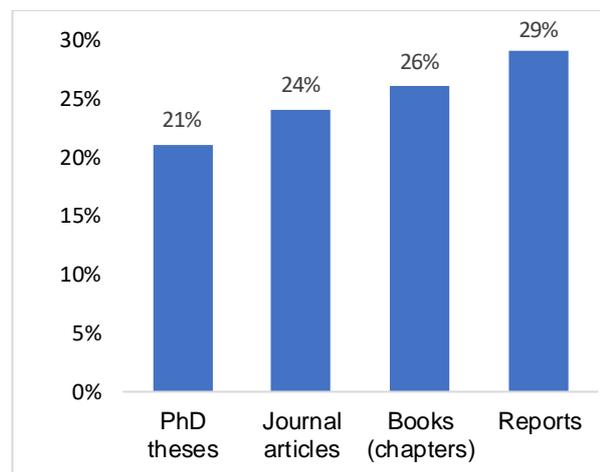
Note: Base = funded research outputs, 58.

facilitating further research and collaboration. The 29 percent funding allocation for reports, however, could be beneficial, as they were more accessible to policymakers and could potentially influence decision-making and policy implementation. This accessibility can also help bridge the gap between research and practical application, ensuring that findings are used to address real-world challenges.

Sources of funding for FLN research

Figure 7: Sources of funding for FLN research
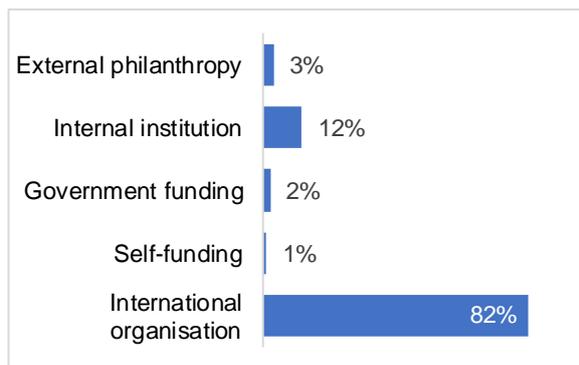
Note: Base = Funding sources counted, 92.

Figure 7 presents a breakdown of FLN funding sources in Tanzania. It shows that funding for FLN research was primarily provided by international organisations, such as multilateral organisations and international development agencies and accounted for 82 percent of the total funding. This indicates the heavy reliance of Tanzanian FLN researchers on external sources for financial support.

Conversely, contributions from government funding (2 percent), self-funding (1 percent), and the researchers' own/internal institutions (12 percent) made up a much smaller percentage of the funding. This indicates a need for greater domestic investment in FLN research initiatives.

An analysis of the top FLN research funders in Tanzania is provided in Figure 8. The Åbo Akademi Foundation (Finland) ranked as the top funder with six FLN studies supported over the period considered, followed by the Swedish Council for Research with five FLN studies supported. The United States Agency for International Development (USAID) and The Open University of Tanzania funded four FLN studies each. Additional funders included the World Bank, William and Flora Hewlett Foundation, Bill & Melinda Gates Foundation, and Research Council of Norway. This distribution highlights the significant support from international organisations and foundations in advancing FLN research in Tanzania. Notably, local institutions also made substantial contributions, with the Open University of Tanzania ranking among the top three FLN funders. Although the Ministry of Education, Science, and

Technology (MoEST) supported fewer studies, their involvement still plays a crucial role in the FLN research landscape.

Figure 8: Top funders identified
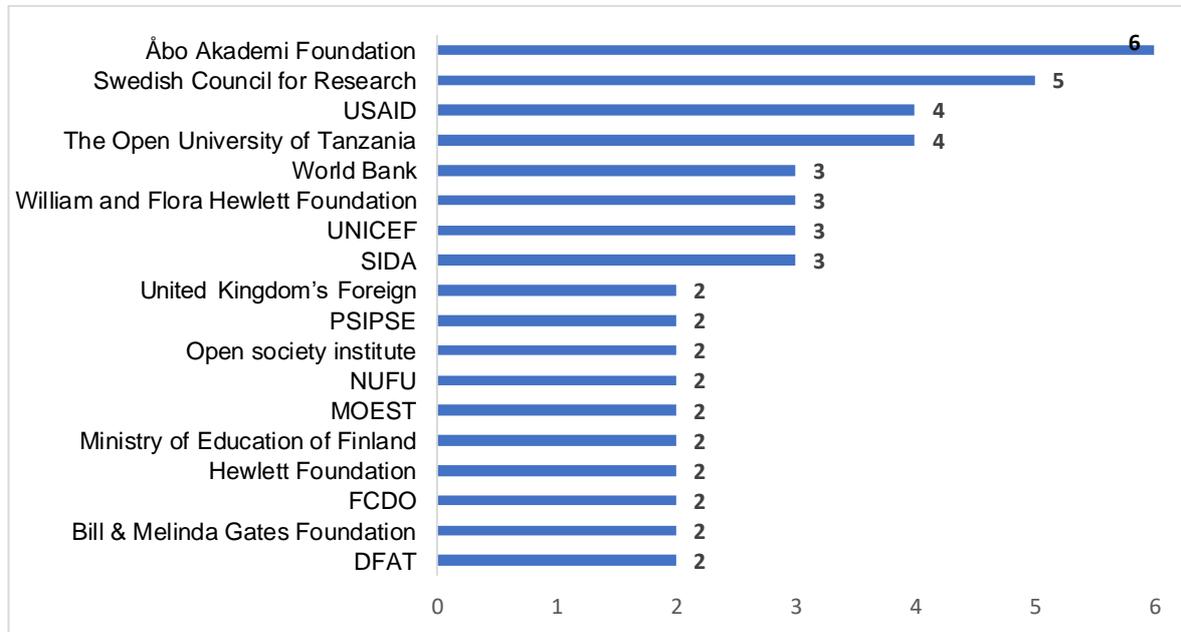
Note: Note: Base = funded research outputs, 58. Some of these research outputs received funding from more than one source / funder.

Research focus

Figure 9 shows the relative importance of each of the 11 thematic areas covered in our analysis. Literacy (87 keywords counted) emerged as the most researched thematic area based on the frequency of keywords counted. This was followed by language, equitable and inclusive education, learning and assessment, teachers and teaching, numeracy, curriculum, education access, social environment, facilities and institutional leadership, policy and financing and lastly Information and Communication Technology (ICT) with only 6 keywords counted.

Although literacy and language received significant attention, numeracy was comparatively overlooked. More specifically, we found that literacy (87 keywords counted) and language (81 keywords counted) each received approximately twice as much focus as numeracy (43 keywords counted). This research gap highlights the lack of attention given to numeracy compared to literacy and language, emphasising the need for more research and funding for numeracy to ensure a holistic and inclusive learning experience.

Figure 9: Thematic areas covered by FLN research

Literacy, 87
Language, 81
Equitable and inclusive education, 60
Learning and assessment, 53
Teachers and teaching, 49
Numeracy, 43
Curriculum, 25
Education access, 15
Social environme... facilities and institutional leadership, 14
Policy and financing, 11
ICT, 6
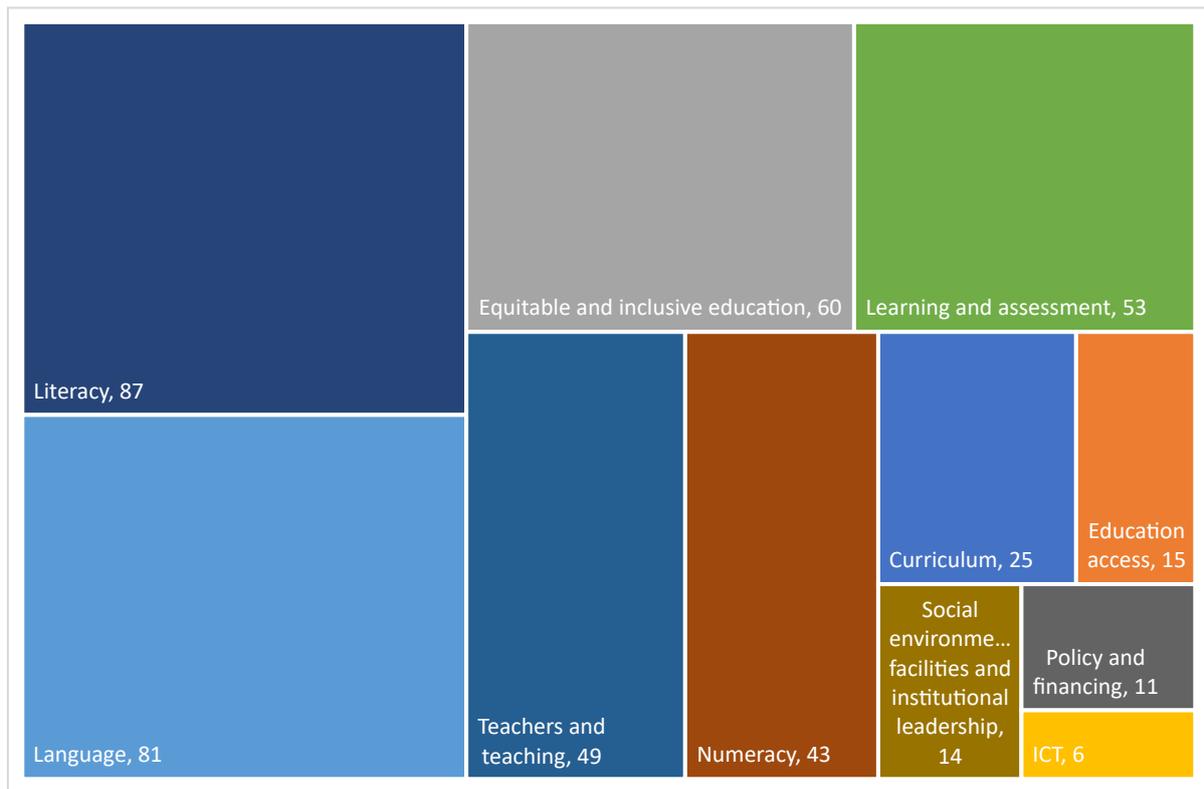
Note: Base = Total studies identified, 206. Studies fit under multiple thematic areas.

Inequality indicators in FLN research

Understanding and addressing social inequalities (such as gender, disability, poverty, ethnicity, religion and related issues) is crucial to ensure the provision of quality education for all.

Therefore, we examined the extent to which FLN researchers based in Tanzania had incorporated such factors into their research. This enabled us to shed light on what was working well, the gaps, and the potential areas for improvement in addressing these critical topics. As shown in Figure 10, the majority of FLN studies conducted by Tanzania-based researchers did not adequately

Figure 10: Inequality factors included in FLN research (percent)

Factor	Percent
Religion	1%
Ethnicity	2%
Poverty	7%
Disability	8%
Gender	12%
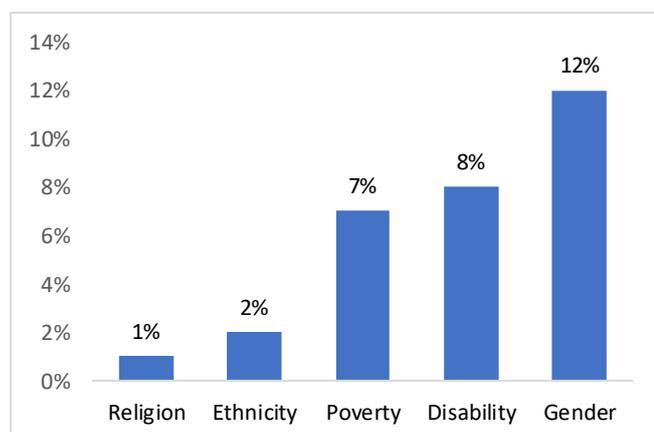
Note: Base = Total studies identified, 2O6.

address issues related to gender, disability, poverty, ethnicity, and religion, highlighting a significant gap in their research. Gender was the most researched issue, with 12 percent of FLN studies taking it into account. Disability (8 percent) and poverty (7 percent) followed, while ethnicity and religion were significantly underrepresented, with only 2 percent and 1 percent of studies respectively addressing these aspects of inequality. This lack of attention to some of these important societal issues highlights the need for FLN researchers to prioritise a more inclusive and diverse approach in their investigations. This would be of course limited to the available funding for such research.

Research location

The location of the research is important when interpreting results, as urban or rural areas may present different circumstances that could affect education opportunities, with rural areas often facing greater deprivation.

Figure 11 provides a breakdown of the research locations in FLN studies in Tanzania. We observed interesting patterns in the data, with 17 percent of the studies covering rural areas, 60 percent focusing on urban areas, and 23 percent examining both urban and rural areas.

Figure 11: Location of FLN research
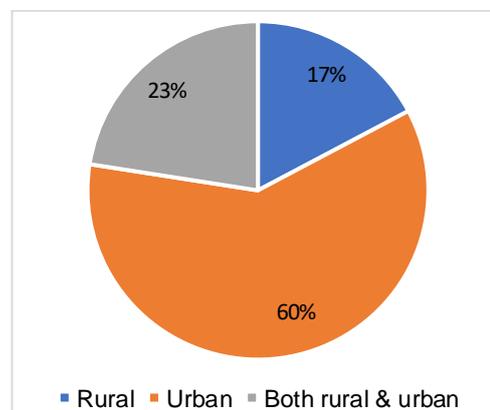
Note: Base = Total studies mentioning research settings, 151.

This analysis highlights the predominance of urban-focused research in the FLN field in Tanzania, indicating a potential gap in understanding and addressing the unique challenges and dynamics of rural communities.

FLN research methods

As shown in Figure 12, the identified FLN studies were conducted using a range of research methods, which can be categorised into five groups: quantitative, qualitative, mixed, review, and action research.

We found 33 percent of FLN studies conducted by Tanzania-based researchers relied on qualitative methods, highlighting the significance

Figure 12: Synopsis of FLN research methods

Note: Base = Total studies identified, 198.

of in-depth exploration. Following closely behind were mixed-method approaches and quantitative methods, accounting for 30 percent and 24 percent of the FLN studies, respectively. Desk review and action research methods were less frequently used, comprising 12 percent and 1 percent of FLN studies respectively. The 1 percent of FLN studies using action research methods was surprisingly low, given the potential benefits of this approach. Action research involves a hands-on methodology that not only identifies problems but also implements and evaluates solutions in real-time, making it a powerful method for immediate impact.

Gender of FLN researchers

The gender composition of FLN researchers was also considered in our analysis, as it provides valuable insight into the extent to which women are represented and involved in this specific field. Considering the gender of the first authors of the research outputs identified, we found that FLN research was dominated by men, as the data showed a 68:32 male:female ratio (Figure 13-A).

Figure 13: Gender distribution in FLN research

A. First author's gender

32%

68%

■ Male ■ Female

B. All authors' gender

30%

70%

■ Male ■ Female
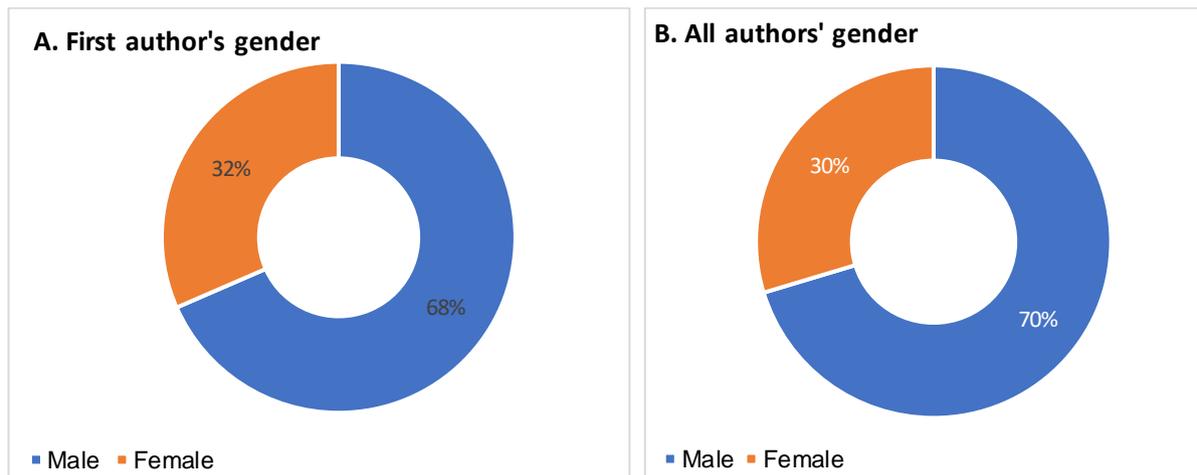
Note: Base = Total researchers identified, 337.

As focusing only on the first authors can mislead the gender distribution, we also considered all the authors (see Figure 13-B). In doing so, the analysis revealed a significant gender imbalance where male FLN researchers were over-represented in the field (male:female ratio of 70:30 percent), highlighting the need for greater gender diversity and inclusion for authorship within the field.

Overall, the gender distribution data shows a persistent and significant under-representation of women in FLN research.

Collaboration in FLN research

Research collaboration plays a crucial role in advancing knowledge and driving innovation. By bringing together diverse perspectives, expertise, and resources, collaboration usually allows researchers to tackle complex problems, share insights, and make significant breakthroughs that may not be possible through individual efforts alone. Figure 14 illustrates the extent of collaboration among FLN researchers in Tanzania.

Figure 14: Research collaboration

26%

74%

■ Collaboration ■ No collaboration
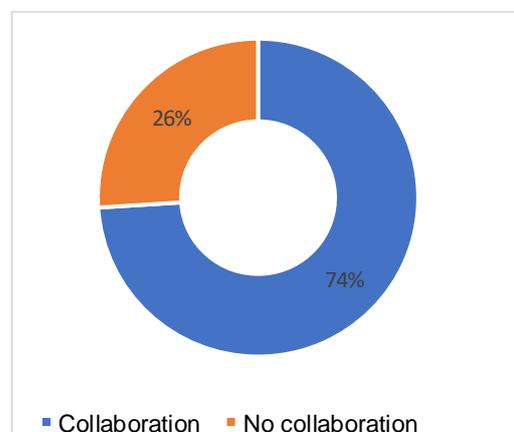
Note: Base = 186 publications identified, excluding PhD theses.

The data shows a high level of collaboration, with most of the identified studies (74 percent) resulting from collaborative efforts. In contrast, only 26 percent of the

studies were conducted individually. This underscores the presence of a robust collaborative culture within the FLN research community in Tanzania.

In Figure 15, research collaboration is divided into three main categories: collaboration within Tanzania, collaboration within sub-Saharan Africa, and collaboration outside the region. The data revealed that the majority of FLN studies (66 percent) prioritised local collaboration, while 25 percent of collaborative efforts occurred outside of SSA. However, there was less collaboration within SSA, with only 9 percent of the

Figure 15: Collaborative research by geographical area
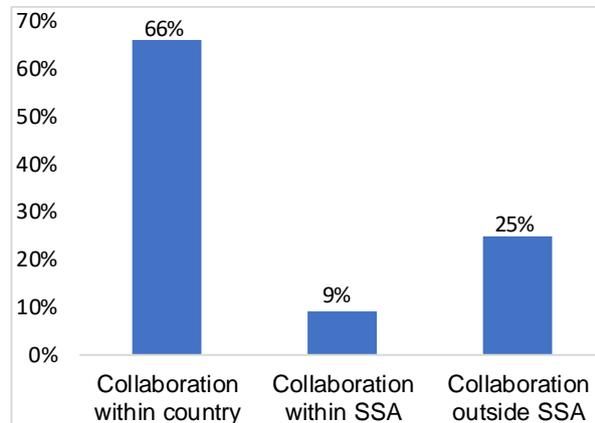
Note: Base = Total studies involving collaboration, 138

identified FLN studies involving researchers from the region. The limited collaboration within SSA may be attributed to factors such as language barriers, inadequate financial support and resources, as well as a lack of well-established networks and partnerships among researchers in the region.

Top FLN research institutions

Tanzania is home to several institutions that focus on FLN research. These institutions play a crucial role in advancing our understanding of effective FLN strategies and interventions, and their research findings have the potential to greatly impact educational policies that improve learning outcomes for children across the country. Figure 16 illustrates the top FLN research institutions that have made significant contributions in the field.

Figure 16: Top research institutions focusing on FLN

Institution	FLN studies
University of Dar es Salaam	90
University of Dodoma	73
The Open University of Tanzania	15
Mkwawa University	12
Mwenge Catholic University	11
Sebastian Kolowa Memorial University	10
Jordan University College	10
St. Augustine University of Tanzania	10
College of Business Education	10
University of Arusha	9
Aga Khan University	7
Sokoine University of Agriculture	5
Mzumbe University	5
Institute of Accountancy Arusha	4
Ruaha University College	3
Muslim University of Morogoro	3
Kenyatta University	3
Institute of Adult Education	3
Department of Informatics Institute of Accountancy…	3
Dar es Salaam University College of Education	3
UNICEF Tanzania	2
Tanzania Institute of Education	2
Tanzania Institute of Accountancy	2
Mpwapwa college	2
Ministry of Education Science and Technology	2
Zizi Afrique Foundation	1

Note: Base = Total studies identified, 206

In terms of research outputs, the five institutions with the most FLN studies were ranked in descending order as follows: University of Dar es Salaam (90 FLN studies), University of Dodoma (73), the Open University of Tanzania (15), Mkwawa University (12), and Mwenge Catholic University (11 FLN studies). It is worth noting that together, the University of Dar es Salaam and University of Dodoma accounted for almost 80 percent of the overall research outputs, making them the leading contributors in the FLN field. This suggests that their research findings have the potential to influence educational policies in Tanzania and beyond. Although several other institutions had a low number of FLN studies, ranging from as few as ten to one FLN studies, they also made positive contributions to the FLN research in Tanzania and should be encouraged and supported to do more.

5.   Challenges and limitations

The process of identifying locally published or unpublished FLN research was time-consuming and laborious. It required going through many documents to find those that met the specific criteria. Furthermore, the lack of systematic search support in most databases meant that information from an identified study had to be manually transferred to our Excel spreadsheet, adding to the complexity of the task.

A major challenge for the Tanzania study was the lack of research specifically dedicated to foundational literacy and numeracy. Accessing locally published and unpublished research on this topic online was also difficult. Many of the research outputs were dispersed and not available online, making it challenging to obtain a holistic and effective understanding of the existing research. Additionally, the absence of a centralised database for education research in Tanzania further hindered the identification and mapping of relevant studies.

Only the funding sources disclosed by the researchers could be considered within the mapping process. This presented a limitation in the data and analysis, as no funding information is not a proxy for non-funded research. Numerous databases and publishing platforms lacked data focusing on authors' gender, which hindered the gathering of precise statistics. Moreover, names may be ambiguous or culturally unfamiliar, adding complexity to identifying gender.

6.   Conclusion and recommendations

The mapping exercise allowed us to identify 206 FLN studies conducted by Tanzania-based researchers during the period 2010 to 2023, based on our selection criteria. This demonstrated a steady increase over the period and drew attention to the extensive body of FLN research that was potentially unnoticed in local and international forums.

Most of the research outputs were journal articles indicating a preference for conventional academic channels to share FLN research findings. Less than 30 percent of identified studies provided information about funding, with 82 percent of that funding coming from international organisations.

Literacy stood out as the most researched thematic area, receiving twice the attention compared to numeracy. Most FLN studies did not address social inequalities, with gender the most prominent inequality appearing in the research outputs. Disability and poverty issues less researched than gender, but ethnicity (2 percent) and religion (1 percent) were significantly underrepresented. When all authors were considered, the findings also uncovered that women were underrepresented in FLN research, with men contributing twice as much as women. Lastly, most of the FLN studies were the result of collaborative efforts, despite limited collaboration with researchers in sub-Saharan Africa.

Recommendations

The following recommendations (in no particular order) stem from the analysis presented above and are targeted towards all education decision makers.

- **Strengthen the accessibility and visibility of FLN research.** One strategy to increase the accessibility and visibility of FLN research in Tanzania is to establish an online platform to centralise FLN research findings. This platform could enable policymakers, educators, and other stakeholders to access up to date research and evidence-based practices in the FLN field. Additionally, organising regular conferences, workshops, and webinars/seminars focused on FLN research could create a platform for researchers and policymakers to exchange knowledge and ideas, further promoting the visibility of FLN research. Encouraging researchers to create and regularly update their profiles and research interests on this platform could further enhance collaboration and networking opportunities. This would allow stakeholders to easily identify and connect with experts in specific areas of FLN research.

- **Promote collaboration between researchers in sub-Saharan Africa.** Some strategies for fostering further collaboration in Tanzania as well as with FLN researchers across sub-Saharan Africa could include establishing local/national and regional research networks, as well as organising regular conferences and workshops to create opportunities for networking. Furthermore, providing funding opportunities for joint/collaborative FLN research projects, and creating platforms for knowledge sharing and

exchange among researchers could strengthen research collaboration across the region.

- **Advance gender parity in FLN research.** To increase female participation/general authorship in FLN research in Tanzania, it is important to provide mentorship and support for women pursuing careers in this field. Additionally, creating inclusive and diverse research teams can help foster an environment where women feel empowered to contribute their expertise. Finally, promoting gender-sensitive research topics, such as the role of female educators in language acquisition, can also attract more female researchers to FLN research.

- **Increase funding for FLN research.** Actively advocating for government investment to generate policy-relevant FLN research and evidence for Tanzania could play a significant role in unlocking additional funding opportunities. Additionally, to secure increased funding for FLN research in Tanzania, it is crucial to establish/strengthen equitable and mutually beneficial partnerships and collaborations with international organisations and research institutions dedicated to supporting research in this field. Researchers also need to disclose their funding sources in their research outputs, including personal funding. Such transparency would highlight who is financing specific studies, which can reveal potential biases and funding disparities. This could enable decision-makers, including policy makers and funders, to make evidence-based choices and promote a fairer allocation of resources for FLN research in Tanzania.

- **Promote research about issues of inequality through targeted funding initiatives.** The findings highlight a narrow focus on research in rural settings and poverty-related topics, as well as ethnicity and religion. To bridge this gap, funding organisations could direct more resources toward research focusing on inequality issues, for example by providing specialised grant initiatives.

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Appendices

Appendix 1: List of platforms/institutions where searches were conducted

1. African Minds — https://www.africanminds.co.za/
2. BRILL — https://brill.com/
3. UWEZO — https://uwezotanzania.or.tz/
4. CORE — https://core.ac.uk/
5. SSRN — https://papers.ssrn.com/sol3/DisplayAbstractSearch.cfm
6. AJOL — https://www.ajol.info/
7. Google — www.google.com
8. Google Scholar — https://scholar.google.com/
9. The Open University of Tanzania Institutional Repository — http://repository.out.ac.tz/
10. U.S. Agency for International Development (USAID) — https://pdf.usaid.gov/
11. University of Dar es Salaam Journals — https://journals.udsm.ac.tz/
12. ERIC institute of education sciences — https://eric.ed.gov/?
13. University of Dar es Salaam Research Repository — https://repository.udsm.ac.tz/home
14. The University of Dodoma Institutional Repository (UDOMIR) — https://repository.udom.ac.tz/home
15. PROJECT ZAWADI — https://projectzawadi.org/
16. ResearchGate — https://www.researchgate.net/
17. IIEP Learning Portal — https://learningportal.iiep.unesco.org/fr/bibliotheque
18. EDUCATIONLINKS — https://www.edu-links.org/
19. Sokoine University of Agriculture Institutional Repository (SUA IR) — https://www.suaire.sua.ac.tz/
20. HAKIELIMU — https://hakielimu.or.tz/
21. COSTECH Integrated Repository — http://repository.costech.or.tz/
22. DSpace Repository DSpace — http://repository.iaa.ac.tz:8080/xmlui/
23. RISE Programme — https://riseprogramme.org/

Appendix 2: Keywords and corresponding thematic areas

Thematic areas	Keywords
Literacy	Literacy; Reading; Writing; Speaking skills.
Numeracy	Numeracy; Maths, Mathematics.
Learning and assessment	Assessment; Intervention evaluation; Household factors associated with student learning; Standards of attainment; Student motivation; Learning outcomes.
Curriculum	Textbooks; Curriculum reform; Curriculum relevance; Socio-emotional skills; Health education; Science education; Peace education; Value education; Environmental education; Mathematics Education.
Teachers and teaching	Peer learning; Teacher-student relations; Teacher education; Teacher capacity; Teacher motivation; Teacher deployment; Indigenous pedagogies; Problem-based learning; Time for learning; Class size; Teacher supervision; Teaching methods.
Social environment, facilities and institutional leadership	Community participation; Local knowledge and practices; Library; Violence; Wellbeing; Home-school relations; Parental engagement; Nutrition; Infrastructure; Student voice; Leadership and management.
Education access	Drop-out; Progression, repetition; Enrolment; Access to education; Distance education; Alternative provision; Out-of-school children; Completion; Emergency education provision; Student attendance; Widening participation.
Language	Language of instruction; African languages; French language; English language; Portuguese language.
Equitable and inclusive education	Special education; Child labour; Psychosocial support; Regional disparities in access and learning; Mental health; Emotional and behavioural difficulties; Low attaining students; Remedial education; Early pregnancy/marriage; Disability; Gender; Ethnicity; Poverty; Religion.
ICT	Learning using mobile phones; ICT in education; E-learning
Policy and financing	Education policy; Government spending; Household spending; Private schools; Public private partnership; Cost-effectiveness; Expansion of provision; National development; Regional disparities in resourcing; Donors and NGOs; Benefits of education; Student financial support; School feeding.
Other	Covid-19; Intervention evaluation.

Endnotes

[i] As a prerequisite for reading with comprehension, independent studies conducted in various countries have found that children in Grade 2 should achieve a fluency rate of approximately 45 - 60 correctly read words per minute (see Abadzi, 2011).

[ii] We used journal articles to refer to research papers mostly published in local, regional and international non-indexed academic journals.

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