

A young girl in primary school, Senegal
GPE/ Carine Durand



Mapping foundational literacy and numeracy research in Sub-Saharan Africa

Senegal country report

Authors

The writing of this report was led by Thierno Malick Diallo who collected all the data, analysed the qualitative data, and wrote the first draft of the report. Laté 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

ACAREF	Académie Africaine de Recherches et d'Etudes Francophones
AERD	African Education Research Database
ARED	Associates in Research and Education for Development
CESA	Continental Education Strategy for Africa
CE2	Cours élémentaire deuxième année
CI	Cours d'Initiation
CM2	Cours moyen deuxième année
CRES	Consortium pour la Recherche Economique et Sociale
DIP	Pedagogical Registration Rights
ESSA	Education Sub Saharan Africa
FDA	French Development Agency
FLN	Foundational Literacy and Numeracy
FUA	Francophone University Agency
GTE	Groupes Thématiques d'expertise
HAL	Hyper-Articles en Ligne
ICT	Information and Communication Technology
IDRC	International Development Research Centre
MOHEBS	Harmonised Model of Bilingual Education
NGOs	Non-Governmental Organisations
OPA	Observatory of African Plurilingualism
PAQUET	Programme d'Amélioration de la Qualité, de l'Équité et de la Transparence du secteur de l'Éducation et de la Formation
PASEC	Programme for the Analysis of Education Systems
REAL	Research for Equitable Access and Learning
SMCs	School Management Committees
SSA	sub-Saharan Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development

Summary

FLN research has gained considerable attention over the past few years. However, relatively little is known about the contributions of Africa-based researchers to this field. The purpose of this report is twofold. First, we present the findings from a mapping exercise of foundational literacy and numeracy (FLN) studies carried out by Senegal-based researchers during the period 2010 to 2023. These studies included local journal articles (research papers mostly published in local, regional and international non-indexed academic journals), working papers, PhD theses, books (chapters), and evaluation reports. Second, we provide the findings of in-depth interviews conducted with FLN researchers in Senegal to better understand their research priorities and professional development needs.

The mapping showed a growing interest in FLN research in Senegal since 2010. Journal articles were the most prevalent type of research output among FLN researchers in Senegal, indicating a preference for traditional academic channels for disseminating research findings. Among the studies included in the mapping, the majority (88 percent) were available through open access. Only one-third (34 percent) of the identified studies provided information about funding. International institutions such as the United States Agency for International Development (USAID), Francophone University Agency (FUA), and International Development Research Centre (IDRC) ranked as the top funders of FLN research. When disaggregated by the type of research output, most of the funding (65 percent) went to evaluation reports, while journal articles, books (chapters), and PhD theses each received less than 15 percent.

Regarding the thematic areas covered in our analysis, literacy was the most explored area, receiving twice as much attention as numeracy. We also found a limited focus on inequality and poverty indicators, with gender receiving the greatest attention, with 33 percent of FLN studies focusing on gender-related topics. Disability, ethnicity, and poverty were the least emphasised issues. The gender distribution of researchers revealed that women were underrepresented in FLN research, contributing three times less than men. Most FLN studies (88 percent) in Senegal were the result of collaborative efforts, despite limited collaboration (12 percent) with other researchers based in sub-Saharan Africa. The top five institutions

with the highest number of FLN studies were: the University Cheikh Anta Diop, Laboratoire de Recherche sur les Transformations Économiques et Sociales, Ministry of Education, Gaston Berger University, and the Consortium pour la Recherche Economique et Sociale.

The findings of the interviews revealed that researchers' motivations for investigating FLN issues varied, but all stemmed from a common desire to better understand and address the challenges observed at the primary school level. While collaboration was widespread among the researchers in Senegal, only a few reported being part of an FLN network or community of practice. Furthermore, the lack of sufficient financial support from universities or elsewhere posed significant challenges for researchers, forcing them to rely heavily on personal resources to fund their work. Particularly concerning was the limited financial support for early career researchers, who often felt unsupported and isolated.

Based on the findings from our mapping exercise and in-depth interviews, this report advocates for greater institutional support, networking opportunities, and resources to address the challenges faced by FLN researchers based in Senegal, as well as to foster FLN research collaboration within sub-Saharan Africa as highlighted in the recommendations below:

- Increase the visibility and use of FLN research in Senegal.
- Improve collaboration between researchers in Senegal and those within other countries in sub-Saharan Africa.
- Implement targeted initiatives and policies to increase the representation of women in FLN research in Senegal.
- Allocate more funding to FLN research in Senegal.
- Encourage researchers to disclose the funding sources of their research outputs.
- Foster numeracy research in Senegal.
- Ensure that clear national and institutional policies/norms/statutes, guidelines and protocols are in place.

1. Introduction

Foundational literacy and numeracy (FLN) refers to the literacy and numeracy, and socio-emotional skills that should be acquired during the early years of primary school (Bill & Melinda Gates Foundation, 2020; Evans & Hares, 2021). These skills are a crucial component of the global education agenda, as reflected in policy documents such as the Sustainable Development Goal (SDG) Indicator 4.1.1a¹, African Union's Agenda 2063, and the Continental Education Strategy for Africa (CESA 16-25).

Since the COVID-19 pandemic, FLN research has gained considerable attention (Engzell, Frey & Verhagen, 2020; Kuhfeld et al., 2020; Tomasik, Helbling & Moser, 2021; Maldonado & Witte, 2021; Domingue et al., 2022; Cortés-Albornoz et al., 2023). However, relatively little is known about the contributions of Africa-based researchers to this field. Africa-based researchers are well-placed to produce contextually relevant research that can be useful for addressing development challenges (McLean & Sen, 2019). However, such research is usually overlooked in international forums. This is in part because most of them publish in local and regional journals and much of their research is also classified as grey literature and not available online (Edwards, 2023).

In 2022, Education Sub Saharan Africa (ESSA) and the Research for Equitable Access and Learning (REAL) Centre at the University of Cambridge received funding from the Bill & Melinda Gates Foundation to conduct research to identify Africa-based FLN researchers and their work. This would then lead to improved visibility of the research(ers) and the use of FLN research generated in Africa. As part of the project, we mapped FLN studies conducted by researchers based in Senegal, to identify their research outputs and key themes and trends. In doing so, we aimed to gain a comprehensive understanding of the current state of FLN research in Senegal, identify potential knowledge gaps, and contribute to the existing literature. We also investigated the research priorities and professional development needs of the FLN researchers based in Senegal through in-person and telephone interviews.

2. Policy context in Senegal

Over the past few years, Senegal has successfully achieved gender equality in terms of access to education at primary level, making remarkable strides in promoting girls' access to education (Ministry of Education, 2015; UNESCO, 2022). The government has also undertaken several initiatives, through the Sector Program for Quality, Equity and Transparency in Education (PAQUET 2018 – 2030), to improve access to quality education for all. Nevertheless, the primary education system still faces numerous challenges, including low enrolment and completion rates, as well as poor learning outcomes.

Between 2010 and 2020, the gross enrolment rate in primary education remained largely stagnant at around 84 percent, before declining to 83 percent in 2021/2022 (World Bank, 2024). Approximately six out of every 10 children who enrolled in the first grade Cours d'Initiation (CI) managed to make it to the last grade, Cours moyen deuxième année (CM2) in both 2013 and 2020. This indicates that 60 percent of the children completed the primary cycle of schooling with no substantial improvement on that statistic in recent years (UNESCO, 2022). Senegal also has a high number of out-of-school children, which poses a serious challenge to the country's human capital. In 2018, almost half (45 percent) of primary school-age children in Senegal were not attending school, of which 41 percent had never received any formal education. Most of these out-of-school children (60 percent) attended Koranic schools. However, official enrolment statistics do not reflect this information. This means that many children who attend Koranic schools are not counted in the national education data. As a result, the actual number of children receiving some form of education is likely to be higher than that reported. This discrepancy highlights the gap between formal and informal education systems in Senegal (World Bank, 2022).

Learning outcomes among primary school pupils have improved, but there is still room for progress. In 2019, the Programme for the Analysis of Education Systems (PASEC) assessed the reading and mathematics skills of Grade 6 students in 14 Francophone sub-Saharan African countries, including Senegal. The results of the assessment revealed that 65 percent of Grade 6 children in Senegal demonstrated sufficient proficiency in mathematics and 74.7 percent in reading. These figures mark

a substantial improvement compared to the 2014 results, where only 41.2 percent of Grade 6 children reached sufficient proficiency in mathematics and 38.9 percent in reading. However, Senegal has a high learning poverty rate, with 74.1 percent of children unable to read and understand a simple text by age 10. This learning poverty rate is 12.6 percentage points better than the average for the sub-Saharan Africa region, but 19 percentage points worse than the average for lower middle-income countriesⁱⁱ (World Bank, 2019).

Senegal is home to a diverse population that speaks a total of 38 languages. Although French is the national language, based on the Organisation Internationale de la Francophonie figures, only 37.2 percent of the population speaks French, and less than 50,000 people consider it their first language. The most spoken language in Senegal is Wolof, with 40 percent of the population using it as their mother tongue and another 40 percent speaking it as a second language. Although there are articles in the Senegalese constitution that support literacy in national languages, Senegal currently does not have a policy for the official language of instruction.

To address this need, the Ministry of Education introduced the national bilingual education reform, or the Harmonised Model of Bilingual Education (Modèle harmonisé d'éducation bilingue au Sénégal - MOHEBS) in December 2020. However, the implementation of this framework faces challenges due to the lack of systematic instruction on teaching national languages and developing literacy skills in multiple languages in pre-service and in-service teacher training (World Bank, 2022). The collaboration between the Associates in Research and Education for Development (ARED) and the Ministry of Education, along with Lecture pour Tous, is of great importance in this aspect, as explained below.

ARED has implemented a bilingual programme that utilises a real time bilingual education model. This model involves the simultaneous teaching of foundational literacy skills in the child's mother tongue (L1), which can be either Wolof or Pulaar, alongside French, the second language (L2). The programme encompasses all subjects in Senegal's national curriculum and aims to foster literacy development in both languages until the end of Grade 4 Cours élémentaire deuxième année (CE2). Key programme components include teacher professional development, the creation of teaching materials in Pulaar, Wolof, and French, community awareness initiatives

that encourage parental involvement in school management committees (SMCs), and a robust monitoring and evaluation system (Benson et al., 2019).

3. Methodology

In this sub-section, the process for mapping FLN studies conducted by researchers based in Senegal is outlined. This utilises the definition provided by the Bill & Melinda Gates Foundation, which defines FLN as literacy and numeracy skills among primary school aged children.

Our mapping is based on 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 set out 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 2010-2023. The types of research outputs mapped included journal articles, PhD theses, books, (book chapters), and evaluation and intervention reports. We searched for research outputs in national and regional non-indexed academic journals, institutional repositories, and websites of international organisations and charities implementing FLN interventions. We also conducted thorough searches on Google Scholar to ensure comprehensive coverage of relevant studies (Gusenbauer, 2019). Additionally, we engaged directly with researchers and visited the library of Gaston Berger University in Senegal to ensure we included studies not available online.

We tested different combinations of keywords for searching FLN research (see Binesse, Rose and Silva, 2023). After an extensive search, the following search string, in its various lengths, yielded 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 "Senegal".

Following the search, our mapping was guided by key selection criteria that determined the suitability of research outputs for inclusion. These included the following:

- Research conducted by at least one Senegal-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 (e.g., title, abstract, year), researchers (e.g., institutions, contact details, gender), information on inequality factors (e.g., ethnicity, disability, gender, poverty, religion, and location), related keywords (e.g., literacy, reading, writing, speaking skills), funding information (e.g., funders, funding types), collaboration, and other pertinent data. Appendix 1 presents a list of the institutions and platforms where the searches were conducted.

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 comprehensive understanding of the FLN research ecosystem. 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 method*: 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 assigned 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*: authorship patterns and the geographical locations of the researchers were analysed to determine the level of collaboration among researchers.
- *Top research institutions*: research institutions were ranked by analysing the frequency of studies attributed to each, based on authors' affiliation data.

In addition to the mapping, we conducted in-person and telephone interviews with Senegal-based researchers between August and October 2023. In total, we interviewed ten researchers: seven from Gaston Berger University, one from the University Cheikh Anta Diop, and two from the Ministry of Education. Of the respondents, there were four early career researchers, specifically PhD candidates, and one (senior) female researcher who was the only one available at the time to take the interview. The researchers were purposefully selected to participate in the study because of their availability, willingness to be interviewed, and aptitude for effectively conveying their experiences and opinions. Researchers are referenced using interview codes (e.g. R3) as listed in Appendix 3.

To collect the data, informed consent was obtained from all participants prior to conducting the interviews and making audio recordings. This ensured that participants were fully aware of the study's purpose and their rights. Also, in all cases, the researchers were assured of confidentiality to enable them to speak frankly about their work and experiences. Our ethical approach was designed to protect their privacy and encourage open, honest communication. We used a semi-structured interview guide with open-ended questions. Semi-structured interviews were preferred, as they allowed researchers to share their perspectives in a flexible and unrestricted manner. The interviews were conducted in French, audio-recordedⁱⁱⁱ, and transcribed. We used a thematic analysis approach to analyse the transcripts. This approach allowed us to identify common themes and patterns in the data. All findings were also translated into English to enable reporting in both languages.

4. Findings from mapping exercise

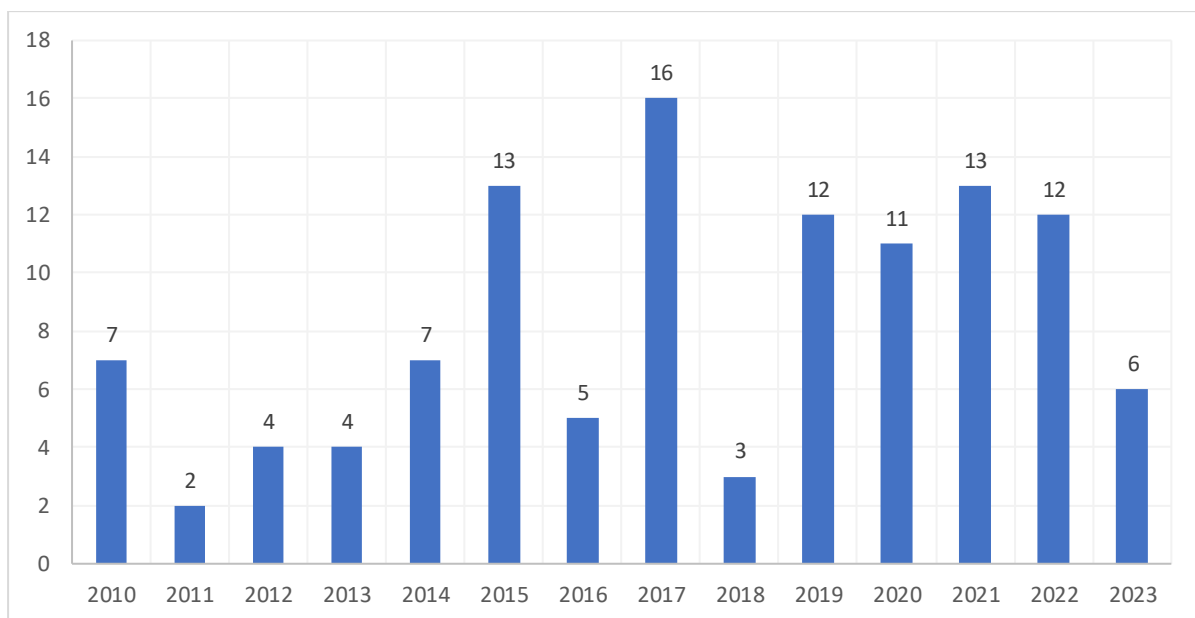
This section provides an overview of the FLN research, including a breakdown of studies from 2010 to 2023, and a typology of FLN studies. It also explores the relevance and accessibility of FLN research, as well as the funding landscape, including the types of research funded and the top funders of FLN research. Additionally, it delves into the thematic areas and design of FLN research, examining existing evidence gaps, poverty and inequality indicators, 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)

Figure 1 presents an analysis of the number of FLN research outputs from 2010-2023 in Senegal. A total of 115 FLN research outputs were recorded during this period, hence raising awareness about the substantial body of FLN research to inform policies designed to improve learning outcomes in Senegal. Of these 115 studies, 38 (33.04 percent) were authored in English, 76 (66.09 percent) in French, and 1 (0.87 percent) in Portuguese.

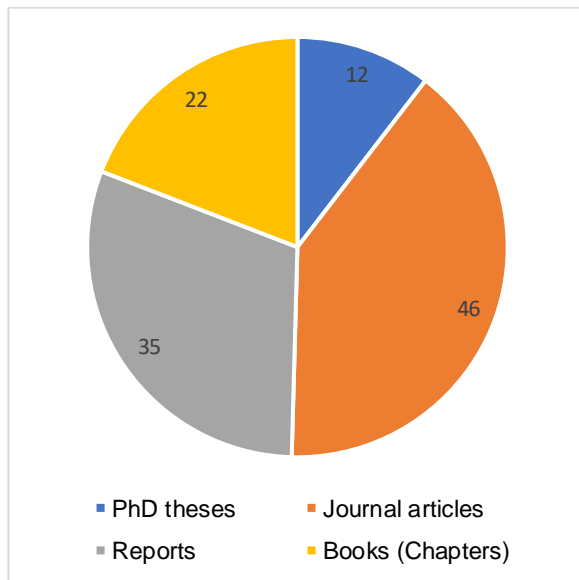
The data also showed a fluctuating trend, with the highest number of studies recorded in 2017 (16 studies) and 2015 (13 studies). However, after 2017, there was a noticeable decline in the number of studies, reaching as low as three studies in 2018 before slightly rebounding in the following years. Overall, the data suggested a growing interest in FLN research in Senegal. This increase in interest could be attributed to several factors, including the recognition of the importance of FLN skills in achieving desired learning outcomes, and the efforts of organisations and institutions to prioritise and invest in this important field in Senegal.

Figure 1: Number of FLN research studies between 2010 and 2023



Note: Base = Total studies identified, 115. The figures reported here include journal articles, books, PhD theses and reports.

Figure 2: Types of research outputs



Note: Base = Total studies identified, 115.

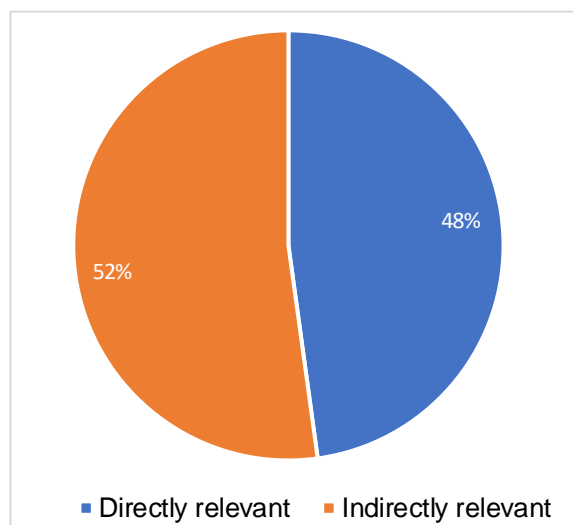
The data from Figure 2 revealed that the most common type of FLN research outputs in Senegal were journal articles, with a total of 46 studies identified (40 percent). We used journal articles to refer to research papers mostly published in local, regional and international non-indexed academic journals. This was followed by reports, 35 (31 percent), books, 22 (19 percent), and PhD theses, 12 (10 percent).

The prevalence of journal articles in Senegal can be explained by several

factors. First, journal articles are considered a credible and validated source of information, making them highly valued in the academic community. Second, publishing in journals allows researchers to disseminate their findings to a wider audience and gain recognition within the field. Reports were also a common type of FLN research output in Senegal arguably due to their practical and informative nature. The reports often serve as important tools for policymakers, organisations, and stakeholders, providing them with valuable insights and evidence-based recommendations for decision-making and action.

Relevance and accessibility of FLN research

Figure 3: Relevance of research identified

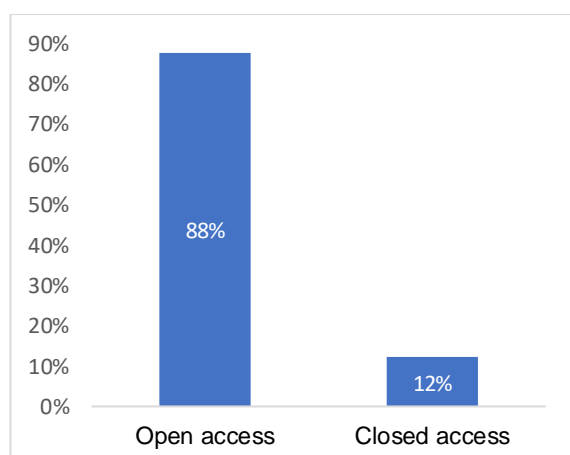


Note: Base = Total studies identified, 115.

approximately 48 percent of the identified studies in Senegal were directly relevant to FLN research, while the remaining 52 percent were indirectly relevant.

We categorised the identified studies based on their relevance to literacy or numeracy skills. Studies that focused on 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 (Binesse, Rose and Silva, 2023). Figure 3 illustrates the relevance of FLN research. The data revealed that

Figure 4: Access to FLN research outputs



Note: Base = Total studies identified, 115.

knowledge dissemination and accessibility. This is important, as open access allows for greater visibility and reach of research studies with the principles of inclusivity and democratisation of information (Heaton, Burn & Thoms, 2019; Kankam, Acheampong & Dei, 2024).

Figure 4 provides an overview of the accessibility of FLN research outputs in Senegal. The significant majority, 101 studies (88 percent) identified, including journal articles, PhD theses, reports, and books (chapters), were available through open access, while only 14 studies (12 percent) were categorised as closed access. This data indicated that most FLN studies in Senegal are freely available to the public, promoting

Table 1: Typology of closed access research outputs

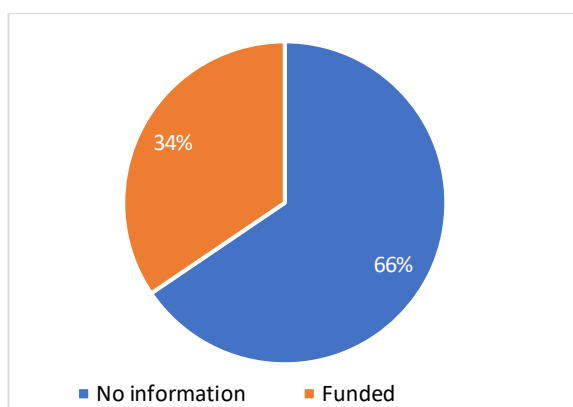
Books (chapters)	Journal articles	PhD theses
7 (50 percent)	6 (43 percent)	1 (7 percent)

A closer assessment of the type of research outputs that were not freely available indicated that books (chapters) and journal articles represented the majority, accounting for 50 percent and 42.8 percent respectively (Table 1).

Funding of FLN research

Information about the funding aspect of FLN research is provided in this sub-section, including the types of research that were funded, the sources of funding, and the top funders involved.

Figure 5: Funding of FLN research



Note: Base = Total studies identified, 115.

Figure 5 provides an overview of the funding status of FLN research in Senegal. Out of a total of 115 FLN studies, only one-third (34 percent) received funding, while the funding status of the remaining 66 percent is unknown (hence may or may not have been funded, but the information was not available).

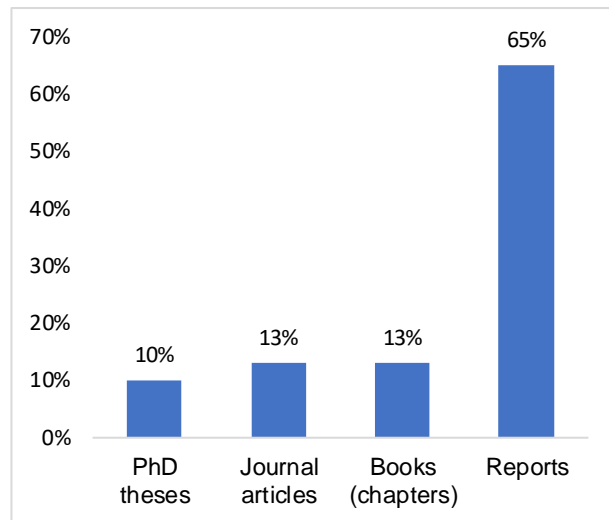
If these 66 percent of studies, or a significant proportion of them did not have funding, then that could have significant implications, since without adequate financial support, researchers may struggle to conduct in-depth studies and access necessary resources, ultimately hindering the development of effective interventions and policies. If the resources are limited, and there are competing priorities, then it could be challenging for decision makers to allocate funding specifically for FLN research. Therefore, action and data are needed, to provide clarity about the availability or lack of funding for FLN research in Senegal.

Type of research funded

We also analysed the distribution of different types of FLN research funded in Senegal, as illustrated in Figure 6. The data showed that most of the research funding (65 percent) was allocated to evaluation reports. Journal articles and books each received 13 percent of the funding, while PhD theses accounted for 10 percent. This indicates a prioritisation of assessing the impact and effectiveness (or otherwise) of FLN interventions in Senegal. The

emphasis on evaluation is important for evidence-based decision-making but limits the dissemination of research findings beyond evaluation reports.

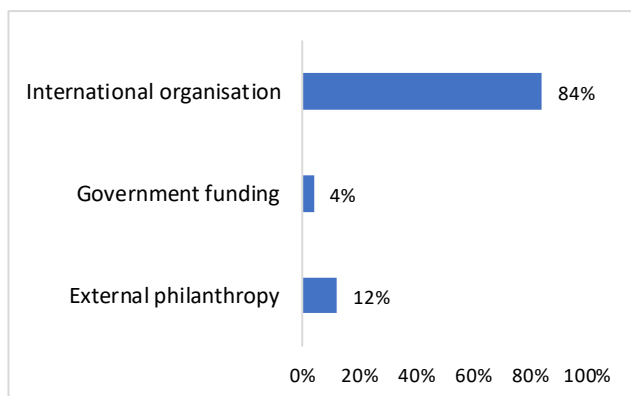
Figure 6: Types of FLN research funded



Note: Base = Total studies having information about funding, 40

Sources of funding for FLN research

Figure 7: Sources of funding for FLN research

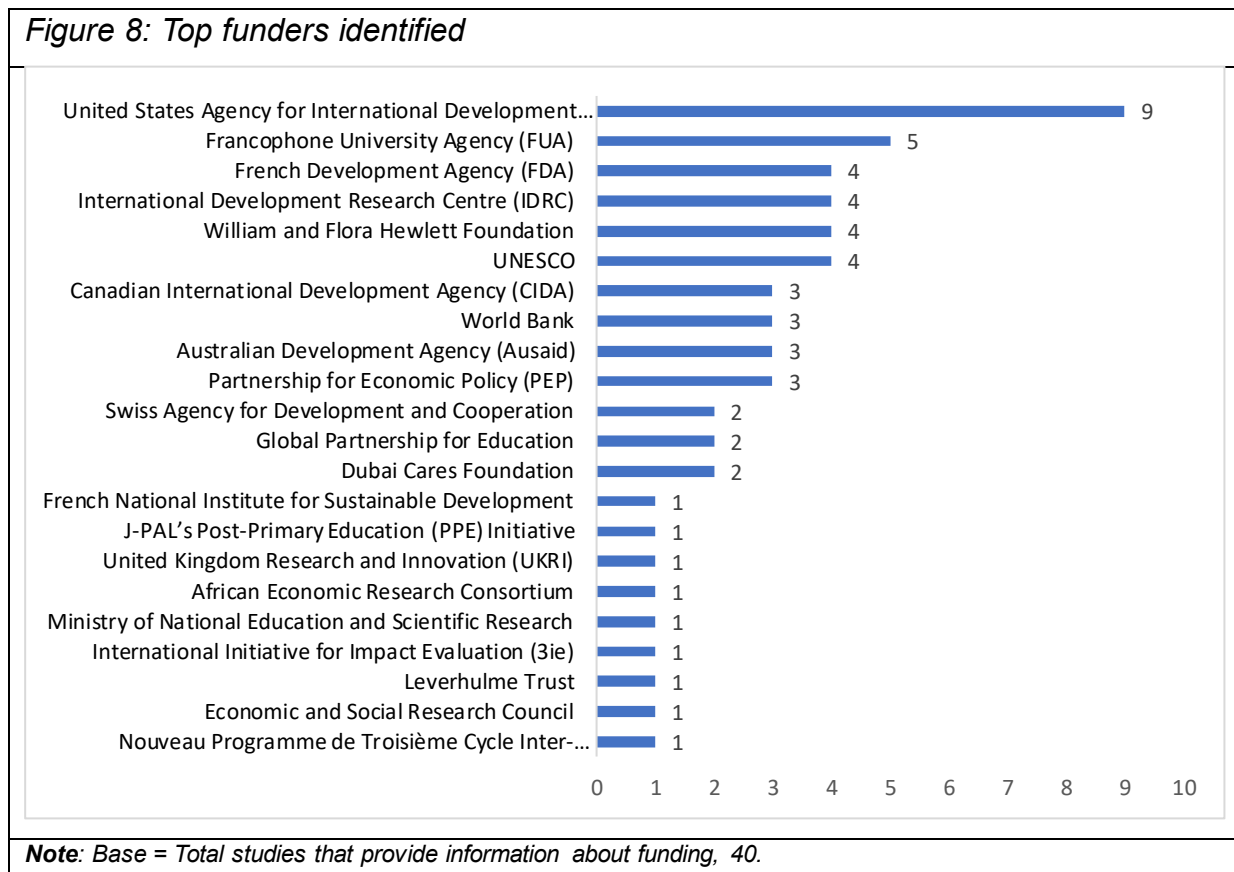


Note: Base = Funding sources counts, 57.

Figure 7 provides a breakdown of the types of FLN funding sources identified. International institutions, such as multilateral organisations and international development agencies, accounted for most (84 percent) of the funded studies. Government funding, on the other hand, only contributed to 4 percent of the studies, while external philanthropy accounted for 12

percent. This indicates the significant role played by international institutions in supporting FLN research in Senegal.

Figure 8 provides a detailed analysis of the top FLN research funders in Senegal. The USAID ranks as the top funder with nine FLN studies funded, followed by the FUA with five FLN studies funded.



The IDRC, French Development Agency (FDA), William and Flora Hewlett Foundation and UNESCO funded four each. Additional funders included the World Bank, Partnership for Economic Policy, Australian Development Agency, Canadian International Development Agency, Global Partnership for Education, and Dubai Cares Foundation, with varying numbers of funded studies. This highlights the significant support and investment from various international organisations and foundations in advancing FLN research in Senegal.

Research focus

In this sub-section, we examine the various topics covered in FLN research, analyse the poverty and inequality indicators used, and the different research settings, as well as provide a synopsis of FLN research design.

Figure 9 illustrates the relative focus on each of the 12 thematic areas covered in our analysis (see Appendix 2).

Figure 9: Thematic areas covered by FLN researchers



Note: Base = Total studies identified, 115. Studies fit under multiple themes.

Based on the frequency of keywords, literacy is the most explored thematic area, followed by (in ascending order): information and communications technology (ICT); education access; policy and financing; social environment, facilities and institutional leadership; curriculum; numeracy; teacher and teaching; equitable and inclusive education; learning and assessment; and language. While literacy and language received a substantive focus, numeracy seems to be comparatively overlooked. In fact, literacy (127 keywords count) and language (107 keywords count) were given almost twice as much attention as numeracy (54 keywords count). This research gap indicates that numeracy, despite being an essential component of primary education, does not receive the same level of emphasis and focus as literacy and language. This underscores the need for increased research and investment in numeracy education to ensure a well-rounded and comprehensive approach to foundational-level teaching and learning in schools in Senegal.

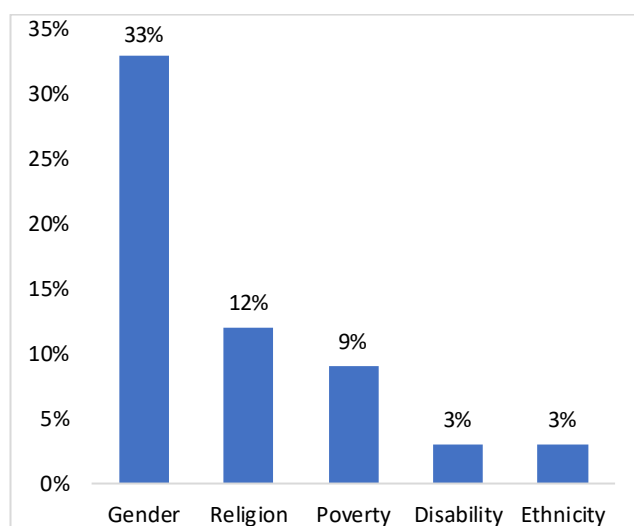
Inequality indicators in FLN research

In line with the SDGs, African Union Agenda 2063 and its Continental Education Strategy for Africa (CESA 2016-2025), we explored aspects of inequality included in FLN research. These included gender, poverty, disability, ethnicity, and religion. Addressing these gaps is essential for developing inclusive and effective policies and interventions that cater to the needs of all children, regardless of their background or circumstances.

Poverty and inequality are significant challenges that can have a profound impact on educational outcomes (Diagne et al., 2012; Malinick and Diop, 2020).

Figure 10 analyses the extent to which FLN researchers based in Senegal have addressed these issues in their research.

Figure 10: Inequality factors included in FLN research



Note: Base = Total studies identified, 115.

Among the inequality aspects addressed, gender received the greatest attention, with 33 percent of FLN studies focusing on gender-related topics. Religion and poverty were comparatively less emphasised, with 12 percent and 9 percent of studies focusing on each of these issues, respectively, while disability and ethnicity each accounted for 3 percent of FLN studies. The findings revealed that FLN researchers in Senegal focus

little on poverty and inequality measures, indicating the need for further research on these critical issues that affect learning outcomes.

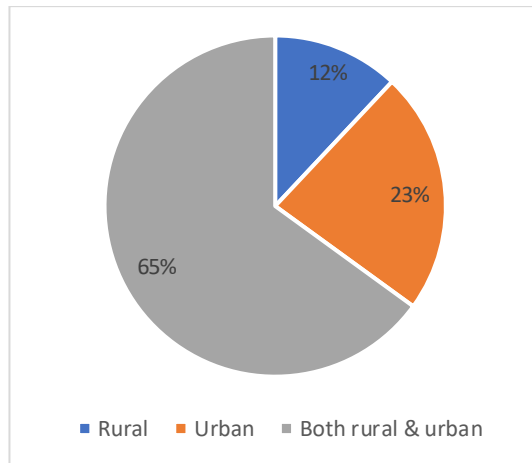
Research location

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 an overview of

the geographical locations of FLN research in Senegal. Almost two-thirds of FLN studies focused on both rural and urban areas.

The data also indicated that rural areas (12 percent) received less attention in FLN research, compared to urban areas (23 percent). This stronger focus on urban settings may overlook significant insights and challenges present in rural communities and limit the development of evidence-based interventions aimed at improving the learning outcomes of children located in rural settings. However, collecting data about children’s education in the rural areas is often challenging due to limited infrastructure, difficulty in accessing remote areas, and a lack of resources and funding available to researchers.

Figure 11: Geographical location of FLN research



Note: Base = Total studies mentioning research settings, 89.

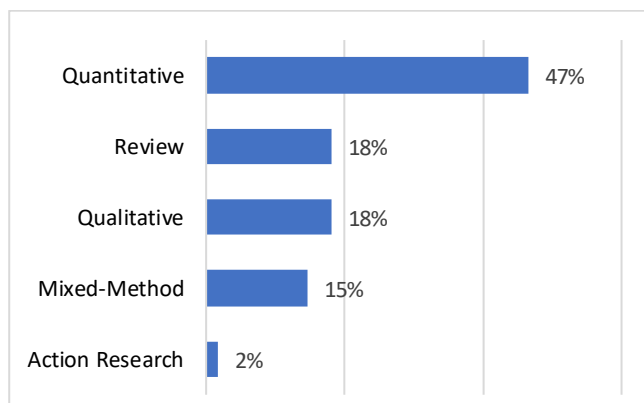
Research methodology

Figure 12 illustrates the research methods used in FLN studies. The methods were classified into five categories: quantitative, qualitative, mixed, review, and action research.

We found that nearly half (47 percent) of the identified FLN studies in Senegal used quantitative research methods.

This was followed by qualitative methods and reviews accounting for 18 percent of the studies each, and mixed methods with 15 percent. On the other hand, action research had a much lower representation of only 2 percent. The prevalence of quantitative research methods in FLN studies in Senegal indicates a strong reliance on empirical data, while the

Figure 12: Synopsis of FLN research methods



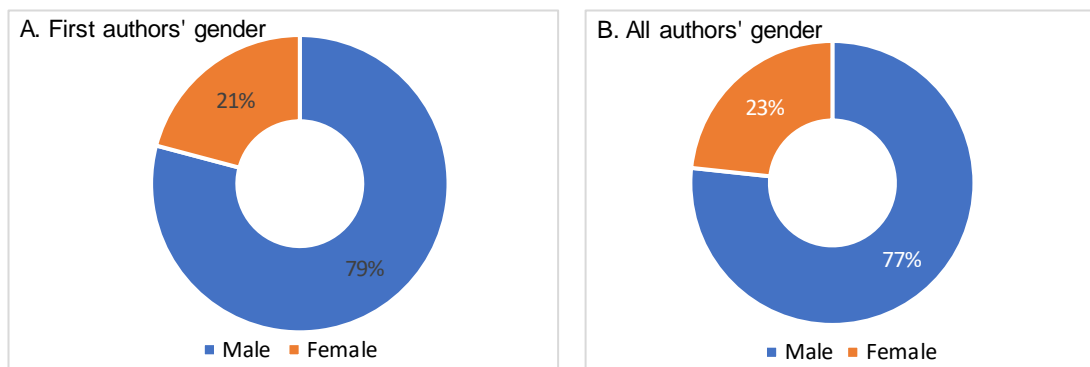
Note: Base = Total studies identified, 115.

underrepresentation of qualitative and action research methods underscores the necessity for a more comprehensive approach to examining FLN issues.

Gender of researchers

Figure 13 shows the gender distribution of FLN researchers in Senegal. When focusing on the gender of the first authors of the research output identified, the results indicated that the field of FLN research is dominated by men, as the data shows a 79-21 male and female ratio (Figure 13-A).

Figure 13: Gender distribution in FLN research



Note: Base = Total researchers identified, 236

As focusing only on the first authors can mislead the gender distribution, we also considered the gender of all authors (see Figure 13-B). In doing so, the analysis revealed a significant gender imbalance where male FLN researchers were over-represented, highlighting the need for greater gender diversity and inclusion. This gender gap may be attributed to factors such as a lack of support for work-life balance, which disproportionately affects women (Fathima et al., 2020), and limited mentorship and research opportunities, since female researchers have a lower propensity than their male colleagues to successfully apply for grants (Mancuso, Rossi-Lamastra and Franzoni, 2023).

Research collaboration

Collaboration allows researchers to pool their expertise and resources to achieve greater outcomes.

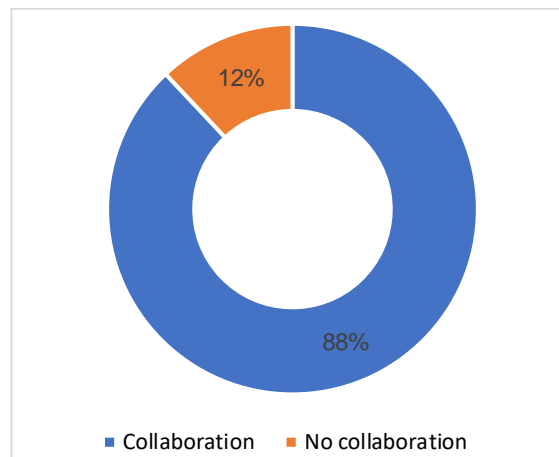
The data presented in Figure 14 demonstrates an extensive level of collaboration among FLN researchers in Senegal.

Of the 115 studies identified, the majority (88 percent) were the result of collaboration, with only 12 percent being individual endeavours. This highlights a strong culture of knowledge sharing within the FLN research community in Senegal.

Figure 15 illustrates the collaborative research efforts in Senegal categorised into collaboration within Senegal, collaboration within sub-Saharan Africa, and collaboration outside of sub-Saharan Africa.

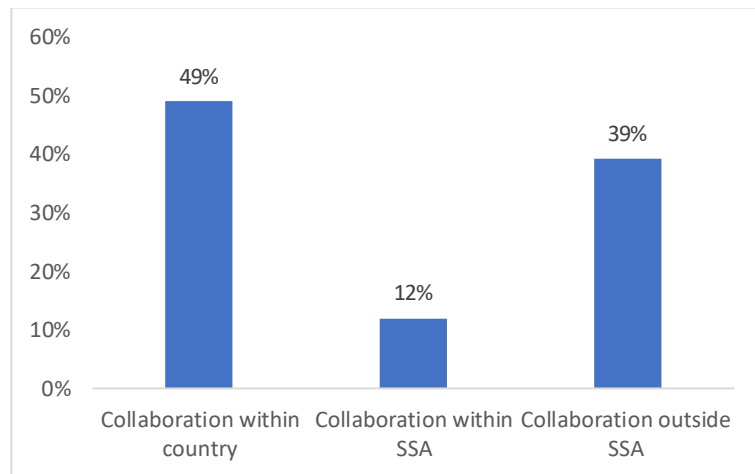
The data demonstrated a strong emphasis on local collaboration, accounting for 49 percent of the identified studies. Additionally, 39 percent of collaborations took place outside of sub-Saharan Africa. However, there was limited collaboration among researchers within sub-Saharan Africa, with only 12 percent of identified studies. Possible reasons for limited collaboration within sub-Saharan Africa could include language barriers, limited funding and resources, and a lack of established networks and partnerships between researchers in Senegal and those in the region.

Figure 14: Research collaboration



Note: Base = 103 studies identified, excluding PhD theses.

Figure 15: Collaboration in FLN research by geographical area

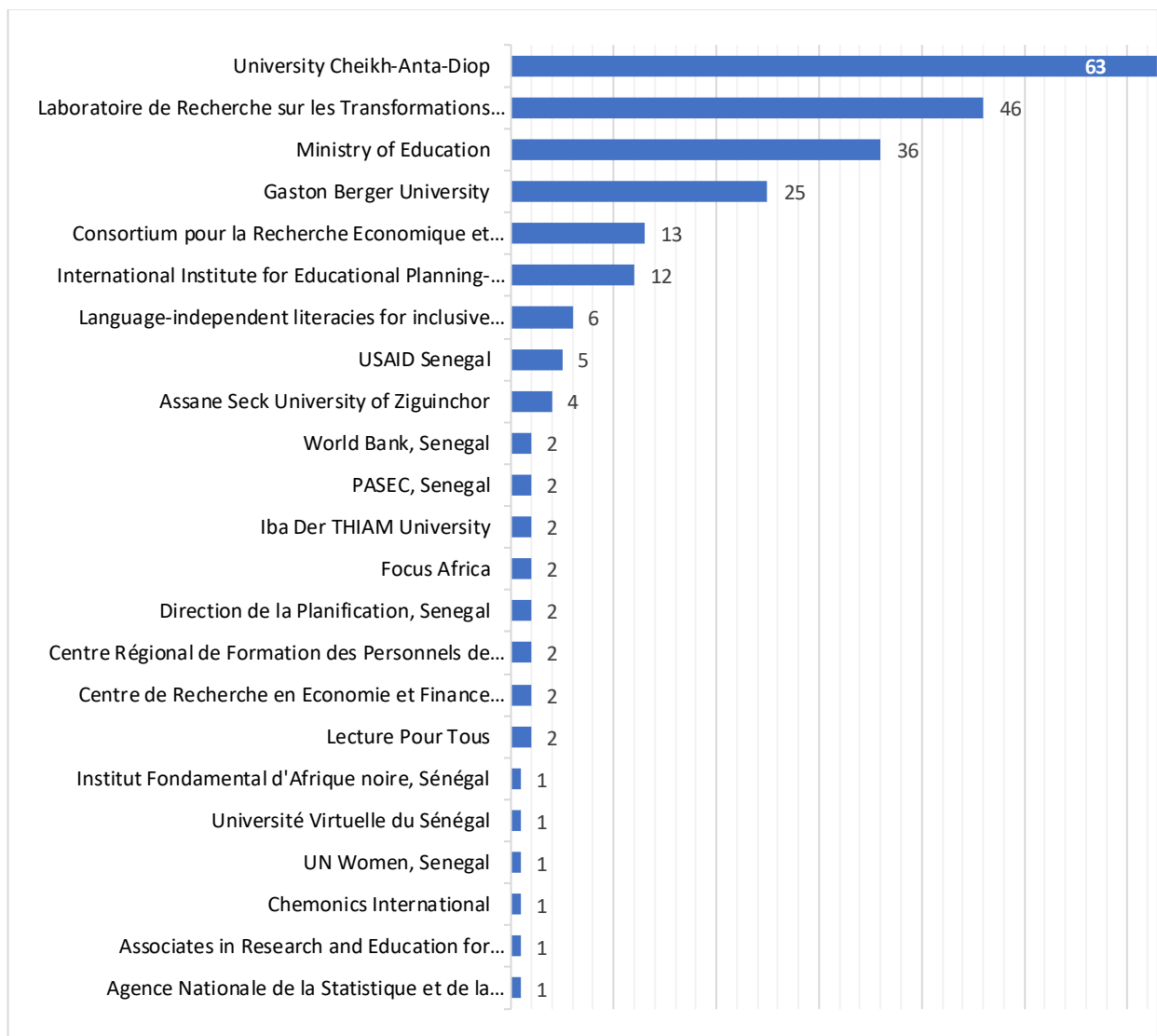


Note: Base = Total studies involving collaboration, 54

Top FLN research institutions

Figure 16 illustrates the top FLN research institutions in Senegal. The six institutions with the highest number of FLN studies are listed in descending order of output. The University Cheikh Anta Diop and the Laboratoire de Recherche sur les Transformations Économiques et Sociales^{iv} alone account for almost half of the overall research outputs identified in this mapping. The top five comprise University Cheikh Anta Diop (63), Laboratoire de Recherche sur les Transformations Économiques et Sociales (46), Ministry of Education (36), Gaston Berger University (25), and Consortium pour la Recherche Economique et Sociale (13).

Figure 16: Top research institutions focusing on FLN



Note: Base = Total studies identified, 115

In summary, the mapping exercise allowed us to identify 115 (locally) published and unpublished FLN studies conducted by Senegal-based researchers between 2010 and 2023. This analysis draws attention to the extensive body of FLN research that may go unnoticed in global forums, potentially leading to its exclusion from local and international policy formulation.

5. Findings from in-depth interviews

As shown in the previous section, Senegal-based researchers have generated significant FLN evidence over the past decade. However, little is known about these scholars themselves, including their backgrounds, professional experiences, and the challenges they face in conducting their research. Therefore, this section of the report presents the key findings of interviews conducted with FLN researchers based in Senegal. It investigates their motivation for focusing on FLN, analyses their funding sources and participation in networks, as well as identifies emerging trends and knowledge gaps that they believe should be prioritised. The section also examines the various documentation sources and research output formats used by these researchers, as well as the nature of their collaborations. Furthermore, it delves into the challenges faced by the researchers, and their strategies for overcoming them.

Research motivation

The interviews highlighted various factors that prompted researchers to investigate the issue of FLN. For some, it was their lived experience as teachers that motivated them to find effective teaching methods and assessment practices, as one of the researchers (R10) stated below:

My first-hand experience as a former primary school teacher motivated me to conduct research on learning assessment in French and mathematics, in order to address the challenges I faced in designing effective teaching and learning assessment methods.

This was reiterated by another researcher (R7), saying:

I was deeply concerned by the number of pupils progressing to the next class without acquiring basic skills. This highlights the need to reconsider current assessment methods in primary schools and find viable solutions to address this issue.

Other researchers also expressed other sources of motivation, such as the lack of scientific studies and data on non-formal education and the phenomenon of school dropouts. The importance of local languages further motivated researchers to examine the issue of FLN, as R1 noted:

I was driven to focus on foundational literacy and numeracy because it is essential to possess the relevant knowledge and skills to accurately label and elucidate educational concepts in local languages, especially in subjects like mathematics. This plays a vital role in empowering teachers with the necessary tools to facilitate effective teaching and learning.

Network affiliation and collaboration

During the interviews, researchers were asked whether they belonged to an FLN network. Out of the ten researchers interviewed, only two reported being affiliated with an FLN network. Specifically, one researcher (R10) is involved with Group GTE 7^v, which focuses on improving learning outcomes assessment in Francophone countries, while the other (R1) is a member of the OPA (Observatory of African Plurilinguism) network, which strives to promote African languages.

Consistent with the data in Figure 14 and 15, the researchers had a range of collaboration experiences, with five of them collaborating with colleagues in Senegal, two collaborating within Africa, and four collaborating outside of Africa. Interestingly, only one researcher (R7), who happened to be female, was involved in collaboration in Senegal, within Africa, and outside Africa. Out of the ten researchers interviewed, two (both PhD candidates) did not engage in any collaboration. This is not surprising because PhD candidates may be more interested in completing their individual thesis, which does not require collaboration.

The limited collaboration within Africa (i.e., between Senegal-based Senegalese researchers and researchers in other African countries) is also reflected in Figure 15, as well as in the synthesis from the African Education Research Database (AERD), (Rose et al., 2019). The online AERD was developed by the Research for Equitable Access and Learning (REAL) Centre at the University of Cambridge, in partnership with ESSA. It is a curated collection of research undertaken from 2010 by scholars based in sub-Saharan Africa, with the aim to raise the visibility of African research, consolidate the evidence base for policy and practice, and inform future research priorities and partnerships. The database includes peer-reviewed articles, book chapters, PhD theses and working papers identified through structured searches of academic and grey literature databases, expert consultation, and pearl-growing techniques^{vi}.

Research priorities

In line with the information provided in Figure 9, the interviews revealed a consensus among some researchers (R1, R6, R9) on the importance of prioritising the integration of national languages into the curriculum. They strongly advocated for conducting additional research on this matter to further explore its implications. However, in their opinion, Senegalese universities and research centres lack the necessary resources and infrastructure to conduct comprehensive and advanced research focusing on this subject. The following quote from a senior lecturer (R6) substantiates this view:

There is a growing interest in investigating the inclusion of national languages in the education system. However, the absence of more advanced research programmes in universities and research institutions, and the lack of support from the Ministry of Education, make it difficult to progress in this area

Further, researchers (R8 and R10) expressed concern about the limited research devoted to teacher training and learning assessment in literacy and numeracy, suggesting a need for comprehensive studies to address these issues.

According to one early career researcher (R5), non-formal education (especially Koranic education) is also an area that requires attention and exploration to ensure a well-rounded educational experience for Muslim children in Senegal:

Non-formal education, particularly Koranic education, plays a crucial role in the holistic development of students. It instils values, ethics, and a sense of community that complements formal education.

Research production and dissemination

During the interviews, researchers reported using a variety of databases and sources to gather literature for their research, including Cairn.info, Google Scholar, Google, the digital libraries of University Cheikh Anta Diop, and Assane Seck University, Zlibrary, sudoc.fr, erudit, Scholarvox, Hyper-Articles en Ligne (HAL), and Persée. Google Scholar was the most used academic database (six researchers), followed by Cairn.info (four researchers), and Scholarvox (two researchers).

While the researchers did not exclusively focus on African literature in their search, as they used a variety of databases with broader scopes, most of them published in African or local journals that were not indexed. These include Djiboul^{vii}, Acares^{viii}, and Liens^{ix}. This means that much of their valuable research in the FLN field may not be easily accessible or recognised by international databases.

Funding challenges

The interviews revealed that researchers in Senegal face numerous obstacles in advancing their research and careers. As highlighted in Figure 5, one common obstacle was the lack of resources, including funding and access to relevant journals. On this, one of the PhD candidates (R2) stated:

The main problem here is the lack of financial resources available to Senegalese doctoral students. The current monthly allowance of CFA 65,000 (approximately USD 110) provided by the state to doctoral students falls short of meeting their financial needs, including living expenses, conference participation, and research material purchases. In addition, the lack of resources becomes particularly problematic when access to certain journals requires payment.

R2 further emphasised that the lack of mobility options, especially for doctoral students, restricts their ability to explore new ideas, form collaborations, and ultimately limits the progress and impact of their research.

In Senegal, doctoral students are often limited to conducting their research solely within their own university, without the possibility of traveling for further exploration. Yet, without the chance to travel and experience different cultures, collaborate with professors and students from other countries, and exchange ideas in diverse settings, doctoral students may face limitations in their research and miss out on valuable learning experiences.

As a result, the researchers found themselves in a challenging situation. The lack of support from universities and organisations further exacerbated their financial burden, placing a heavy reliance on their own resources to carry out their research endeavours. R1 argued:

Regrettably, the sources of funding for research are primarily personal. This poses a significant challenge, as the university budget allocates a staggering 90 percent towards salaries, leaving very little room for research funding.

R10 also reported:

Unfortunately, the university provides minimal support to researchers, leaving me to rely primarily on my personal funds. The amount allocated for conference participation is often a mere CFA 100,000 (equivalent to approximately USD 170), which is highly insufficient.

Overall, these responses highlight the challenges that the researchers face in securing funding and the significant personal investment they make to pursue their research goals in Senegal. It also raises concerns about the sustainability of their research efforts, as relying solely on personal resources may not be a viable option.

Heavy administrative workload

Excessive administrative work also negatively impacted researchers in Senegal, as highlighted below.

During the interviews, one researcher from Gaston Berger University (R1) commented:

Excessive administrative work also poses a significant obstacle for researchers in advancing their research and careers. The burden of administrative tasks consumes a significant amount of time and energy that could otherwise be dedicated to conducting research.

In relation to the previous respondent's frustration, another researcher commented on administrative burdens such as excessive papers to mark, and student queries to deal with, many of which resulted from under-staffing in the institutions:

The major challenges we face as lecturers include time-consuming administrative responsibilities and the bureaucratic nature of some academic institutions which frequently detract from the time that researchers can allocate to their research endeavours.

This also highlights the need for adequate faculty numbers in the institutions to ensure effective staff to student ratios, and a more balanced allocation of administrative tasks and research responsibilities to support the professional development and career advancement of researchers in academia in Senegal.

Institutional support for addressing challenges

Internal

In the interviews, researchers were asked how much support they receive from their own institutions to address the challenges they face. The responses varied depending on whether the researchers were early career or senior researchers. Most senior researchers reported receiving some level of support from their institutions, despite insufficient funding. One of them (R10) stated:

We do receive support from the university for study trips every two years; this allows us to attend conferences and present our research. We also often receive grants, but these are somewhat inadequate in comparison with what is provided elsewhere.

The situation is more challenging for early career researchers. Most of them mentioned a lack of support and a feeling of being left alone to navigate challenges as illustrated in the following quote from R7:

We are left relying solely on our monthly allowance. Despite our attempts to secure funding from the university through the Pedagogical Registration Rights (DIP), we have unfortunately not been successful. As doctoral students, we often find it challenging to obtain the DIP, which are rightfully ours. Nevertheless, we adapt to our circumstances and strive to make the most of what we have.

External

External support (support from outside one's university/institution) can play a crucial role in the advancement of academic research, offering valuable resources and opportunities for researchers and doctoral students. One proposed solution to secure such support is by establishing local and international partnerships with ethical and sustainable organisations that specialise in promoting and implementing educational initiatives. This proactive approach could provide the necessary funding, and foster mutually beneficial collaborations that facilitate the growth and success of researchers in Senegal. One of the PhD candidates (R4) commented,

Our professors should take proactive steps to secure funding and establish partnerships with international Non-Governmental Organisations (NGOs). By doing so, they can obtain the necessary resources to support the academic endeavours of both researchers and doctoral students.

The above quote highlights the need for external support in academic research for various reasons. Firstly, external support helps researchers and doctoral students access resources that may not be available within their own institutions. This includes funding for research projects, access to specialised equipment and facilities, and opportunities for participating in conferences and workshops. Secondly, partnerships with international organisations can lead to collaborative research initiatives, allowing researchers to work with experts in their field from around the world. This can result in the exchange of knowledge, expertise, and innovative ideas.

Lastly, external support can enhance the visibility and profile of Senegalese researchers, as collaborations with reputable organisations can lend additional credibility to their work and open doors for them to access further opportunities in academia and beyond.

6. Challenges and limitations

The availability of French language papers was limited, and far fewer French language research studies were available online with most available in hard copy. Despite efforts to establish connections with universities and research institutions, the availability of digitalised FLN research remained limited. The lack of a centralised database for education research in Senegal was also a major obstacle. Without a comprehensive repository, it was challenging to identify and map the existing research holistically and effectively. The fact that only University Cheikh Anta Diop currently has a well-functioning online library where PhD theses and journal articles can be found, further exacerbated the issue.

Identifying and mapping locally published or unpublished FLN research is a time-consuming process, as it involves sifting through a vast amount of documents to determine which research outputs meet the project's inclusion criteria. Additionally, most databases were limited for systematic searches, which increased the manual component of the process (e.g., copying and pasting information from each research output to the Excel spreadsheet, and in some cases, the inability to search for outputs spanning multiple years).

In addition, only funding sources mentioned by the researchers were taken into consideration. This was an unavoidable challenge, but a limitation in the data collection and the analysis, as the absence of funding details for research outputs may not necessarily indicate a lack of funding for the research conducted.

Many databases and publishing platforms did not include information on authors' gender, making it difficult to compile accurate statistics. Additionally, names can be ambiguous or culturally unfamiliar, complicating the process of determining gender.

Some of the research outputs identified from institutional repositories, websites, or online academic portals may also be indexed in international databases. However, only a small fraction—3 out of 115 identified research outputs—were indexed in these databases, which is unlikely to significantly affect the results.

7. Conclusion and recommendations

In this report, we presented the main findings from the mapping exercise of FLN studies conducted by Senegal-based researchers, along with in-depth interviews we conducted with some of the researchers.

These highlighted the growing interest in FLN research since 2010, particularly journal articles. Few (34 percent) of the identified studies provided information about funding, with international institutions such as USAID, FUA, and IDRC ranked as the top funders of FLN research. Literacy was identified as the most explored area, receiving twice as much attention as numeracy. There was also a limited focus on inequality and poverty indicators, with disability, ethnicity, and poverty being the least emphasised issues. The gender distribution of researchers revealed that women were underrepresented in FLN research and (88 percent) of FLN studies were the result of collaborative efforts, except with other researchers based in sub-Saharan Africa.

The findings of the individual interviews revealed that researchers' motivations for investigating FLN issue varied, and while collaboration was widespread, few researchers were part of an FLN network. The lack of sufficient financial support from universities or elsewhere posed significant challenges for researchers (particularly early career researchers), forcing them to rely heavily on personal resources to fund their work.

Based on the findings above, this report advocates for greater institutional support, networking opportunities, and resources to address the challenges faced by FLN researchers based in Senegal, as well as to foster FLN research collaboration within sub-Saharan Africa as indicated by the recommendations below.

Recommendations

- **Increase the visibility and use of FLN research in Senegal.** This can be done through partnerships and participation in international conferences and workshops focused on FLN. Additionally, establishing open access platforms and databases can make local FLN research accessible to a wider audience, including researchers, policymakers, and the community or public.
- **Improve collaboration between researchers in Senegal and those within other countries in sub-Saharan Africa.** To deal with this issue, initiatives could be established to facilitate development of relevant and mutually beneficial FLN research agendas, knowledge sharing, and networking opportunities within the region. This could include organising regular conferences, workshops, and research forums specifically designed to connect researchers in sub-Saharan Africa. Moreover, funding programmes could be implemented to support collaborative research projects and incentivise researchers to work together across different institutions and countries within the region.
- **Implement targeted initiatives and policies to increase the representation of women in FLN research in Senegal.** This could involve providing mentorship and support programmes for female researchers, promoting gender equality in academic institutions, and actively encouraging women to pursue careers in FLN research through mentorship, scholarships and grants. Additionally, fostering a supportive and inclusive research environment can help to attract and retain more women in the field.
- **Allocate more funding to FLN research in Senegal.** This could be achieved by fostering collaborations with international organisations, advocating for government support, and diversifying the funding allocation to include more support for preparing journal articles, PhD theses, and authoring books (chapters). Additionally, providing funding specifically to early career researchers through grants, scholarships, fellowships, and mentorship opportunities, as well as dedicating more resources for research focusing on rural settings, poverty and inequality issues, can foster innovation in this field and help address critical societal challenges.

- **Encourage researchers to disclose the funding sources of their research outputs.** This transparency (even if the funding is from personal sources) could provide valuable evidence about who is funding what research and help to identify potential biases and/or gaps in research funding. Decision-makers and funders can then make more informed decisions and ensure a more equitable distribution of resources.
- **Foster numeracy research in Senegal.** A proposed strategy could be to establish research grants and funding opportunities specifically dedicated to numeracy studies. Organising conferences and professional development activities focused on numeracy could also provide platforms for Senegalese researchers in Senegal to share their findings, strengthen their capacity, and engage in meaningful discussions to further advance themselves, and the field, with a view to improving FLN and education outcomes for the children.
- **Ensure that clear national and institutional policies/norms/statutes, guidelines and protocols are in place.** These should include staff to student ratios and administrative tasks. They would support researchers in Senegal to manage their administrative responsibilities with greater efficiency and effectiveness, to enable them to dedicate time to conducting impactful FLN research.

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Appendices

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

1. Revue électronique internationale Sudlangues <http://www.sudlangues.sn/>
2. Initiative francophone pour la formation à distance des maîtres <https://www.ifadem.org/fr>
3. Revue de sociolinguistique en ligne <http://glottopol.univ-rouen.fr/>
4. Portail HAL theses <https://theses.hal.science/>
5. Consortium pour la Recherche Economique et Sociale (CRES) <https://www.cres-sn.com/>
6. AJOL <https://www.ajol.info/>
7. Google www.google.com
8. Google Scholar <https://scholar.google.com/>
9. Bibliothèque numérique UCAD <http://bibnum.ucad.sn/>
10. U.S. Agency for International Development (USAID) <https://pdf.usaid.gov/>
11. IDEAS <https://ideas.repec.org/>
12. Laboratoire de Recherche sur les Transformation Economiques et Sociales (LARTES) <https://lartes-ifan.org/fr>
13. Liens, Revue Internationale des Sciences et Technologies de l'Education <https://fastef.ucad.sn/liens/>
14. HAL science ouverte <https://hal.science/>
15. Apprendre <https://apprendre.auf.org/>
16. Programme d'Analyse des Systèmes Educatifs de la CONFEMEN (PASEC) <https://pasec.confemen.org/>
17. ResearchGate <https://www.researchgate.net/>
18. UNESCO <https://unesdoc.unesco.org/>
19. IIEP Learning Portal <https://learningportal.iiep.unesco.org/fr/bibliotheque>
20. Revues de l'ACAREF <https://revues.acaref.net/>
21. Supdeco <https://supdeco.sn/>
22. DIAL (Développement, Institutions et Mondialisation) <https://dial.ird.fr/>
23. Revue Djiboul <http://djiboul.org/>
24. PAL Network <https://palnetwork.org/jangandoo-senegal-publications/>
25. Dakar IIEP UNESCO <https://dakar.iiep.unesco.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.

Appendix 3: Interview codes, interviewee positions and affiliations

Researcher Name	Gender	Title	Institution	Type of interview
R1	Male	Professor	Gaston Berger University	In-person
R2	Male	PhD Candidate	Gaston Berger University	Telephone
R3	Female	Professor	Gaston Berger University	In-person
R4	Male	PhD Candidate	Gaston Berger University	Telephone
R5	Male	PhD Candidate	Gaston Berger University	Telephone
R6	Male	Professor	Gaston Berger University	In-person
R7	Male	PhD Candidate	Gaston Berger University	In-person
R8	Male	Retired education inspector	Ministry of education	Telephone
R9	Male	Education Analyst	Ministry of education	In-person
R10	Male	Professor	University Cheikh Anta Diop	Telephone

Endnotes

- ⁱ This indicator tracks the proportion of children and young people in Grades 2 or 3 who are achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex.
- ⁱⁱ The PASEC learning assessment focuses on evaluating the academic performance of children in Grade 6, specifically those at the end of primary school (typically age 6). In contrast, learning poverty is calculated as the share of children who have not achieved minimum reading proficiency by age 10, typically in Grade 4, adjusted by the share of children who are out-of-school.
- ⁱⁱⁱ An explanation was provided for the researchers to appreciate the need for recording, and they all consented.
- ^{iv} Despite being part of the University Cheikh Anta Diop, the *Laboratoire de Recherche sur les Transformations Économiques et Sociales* is listed separately in this analysis. This separation is based on the institutional affiliations given by the researchers, emphasising the unique contributions of each entity to the total research output.
- ^v For more information, please refer to <https://apprendre.auf.org/gte-7-suivi-evaluation-des-enseignements-apprentissages>.
- ^{vi} For further information, please refer to <https://essa-africa.org/AERD>.
- ^{vii} For more information, please refer to <https://djboul.org>.
- ^{viii} For more information, please refer to <https://revues.acaref.net>.
- ^{ix} For more information, please refer to <https://fastef.ucad.sn/liens>.

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