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Report

Mapping the landscape of education research by scholars based in sub-Saharan Africa

Insights from the African Education Research Database

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ESSA
Education Sub Saharan Africa

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Overview

This report outlines key features of education research undertaken by scholars based in sub-Saharan Africa, as represented in the African Education Research Database. The database catalogues social science research with implications for education policy and practice in sub-Saharan Africa, published in reputable journals and written by at least one researcher based in the region. **In exclusively cataloguing research conducted by researchers based in sub-Saharan Africa, the African Education Research Database is a unique resource for educational development research and policy in the region.**

Drawing on 1650 English-language articles published in internationally-recognised, peer-reviewed journals between 2010 and 2018, this report offers an analysis of major patterns in the thematic areas of research from the region, as well as funding, collaborations, and institutional and national patterns that characterise the education research landscape. The main findings are organised around five key questions:

- What are the phases of education and key thematic areas being explored by researchers based in sub-Saharan Africa?
- In which countries is the research being undertaken?
- What are the institutional arrangements for the research, including funding, and forms of institutional collaboration within and outside of the region?
- How does research by scholars based in sub-Saharan Africa align with the education Sustainable Development Goal?
- What are the key priorities for investing in research by scholars based in sub-Saharan Africa?

The report is written for researchers, research funders, policymakers, and practitioners interested in education policy-relevant research in sub-Saharan Africa. The findings aim to inform the direction of new research, patterns in South-South and South-North collaborations and funding, and potential partnerships with researchers based in sub-Saharan Africa to promote policy-relevant and contextually-appropriate research to advance educational development in the region.

Key priorities for investing in research by scholars based in sub-Saharan Africa

Our findings highlight key priorities for future investment. This investment will not only strengthen education knowledge systems within sub-Saharan Africa, but will also provide a strong foundation for policy impact:

1. Increase funding to education research by scholars based in sub-Saharan Africa, particularly focused on under-researched areas identified in the database associated with national, regional and global policy priorities (such as early childhood education; and conflict).
2. Promote dialogue between policymakers and researchers based within sub-Saharan Africa to identify further policy-relevant research related to education priorities.
3. Direct funding towards equitable partnerships between South-South and South-North institutions and researchers, driven by policy-relevant research agendas originating from within the region.
4. Support training and capacity development for researchers and institutions within sub-Saharan Africa on:
   - applying for competitive research grants
   - publishing in reputable journals
   - developing strategies for research impact, with a focus on successful engagement with non-academic stakeholders.
5. Develop research capacity particularly for countries with fewer publications, including through promoting regional collaborations and networks.
6. Target support towards female researchers in sub-Saharan Africa, linked to systemic barriers to girls and women in education, to promote gender equality and a more inclusive research community.
7. Continue efforts to catalogue and promote education research from sub-Saharan Africa by maintaining the African Education Research Database hosted by an organisation based in the region.

Introduction: what is the African Education Research Database?

'It is morning in Africa, the skies are clear. This is Africa's time.'[i]

Peter Tabichi, Science teacher from Kenya, recipient of the 2019 Global Teacher Prize

Context: improving learning outcomes while sustaining access for all

It is a critical moment for education across sub-Saharan Africa. The region's large youth population presents a unique resource for the continent at a key time for sustainable development. **However, as the African Union highlights, 'Africa's prosperity can be achieved only if the continent invests in the education and training of its youth**' (CESA 16-25, 2016, p. 10).

Sub-Saharan Africa has made strong gains in increasing access to primary education in recent decades. However, the region continues to have the highest rates of exclusion globally, with millions of children—particularly those from disadvantaged backgrounds —out of school. Learning outcomes remain low even for students in schools, and only a privileged few complete secondary education. In its Continental Education Strategy for Africa, the African Union cautions that 'the main challenge in Africa is to sustain access, while improving learning outcomes' (CESA 16-25, 2016, p. 15)

A robust and contextually relevant evidence base drawing on research from scholars within sub-Saharan Africa will play a vital role in improving learning outcomes while sustaining access for all. Specifically, evidence-based social science research on African systems of education by researchers in the region is needed to inform and improve meaningful policy decision-making, planning and implementation across the continent.

A sizeable body of education research by scholars based in sub-Saharan Africa already exists. As our analysis of research included in the African Education Research Database shows, the last two decades has seen steady growth in education research generated by scholars based in sub-Saharan Africa. This literature contains a wealth of policy-relevant studies spanning the full education cycle, and covering a diverse range of topics that reflect African educational contexts and realities.

Research from the region however remains under-utilized in informing debates in academia and education policy domains. The absence of a centralised platform for consolidating and coordinating education research by scholars in sub-Saharan Africa has limited the potential impact of the evidence base and inhibited the development of a research and policy community across the region.

The African Education Research Database

The Research for Equitable Access and Learning Centre at the University of Cambridge developed the African Education Research Database in partnership with Education Sub-Saharan Africa, which was launched in June 2017. The database (available here: https://essa-africa.org/AERD) is a publicly accessible, searchable database that catalogues education research by scholars based in sub-Saharan Africa. In particular, the database identifies social science research with implications for education policy and practice in sub-Saharan Africa, understood in the context of the education Sustainable Development Goal 4, and the African Union's Agenda 2063 and Continental Education Strategy for Africa. The three main strands to the literature identification process for the database were searching academic databases, expert consultation, and pearl-growing (that is reference searching) techniques. Structured searches of Scopus and Web of Science were conducted using the terms 'education' and 'school' in English, Spanish, Portuguese and French (further information about the search protocol is available in Mitchell and Rose, 2018). At the time of analysis, the database included 3067 publications over the period 2010 to 2018 by researchers based in sub-Saharan Africa.[ii]

The objective of cataloguing this research and making it easily accessible is: to improve the visibility and accessibility of quality education research by scholars based in sub-Saharan Africa; to strengthen the use of this evidence base for informing education policy and practice in the region; to inform research priorities by providing an up-to-date overview of existing research and a gap analysis of the current research landscape by these scholars; and to promote a community of education researchers, policymakers and other stakeholders in the region.

Approach of this report

The report shares key insights from the analysis of this research by scholars based in sub-Saharan Africa through five sections:

- What are the key phases of education and thematic areas being explored by researchers based in sub-Saharan Africa?
- In which countries is the research being undertaken?
- What are the institutional arrangements for the research, including funding, and forms of institutional collaboration within and outside of the region?
- How does research by scholars based in sub-Saharan Africa align with the education Sustainable Development Goal?
- What are the key priorities for investing in education research by scholars based in sub-Saharan Africa?

To answer these questions, the report presents key findings from a large-scale analysis of 1650 peer-reviewed articles authored by one or more researchers based in sub-Saharan Africa and published in English in reputable journals (with an impact factor of ≥0.2) over the period 2010 to 2018.[iii] The threshold for inclusion based on the impact factor of a journal was established in order to exclude predatory, pay-to-publish journals (Mitchell et al., 2018), and focus attention on publications which would be internationally recognised as high quality based on conventions of peer review.

While the database includes articles in languages other than English, these are underrepresented in the dataset particularly due to the lack of searches in specialist French language databases. Approximately 1% of the publications in the database are in French. Other systematic searches of the French literature (Bonini et al., 2015) identified only 279 peer-reviewed articles relating to education in Francophone Africa over the period 2000-2013, including studies by researchers based overseas, so a wider scope than those included in our analysis. As such, we do not expect the exclusion of these to affect the analysis in this Report significantly.

The geographical coverage includes research undertaken by scholars based in 48 countries in sub-Saharan Africa. South Africa was excluded from database searches as preliminary analysis revealed it has a markedly different research landscape to other countries in the region, with 3.5 times more outputs than Nigeria (the second most prolific country in the database) (Mitchell and Rose, 2017). As such, the need to promote the visibility of research by scholars based in South Africa was not deemed as much of an immediate priority for the database. Further details on the review process used to developed the African Education Research Database is available in the protocol (Mitchell and Rose 2018).

Alongside the bibliometric analysis, interviews were conducted with researchers based in the region aimed at understanding their priorities for research and experiences of partnership, funding and impact. In total, 31 interviews were conducted with researchers based in Botswana, Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Liberia, Malawi, Niger, Nigeria, Senegal and Tanzania. This Report provides selected quotes from these interviews relevant to the areas covered, with fuller analysis of the interview data reported elsewhere.[iv]

Box 1 How the analysis for this Report was undertaken

Each article in the database was assigned **up to eight keywords** drawn from a set of 128 keywords developed in the initial cataloguing process, with reference to the Education Resources Information Center and British Education Index thesauruses. The 128 keywords were subsequently grouped into eight thematic areas (Table 1) and six phases of education (Figure 1). As such, a single article may be catalogued with up to eight keywords relating to multiple themes (for instance Teachers and Teaching and Language and Curriculum), and phases of education (such as primary education and secondary education). This report therefore analyses the number of times a keyword has been assigned (i.e. frequency of keywords) across the selected 1650 English-language articles included in this analysis, to indicate how prominent phases of education or thematic areas are across the research base, and relationships between thematic areas and phases of education. In the review of the literature, for each of the themes, abstracts were scanned with key areas of focus identified. The review does not aim to provide a comprehensive coverage of all the literature included the database, but rather to give a taste of key trends and themes addressed by the research, and so to encourage further exploration.

Phases of education

All articles have been classified according to the phase or phases of education addressed in each publication, as outlined in Figure 1.

Figure 1 Phases of education

Overarching thematic areas

For the purposes of the analysis in this report, bibliographical data of all articles in the database were text mined, both manually and using computer assisted qualitative data analysis (CAQDAS) software, to identify recurrent thematic keywords associated with the education research. Keywords were then classified according to one of eight thematic areas (Table 1). These thematic areas are not exhaustive, nor do they fully capture the rich diversity of research by scholars based in sub-Saharan Africa. In addition, there is some blurring of boundaries between them. However, they are used in the Report for the presentation of major areas of focus that emerge from the analysis, and the identification of gaps in the research landscape.

Table 1 Thematic areas and definitions

Thematic area	Scope of theme
Language and curriculum	Intended and taught curriculum—including subjects and learning areas, competencies and skills, textbooks, African and non-African languages, and language of instruction.
Teachers and teaching	Teachers and their work, including pedagogical approaches and instructional practices in the classroom; teacher education, knowledge and skills; workforce management (for example teacher deployment, retention and attendance); and other aspects of teachers' working conditions.
Equitable and inclusive education	Structural factors at the societal level associated with differential experiences of, and outcomes from, education (e.g. poverty, gender, disability, ethnicity).
Policy and financing	a) contextual factors at the national level that affect planning and implementation; b) general aspects of the national policy context (e.g. government spending, decentralisation, donors and NGOs); and c) specific issues of policy concern (e.g. school fees, student financial support, public-private partnerships).
Institutional leadership, culture and facilities	Institutional factors outside the classroom: leadership and management at the school and system level; institutional culture (e.g. staff relations, violence); and institutional facilities (e.g. libraries, water, sanitation and hygiene).
Access to education	School and system-level issues including enrolment and age-in-grade data, repetition and progression, completion, exclusion, and provision (including distance or emergency education).
Students, learning and assessment	Diverse factors related to student learning and experiences, including student motivation and student voice, learning outcomes, and forms of summative and formative assessment at the classroom, school, national and international level.
Information and communications technology (ICT)	ICT as a means and focus of teaching and learning at the institutional and classroom level at all phases of education, and as an information management tool.

1 What are the phases of education and key thematic areas being explored by researchers based in sub-Saharan Africa?

This section outlines key trends and features of the education research undertaken by scholars based in sub-Saharan Africa, focusing on 1) the phases of education; and 2) overarching thematic areas covered in the 1650 articles in reputable journals included in the African Education Research Database.

1.1 Phases of education

Figure 2 Mapping the education research landscape by scholars based in sub-Saharan Africa by phase of education

Note: % calculated from number of times each phase of education is identified in the studies included in the analysis, divided by the total number of times all phases are assigned to these articles. 56 studies do not address a specific phase of education and so are excluded from this figure. VET: Vocational Education and Training

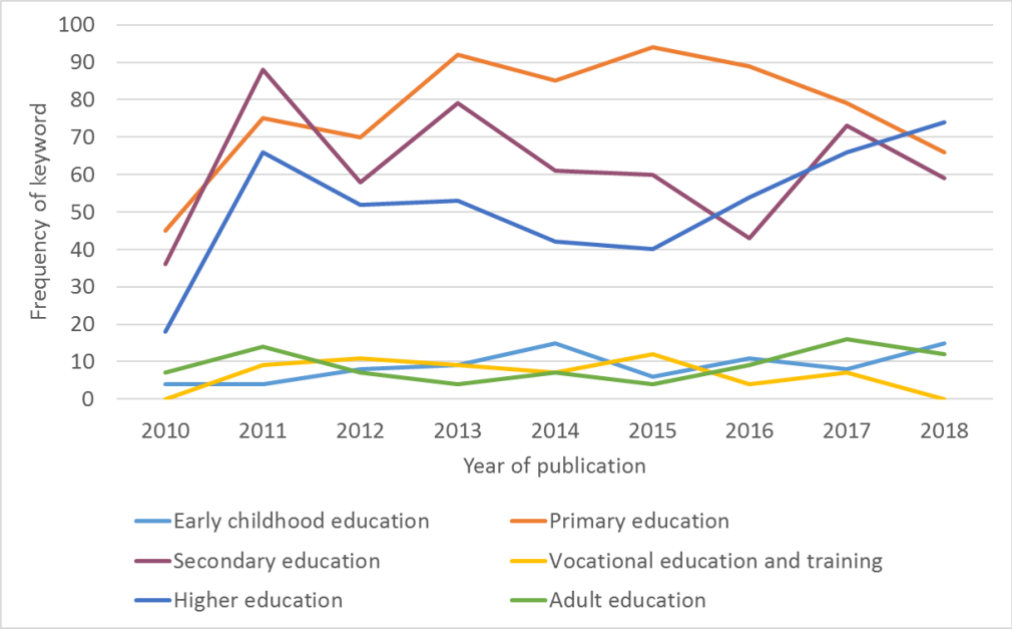
The majority of studies focus on primary and secondary education, accounting for 35% and 28% of the overall research landscape of 1650 studies, respectively. **Higher education** (24%) also receives substantial attention, the focus of one quarter of studies. The emphasis given to this phase is perhaps unexpected given that university students account for less than 2% of the total student population in the region. A possible explanation for this may be the general lack of research funding in the region (see Section 2.4). More than 80% of researchers in the database are affiliated with universities, and conducting research in one's own workplace requires fewer resources than fieldwork in remote rural schools. As one researcher interviewed for this study from Botswana explained:

> *"I don't think we know much really about what is going on in the [primary and secondary] schools, in the classrooms – and to me that is the beginning. Because once you get to understand what is going on in there then you may move on to see what needs to be done… [But] it's not easy because there is no…national funding dedicated to research, as such. [W]e get some funds for research from the university budget, but it's not much really. [So we] are able to carry out some research. But when it comes to big research grants – in country there is really nothing."*
>
> *(Male researcher, Botswana)*

Figure 2 reveals **early childhood education** is an area of comparative neglect, representing only 4% of studies, despite evidence of its importance for school readiness and future life opportunities, and its prioritisation in global and regional agendas. Moreover, as illustrated in Figure 3, research attention to early childhood education—as on vocational education and training, and adult education—has been a minimal focus across the entire period 2010 to 2018, which links with the African Union's assertion that pre-primary education 'is a neglected area in terms of policy and investment.' Figure 3 shows a sharp increase in research focusing on primary education, secondary education and higher education between 2010 and 2011. This is in line with an overall increase in social science research included in Scopus

database (the main source for the database) over that period. Since 2015, relative attention to primary education appears to be on the decline, while publications on higher education are increasing.

Figure 3 Trends on research related to different phases of education, 2010-2018



Box 2 Key findings from research on early childhood education

'Pre-primary education is the pillar on which future learning and training are grounded.'

("CESA 16-25," 2016, p. 14)

The African Education Research Database corroborates concerns that early childhood education is a neglected area of research in sub-Saharan Africa. Only 80 out of the 1650 articles included in this analysis address early childhood education, with just 2% of funded research in this analysis addressing this phase of education (see Figure 23).

The African Union warns that pre-primary education across the continent is 'severely underdeveloped,' plagued by 'disparities, poor management, and a lack of coherent curriculum and linkages with primary education' ("CESA 16-25," 2016, p. 13). Where policies and strategies do exist, implementation barriers include inadequate infrastructure and resources, poor planning, under-trained teachers, and inadequate materials. Based on these concerns, the African Union nominates pre-primary education as a priority sub-sector for African development.

The neglect of early childhood education in the region is further exemplified by the low overall enrolment. While enrolment in pre-primary education across Africa is expanding, the African Union estimates that on average in 2012, only one in five young children were enrolled in early childhood education, with 9 of the 10 countries with lowest pre-primary enrolment globally located in sub-Saharan Africa ("CESA 16-25," 2016, p. 14; "State of Education in Africa Report," 2015, p. 6).

An analysis of pre-primary research in the database—though modest in size— indicates that researchers based in sub-Saharan Africa are focusing their work on this sub-sector on education policy, language of instruction, and curriculum reform.

In particular, research on pre-primary policies identifies an 'implementation gap' between intention and practice: i.e. a divergence between policy intentions for early childhood education and actual practices in pre-primary settings. The implementation gap seems particularly acute in the intended and applied curriculum, and classroom-level practices. Examining pre-primary education policy and practice in Nigeria, for instance, Odinko (2012) reports 'a discrepancy between policy guidelines and pre-school practices, especially with regard to class size, teaching method, language and instruction, and site facilities and resources.' (Migo, 2018) further

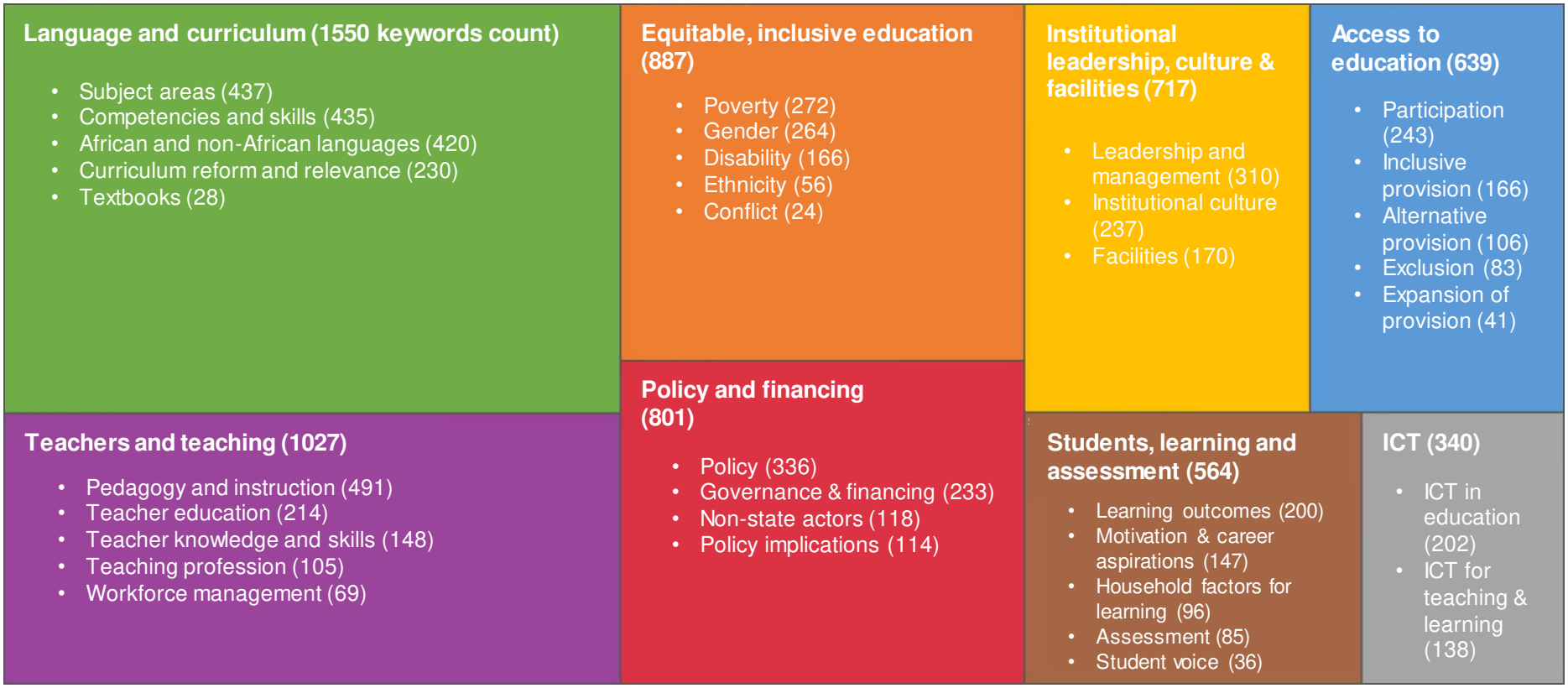
documents a 'mismatch' between the intended early childhood education curriculum and pedagogy, and the taught or applied curriculum in pre-primary education in Tanzania. Mangwaya et al. (2016) argue that in Zimbabwe, school heads require better induction and teachers require more training—particularly around curriculum development and design— if primary schools are supposed to implement early childhood education. Ejuu (2012) calls for added technical assistance to promote the implementation of Uganda's early childhood development training framework, to ensure it improves the quality and effectiveness of pre-primary teachers.

The effect of language of instruction policies in pre-primary provision is another research focus. Auleear (2012) for instance argues that in Mauritius, a linguistically diverse nation where the majority of the population are native speakers of Mauritian Creole, 'the discontinuity between the home language and the school language' (i.e. English or French) risks impeding early childhood development. Ige (2011) similarly calls for the use of mother tongue as the language of instruction in early childhood education in Nigeria.

1.2 Thematic areas

The relative focus on each of the eight thematic areas across the studies included in our analysis is illustrated in Figure 4. Based on the frequency of keywords across the research, language and curriculum is the most widely explored thematic area, followed by (in decreasing order): teachers and teaching; equitable and inclusive education; policy and financing; institutional leadership, culture, and facilities; access to education; students, learning and assessment; and information and communications technology (ICT). The largest thematic area—language and curriculum—receives almost twice as much attention as either institutional leadership, culture and facilities, for instance, or access to education. Major research focuses within the main broader thematic areas include pedagogy and instruction, subject areas, competencies and skills, and African and non-African languages. These and other areas of focus within the thematic areas are discussed in more detail in sections 1.2.1 to 1.2.8.

Figure 4 Mapping the education research landscape by scholars based in sub-Saharan Africa by thematic area

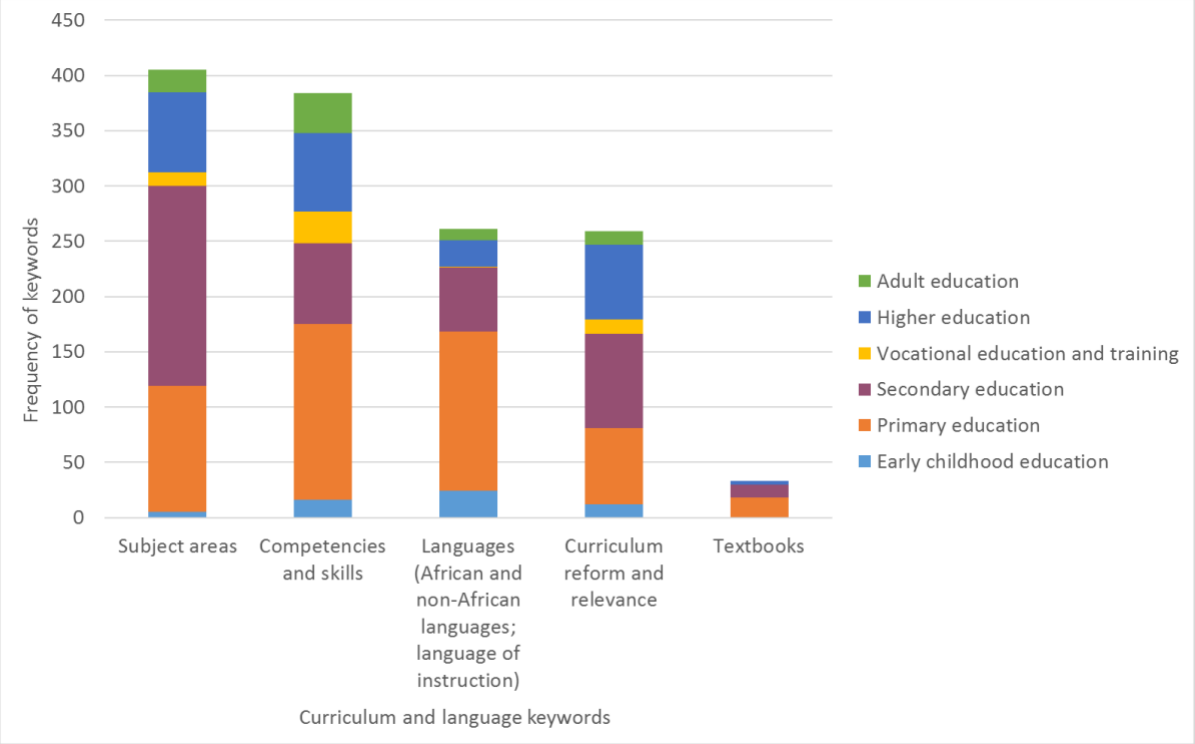


Note: Scale is proportional to the number of times keywords associated with thematic areas are assigned across the studies selected from the African Education Research Database.

1.2.1 Language and Curriculum

Language and curriculum is the most widely covered thematic area in the literature covered in this report, with more than four times the coverage of ICT, the smallest thematic area and around 1.5 times the size of teachers and teaching, the next largest thematic area. Language and curriculum relates to the intended and the taught curriculum—including subjects and learning areas, competencies and skills, textbooks, African and non-African languages, and language of instruction.

Figure 5 Language and curriculum research according to phases of education



Subject areas and **competencies and skills** are two of the most widely covered topics in the literature reviewed (Figure 5). **Health education** accounts for around one quarter of all studies that examine specific subject areas, predominantly in secondary and primary education, followed by **science education** (22% of all studies on specific subject areas, predominantly in secondary education) and **mathematics education** (18%, predominantly in primary and secondary education).

Literacy and reading account for 37% of the research on competencies and skills (around 135 studies), primarily focused at the primary level. Within the research on literacy (around 110 studies in this selection), there are diverse focuses, including literacy acquisition in multi-lingual environments (Box 3). Teaching practices provide another research focus within the research on literacy. Examples include: instructional interventions to target remedial literacy skills for under-performing or disadvantaged students (for example students from low socio-economic status or rural backgrounds, and students with disabilities) (Adetoro, 2012; Fleisch et al., 2017; Sherris et al., 2014; Ugwuanyi and Adaka, 2015); teacher professional development and interventions to prom5ote early years and primary literacy (Mwoma, 2017; Owodally, 2013; Sanoto and Walt, 2018); as well as students' attitudes towards and habits in reading, such as hours spent reading and reading environments at home (Ameyaw and Anto, 2018; Kirchner and Mostert, 2017).

Research relating to **sustainable development** is more concentrated at the secondary level. Some researchers argue that teachers are not adequately engaged in sustainable development to incorporate education for sustainable development into classrooms. In their study on Swazi teachers' views on sustainable development, for instance, Dube and Lubben (2011) find that junior secondary science teachers lack the understanding needed to embed education for sustainable development in the science curriculum. Amado et al. (2017) argue that improving teachers' engagement with sustainable development needs to start with teacher education.

Within the research literature on **citizenship**, Jotia and Morapedi (2011) document efforts to develop democratically-engaged citizens in Botswana secondary schools, while Semela et al. (2013) argue that after decades of military dictatorship in Ethiopia, the inclusion of democratic civic education within the secondary curriculum has been unevenly implemented in schools. Wainaina et al. (2011) argue that fragile states looking to attract foreign investment, such as Kenya, struggle to balance citizenship within the context of national and economic development agendas. With a few exceptions, climate change and biodiversity are largely absent from the literature (Dalelo, 2012, 2011).

The literature on **curriculum reform and relevance** highlights the importance of an effective and coherent curriculum system for promoting sustainable development. However, as Rwantabagu (2010) notes, in under-resourced and conflict-affected countries such as Burundi, the whole system of curriculum, assessment, examinations and certification can be incoherent and impede students' opportunities both to learn and to demonstrate their competencies in order to progress to future opportunities. In the context of higher education, Tadesse and Melese (2016) warn that curriculum reform in Ethiopia is inhibited by an 'implementation gap' between governmental intended reforms, on the one hand, and university teachers' abilities to enact reforms in the classroom on the other hand. Researchers also highlight political and ideological dimensions of curriculum reform, discussing for instance the role of indigenous knowledge and epistemology in a culturally-sensitive curriculum; the case for collaborative approaches to reform, through engaging local stakeholders and voices in reform efforts (Bleck and Guindo, 2013; Fayomi and Fields, 2016); and the tensions between national and international goals for education reform (Nudzor, 2014).

Discussions about **curriculum relevance** take place in the context of broader debates about **decolonising sub-Saharan African systems of education.** In one exploration of Eritrean language and education policies today, for instance, Asfaha (2015) traces the emergence of multi-lingual education in Eritrea to the country's colonial past and the combined impact of missionaries, European colonial powers, and Ethiopian influence. Chisholm and Chilisa (2012) highlight differences in the decolonisation processes in Botswana and South Africa, and the implications for educational reform—including curriculum and assessment, as well as teacher policies—in these countries. Gyamera and Burke (2018) bring a post-colonial lens to higher education policies in Ghana, critiquing the continued prevalence of Western perspective in African universities; while Chimbutane (2017) documents a shift towards more inclusive and diverse language policies in post-colonial Mozambique, highlighting the role that development agencies have had in encouraging the Government to embrace a more inclusive language policy position.

Researchers within sub-Saharan Africa also question the extent to which national curricula are adequately preparing the continent's children and young people for the **world of work** and **further education** in the context of rapidly changing social, economic, environmental and political contexts and national agendas. Researchers interrogate the concept of **curriculum relevance** from multiple perspectives, notably national and system-level objectives, such as workforce policy and national development (Raselimo, 2017); subjects and learning areas, including mathematics,

science and geography (Zinyeka et al., 2016); and students' interests, experiences and career aspirations (Kazima, 2013).

The research on **employment skills** focuses primarily on higher education, vocational education and training and adult education, in the context of youth employment and readiness to work (McCowan, Oanda and Oketch, 2018). There is a strong country focus on Ghana, which has the highest number of publications on adult education in the database. Owusu-Agyeman et al. (2018) for instance argue that the needs of adult learners in three universities in Ghana are not being met, partly because of inappropriate pedagogical approaches; while Wongnaa and Boachie (2018) argue that poor partnerships between universities and industry in Ghana has contributed to a rise in popularity of competency-based training across the country.

Overall, the evidence suggests that improved school-level and post-secondary **vocational education and training and adult education**—including industry partnerships, internships and apprenticeships—can help develop students' employment skills and aid their transition to work, and therefore alleviate poverty and youth unemployment (Kayode and Adeyemi, 2016; Mekgwe and Kok, 2017; Yeboah et al., 2017). A recent study of university-industry linkages in Tanzania for instance found that strong linkages can promote student employability (Ishengoma and Vaaland, 2016). Aryeetey et al. (2013) advocate for a more systematic approach to careers guidance, in order to help apprentice trainees make good choices about their professional and skills development. Openjuru (2011) calls for greater recognition at the policy and higher-education level of the potential of lifelong learning and lifelong education to widen access and improve knowledge and skills among adult learners in Eastern Africa; while Lawal (2013) explores the role of technical and vocational education in national development in Nigeria, arguing that the sector is currently inhibited by poor implementation.

Box 3 Language of instruction: politics, policies and learning outcomes

'Language in education policies are a highly debated topic in Africa, and are at the root of understanding inequalities in Africa's education systems.'

(Altinyelken et al., 2014)

A key focus of research in the database is the impact of language of instruction policies on student learning and equity. Language of instruction policies are highly political. While research evidence consistently shows the benefits of mother-tongue instruction, implementation of language-in-education policies is complicated in linguistically and ethnically diverse populations (Mokibelo, 2014).

There is strong evidence by researchers based in sub-Saharan Africa that instruction in students' mother tongue is significantly beneficial for learning outcomes (Nyaga and Anthonissen, 2012). Hungi, Njagi, Wekulo and Ngware (2017b) for instance found that among pre-primary school children in low-income urban communities in Kenya, children who received basic literacy instruction—including letter naming, letter sounds and rhymes—in Kiswahili 'significantly outperformed' peers who were taught in English. Investigating the effect of medium of instruction reforms introduced in Ethiopia from 1994, Seid (2016) similarly found that instruction in mother tongue improves educational outcomes at the primary school level. Advocates of indigenous language instruction also cite linguistic and ethnic diversity, national culture, and African identity as reasons to preserve and promote multilingual instruction beyond the early years (Mulumba and Masaazi, 2012).

Efforts to implement national languages as the language of instruction have, however, seen mixed success. As Altinyelken et al. (2014) observe, local language policies in Uganda have been 'fiercely disputed by teachers, parents and various authorities at the district and national levels,' with concerns such policies impede children's academic success and limit their transition to secondary school. The introduction of mother-tongue instruction across primary schools in Uganda in 2007 has not been shown to improve children's proficiencies in reading and writing as expected (Akello and Timmerman, 2018).

Igboanusi (2014) found that first-language medium of instruction policies announced in the Gambia from 1988 have been unevenly implemented and that English language remains the medium of teaching in many schools, with implications for drop-out rates, access to education, early-years literacy and learning outcomes across subjects.

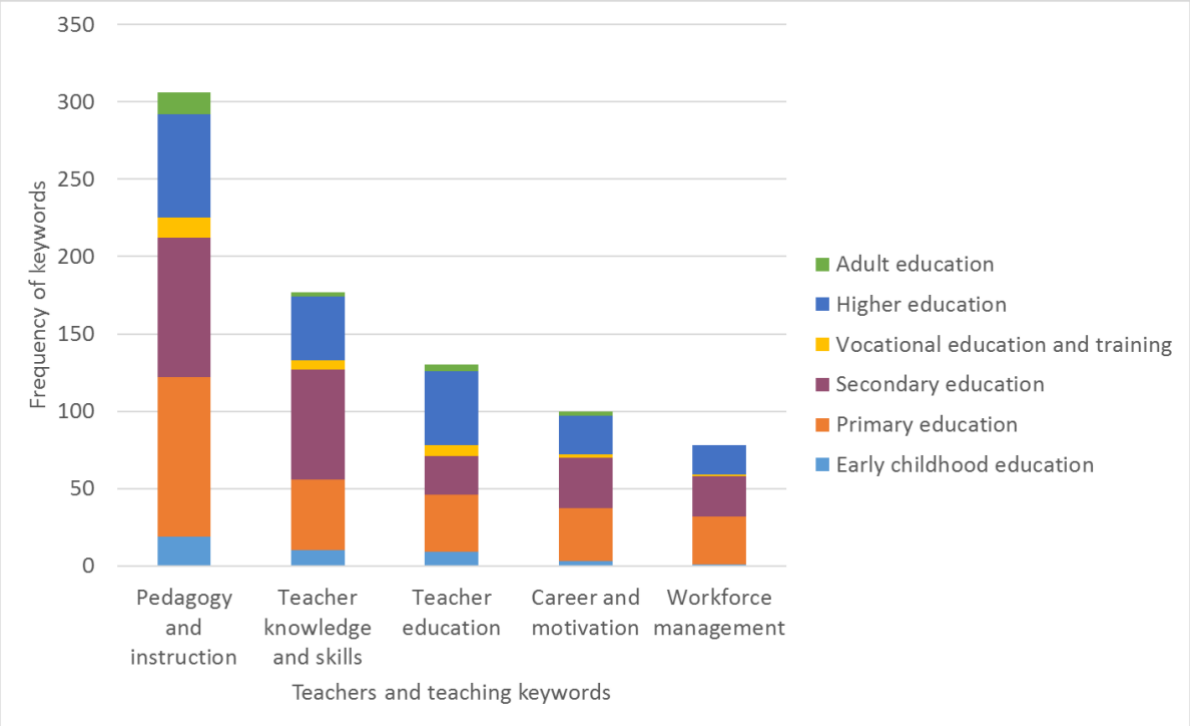
So, what is impeding the implementation of language of instruction policies? A 2016 study of mother-tongue instruction in Kenya identified communities' resistance to mother-tongue instruction as a key barrier, as well as classrooms being more linguistically diverse than presumed at the policy level (Piper, Zuilkowski and Ong'Ele, 2016). Nigeria for instance accorded 3 languages (Hausa, Igbo and Yoruba) out of more than 350 the status of national language, with implications for equity and inclusivity (Oluikpe, 2014).

A lack of implementation planning and support at the system level is another barrier to effective medium of instruction policies. One 2015 survey of secondary teachers in Zimbabwe found for instance that while teachers were positive about English language instruction, they had inadequate support to implement it in the classroom (Nkwe and Marungudzi, 2015). Additional challenges are presented at the school level. Nyaga and Anthonissen (2012) document instances in urban and rural primary schools in Kenya where mother-tongue instruction is impaired by inadequate learning materials and assessments, and conflicting interpretations of 'multilingual education.'

1.2.2 Teachers and teaching

The thematic area on teachers and teaching—which is the second largest thematic area explored in the research in this analysis—relates to teachers and their work, including pedagogical approaches and instructional practices in the classroom; teacher education, knowledge and skills; workforce management (i.e. teacher deployment, retention and attendance); and other aspects of teachers' working conditions.

Figure 6 Teachers and teaching research according to phases of education



'Revitalising' the teaching profession is one of the twelve strategic objectives of the African Union's Continental Education Strategy for Africa (2016-2025), as a mechanism for ensuring both the quality and relevance of all phases of education (CESA 16-25, 2016, p. 8). This dimension of the

CESA strategy includes workforce policies pertaining to teacher training, deployment, professional development and working and living conditions.

Literature by researchers based in sub-Saharan Africa on teachers and teaching covers many of the areas of interest in the CESA strategy such as teacher professional development, motivation and professional culture, remuneration and workforce policies. As the authors of a 2014 review of the Teachers Initiative in sub-Saharan Africa (TISSA) in Uganda emphasise, however, such workforce areas are best conceptualised holistically if school systems are to improve the quality and effectiveness of the teaching workforce (Ministry of Education and Sport, 2014). Curriculum and assessment, for instance, are indelibly linked to pedagogy and instruction, and teachers' professional knowledge and skills—and policies for each must be mutually reinforcing and interconnected.

Pedagogy and instruction is one of the largest topics within the whole database, covering issues such as teaching methods, indigenous pedagogies, and student-teacher relations. However, there is a general lack of evidence on what constitutes effective teaching, especially for disadvantaged learners (Box 4). Consistent with global patterns, researchers based in sub-Saharan Africa report increasing implementation of **learner-centred pedagogies**, i.e. active learning strategies that create space for students to interact with peers and teachers (Asamoah and Oheneba-Sakyi, 2017a; Giwa-Lawal and Ortis, 2017; Johnstone, Nikoi and Kahihu, 2017a). However, there are growing concerns over the feasibility of learner-centred pedagogies in sub-Saharan African contexts, due to challenges such as large class sizes, cultural values and beliefs, limited teacher knowledge and skills, and a lack of appropriate instructional materials (Mannathoko and Mamvuto, 2018; Piper et al., 2014).

Researchers in the region also emphasise that pedagogy and instruction research often fails to lead to sustained behavioural changes in teaching practices in the classroom. **Teachers need the relevant knowledge and skills** for the research evidence to manifest at the classroom level and impact student learning outcomes. Therefore, a related body of literature communicates efforts to change and improve the quality of teachers' instructional and pedagogical practices, through for instance **teacher education and professional learning** (Miyazaki, 2016; Okiror et al., 2017). Researchers explore the impact of key interventions on teachers' instructional practices, such as continuing professional development (Hardman, Dachi, Elliott, Ihebuzor, Ntekim and Tibuhinda, 2015; Okiror et al., 2017), curriculum reform (Anderson et al., 2015), and initial **teacher education** (Bertram, Mthiyane and Mukeredzi, 2013). While findings vary, studies highlight the importance of teacher professional development in relation to teaching practices in the classroom (Mtahabwa and Rao, 2010). One study in Botswana found that teachers who attended in-service workshops improved their use of assessment to enhance student learning (Koloi-Keaikitse, 2016). Similarly, a study in Zambia found continuous professional programmes helped teachers adopt collaborative and inquiry-based pedagogies (Haßler et al., 2015). Strategies found to enhance professional competencies among pre-service teachers include mentoring and supervision during initial teacher education (Ong'ondo and Borg, 2011; Wormnæs et al., 2015). Beyond interventions targeting teachers' knowledge and skills, the provision of meals for teachers can improve their performance (Kigenyi and Kakuru, 2016).

Teaching as a career is influenced by social and personal values as well as financial rewards (Mhishi et al., 2012; Moses et al., 2017; Rothmann and Hamukang'andu, 2013; Salifu et al., 2018). Researchers based in sub-Saharan Africa have identified multiple factors that **motivate teachers**, including fair remuneration and promotion, opportunities for career development, favourable workplace conditions, respect from the wider community, transparent and accountable leadership,

provision of instructional materials, and parental and community involvement (Atuhurra, 2016; Calvert and Muchira-Tirima, 2013; Nyamubi, 2017; Tesfaw, 2014a). However, there is no consensus across this field. In the context of Rwanda, Nizeyimana and Osman (2014a) find that pre-service teachers' beliefs about their careers were more important for professional engagement than their academic background, while Gebre (2018) reports the opposite in a 2018 study on Ethiopia.

Researchers addressing **teacher workforce management** highlight a range of associated challenges impacting the continuity and quality of instruction and educational provision in schools (Kontagora et al., 2018). In some contexts, **teacher attendance** is shown to be inconsistent, with poor punctuality and high absenteeism both from the school and the classroom impacting student learning and access (Alhassan and Adzahlie-Mensah, 2010). **Job dissatisfaction,** inadequate **instructional supervision,** and the practice of 'moonlighting' contribute to a culture of absenteeism and negatively impact teacher effectiveness and student learning (Chua and Mosha, 2015; Fasasi and Oyeniran, 2014; Kodzi et al., 2014; Nalova, 2014; Urwick and Kisa, 2014). **Retention** is another issue, with Adusei et al. (2016) finding that stress at work, the desire for professional autonomy, and a lack of alternative career choices all impact retention among secondary teachers in Ghana. Limited **induction** and **early-career support** for newly-qualified teachers, as well as a heavy **professional workload**, have also been found to relate to low retention rates across the region (Bhebhe et al., 2015; Magudu and Gumbo, 2017; Ssempebwa et al., 2016). A shortage of **teaching assistants** can impact teachers' ability to manage workload, particularly in large class size settings. Mokibelo (2016) demonstrates instances where teachers rely on teaching aides and assistants to comply with national language of instruction policies.

Box 4 Pedagogy and instruction in sub-Saharan Africa

Effective pedagogy and instruction are critical for improving student learning across sub-Saharan Africa (Ngware et al., 2014). Of the 1650 studies included in the analysis, 492 addressed pedagogy and instruction, with pedagogy defined as theory and practice of teaching learners, and instruction as specific strategies used in the classroom to teach key learning outcomes in, for instance, literacy and numeracy. Recurrent areas of focus include:

- Learner-centred pedagogies, including problem-based learning
- Indigenous pedagogies and inclusive instruction
- Teaching methods in particular subject areas
- Class size in an era of expanding access

Despite the considerable attention given to teaching methods, fewer than 10% of these 492 studies investigate classroom practices in relation to learning outcomes. Learner-centred pedagogies have gained prominence in policy statements in sub-Saharan Africa as elsewhere, although some researchers question their relevance to socio-cultural and material conditions in the region (Sonaiya 2002; Sikoyo 2010; Tabulawa 2013). Practices reported in the region include group work, whole class discussion, and teaching and learning using locally available materials (Amalba et al., 2016; Kuchah and Smith, 2011; Mkimbili and Ødegaard, 2017). Researchers based in sub-Saharan Africa have explored the efficacy of learner-centred pedagogies in relation to enhancing student motivation (Argaw et al., 2017a), critical thinking (Tiruneh et al., 2016), communication and interpersonal skills (Moalosi et al., 2012), and entrepreneurial skills (Abubakar and Arshad, 2015).

These researchers have also investigated learner-centred pedagogies within specific subject areas. For example, in Kenya and Nigeria cooperative learning was found to improve learning outcomes in science and promote peace and positive attitudes among students (Esiobu, 2011; Ibraheem, 2011; Muraya and Kimamo, 2011). Students in Tanzania responded positively to one pedagogical intervention that incorporated their experiences and cultural practices into science lessons, with participants reporting

increased motivation and interest (Mkimbili and Ødegaard, 2017). Furthermore, peer learning has been an important feature of health awareness among students in Zambia and Senegal (Denison et al., 2012; Massey et al., 2012).

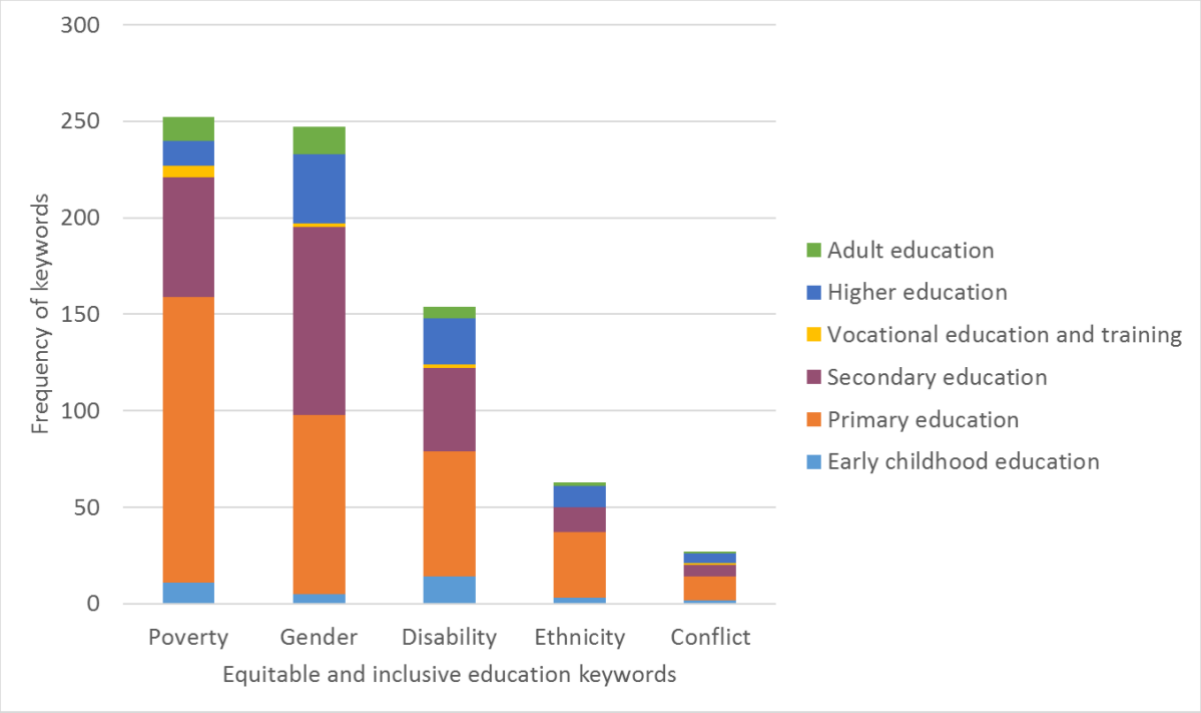
Large class sizes have been reported widely as a barrier to learner-centred pedagogies in classrooms, with studies documenting the impact in Tanzania (Mtahabwa and Rao, 2010), Nigeria (Owoeye and Yara, 2011), Kenya (Ngware et al., 2014), and Zimbabwe (Wadesango et al., 2016). Ndethiu et al. (2017a) argue that given the challenge of overcrowded classrooms is unlikely to be resolved, training teachers to be effective in large class contexts is a higher strategic priority than reducing class size. Ngware et al. (2014a) found that in Kenya, teachers with better subject knowledge were more able to overcome the challenges of large classes.

There is an expanding research base on the use of indigenous knowledge and pedagogies to enhance learning across subjects including mathematics (Weldeana, 2016), environmental education (Mokuku, 2017), and science (Carnevale et al., 2011). Folk-story telling has been used to teach cultural values and promote participation in Ethiopia and Zimbabwe (Charamba and Mutasa, 2018; Jirata, 2012). There is evidence that relating lessons to students' experiences and socio-cultural backgrounds can increase motivation and learning (Kaahwa, 2011; Mkimbili and Ødegaard, 2017).

1.2.3 Equitable and inclusive education

Equitable and inclusive education—the third largest thematic area in the research reviewed—encompasses structural factors at the societal level associated with differential experiences of, and outcomes from, education (such as related to poverty, gender, ethnicity, conflict and disability).

Figure 7 Equitable and inclusive education research according to key phases of education



Poverty receives the greatest attention within education research by sub-Saharan African scholars within the theme of equitable and inclusive education (predominantly in primary education and then secondary education), closely followed by **gender** (see Box 5), and **disability** which appears to receive more attention in research by scholars in sub-Saharan Africa than might be expected from the global priority that this has been shown until recently (Figure 7).

Most research addressing **poverty** takes the perspective of access, rather than the quality of students' experiences in school, or school-level practices that support the learning of young people affected by poverty. This is a notable gap, since research in the database highlights challenges students from poor households face in school, including hunger, stigma, internal exclusion, and other factors which may negatively affect their learning experiences. Researchers explore the impact of poverty across various levels—familial, community and national poverty—on school attendance, drop-out rates and out-of-school students (Cockburn et al., 2014; Kamanda, 2016; Komba, 2013; Tukundane et al., 2014; Wamichwe et al., 2017). This area of focus considers for instance the impact child labour (Aminu et al., 2015; Bandara et al., 2015; Delaunay, 2013), cultural attitudes towards poverty and education (Keiper and Rugira, 2013; Unterhalter et al., 2012), and why students from low socio-economic backgrounds drop out of 'free' education. Findings suggest hidden costs and cultural attitudes towards household chores are contributing factors for the most disadvantaged, including girls (Abuya et al., 2013).

Related to literature on poverty and education is a body of research specifically exploring the effect of intended 'pro-poor' policies that aim to promote equitable and inclusive education. Researchers are investigating for instance: the impact of 'free' and low-fee private schooling policies, and cash transfers for poor families (Akaguri, 2014; Miller and Tsoka, 2012; Oketch et al., 2012; Williams et al., 2015); progress towards Education for All and universal education goals (Ige, 2014; Nudzor, 2015); and household expenditure, family attitudes towards, and demand for education (Abdul Malik Iddrisu et al., 2017; Bougma et al., 2014; Mabika and Shapiro, 2012; Mberu et al., 2014; Mussa, 2014; Oyolola and Abuya, 2014).

With respect to **disability,** Mariga et al. (2014) suggest that 'the stigma and shame associated with disability […] still persists in many cultures [and] communities.' Studies from Ethiopia, Uganda, and Tanzania further report an enduring traditional belief in disability as a 'curse' or 'punishment from God' (Ani et al., 2011; Bannink et al., 2016; Setume, 2016; Tungaraza, 2012). This stigmatisation may lead to children with disabilities being treated as sources of shame, and ostracised from the community (Adeniyi and Omigbodun, 2016). Such traditional beliefs resonate with the colonial-era practice of socially segregating children with disabilities into 'special' provision, which persists to this day in many countries (Pather and Nxumalo, 2013).

Researchers based in sub-Saharan Africa also identify several at-risk communities, including: linguistic minorities, such as the San community in Botswana and Namibia (Haraseb, 2011; Ketsitlile, 2012; Sekere, 2011); religious groups (Ahmed, 2012; Auleear and Unjore, 2013; Baba, 2012; Dev et al., 2016); and pastoralist communities (Farag, 2013; Keiper and Rugira, 2013; Munene and Ruto, 2015; Woldab and Mekonnen, 2013). Exploring provision for ethno-linguistic minorities in rural Botswana, for instance, Mokibelo (2014) identifies schools in which teachers and students do not share a common language, with consequences for students' learning opportunities (see Box 3). Researchers note the need for more work on the educational experiences and outcomes of ethnic groups in different national contexts (Tesfay and Malmberg, 2014).

While **conflict** is widely recognised as a major barrier to equitable participation in education (Novelli et al., 2016), it is an underdeveloped area of research, with only 24 studies in this selection exploring conflict and education in the context of sub-Saharan Africa. Researchers within sub-Saharan Africa are exploring the impact of conflict on women's and children's education (Chauraya and Masakure, 2016; Ortiz-Echevarria et al., 2017), human rights violations—such as sexual violence and human trafficking—in conflict-affected areas, and conflict education to promote the Millennium Development goals (Dawo and Ongachi, 2011). Within this area, research addresses issues in post-conflict contexts, exploring for instance the potential for teachers to play a role in

reconstructing post-conflict countries (Rubagiza et al., 2016), rebuilding higher education institutions in post-conflict contexts (Johnson and Hoba, 2015), and school-based interventions to prevent risky sexual behaviours in post-conflict countries (Atwood et al., 2012). Bennouna, et al. (2018)argue for better surveillance and reporting of attacks on education in conflict-affected areas such as the Democratic Republic of the Congo and Somalia as a starting point to documenting and understanding the issue.

Box 5 Evidence on girls' education

Gender is the focus of almost one third of research on equitable and inclusive education in the database. Nearly 75% of these studies focus on girls' education at the secondary and primary education levels, respectively, with just five studies on gender and early childhood education, and two on vocational education and training. Consistent with the database-level pattern, Ghana, Nigeria and Kenya produce the most research on gender, following by Tanzania and Uganda. The research institutions affiliated with the greatest volume of research output on gender in education include the University of Cape Coast (Ghana), the African Population and Health Research Centre (Kenya), the University of Dar es Salaam (Tanzania), Makerere University (Uganda), and the University of Ghana.

Thirteen sub-Saharan African countries in the database however are not identified with research on gender, including Benin, Eastern Africa, Cabo Verde, Chad, Guinea, Guinea-Bissau, Mauritania, Niger, Gabon, Central African Republic, Comoros, Angola, and Seychelles. While this pattern is similar to research gaps in the database more generally, this national-level research gap is problematic, as what works for improving girls' education in one context will not necessarily be applicable in another: meaningful, local research evidence is needed for each system to address girls' equity and learning outcomes.

Researchers report impressive gains in girls' access to education across sub-Saharan Africa, particularly at the primary level (Abbott et al., 2015). While the transition to secondary school remains a challenge for many girls from disadvantaged backgrounds, Gajigo (2016) finds that a girls' scholarship programme in The Gambia increases enrolment among secondary female students by 5 percentage points, with similar effects on primary attendance.

Researchers warn however that enduring social, cultural and structural barriers continue to inhibit girls' full participation, particularly at the secondary level, with concerns that access alone is not leading to equitable learning outcomes (Abuya et al., 2014). Abuya et al. (2017) for instance report barriers for girls from poor urban communities transitioning from primary to secondary education in Nairobi, recommending greater community support. Kamanda et al. (2016) warn that in Sierra Leone, girls remain 23.4% less likely to attend secondary school than boys, with women's education positively associated with their children's educational well-being. Ahiakpor and Swaray (2015) report that male parents in rural Ghanaian communities prioritise boys' education based on entrenched gender norms.

A major research focus is **girls' health and wellbeing.** Disruptions to girls' physical and mental health impedes regular school attendance and negatively affects their learning in the classroom. Researchers advocate for adequate hygiene and sanitation facilities and education, particularly to promote menstrual hygiene management, remove associated issues with low-self-esteem, promote concentration in class, and encourage positive body image (Ajah et al., 2015; Alexander et al., 2014; Aluko et al., 2014; Sommer, Ackatia-Armah, Connolly, and Smiles 2015). Ndlovu and Bhala (2016) call for greater government action—such as appropriate policy frameworks, education and training, female-friendly sanitary facilities and local hygiene initiatives—as well as more research to promote menstrual hygiene management and inclusive girls' education.

Gender-based physical and sexual violence further threatens girls' participation in and safety at school. Agyepong, Opare, Owusu-Banahene and Yarquah (2011) report coordinated efforts to curb widespread sexual harassment of female students in Ghana, including educational policies from the Ghana Education Service and legislative changes. However, in many contexts, national policies to protect girls and women have not resolved the issue. As Abuya, Onsomu, Moore and Sagwe (2012) report, despite the Sexual Offences Act (2006) in Kenya, high numbers of girls and young women aged 15-24 report sexual coercion, harassment and violence. Muhanguzi (2011) calls for gender-sensitive

education across Africa to combat sexual abuse and exploitation, and to promote gender equality through secondary schools.

A particular body of literature focuses on **adolescent female students**, including equity issues such as exclusion, low educational attainment, and out-of-school adolescent girls (Abuya et al., 2017; Brooks et al., 2014; Chege and Arnot, 2012; Mwita and Murphy, 2017). A 2017 evaluation of the *Biruh Tesfa* (*Bright Future*, in Amrharic) programme in Ethiopia—which provides out-of-school adolescent girls with mentors, literacy and life skills training, and vouchers for medical services—found that girls in the programme were 1.6 times more likely to use health services, and had improved literacy skills compared to the control group (Erulkar and Medhin, 2017).

Adolescent pregnancy and early marriage are identified as major issues across the region, with the contribution of adolescents to fertility rates across sub-Saharan Africa higher than the global average (Beguy et al., 2013). Odebode and Kolapo (2016) found that among vulnerable teenage girls in Ibarapa Central local government area in Nigeria, factors contributing to early pregnancy include a lack of parental care and coming from a single-parent household, poverty, and peer influences. In another study on Nigeria, Ajah et al. (2015) found that while girls' knowledge of contraception was high, actual contraception use was poor. The authors call for adolescent-friendly reproductive health clinics and sex education curriculum in schools, reiterating calls in an earlier Nigerian study on teenage pregnancy by Aderibigbe et al. (2011).

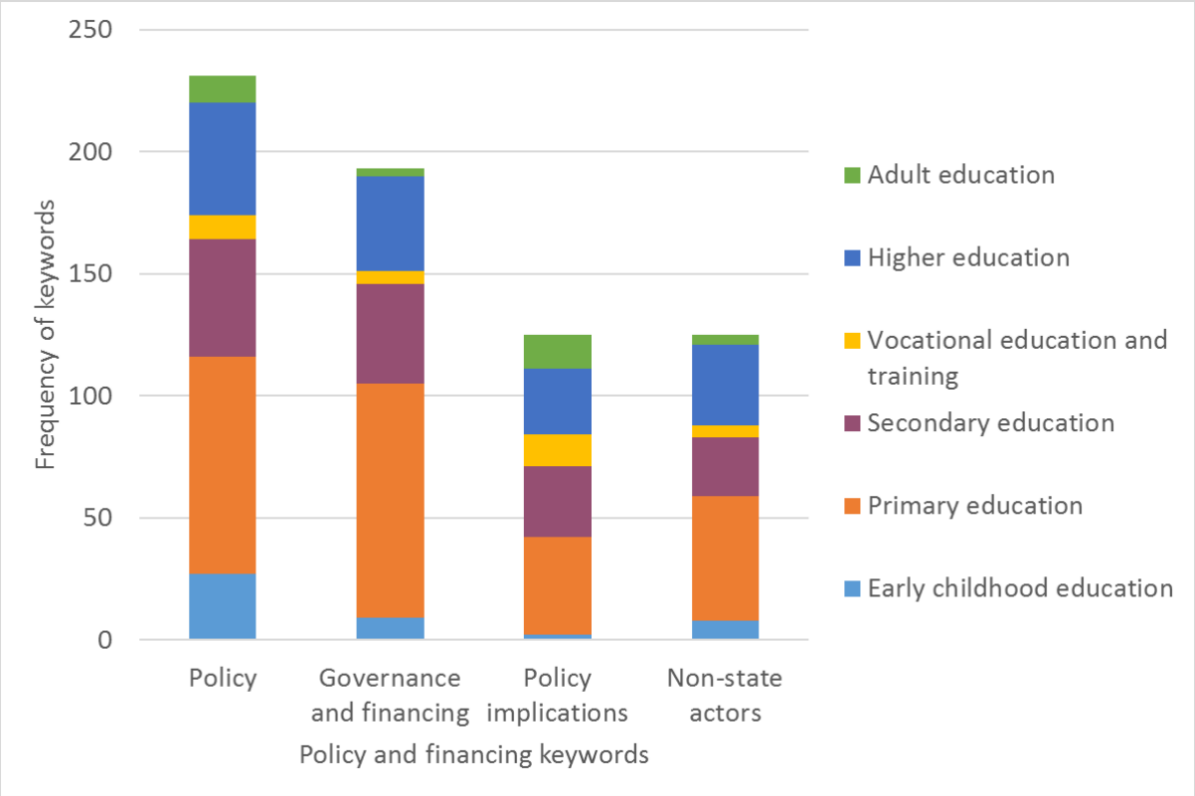
There is some research on **gender and science, technology, engineering and mathematics (STEM)**, including female students' performance in and perceptions of mathematics and science subjects. On the workforce side, the literature explores women in STEM careers, female science teachers as role models, and teachers' perceptions towards gender equity in STEM (Adegoke, 2012; Adesoji and Kenni, 2013; Gajigo, 2016; Mwita and Murphy, 2017).

In one study on **gender in higher education**, Tuomi et al. (2015) investigate the experiences of women with disabilities accessing higher education in Tanzania, finding that these women face the 'double marginalization of being a woman and having disabilities.' Maringa and Maringa (2013) argue that **vocational education and training** in Rwanda lacks an equity and access focus for women's participation, calling for a national-level response to promote TVET reforms for women. In a 2013 review of Malawi's Access to Teaching scholarship, Safford et al. (2013) argue that apprenticeship models provide a means for women to pursue continuing education while addressing chronic teacher shortages.

1.2.4 Policy and financing

Policy and financing—the fourth largest thematic area—incorporates: a) contextual factors at the national level that affect planning and implementation; b) general aspects of the national policy context (e.g. government spending, decentralisation, donors and NGOs); and c) specific issues of policy concern (e.g. school fees, student financial support, public-private partnerships).

Figure 8 Policy and financing research according to key phases of education



Research by scholars based in sub-Saharan Africa on general **education policy** covers issues such as: curriculum and assessment policies, including ICT, environmental education and language of instruction policies; workforce policies, including professional development and teacher performance management; equity and inclusion policies, such to support education programmes for children with disabilities, and school feeding programmes, and school funding policies, particularly in the aftermath of the 2008 global economic crisis; educational governance, including decentralisation policies; and universal basic education policies. A small body of literature addresses early childhood education and care policies (Box 2, Mangwaya et al., 2016; Maunganidze and Tsamaase, 2014; Odinko, 2012). Overall, the literature points to need for contextually relevant research and data to inform and improve policy decision making, planning, implementation and improvement, as complex political, cultural, historical and linguistic factors will impact the effectiveness of policy interventions and programmes.

Within the literature on **governance and financing**, primary education is associated with nearly half the research on cost-effectiveness, decentralisation, government and household spending, school fees, regional disparities in resourcing, and student financial support. There is comparatively little evidence on funding issues in relation to equity, such as gender-responsive budgeting.

As noted earlier, researchers are investigating the impact of **'pro-poor' policies**, such as the effect of government spending for universal basic education on various education outcomes (Amakom, 2016), including net enrolment and continuation in primary schools (Kayabwe et al., 2014; Senadza and Hodey, 2015), and access for low-income students (Gaddah et al., 2015).

Researchers within sub-Saharan Africa are also raising concerns about **inadvertent outcomes** of universal education policies, such as changes in school choice among low and higher-income

families and net enrolment in the free and fee-charging school sectors. Bold, Kimenyi, Mwabu and Sandefur (2015) for instance found that the abolition of primary school user fees in Kenya from 2003 precipitated a shift in demand away from government schools towards fee-charging private schools. In another study on Kenya, Appleford, Odero and Eramus (2015) document uneven implementation of Free Primary Education policies among urban poor communities, finding that poor planning and resource allocation, political interference and teachers' reluctance to work in Nairobi's slum schools are inadvertently increasing inequities for the urban poor.

Researchers are also examining the implications of **decentralisation** (around 21 studies)—such as Ethiopia's District Level Decentralization Programme and Uganda's decentralisation reforms in the 1990s, and Ghana's decentralisation policies from the late 1980s—on education quality. Researchers based in sub-Saharan Africa are investigating the implications of decentralisation policies on, for instance: capacity development and distributed responsibilities at the school, district, and regional levels; financing and resourcing; and strategic planning (Essuman and Akyeampong, 2011; Iyengar et al., 2015; Maractho, 2017; Nudzor, 2014; Venkataraman and Keno, 2015). Ansong et al. (2015) explore the potential of decentralisation policies to improve regional disparities in resourcing and learning outcomes across Ghana, arguing that decentralization may allow educational investments and funding to be tailored to local contexts. Essuman and Akyeampong (2011) warn however that whatever the potential of decentralisation in Ghana, policy implementation contends with local politics of influence within the community, and that community participation and meaningful consultations will be crucial.

To meet the challenge of universal education in resource-constrained contexts, governments across sub-Saharan Africa are exploring partnerships with **non-state actors** and **public-private partnerships** as a means of funding programmes, infrastructure, and facilities for education at all levels. Non-state actors may include for instance donors and NGOs, private partners, and religious organisations. There is however mixed evidence, with very few research studies quantifying the impact of public-private partnerships on educational access and outcomes, such as equity and learning outcomes, across the database (only 7 at the time of analysis). In their 2016 study of the potential for public-private partnerships to offer alternative finances options to governments, Kwarteng and Naibakelao (2016) find that the Sasakawa Africa Fund for Extension Education (SAFE) expanded access and quality in agricultural education in Ghana. From a different perspective, Wokadala and Barungi (2015) warn that wealthier families benefit more than poorer households from government subsidies for public-private partnerships in universal secondary education in Uganda. In the context of alternative financing mechanisms in higher education in Ghana, Badu et al. (2018) argue that public-private partnerships—such as build-operate-transfer or build-own-operate initiatives, management contracts, or service contracts—can offer governments an option to cater for growing demand for tertiary education.

Yogo (2017) finds that high levels of foreign **educational development aid** to sub-Saharan Africa have significantly increased primary school completion rates, demonstrating the impact of aid as a policy tool for sustainable development. While international donors and development partners can provide alternative means of funding other than domestic spending, however, Mattingly and Abdallah (2016) point to **declining financial support from donors and NGOs** as a major barrier to sustainable development across the region, particularly with implications for funding to support children with disabilities.

Box 6 Implementation barriers to education policy

An important contribution of the research by scholars based in sub-Saharan Africa is a body of literature looking at policy implementation barriers across education systems in the region. Implementation barriers identified by researchers based in sub-Saharan Africa can be clustered into four main categories.

System-level barriers to policy implementation at the level of national or local education authorities recur throughout the literature. Specific system-level issues include inadequate policy planning and evaluation, with insufficient attention to school-level perspectives and conditions (Moswelaspi and Mukhopadhyay, 2011); inadequate communication and trust between schools, local communities and national education authorities (Essuman and Akyeampong, 2011; Kunnuji et al., 2017); and challenges inherent in curriculum reform, such as generating space in the timetable for new subject areas without compromising depth, and ensuring alignment between curriculum, instruction and assessment (Chau et al., 2016).

Teacher capacity and professionalism are highlighted as barriers to effective policy implementation. Researchers highlight for instance the impact of teachers' attitudes towards their profession; a lack of knowledge and skills, for example in ICT, pedagogical content knowledge; and low awareness of classroom practices to support students with special learning needs, such as those visual impairment or other disabilities (Nampota, 2011; Zinyeka et al., 2016). Researchers call for investment in teacher professional learning and support to help the workforce implement policies and reforms—such as language of instruction, or effective instruction in large classes (Asim et al., 2013; Koloi-Keaikitse, 2016).

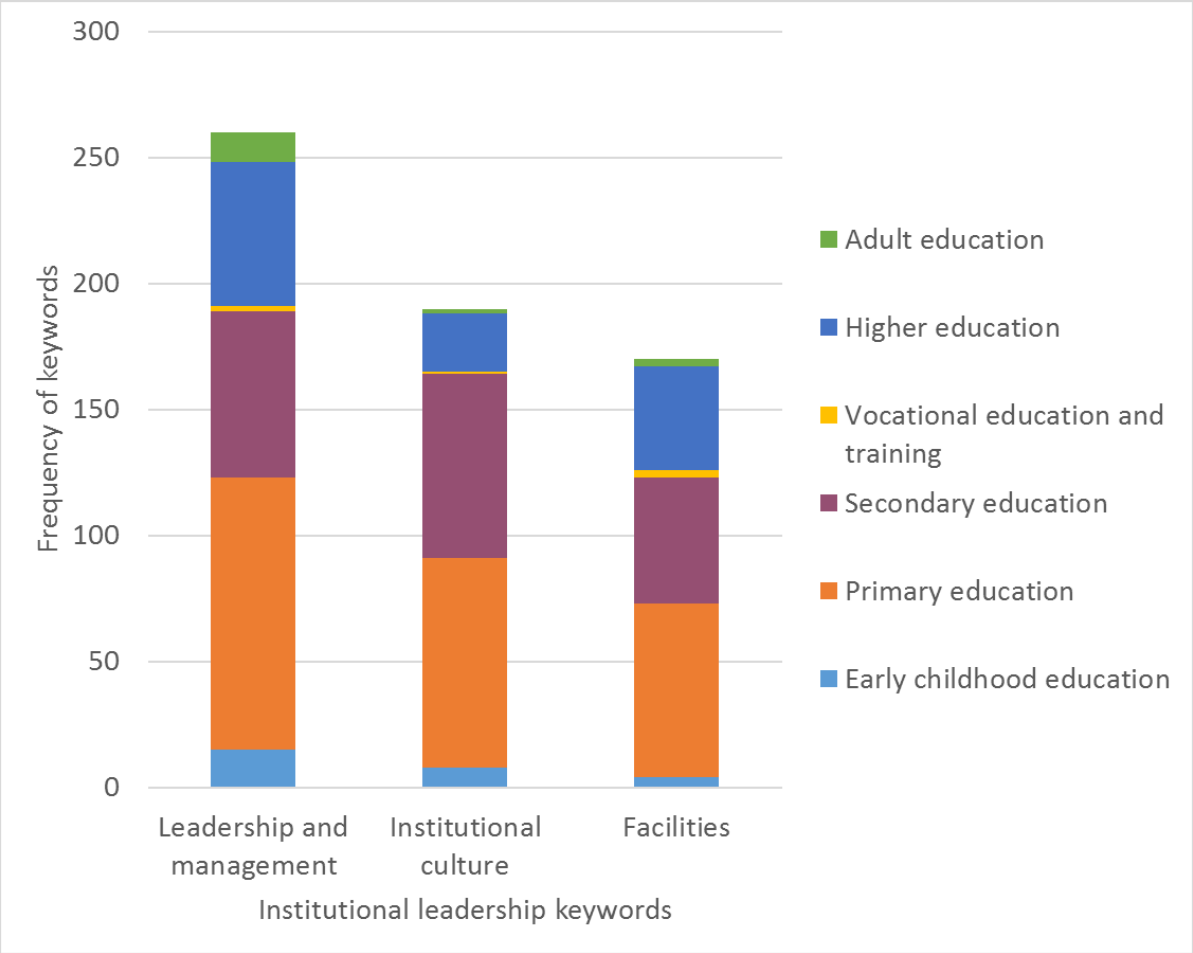
Related to teacher capacity is the issue of **structural and resourcing limitations**, such as school working conditions and workload for teachers (Gemeda et al., 2014; Gemeda and Tynjälä, 2015); poor internet connectivity and a lack of ICT equipment (Asuman et al., 2018; Tarus et al., 2015); inadequate technical support for web-based or online learning; and general lack of resources (Nampota, 2011; Nkoma and Hay, 2018).

The literature also points to **social and cultural barriers**, particularly in regards to social attitudes towards minorities and people with disabilities (Moswelaspi and Mukhopadhyay, 2011); social resistance to areas deemed culturally sensitive, such as sex education and language of instruction policies (Chau et al., 2016); and perceptions about the relative usefulness of English and African languages for students' employment prospects after school (Ndamba et al., 2017).

1.2.5 Institutional leadership, culture and facilities

The thematic area of institutional leadership, culture and facilities—which is about half the size of language and curriculum—relates to institutional factors outside the classroom, including: leadership and management at the school and system level; institutional culture (e.g. staff relations, violence); and institutional facilities (e.g. libraries, water, sanitation and hygiene).

Figure 9 Institutional leadership, culture and facilities research according to key phases of education



Leadership and management research focuses on the primary school level, with roughly equivalent attention to secondary and higher education and comparatively little attention to adult education, early childhood education, or vocational education and training (Figure 9). Research by scholars in sub-Saharan Africa on this thematic area focuses predominantly on issues related to **school-level accountability and school self-evaluation**, and school relationships with **local communities** (particularly at the primary level), **education authorities,** and **school management committees.**

Relative to the global research field, it appears that comparatively few studies examine the impact of school leadership and **instructional supervision** on school performance in sub-Saharan Africa. Quarshie and Oyedele (2011) report improved school performance in Zimbabwe associated with an education leadership, management and development programme run by a private university in Zimbabwe; while Oghuvbu (2011) argues that instructional supervision is critical for the interpretation and implementation of the primary school curriculum in Nigeria.

Research on educational leadership and **principal preparation** emphasises the need for timely and sustained professional development so that newly-appointed and experienced leaders have the professional knowledge and skills they need to improve school performance and implement system policies. Gioko (2013) for instance reports that a leadership and management program designed to promote technology in teaching and learning—in line with Kenya's 'Vision 2030'—

improved school leaders' awareness of benefits of technology. However, studies from Ghana, Tanzania and Botswana report a lack of pre-appointment, induction and in-service leadership development for school leaders, particularly in financial skills, interpersonal skills, ICT skills, and school management processes (Bosu et al., 2011; Pheko, 2018; Totolo, 2011). Donkor (2015) for instance finds that in Ghana, teachers in basic schools have inadequate access to leadership and management training, while Onguko et al. (2012) similarly report concerns of limited principal preparation and induction for newly-appointed headteachers in Tanzania and East Africa.

Only a few studies address female school leaders and **gender equality in educational leadership**. Sperandio and Merab Kagoda (2010) argue that the under-representation of women in secondary level school leadership is the result not of a lack of female teachers aspiring to leadership but rather a lack of support from school administrators. The authors recommend leadership development policies and programmes to help women prepare for leadership applications. Agezo and Hope (2011) find no evidence of differences between female and male leadership styles, challenging traditional Ghanaian beliefs about gender and leadership.

An additional body of research by scholars based in sub-Saharan Africa looks at concepts in **educational leadership and leadership styles** (Adegbesan, 2013; Okoroji et al., 2014), such as transformational leadership (Tesfaw, 2014b), leadership for sustainable education (Oyetunji, 2011), and instructional leadership (Oghuvbu, 2011; Smith and Amushigamo, 2016; Wanzare, 2012). In addition, Pansiri (2011) questions the impact and applicability of 'Western' models of leadership—such as transformational leadership—in low- and middle-income educational contexts.

Many countries across sub-Saharan Africa are pursuing **decentralised school governance and management** (Essuman and Akyeampong, 2011; Harber and Oryema, 2014; Kufaine and Mtapuri, 2014). Researchers in the region investigating this shift are exploring the implications of distributed the roles and responsibilities of central, regional and local authorities, and schools (Nudzor, 2014), and the role of governing school boards and management committees in school effectiveness (Nkundabanyanga et al., 2015). On the issue of **school accountability** (17 studies within the leadership and management research), researchers explore teacher performance management, and effective leadership practices for turning around underperforming schools (Biputh and McKenna, 2010; Chua and Mosha, 2015; Fasasi and Oyeniran, 2014; Mobegi and Ondigi, 2011; Odendaal and du Plessis, 2018; Oluremi and Oyewole, 2013; Ramseook-Munhurrun and Nundlall, 2013). Adapting the accountability framework of the World Bank's 2004 World Development Report, Komba (2017) for instance advocates clearer relationships, guidelines and policies to support accountability for student learning in public pre-primary, primary and secondary schools in Tanzania. Iyengar et al. (2015) found that programmes that provide technology and training to local decision-makers in Nigeria helped the implementation of data-driven education planning, information systems development, and data-informed accountability.

An important contribution of education research by sub-Saharan African scholars is a body of literature examining the impact of **institutional facilities and infrastructure on access and equality**. Researchers have identified key factors contributing to schools becoming safer and more inclusive (Agol and Harvey, 2018). The installation of secure, female-only toilets led to significant improvements in female attendance in Somalia (Kipchumba and Sulaiman, 2017), while evidence from Kenya indicates that financial assistance can improve female attendance and learning outcomes (Brooks, Bryant, Shann, Bukuluki, Muhangi, Lugalla, Kwesigabo 2014). One study found that school electrification can promote improved student learning across districts' in Ghana,

particularly for rural and deprived communities (Adamba, 2017); and others that electricity and water supplies promote gender equality in schools (Alexander et al., 2014; Njoh et al., 2016).

Box 7 Violence and disciplinary policies in schools

Researchers within sub-Saharan Africa are exposing the impact of **violence against children and young people** in a range of contexts, including violence arising in the school, at home, and in the community. Researchers call for school and national-level policies to reduce all forms of violence against and harassment of children and young people (Aluede et al., 2012; Gudyanga et al., 2014; Olujuwon et al., 2013).

The literature documents violence against children and young people at school perpetrated both by other students and by staff and teachers. Within this, 49 studies directly exploring violence in schools report diverse instances of physical violence, emotional abuse and verbal abuse. In their 2016 study on **school-level factors associated with teacher violence against students**, Knight, Allen, Gannett, Naker and Devries (2016) found that 53% of students at one low-resource school in Uganda reported experiencing physical violence from staff, with higher incidences of violence reported at schools with a higher proportion of girls.

National-level legislation, school policies, and cultural attitudes at schools shape **teacher attitudes towards corporal punishment**. However, across the 23 studies on corporal punishment, findings vary as to what teacher attitudes look like in schools. One study in Tanzania found that many teachers support moderate corporal punishment as behavioural management strategy (Feinstein and Mwahombela, 2010); while a 2014 study in Zimbabwe found that few teacher respondents participating in a Problem Behaviour Survey reported that physical punishment was effective for managing problem behaviours (Chitiyo et al., 2014).

At-school violence and bullying negatively impact student learning and mental health. Devries, Child, Allen, Walakira, Parkes and Naker, (2014) for instance found that recent physical violence at school doubled the odds of poor academic performance among female students, and negatively affected their mental health and wellbeing. Dunne, Sabates, Bosumtwi-Sam and Owusu, (2013) similarly report that experiences of bullying may contribute to truancy, particularly among girls, though positive peer relationships may mitigate against absenteeism associated with bullying. A primary-school level study by Opoku-Asare et al. (2015) found that high rates of fighting and bullying among students in Ghana lowered students' self-esteem, reduced concentration in class, and led to passive attitudes towards learning.

Researchers have also identified diverse risk and protective factors associated with at-school violence and bullying between students (Mosia, 2015). Ohene et al. (2015) found for instance that among **secondary school students** in Ghana, students' history of sexual activity, feelings of hopelessness or depression, and being a victim of bullying were risk factors of sexual violence victimisation, while belonging to a friendship circle that is not sexually active may be protective.

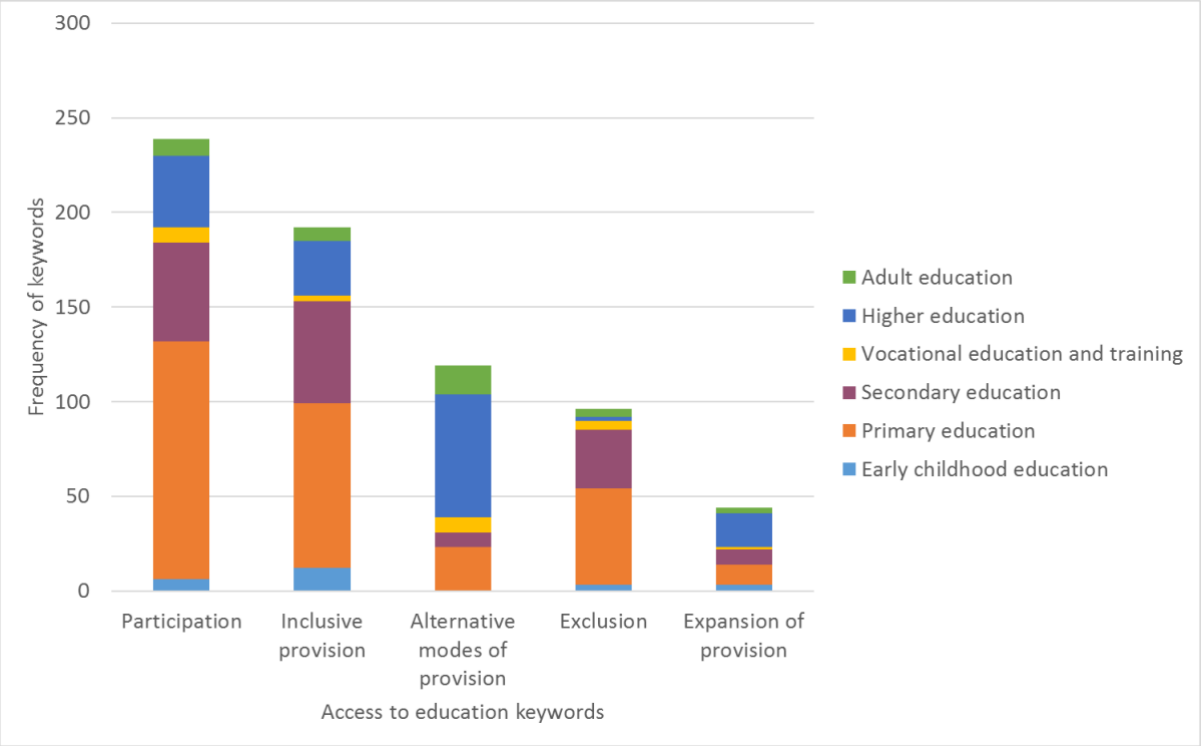
Another body of literature looks at **violence against girls and women in conflict-affected areas, and attacks against education** in the region. In an analysis of the impact of gender-based violence on women's education in Africa, Chauraya and Masakure (2016) argue that women and children bear the brunt of civil conflict, sexual violence, disease, lack of food, and forced servitude. In their study on human rights violations in the Democratic Republic of Congo, Alfaro et al. (2012) report widespread attacks against education, with an estimated 44,898 children, including female and male students, throughout South Kivu Province subjected to grave physical violence (including abduction, maiming or killing, recruitment, or attacks on education) within the first half of the year.

Research by scholars in sub-Saharan Africa includes limited evidence of school-based interventions designed to reduce violence against children. One example is research on an intervention—the *Good School Toolkit*—which was found to improve student-teacher relationships and reduce, though not eradicate, teacher-based violence against students (Kyegombe et al., 2017).

1.2.6 Access to education

Access to education covers school and system-level issues including enrolment and age-in-grade data, repetition and progression, completion, exclusion, and provision (including distance or emergency education).

Figure 10 Access to education research according to key phases of education



Research on access to education emphasises a recurrent theme across research by scholars in sub-Saharan Africa: namely, that **increased access does not automatically lead to equitable learning outcomes for all.** Researchers looking at a range of contexts demonstrate that access or parity alone is not leading to improved outcomes. In the era of Education for All, investments in facilities and resources to meet increased enrolments and access need to be balanced with efforts to improve teaching and leadership (Ngwaru and Oluga, 2015; Nudzor, 2015).

Research on **participation in education** and **inclusive provision** follows the database-level pattern, with the majority of studies concentrated on primary, secondary and higher education. Studies exploring **alternative of modes of provision**—such as e-learning, distance learning, emergency provision and mobile learning—concentrate on higher education, potentially because of the role of ICT and resources such as the internet, which are inadequately or inconsistently provided at the primary and secondary level.

The literature exploring **access to education** encompasses actual school attendance rates, as well as official or claimed enrolment. The majority of studies in the database on **enrolment** (45 studies) focus on primary education, followed by secondary and higher education. As in other areas, extremely few studies examine enrolment in early childhood education.

Researchers are exploring multiple themes, such as low educational participation among marginalised children in remote and rural areas (Molosiwa and Boikhutso, 2016), the impact of access to village- or community-based savings and cash transfer programmes on educational

access (Cameron and Ananga, 2015; Skovdal et al., 2013), and the impact of out-of-grade or late entry to schooling on student outcomes (Ngware et al., 2013, see Box 8). Additional focuses include education subsidies for basic schools and factors influencing parents' enrolment choices in rural in rural Ghana (Ahiakpor and Swaray, 2015; Gaddah et al., 2016), and the impact of girls' scholarships on female student enrolment (Gajigo, 2016).

A specific research focus within access to education is **age range within grade levels** and **repetition** (16 studies on progression and repetition), which has implications for net and gross enrolment data as well as for curriculum implementation (such as multigrade teaching) and learning outcomes.[v] Though modest in scale, research by scholars based in sub-Saharan Africa makes an important contribution to understanding the impact of and factors associated with grade-level repetition in sub-Saharan Africa (Ahmed and Mihiretie, 2015; Dunne and Ananga, 2013). Hungi, Ngware and Abuya (2017a) for instance found that grade repetition is among the individual-level learning barriers with the greatest impact on student achievement for primary school students in rural Uganda; while Sunny, Elze, Chihana, Gondwe, Crampin, Munkhondya, Kondowe and Glynn (2017) found that being over age in later primary school grades (4 to 8) was associated with dropping out of school.

Research by scholars in sub-Saharan Africa on educational access also touches on the impact of **school facilities and infrastructure**, particularly for disadvantaged children. Many young people from rural areas report finding it difficult to enrol in a local secondary school, while inadequate hygiene facilities can adversely impact attendance among adolescent female students (Alexander, Oduor, Nyothach, Laserson, Amek et al. 2014). Studies on the role of facilities and infrastructure to improve access—such as library media sources for secondary students in prison—indicate the need for greater resources and investment for at-risk student populations (Busayo and Elaturoti, 2016; Dzandza, 2017). In their analysis of the effects of 'girl friendly spaces' on girls' enrolment and attendance at secondary schools in Somalia, for instance, Kipchumba and Sulaiman (2017) found that inclusive spaces can improve adolescent girls' attendance and reduce absenteeism associated with menstruation. However, Njoh et al. (2016) caution that government investment in improved sanitation in African systems has not in fact been matched by a commensurate increase in female secondary education, and that attention must also be paid to the negative impact of domestic chores on girls' and women's educational participation. Bamgboye et al. (2017) similarly find that domestic chores, as well as food insecurity, contributes to high drop-outs and out-of-school rates among vulnerable children and orphans.

Humphreys, Moses, Kaibo and Dunne (2015) recommend looking beyond indicators of access—such as enrolment—towards more nuanced school-level factors influencing student access, such as timetabling and disciplinary policies which may implicitly or explicitly exclude disadvantage children, such as those travelling long distances to school.

Box 8 Exclusion and alternative modes of provision

Exclusion from education affects millions of primary and secondary-aged children across sub-Saharan Africa, driven by diverse and complex social, economic and political factors. Research by scholars in sub-Saharan Africa on exclusion and alternative modes of education explores risk factors associated with students **dropping out** of primary and secondary education, including for instance gender (Ajaja, 2012; Nsagha and Thompson, 2011), economic shocks (Woldehanna and Hagos, 2015), migration (Pufall et al., 2015), flood and natural disasters (Mudavanhu, 2015), ethnicity (Maruatona, 2015; Tesfay and Malmberg, 2014), disability (Lynch, Lund and Massah 2014), and loss of parents (Ha et al., 2015; Yamin et al., 2015). Studies on Kenya (Abuya, Oketch and Musyoka, 2013) and Rwanda (Williams, Abbott and Mupenzi, 2015) have identified specific factors—such as hidden costs and chronic

poverty—that contribute to children and young people dropping out of formal education, even in contexts where there is 'free' education.

In the context of Ghana, Ananga (2011) recommends targeted policies for preventing drop outs, rather than generic approaches (such as identifying teachers and community members who are responsible for monitoring and supporting children who are deemed at risk of dropping out); while Alika and Ohanaka (2013) found parent support and school-level counselling to have a positive effect on encouraging re-entry to school among secondary drop-outs in Abia state, Nigeria.

To address exclusion, governments and researchers are also exploring options for **alternative provision**. While modest in size, literature by researchers based in sub-Saharan Africa examines alternative provision in for instance arid and semi-arid areas (Munene and Ruto, 2015), the Sahel-Saharan strip (Bah-Lalya, 2015), and malaria-affected areas (Thuilliez et al., 2017). In a study on primary and secondary education in Ghana, Sherris, Sulemana, Alhassan, Abudu and Karim (2014) argue that complementary education programmes like School for Life is one means of providing basic literacy and numeracy skills for young people excluded from formal schooling due to diverse sociocultural and socio-economic reasons (e.g. those from subsistence farming families).

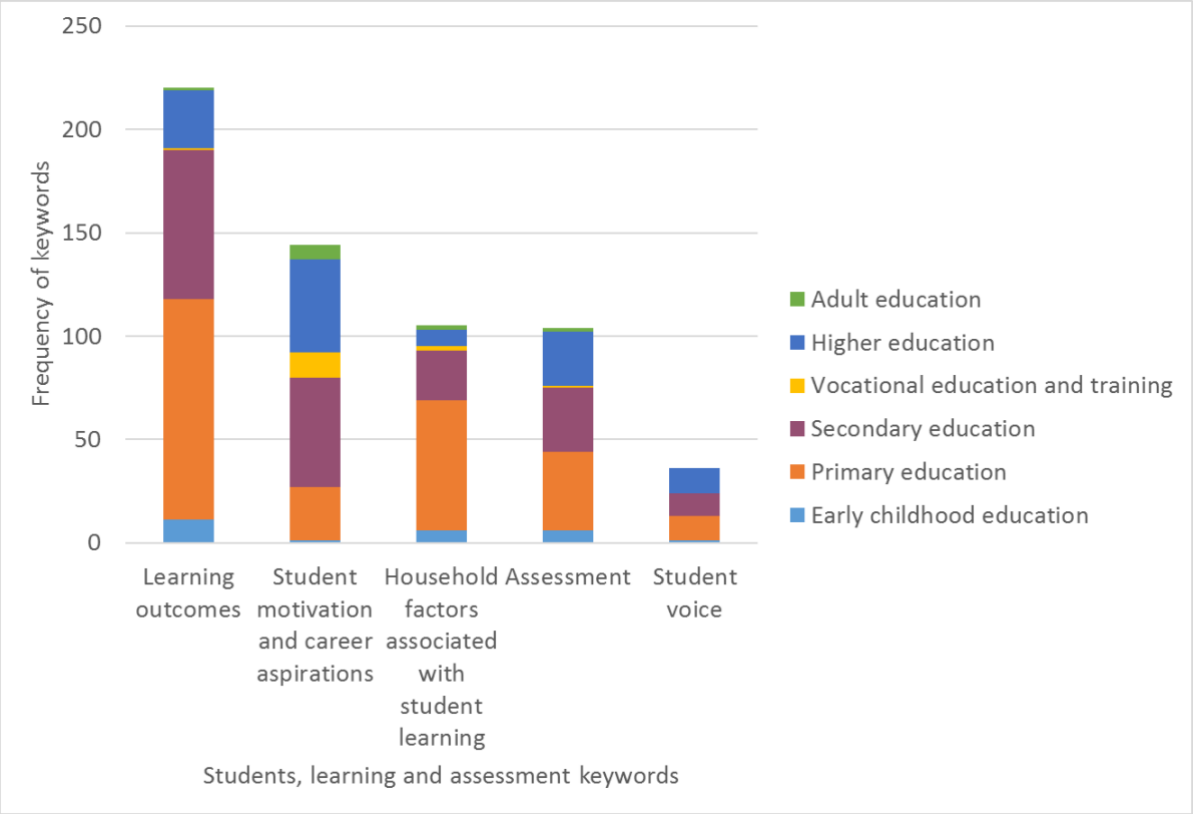
Alternative provision, such as via online or mobile learning, can serve to sustain learning opportunities for children and young people most at risk of exclusion through conflict and other factors. Stubbé, Badri, Telford, van der Hulst and van Joolingen (2016a) for instance found that e-learning Sudan—a computer/ tablet game that provides alternative learning opportunities for Sudanese children excluded from regular schooling—can increase mathematics knowledge and maintain motivation to learn among students from remote villages. Mpofu et al. (2013) note that the lack of access to either computers or electricity is limiting the impact of ICT for distance education for students from rural areas in Zimbabwe.

More research is needed on alternative provision for children affected by conflict, forced migration and other forms of exclusion.

1.2.7 Students, Learning and Assessment

This thematic area (the second smallest across the research reviewed in this analysis) covers diverse factors related to student learning and experiences, including student motivation and student voice, learning outcomes, and forms of summative and formative assessment at the classroom, school, national and international level.

Figure 11 Students, learning and assessment research according to key phases of education



The research on learning outcomes—which receives comparable attention to, for instance, gender, or participation, across the research in this analysis—focuses largely on primary and secondary education, and concentrates on student learning outcomes (172 studies) and standards of attainment (Box 9). Few studies address learning outcomes in vocational education and training or adult education.

The literature on **student motivation and career aspirations** engages with diverse topics ranging from classroom practice to system-level policies. At the classroom level, researchers are investigating for instance the role of **student attitudes towards science subjects** (Mutonyi, 2016), such as how student motivation impacts the effectiveness of problem-based learning in physics (Argaw et al., 2017b; Qhobela and Moru, 2014). In an investigation into girls' attitudes towards careers in STEM subjects, Nwosu et al. (2014) found that 'differentiated mentoring' can positively change female school students' perceptions of and interest in science and technology. At the system level, Ahmed and Mihiretie (2015) caution that **automatic promotion policies** in Ethiopia may negatively affect low-achieving students' motivation to learn, particularly when promotion policies are not accompanied by system support and implementation guidelines.

The literature also investigates the role of **parental and teacher attitudes** in students' motivation to learn. Akaneme et al. (2016) found that teachers' and parents' attitudes can foster positive motivation to learn among students at the secondary level. Komba (2013) corroborated these findings at the primary school level, finding that the attitudes of disadvantaged primary-school aged children towards their schooling is impacted by diverse home and school factors, including parental and teacher attitudes, as well as the attitudes of their peers.

Almost 100 studies explore **household factors associated with student learning**, such as wealth, education level and location. Parental involvement and level of education (Bellon et al., 2017; Kiwanuka et al., 2015), including whether students engage in literacy activities at home, have been found to be associated with a range of student learning outcomes, including early years' literacy in low-income families (Chansa-Kabali, 2017), and mathematics achievement (Abuya et al., 2015; Fajoju et al., 2016; Kiwanuka et al., 2015; Sunny et al., 2017). Conversely, research indicates that instability at home—including migration, and students living away from their mothers—is negatively associated with academic attainment (Pufall et al., 2015).

Researchers in sub-Saharan Africa are also exploring issues related to **assessment and examinations.** Literacy assessment is a major focus, with researchers investigating oral and silent reading tasks in assessing reading fluency and other assessments for early grade reading (Brunette et al., 2014; Lucas et al., 2014), reading to learn programmes (Oketch et al., 2014), and English language assessments for primary and secondary school students (Alimi, 2011; Vikiru, 2011). Aside from literacy, researchers are exploring assessment in other areas such as life skills (Adewale, 2011) and student knowledge of HIV/AIDS (Mutonyi and Kendrick, 2011). The research does demonstrate, however, the need for professional learning to develop **teachers' competencies** in assessment practices (Ekuri et al., 2011; Koloi-Keaikitse, 2016), for instance in developing multiple-choice assessments for large class contexts (Asim et al., 2013).

At the system level, researchers are investigating **assessment in curriculum reform**, and the extent of alignment between curriculum, assessment and learning standards. Wasanga and Somerset (2013), for instance, explore the role of examinations in pedagogical change in Kenya since the 1970s; Kanjee and Acana (2013) consider the role of examinations for selection and certification, large-scale assessments for monitoring education quality at the national level, and classroom assessments to improve teaching and learning in Uganda; while Iipinge and Kasanda (2013) examine curriculum and assessment reforms in Namibia since the 1990s, arguing that 'there is a need to align curriculum changes, standards and assessments in Namibia, since this is viewed as critical for the effectiveness of any education system.'

Box 9 Evidence on student learning outcomes

Researchers in sub-Saharan Africa investigating learning outcomes across the region are confirming the learning crisis: more children are accessing primary and secondary education, but learning outcomes are not improving, with millions of children failing to meet curricular standards in literacy and numeracy.

The impact of increasing enrolment and universal education policies on student learning outcomes is a particular focus within research by sub-Saharan African scholars. Busingye and Najjuma (2015) for instance investigated the role of learning and teaching materials in advancing student learning after Uganda's universal primary education policies. In a study on the impact of Universal Basic Education on teaching and learning in mathematics in Southern Africa (including Botswana, Malawi and Zambia), Kazima (2014) argues for age-appropriate enrolment and quality primary education to promote student learning. Bellon et al. (2017) have investigated the impact of parental engagement and leadership on academic performance in the wake of inadequate learning resources for students in a Free Primary Education program in Kenya.

The research base on learning outcomes makes use of large-scale assessment data at the national and cross-national level, including Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ) assessments and Uwezo assessments in East Africa. Researchers are using Uwezo data to explore enduring functional illiteracy and innumeracy in East Africa, despite gains in enrolment and gender parity (Jones, Schipper, Ruto and Rajani, 2014), literacy and numeracy in Tanzania primary schools (Sumra et al., 2015), and progress in children's learning in Uganda (Uwezo,

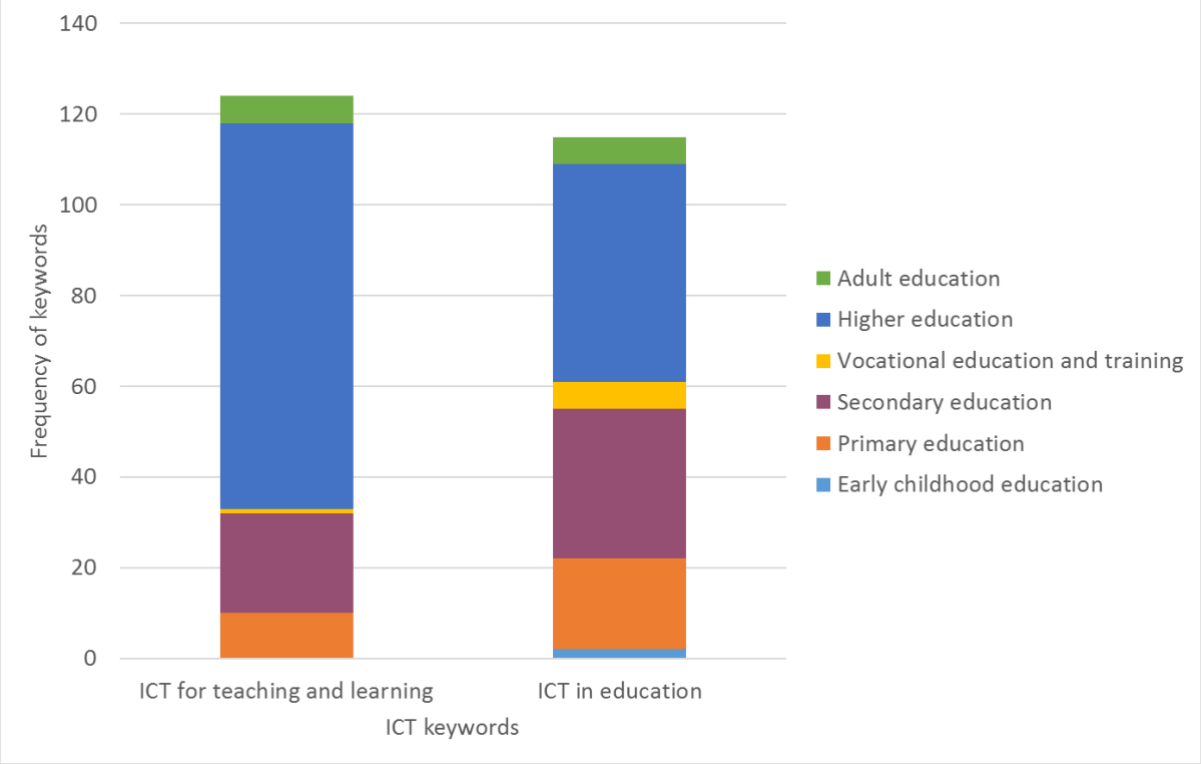
2016). Researchers in the region are calling for access to quality assessment data to inform policy-relevant research.

Accountability is another focus within the research on learning outcomes. Researchers investigate the role of different forms of accountability—such as financial, regulatory, professional and participatory accountability—in improving student learning outcomes (Komba, 2017); and regional disparities in student performance and resourcing arising from school decentralisation, for instance in Uganda (Maractho, 2017).

1.2.8 Information and communications technology (ICT)

The thematic area of information and communications technology (ICT) relates to ICT as a means and focus of teaching and learning at the institutional and classroom level at all phases of education, and as an information management tool. ICT is a more specific area than some of the other themes, and is the smallest of the eight thematic areas identified in this analysis.

Figure 12 ICT research according to key phases of education



Unlike the other thematic areas, research on **information and communications technology** is heavily concentrated in higher education, followed by secondary and primary education (Figure 12). This weighting possibly reflects the availability of ICT resources and facilities at these respective phases of education, the feasibility of studies on ICT in education in terms of access to data, and a lack of resources in schools.

The research literature on **ICT for teaching and learning**—which is a comparatively small topic—focuses primarily on e-learning (98 studies) (see Box 10), information management (9 studies) and learning using mobile phones (31 studies). Researchers present two sides to the use of **mobile phones** in schools, including within and outside the classroom: the potential of mobile phones as an assistive technology to improve teaching and learning; versus the risk that mobile phone use in

class is a potential distraction, and can negatively impact concentration and time on task in the classroom (Joyce-Gibbons et al., 2017; Omiunu, 2017; Porter et al., 2016).

The literature on **mobile technologies** generally explores how these technologies can expand access to and ensure continuity of education, particularly in remote or conflict-affected areas, and for transient or nomadic learners at all phases of education (Awoyemi, 2017; Barreh and Abas, 2014; Kabir and Kadage, 2017; Ogunduyile, 2013; Wassa et al., 2015). Mobile technologies to improve pedagogy, such as computer- or mobile-phone based learning games, have been found to promote literacy skills and to aid English-language instruction in schools (Jere-Folotiya et al., 2014; Ogunduyile, 2013; Ojanen et al., 2015). Research on ICT and mobile phone-enhanced learning to support access to reading materials and digital reading is another area of focus (Babarinde et al., 2018; Gbadamosi, 2011; Ojanen et al., 2015; Osuchukwu and Edewor, 2016; Rabaud et al., 2018; Sailors and Kaambankadzanja, 2017; Walubita et al., 2015). Evidence is mixed, however, with outcomes contingent upon teacher knowledge and student engagement. Notably, ICT researchers emphasise the need for **targeted professional learning** to ensure teachers have the requisite knowledge and skills to effectively use mobile phones for teaching and learning and to mitigate potential misuse of mobile technologies in the classroom (Busulwa and Bbuye, 2018).

A subset of the literature explores the potential of mobile technologies to promote more equitable learning opportunities (Sungkur et al., 2017). Sanya and Odero (2017) explore for instance the positive impact of mobile phone use and civic education programmes on the literacy levels of self-identified 'illiterate' women living in rural communities in Kenya, while Adetoro et al. (2017) recommend that mobile learning providers could have a role to play in developing user-friendly technologies to promote computer literacy among students with disabilities.

The research literature on **information management** concentrates on the use of data in higher education, though the overall number of studies is small. At the school level, Kinai et al. (2017) explore the use of School Census Hub to improve school effectiveness, budgeting, and learning environments; while Iyengar et al. (2015) analyse efforts to train local decision-makers to use data to improve national-level policy implementation in Nigeria.

The capacity of students to use ICT is an important factor if such tools are to enhance student learning. However, few studies focus on the teaching and learning of ICT as a subject to develop students' knowledge and skills for effective application of ICT in other subjects and life beyond school. One evaluation study of ICT curricula in six sub-Saharan African countries indicated that teaching fails to focus on how ICT can be applied to enhance learning across subjects and to promote lifelong learning (Mereku and Mereku, 2015). In Malawi, teachers stressed the introduction of technology studies in primary schools will help learners to develop survival skills, as chances for secondary education is limited (Chikasanda et al., 2013). In a study in Uganda, Ameri (2013) found that only 25% of secondary school students attain required computer literacy, with female students underperforming relative to their male peers. Challenges facing teaching and learning in ICT include large class sizes and lack of facilities, such as computers and access to internet (Mtebe and Twaakyondo, 2012; Tedre et al., 2011).

Box 10 Evidence on e-Learning

E-learning is a prominent focus within research on ICT for teaching and learning, with 98 studies addressing this issue. The increasing availability of computers and other devices such as smartphones across sub-Saharan Africa has encouraged a focus on e-learning as a tool for teaching and learning (Tarus et al., 2015). The research included in the database shows research on e-learning is skewed

towards higher education, potentially because of greater investment in ICT facilities by higher education institutions (i.e. for distance education), greater access among graduate students to devices which facilitate e-learning, and the fact that three quarters of rural schools in the region do not have electricity.

E-learning has influenced education delivery through changes in instruction (Chawinga, 2017), assessment (Ogange et al., 2018), widening participation strategies (Musita et al., 2018) and massive open online courses (MOOCS) for teacher professional development (Oyo et al., 2017). As an instructional tool, for instance, Twitter and blogs were integrated into undergraduate courses in Malawi, which facilitated sharing of learning materials and interaction between students and teachers (Chawinga, 2017). Similarly, students in Sudan reported finding Forum and Wiki as effective tools for engineering education (Elmahadi and Osman, 2012). Cooperative e-learning strategies have been found to improve chemistry instruction and learning outcomes for secondary students in Kenya (Chebii et al., 2018).

In relation to assessment, students rated **online formative assessment** as more effective than traditional forms of summative assessment, given they receive detailed feedback from peers and through computer programmes (Ogange et al., 2018), while voice-based e-examination systems have been found to benefit visually-impaired students in open and online distance course (Azeta et al., 2017).

E-learning has similarly been shown to widen education participation for disadvantaged groups. As flagged earlier, Stubbé et al. (2016a) for instance found that *E-learning Sudan*—a project which provided computer games for out-of-school children to assist their mathematics learning opportunities—led to improved mathematics knowledge. Takang and Bukania (2015a) found that a literacy programme called *GraphoGame*—a tablet game for early year students—similarly showed potential for enhancing literacy skills in children in rural Zambia. Further evidence of e-learning in widening participation is found in an open distance programme for secondary school dropouts in Kenya, designed to provide alternative pathway to secondary education (Musita et al., 2018).

E-learning is also used to enhance **teacher knowledge** in formal and informal settings. For instance, in-service teachers in Uganda report using teacher e-learning portals to enhance digital literacy and for lifelong learning (Oyo et al., 2017). Similarly, academics in Nigeria report using e-learning opportunities for research, curriculum development and personal development (Nwezeh, 2010; Tella et al., 2018).

Studies show that implementation of e-learning in sub-Saharan Africa has many challenges, including:

- Inadequate infrastructure (including computers and internet access) (Asuman et al., 2018)
- Irregular supply of power (Bugi, 2012; Obuekwe and Eze, 2017)
- Lack of technical support and training for students and staff (Idris and Osman, 2016)
- Few incentives for teaching staff to use e-learning, as converting printed materials to e-content entails additional work without compensation (Tarus et al., 2015)
- Lack of feedback from instructors and peers (Muuro et al., 2014).

To address some of the challenges associated with implementation of e-learning, it is recommended that issues relating to the quality of content, system, support service and teaching and learning are tackled (Tella et al., 2018).

2 In which countries is the research being undertaken?

The African Education Research Database catalogues research from 48 countries and more than 1000 research institutions across sub-Saharan Africa. As noted in the introduction, South Africa is excluded from the database owing to its vastly different national research context and significantly higher research output than the rest of the region.

By analysing the African Education Research Database in terms of country and institution of publication (to follow in section 3), we aim to provide:

- A regional overview of the research in the database
- National-level research strengths and gaps
- Current research hubs and collaborations
- Opportunities for South-South and South-North research networks and collaborations, based on existing research strengths by phase of education and thematic areas
- Research and funding patterns at the institutional and national level.

2.1 Countries

The eight countries in sub-Saharan Africa with the greatest number of publications included in this review are listed in order of descending research output, including those with at least 90 publications:

- Nigeria
- Ghana
- Kenya
- Tanzania
- Uganda
- Ethiopia
- Botswana
- Zimbabwe

After these eight countries, the number of articles published per country drops markedly, to fewer than 50 articles, and as few as one article, in the case of Comoros, Equatorial Guinea and Seychelles) in the selection of 1650 articles included in this analysis.

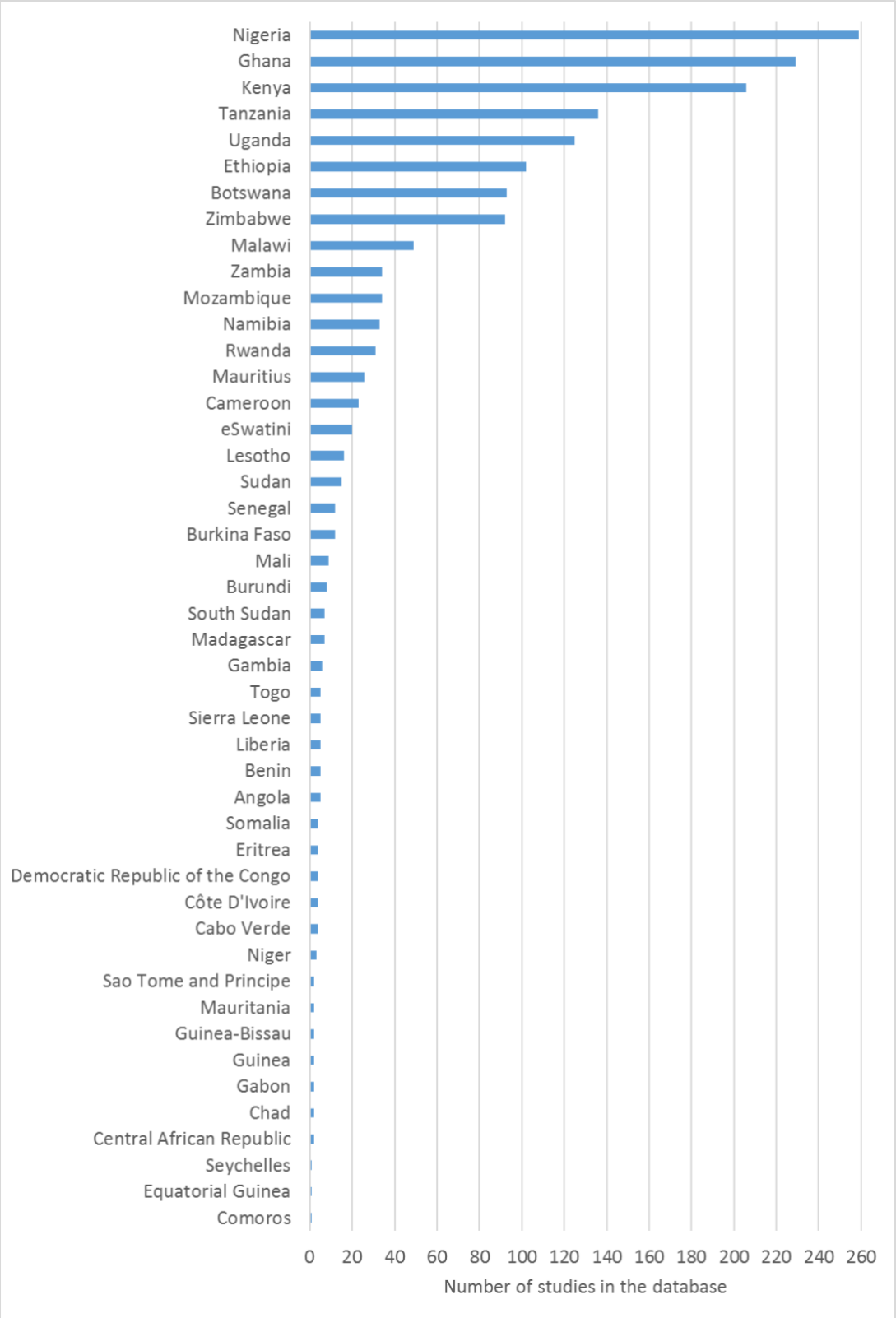
Nigeria, Ghana and Kenya alone account for just over 40% of the overall research output in this analysis. Nigeria has several institutions that rank among the top 20 by output, including the University of Ibadan, the University of Ilorin, the University of Nigeria, and the University of Lagos. Ghana is home to four of the top 20 institutions publishing research included in the database (Figure 17 and Figure 18). In the case of Ethiopia, only one institution – Addis Ababa University– is ranked among the top 20. Similarly, Botswana is among the top ten countries for research output primarily because the University of Botswana is the single most prolific research institution represented in the Database, producing about 90% of education studies associated with the country.

By contrast, **30 sub-Saharan African countries published fewer than 20 articles within this selection of 1650 articles from the African Education Research Database between 2010 and 2018** (Figure 13). Of these, 26 countries published fewer than 10 studies, including (in decreasing order) Mali, Burundi, South Sudan, Madagascar, Gambia, Togo, Sierra Leone, Liberia, Benin,

Angola. Indeed, Somalia, Eritrea, the Democratic Republic of Congo, Côte D'Ivoire, Cabo Verde, Niger, São Tomé and Principle, Mauritania, Guinea-Bissau, Guinea, Gabon, Chad, Central African Republic, Seychelles, Equatorial Guinea and Comoros published fewer than 5. It should be noted that it is likely that researchers in some of these countries publish in French or Portuguese, which is omitted from our analysis. As noted, previously, while further searches of French or other language specialist databases could increase the number of publications in some countries, it is unlikely to change the pattern significantly.

For many of these countries, there appears to be very little, or no, country-specific education research addressing some phases of education (for example early childhood education) or some thematic areas (for example ICT). These national-level gaps are likely to be problematic for achieving inclusive, equitable education, as the evidence on 'what works' depends on contextual factors which vary between systems.

Figure 13 Sub-Saharan African countries ranked by quantity of research output



Note: Figure based on the 1650 studies included in the analysis in this report.

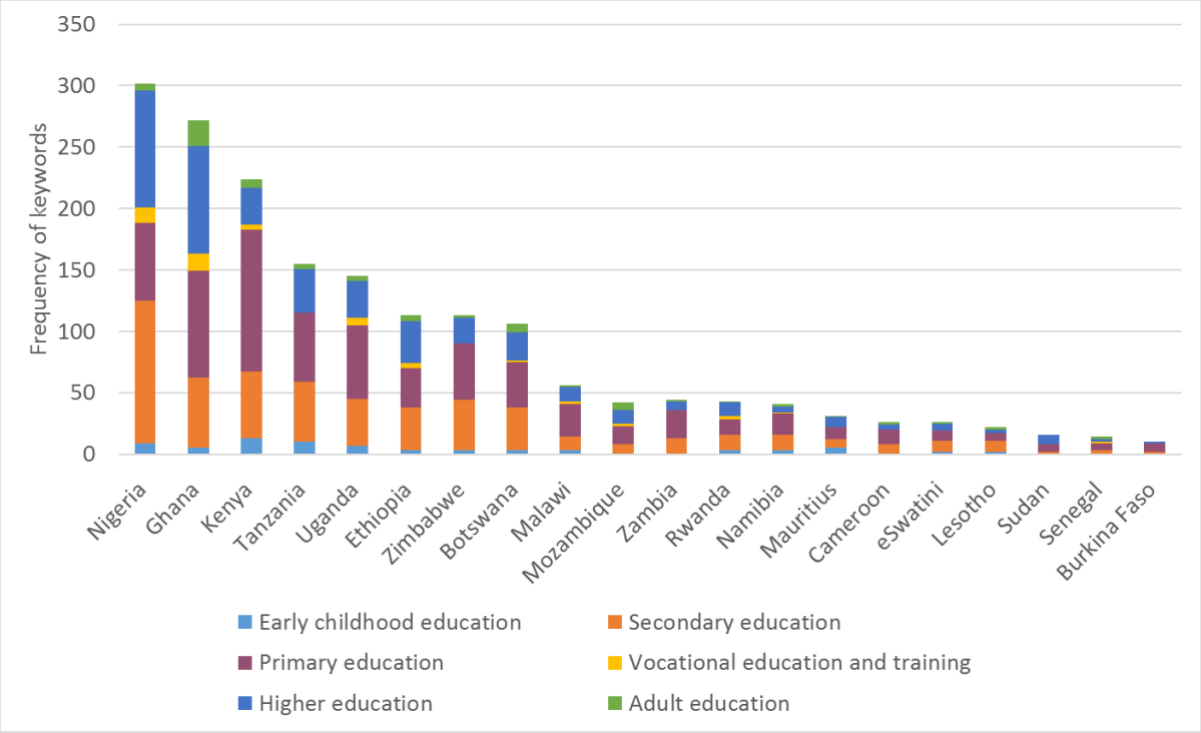
2.1.1 Phase of education and thematic areas within countries

National patterns on the phases of education for countries with the largest amount of research output mainly reflects the database-wide composition (Figure 2): namely, countries exhibit an overall focus on primary, secondary and higher education, with less attention on early childhood education, VET and adult education (Figure 14).

Kenya, Ghana, Nigeria, Uganda and Tanzania published the highest number of articles on **primary education** (ranging from 116 to 56, respectively); while Nigeria, Ghana, Kenya, Tanzania and Zimbabwe produced more **secondary education** research (ranging from 116 to 41, respectively). Nigeria and Ghana produced the largest number of articles on **higher education** (95 and 88 articles, respectively) compared to 36 articles for Tanzania, the third largest for research on this phase of education.

Countries with a relatively strong focus on **early childhood education** are Kenya, Tanzania, Nigeria and Uganda. However, no country has more than 13 articles on this phase amongst those publications included in the analysis. **Adult education** also appears to be neglected, with Ghana having 21 articles on this, with Kenya and Botswana being the next largest, but with only 7 articles each.

Figure 14 Research on phases of education for top 20 countries



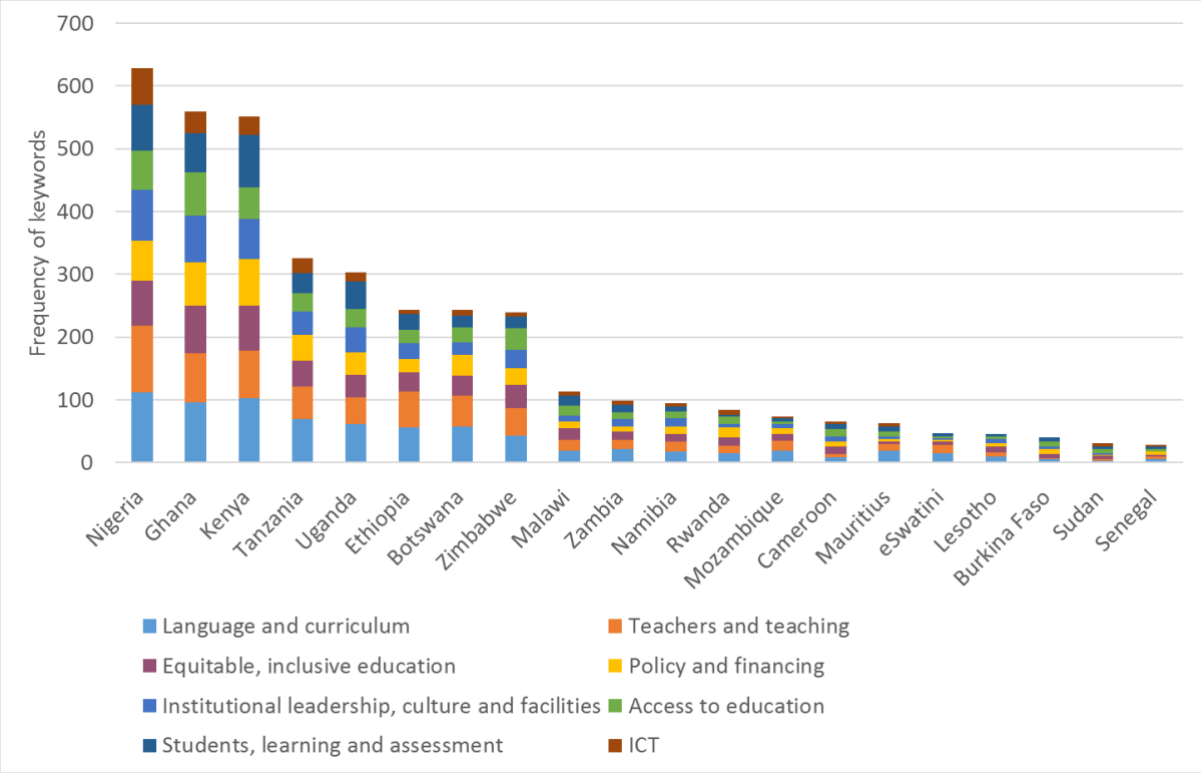
Note: The order of countries may differ from ranking by overall output because publications that do not address a specific phase of education are excluded from this figure.

There is little variation between countries in the attention given to the eight thematic areas (Figure 15).[vi] Nigeria has a slightly larger focus on both institutional leadership, culture, facilities, and on students, learning and assessment than the database-wide level pattern. Kenya also has a slightly larger than average focus on students, learning and assessment, being the single largest national producer of research on this thematic area (followed by Nigeria and Ghana). Zimbabwe has a

slightly greater focus on access to education than other countries, with access being the fourth largest thematic area at the national level (compared to being the sixth largest area at the database level). Among the top countries, there is otherwise no significant variation from the database-level spread across the thematic areas.

In general, among countries with the lowest overall research output, language and curriculum receives the most attention (consistent with database-level patterns). Benin, Eritrea and Angola, for instance (which produce extremely little research overall) each produced four or five studies on language and curriculum, but no more than three studies on the other thematic areas.

Figure 15 Research on thematic areas for top 20 countries



Note: Ranking of institutions differs slightly from ranking by overall research output, as this figure ranks institutions by frequency of keywords associated with institutional research output (not by number of articles).

3 What are the institutional arrangements for the research?

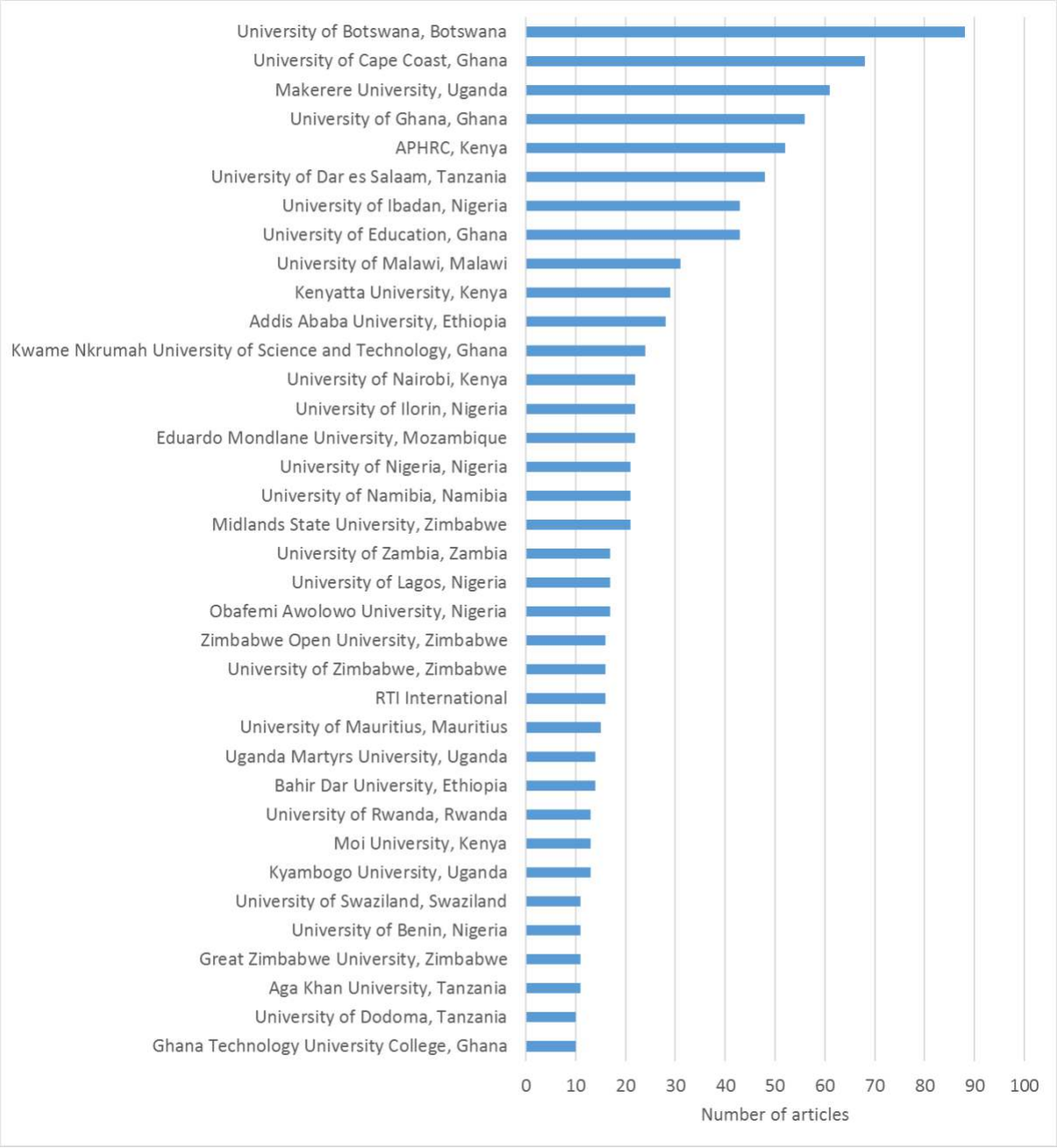
The African Education Research Database catalogues research studies from more than 1000 sub-Saharan African institutions, around 450 northern-based institutions, and more than 180 funders. Through the following institutional and funding analysis of research published in reputable journals included in the database, we aim to identify:

- Current institutional hubs and collaborations
- Opportunities for South-South and South-North research networks and collaborations
- Research and funding patterns at the institutional level
- Gender of researchers based in sub-Saharan Africa.

3.1 Institutions

This section provides an overview of the sub-Saharan African institutions producing the greatest number of published studies included in this analysis. The eight institutions with the largest number of publications in the database are associated with around 25% of the overall research output (Figure 16). The University of Botswana is the most prolific single institution, followed by the University of Cape Coast, Makerere University, the University of Ghana, and the African Population and Health Research Centre (APHRC).

Figure 16 Most prolific sub-Saharan African institutions in the African Education Research Database



Note: The figure includes sub-Saharan African institutions with at least 10 out of the 1650 publications included in this analysis

Phases of education

The African Population and Health Research Centre (APHRC), based in Nairobi, has a strong institutional focus on primary education (40 articles), which accounts for around 70% of the institution's education research in the database. This output makes the APHRC the most prolific research institution on primary education in the region, followed by the University of Botswana, which also appears to have a strong research focus on this phase of education, (34 articles), the University of Cape Coast in Ghana (31 articles) and Makerere University (27 articles).

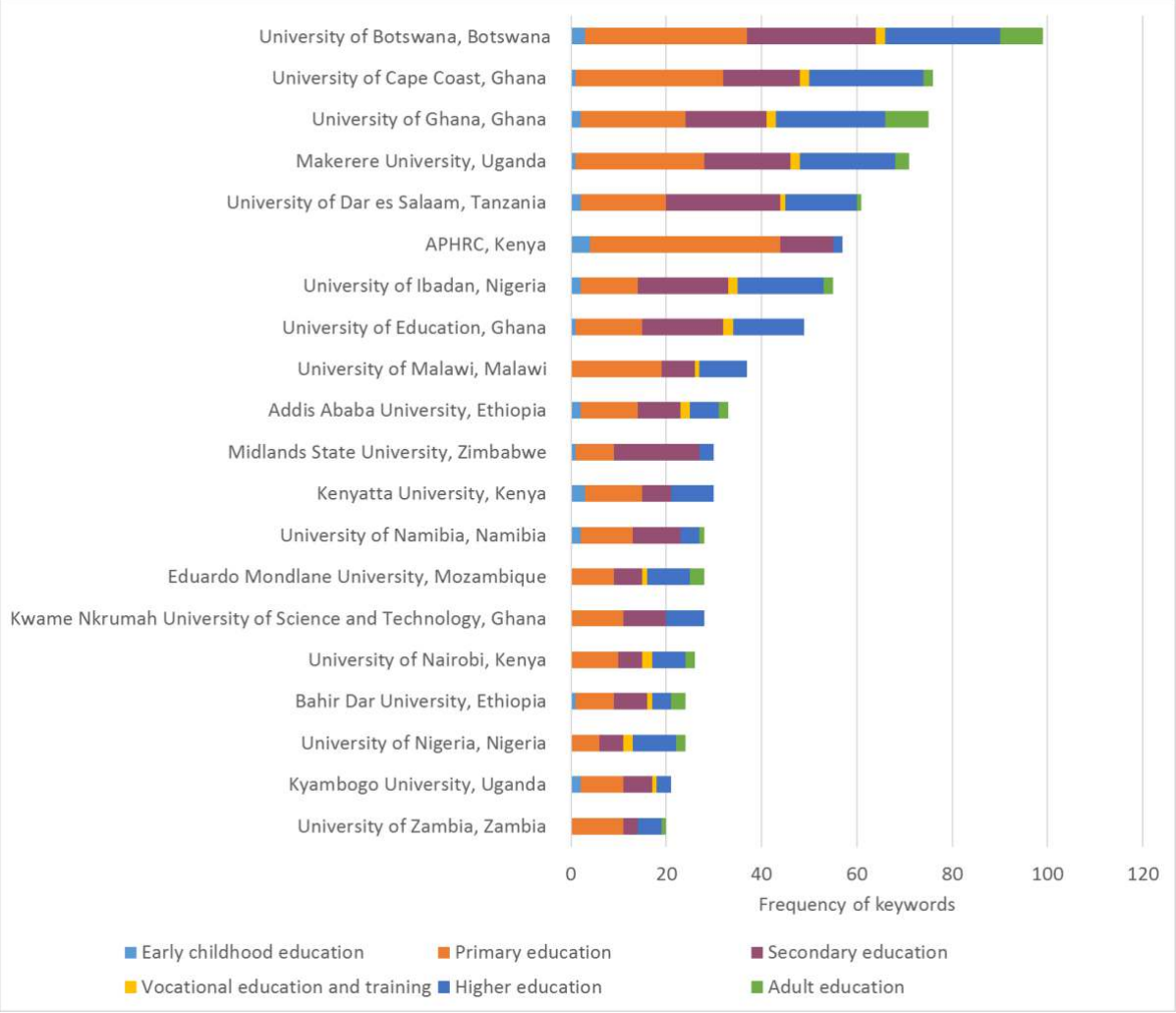
Institutions publishing the most research on secondary education within this selection include the University of Botswana (27 articles), the University of Dar es Salaam (24 articles), the University of Ibadan (19 articles), Midlands State University, Zimbabwe (18 articles), and the University of Ghana and the University of Education, Ghana (17 articles each).

Leading institutions for early childhood education research—though the overall output is low--include African Population and Health Research Centre (4 articles), and the University of Botswana and Kenyatta University (3 articles each).

No institution published more than two articles on vocational education and training within this selection of articles. The University of Botswana and the University of Ghana published the most articles on adult education (9 articles each), with no other institution publishing more than 3 articles on this phase of education.

The institutions that published the most higher education research include the University of Cape Coast, Ghana and the University of Botswana (24 articles each), the University of Ghana (23 articles), Makerere University (20 articles), and the University of Ibadan (18 articles).

Figure 17 Top 20 most prolific African institutions by phase of education

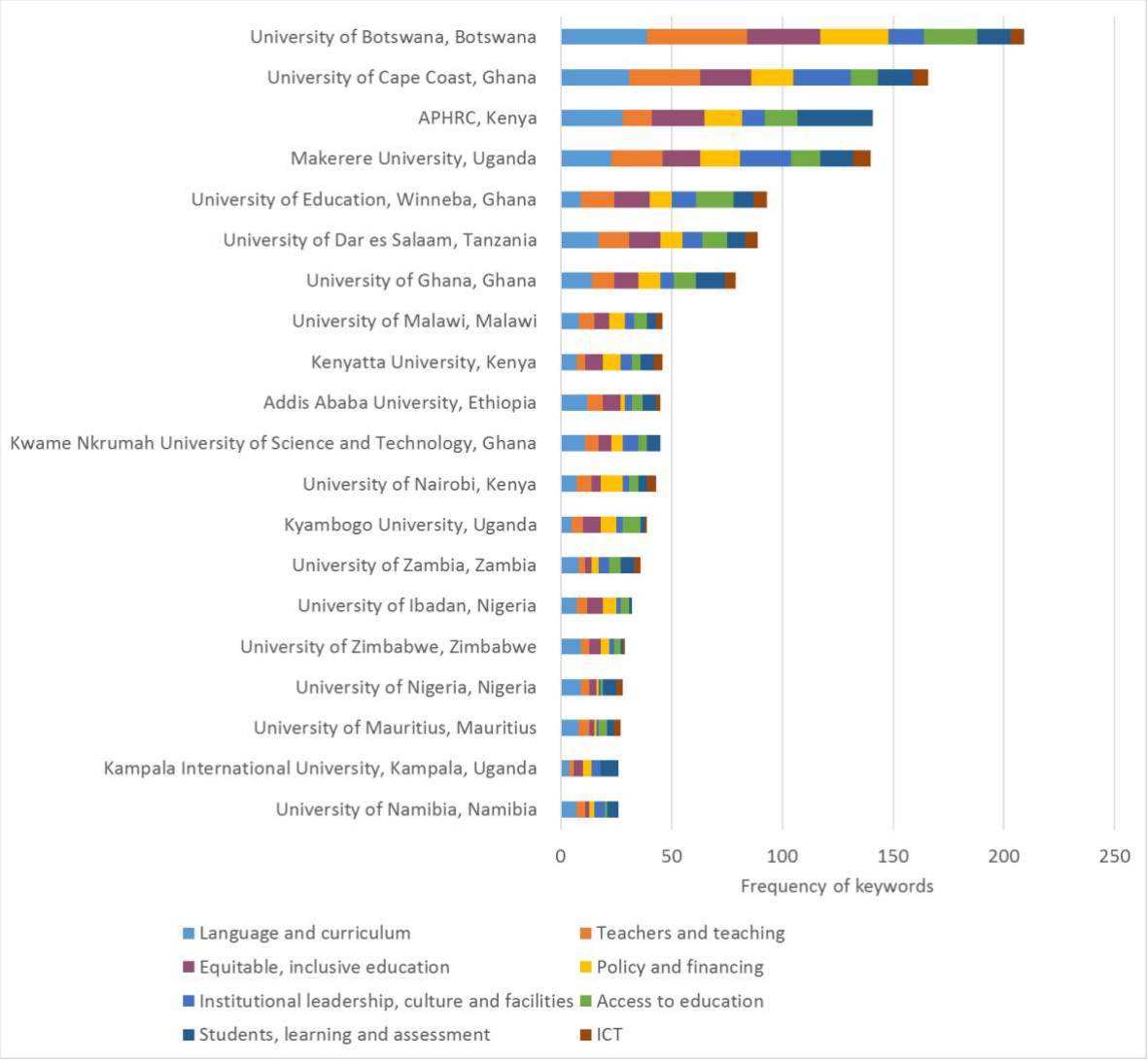


Note: List of institutions differs from overall ranking by number of articles, because some institutions produced studies that do not address a specific phase of education: these studies are excluded.

Thematic areas

With respect to thematic areas, institutions with a comparatively strong focus on **access to education** include the University of Botswana, the University of Education (Ghana), and APHRC. Three leading institutions for research on **teachers and teaching** are the University of Botswana, the University of Ghana, and Makerere University. Those most frequently associated with research on **equitable and inclusive education** and **language and curriculum** research are the University of Botswana, APHRC, and the University of Cape Coast. The top institutions affiliated with research on the themes of **institutional leadership, culture and facilities**, and **policy and financing** are the University of Cape Coast, Makerere University and the University of Botswana. **Students, learning and assessment** studies are produced by authors affiliated with APHRC, the University of Cape Coast, and both the University of Botswana and Makerere University. There are no obvious hubs for research on **ICT**. Makerere University in Uganda and the University of Cape Coast, Ghana, have produced the greatest number of articles on ICT, however overall research output is modest (around 7 articles each over the period 2010 to 2018).

Figure 18 Top 20 most prolific African institutions by thematic area



Note: Ranking of institutions differs from overall research output, as this figure ranks institutions by frequency of keywords associated with research output (not by number of articles).

3.2 Who is doing the research?

3.2.1 South-South and South-North research collaborations

For each article, information on the institutional affiliation of authors was manually harvested, enabling analysis based on the location of contributing authors. For each article, we identified whether or not it resulted from collaboration, and if so whether this occurred in-country; between researchers in different sub-Saharan African countries; or between researchers based outside the region. The prevalence of these different collaborative arrangements is illustrated in Figure 19.

Around two-thirds of the publications are not the result of collaboration outside the author's institution. Where collaboration does occur, it is far more likely to be with researchers based outside than inside the region. The least common form of collaboration occurred within-country. One Ethiopian researcher explained:

> "The tradition has not been there [for collaborative research between Ethiopian universities]. I think funding is the issue…There is limited funding to extend the scope beyond [our own] university." (*Male researcher, Ethiopia*)

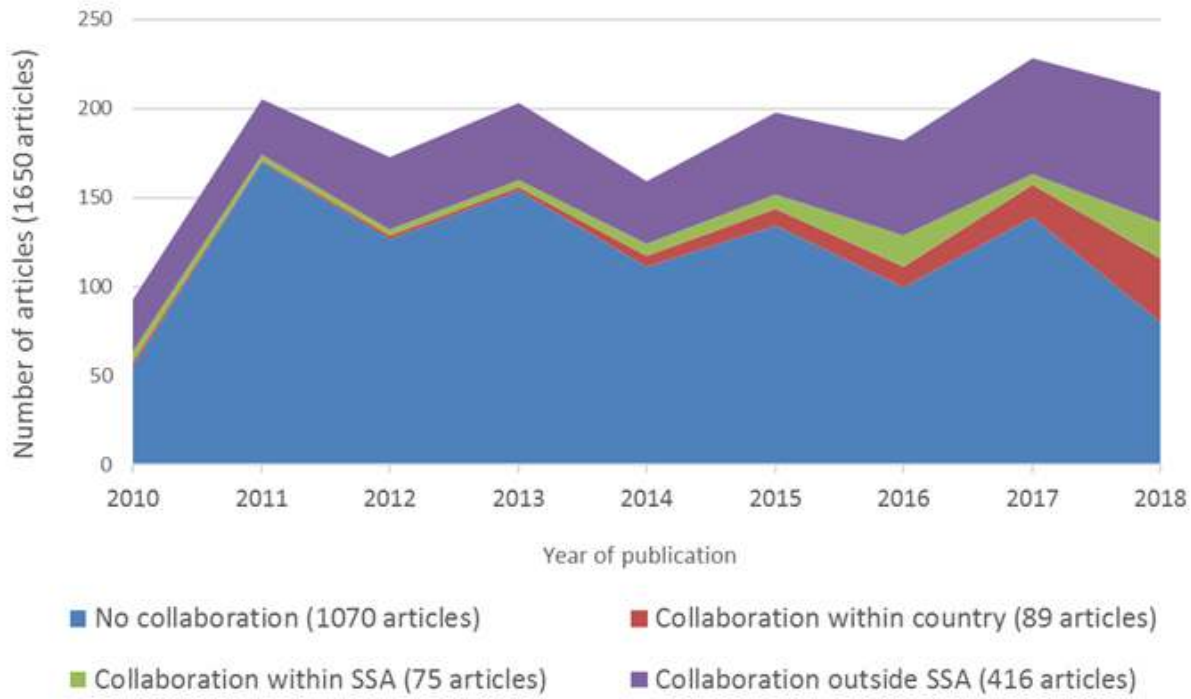
One-quarter of publications involved South-North research collaboration, that is collaboration between institutions in sub-Saharan Africa and the global North. Out of the 416 studies involving South-North collaboration, 26 also involved collaboration within sub-Saharan Africa: for example, a study involving researchers from Ghana, Ethiopia and UK is included amongst these.

Only 5% of the publications involved collaborations between researchers affiliated with institutions in different sub-Saharan African countries; and also just 5% of articles were produced through a collaboration between researchers at institutions within a country in the region.

While South-North collaborations have remained the most prevalent type of research collaboration since 2010, the number of collaborations within the region has increased since 2010. An analysis of research collaboration within sub-Saharan Africa suggests that South African institutions are driving research collaborations within the region. Out of 75 publications involving such collaboration, more than two thirds are co-authored by researchers with an affiliation to South African institutions. The South African institution with highest number of collaborative publications is the University of South Africa (11 publications), followed by the North-West University (8 publications). Others include the Universities of Cape Town and Johannesburg, both with 5 publications.

There is also some evidence of collaboration between sub-Saharan African and Southern countries outside the region, such as India and Bangladesh. Examples of the institutions collaborating with sub-Saharan African institutions are Indian Institute of Technology; and Islamic University of Technology, Bangladesh.

Figure 19 Education research involving scholars based in sub-Saharan Africa by type of collaboration

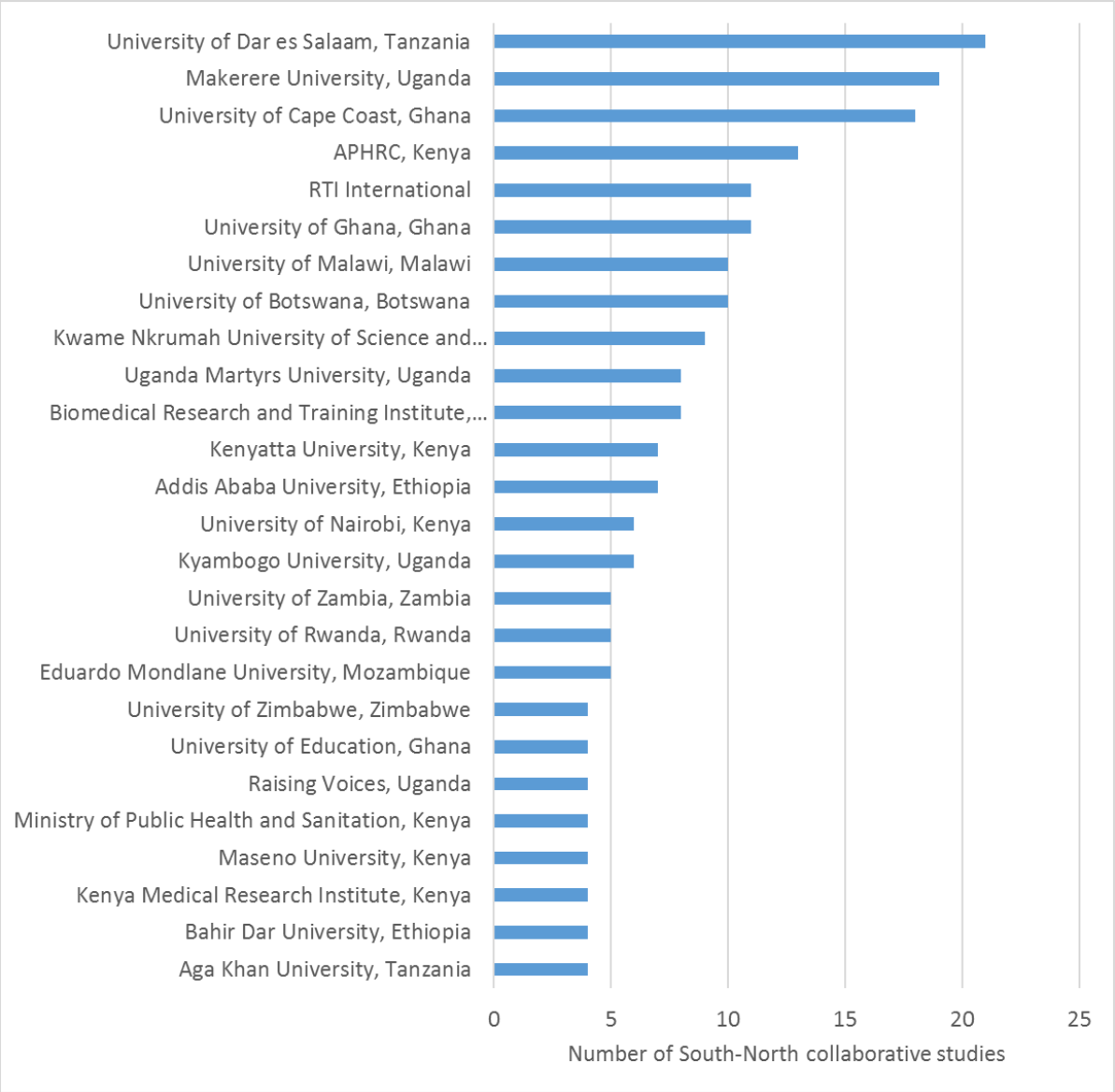


The slight drop in 2018 is likely to be attributable to the fact that research articles published that year were not yet classified in online search databases (Scopus and Web of Science) at the time of analysis. More generally, in line with the increasing overall research base, all types of research collaboration have increased on average since 2010. The proportion of South-North collaborations does seem to have remained a similar proportion over this period, from 76% of collaborations in 2010 to 73% of collaborations in 2017. Over this same period, the proportion of collaborations between countries within sub-Saharan African appears to have dropped from 16% to 7% of all research collaborations, while collaborations within countries seems to have increased from 8% to 20% of all research collaborations over this same period.

Which sub-Saharan African institutions are collaborating with institutions in the global North?

Of the 1650 studies in the analysis, 416 were produced through a collaboration between at least one sub-Saharan African research institution and one in the global North. The top eight sub-Saharan African institutions that collaborated with northern partners on published articles are the University of Dar es Salaam (Tanzania), Makerere University (Uganda), the University of Cape Coast (Ghana), APHRC (Kenya), RTI International, the University of Ghana (Ghana), the University of Malawi (Malawi) and the University of Botswana (Botswana) (Figure 20).

Figure 20 Sub-Saharan African institutions collaborating with institutions outside the region

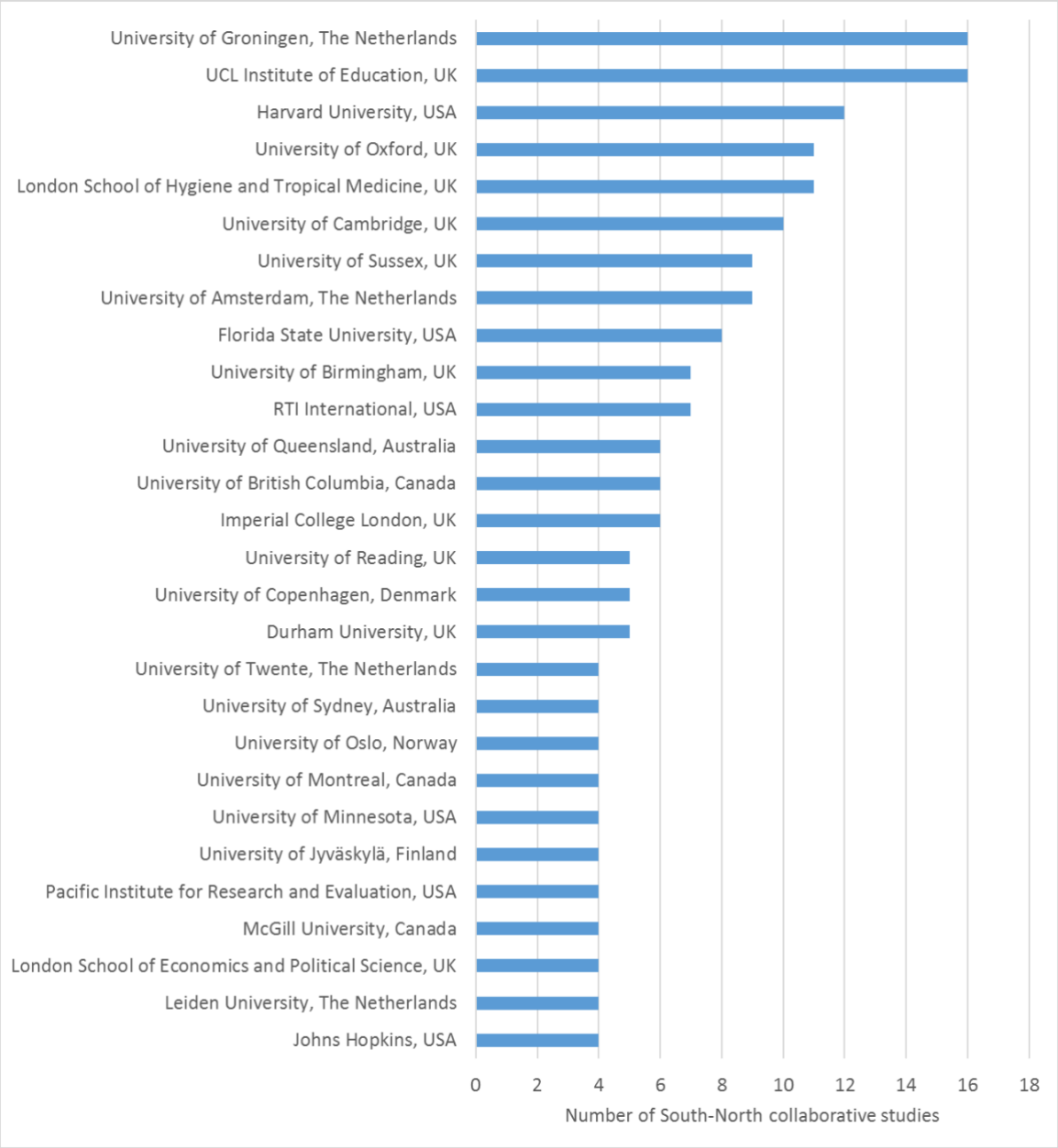


Note: Figure includes sub-Saharan African institutions that collaboratively published at least 4 research articles with Northern partners in the African Education Research Database between 2010 and 2018.

With which institutions in the North are sub-Saharan African institutions collaborating?

The top five countries in the Global North engaging in research collaborations in sub-Saharan Africa include the USA, UK, the Netherlands, Canada and Australia. The top Northern institutions engaging in collaborative research are all based in these countries, including (in order): University of Groningen (The Netherlands); Institute of Education at University College, London (UK); Harvard University (USA); University of Oxford (UK); London School of Hygiene and Tropical Medicine (UK); the University of Cambridge (UK); University of Sussex (UK) and University of Amsterdam (The Netherlands) (Figure 21).

Figure 21 Northern institutions collaborating with sub-Saharan African institutions



Note: Figure includes Northern institutions that collaboratively published at least 4 research articles with researchers based in sub-Saharan Africa in the African Education Research Database, 2010- 2018.

With some notable exceptions, the Northern institutions in these rankings are commonly viewed as world-class, research-intensive universities with effective systems in places to capture funding opportunities for international research collaborations. In interviews, some researchers emphasised the value of long-standing partnerships with Northern institutions as a means of securing funding to conduct research based on local priorities:

> "Some time back my centre had a link with [a UK university] and we have actually carried out a number of research studies [where] we sat down at the table and said "What are the issues?" We looked at the…education system in Malawi…We were using the leverage of

> [the UK university] from a developed country [to get] a lot of funding. We actually wrote proposals [to] seek funding [and] come up with our own research agenda." (*Female researcher, Malawi*).

3.2.2 Gender of authors

Internet searches were conducted to gather information on the gender of researchers whose publications feature in the database. Given some articles had more than one author based in sub-Saharan Africa, in total the gender of 1711 researchers was identified: of these, just 29% are female.[vii] The top eight countries by research output generally appear to have a better gender balance than the average: Botswana has the highest proportion of female researchers (48% of those within the country), followed by Zimbabwe with 40%. Around one-third of the researchers in Kenya, Nigeria, Tanzania and Uganda are female. Ghana and Ethiopia have the lowest percentage of female researchers, 24% and 16%, respectively.

The comparative under-representation of female authors in the database could in part reflect women's low overall participation in higher education across sub-Saharan Africa. UNESCO data for 2016 indicate that on average, just 24% of academic staff in tertiary education across sub-Saharan Africa were female (UNESCO Institute for Statistics, 2019). There is considerable between-country variation, with data for 2016 indicating for instance that for Botswana, 37% of academic staff in tertiary education was female, while for many countries, this figure was less than 10%.

3.3 Funding and funders

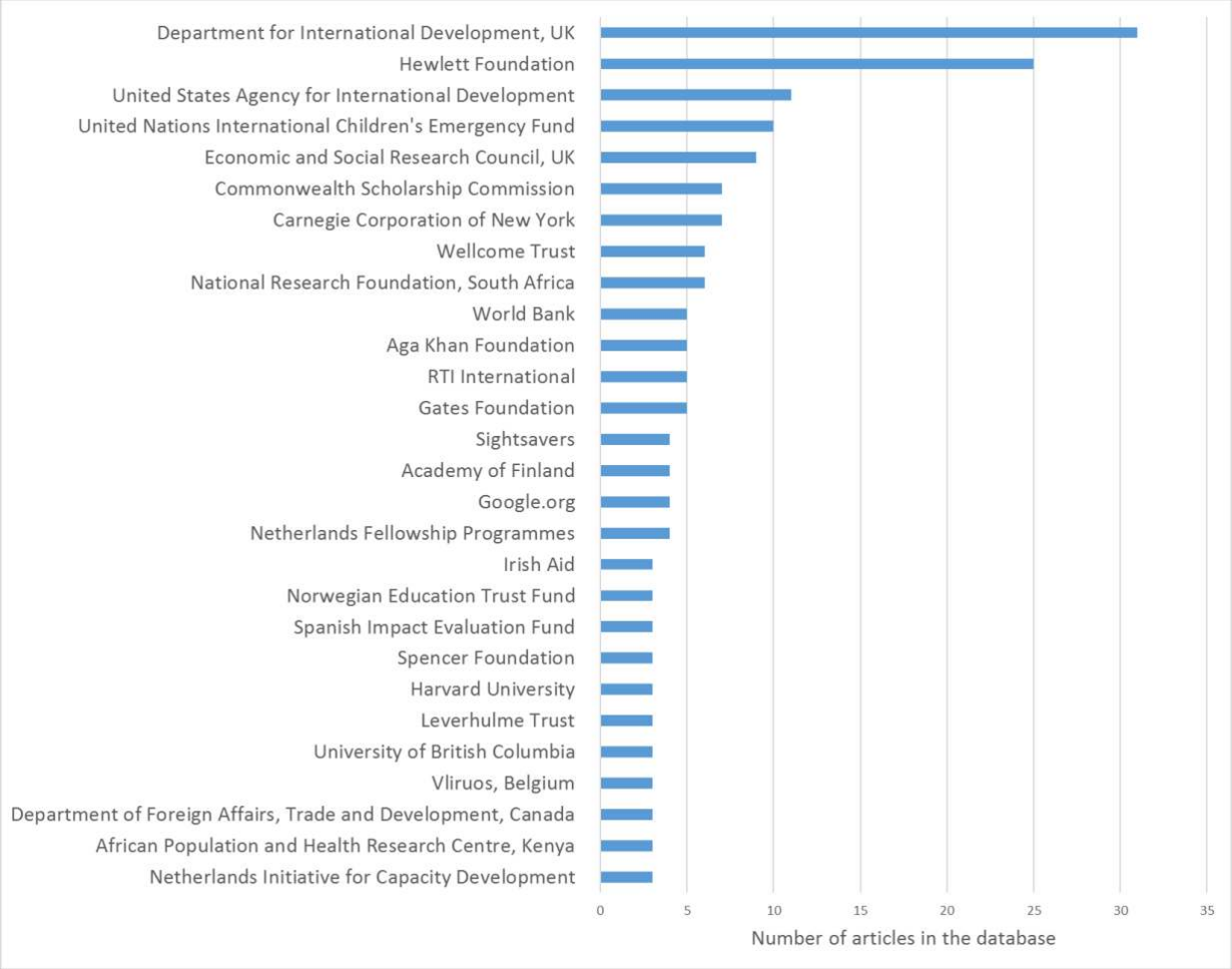
Information on funding to support research included in the publications was harvested for all articles in the database, from it was identified that the large majority of studies appear to be un-funded. Receipt of research funding is normally reported at the end of peer-reviewed articles, in a Funding or Acknowledgements section, although it is possible that funding is under-reported due to variations in funding disclosure policies of journals or omissions on the part of authors. Only 257 articles included in this analysis—just over 15%— reported funding sources.

Funders of research reported in studies included in the database fall into four main categories:

- National aid and development agencies
- International aid and development agencies
- Research councils and research institutions, including universities
- Charitable foundations and philanthropic organisations

The largest single funder of research in this analysis is the UK's Department for International Development (DFID), which accounts for 12% of funded studies (31 studies). The United States Agency for International Development (USAID) is another major funder, with 4% of funded studies (11 studies) reporting funding from this source. Aside from government agencies, charitable foundations and philanthropic organizations are also major donors, with the Hewlett Foundation cited as a sponsor by 25 studies (8% of funded studies), and The Bill and Melinda Gates Foundation by 5 studies (2% of funded studies).

Figure 22 Major sources of external funding for published African education research (2010-2018)



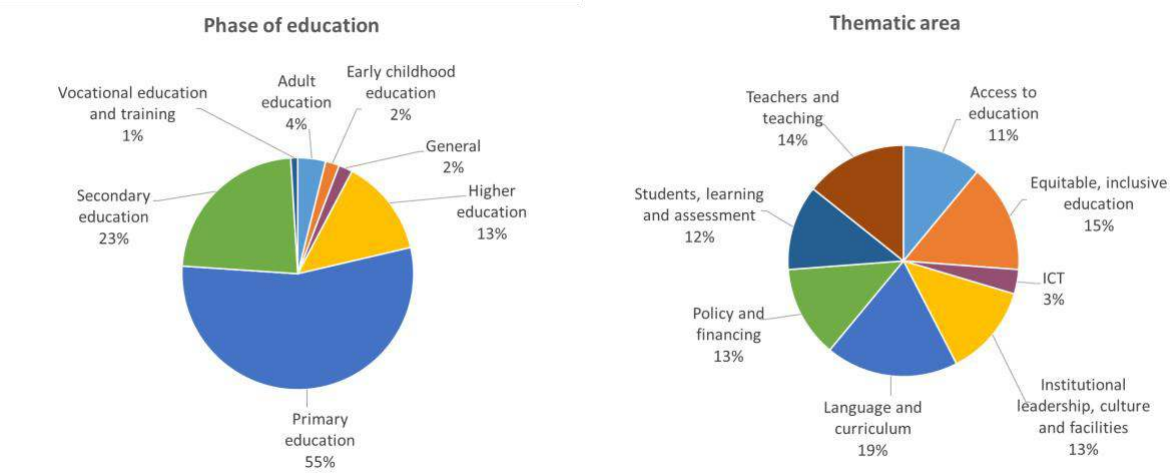
Note: The figure includes funders associated with at least 3 articles included in this analysis.

3.3.1 Funding by phase of education and thematic area

The analysis reveals that funding is not evenly distributed across the different phases of education, suggesting areas of priority for researchers and funders. More than half of funded studies address primary education, and almost one-quarter address secondary education. Early childhood education accounts for only 2% of funded studies (Figure 23).

Unlike the analysis of phases of education, the thematic areas did not suggest strong preferences in terms of funding allocation.

Figure 23 Where did funding go between 2010 and 2018?

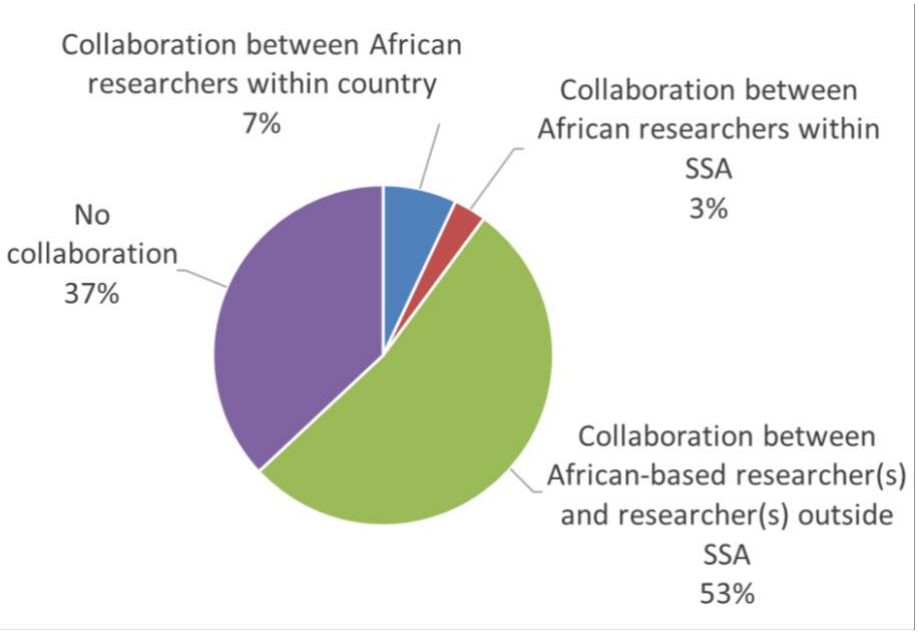


Note: Figure shows % of the 257 funded studies categorised by phases of education (left panel) and thematic area (right panel).

3.3.2 Funding by research collaboration

Most funding is associated with South-North collaborations. Little funding is linked with South-South research collaborations, either within or between countries in sub-Saharan Africa. While 25% of the articles in this analysis were produced through South-North collaborations, this subset accounts for more than half (53%) of all reported funding (Figure 24). Of the 65% of the selected articles reported no research collaboration, these were associated with 37% of reported funding. For **collaborations either within or between countries in sub-Saharan Africa, only 7% and 3% of articles received funding, respectively.**

Figure 24 Is funding reaching all kinds of research collaborations?



Note: Figure shows % of the 257 funded studies by type of collaboration

These findings have implications for policy and practice, as it suggests that for researchers based in sub-Saharan Africa, collaborating with a Northern partner is the most likely means of engaging in funded research leading to peer-reviewed publications. Although collaboration is by no means necessary or desirable in all cases, researchers explained some benefits they derived from working with colleagues outside their own institutions. For example, a Kenyan researcher explained how this enabled him to work in an interdisciplinary team, which improved the quality of his research:

> "Recently I'm approaching research from…almost 100% collaborating with other people. And I think I'm finding it more strategic for various reasons, including "two minds are better than one". When…you have team members who come with different perspectives, I think that improves the quality of research, if you get an interdisciplinary team…[Because] you need a sociologist, you need an economist there – people with a background of early childhood education, demographers…I think collaboration is also very, very important." *(Male researcher, Kenya).*

Another male researcher explained how long-term collaboration with Northern institutions had enabled the development of a 'critical mass' of local research capacity:

> "You cannot work on projects alone, you need a very good team. And [finding] a good team in Ethiopia was a challenge, but through time we managed to get a pool of people whom I can work with…[Through a UK-funded research programme] we know many people, and then we hired research assistants. And then those RAs are upgraded, and some of them hold PhDs, and they come back and they join us. Now we have created the kind of critical mass." *(Male researcher, Ethiopia).*

The analysis in this Report has indicated key institutions which appear to have substantial research experience as identified by publication in reputable journals (see Section 2.2). As such, the current low levels of South-South collaboration is a clear area for development, which may be addressed through targeted opportunities and funding within the region. In addition to improving the quality of individual studies, this can contribute to the long-term development of research capacity in the region, including in areas such as applying for competitive research grants, strategies for research impact, and publishing in reputable journals. This in turn is likely to provide opportunities for national and regional policy impact.

4 How does research by scholars based in sub-Saharan Africa align with the education Sustainable Development Goal?

To what extent is research by scholars in sub-Saharan Africa a supporting resource for achieving global, regional and national goals for equitable and inclusive education? This section addresses this question by exploring links between the research identified in the African Education Research Database and the Sustainable Development Goal for Education (SDG4). This process was conducted through a framework that maps keywords from the African Education Research Database against the SDG targets for education. While this process only provides an overview, it can be helpful to demonstrate the contribution of researchers based in sub-Saharan Africa to the sustainable development agenda, and highlight priority areas for further research in light of the targets for education – which are also closely related to the regional Agenda 2063 and CESA 16-25 agenda.

Universal primary and secondary education (SDG4.1) is the most widely covered SDG target across the database; with **gender** (SDG4.5) and **literacy** (SDG4.6) prevalent topics within their respective research fields. However, this analysis indicates gaps within the research coverage: for instance, few studies investigate the impact of conflict on access in primary and secondary education; and the analysis highlights national-level gaps in research on gender in education for thirteen sub-Saharan African countries.

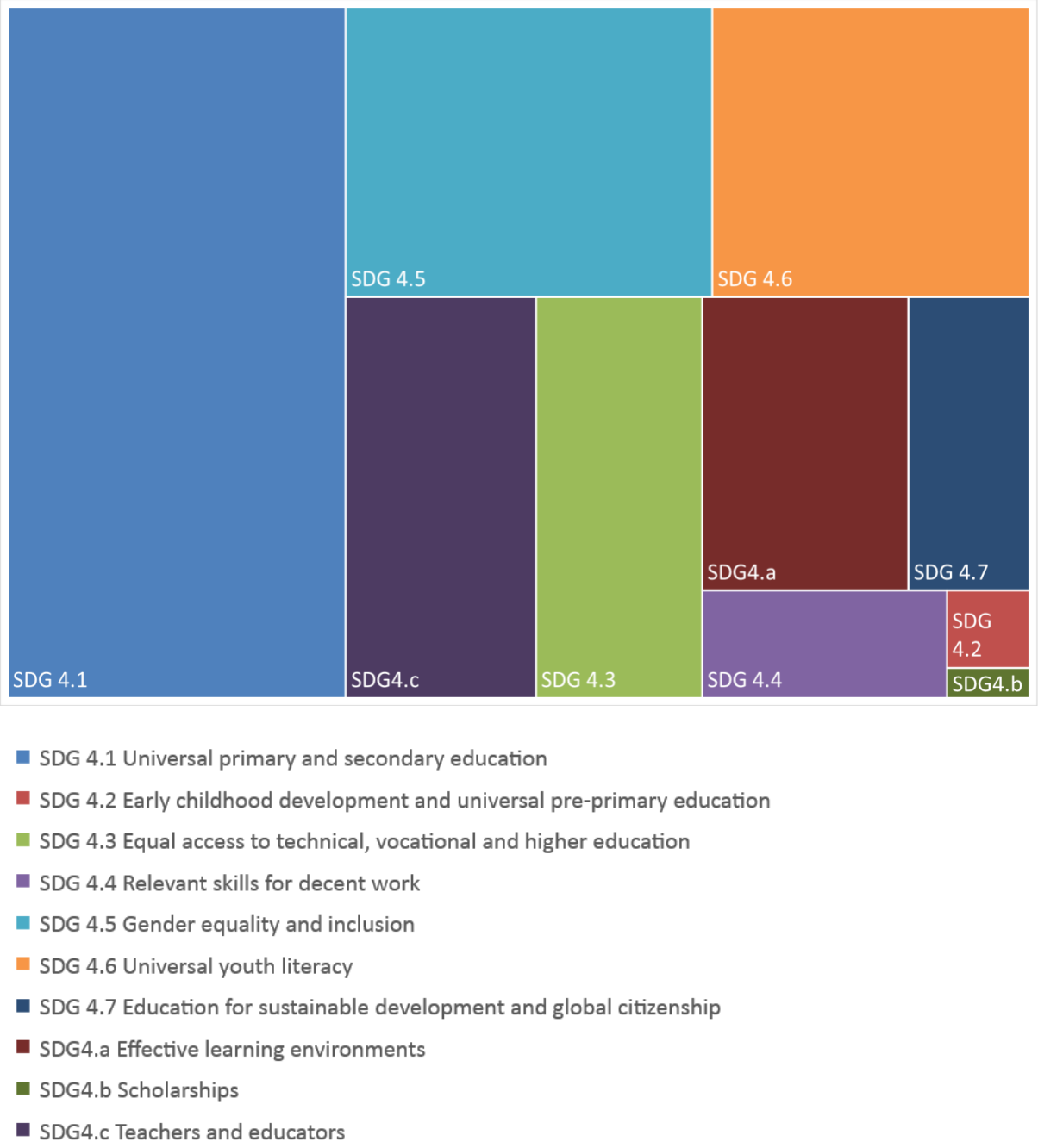
Early childhood development and universal pre-primary education (SDG4.2) receives the least research attention of all main sustainable development targets.

While **equal access to technical, vocational and higher education** (SDG4.3) receives a proportionate share of scholarly attention, research overwhelmingly focuses on higher education, with VET and adult education receiving significantly less attention (Figure 2). This analysis also highlights that female researchers are less likely than their male colleagues to publish education research in sub-Saharan Africa. Some researchers in the region are calling for greater investment in VET and adult education to bridge a skills gap for young people who are leaving school—either through graduation or dropping out—without **relevant skills for decent work** (SDG target 4.4), which is a minor focus in the database (Adjrah and Quashie, 2014).

Research on **education for sustainable development and global citizenship** (4.7) primarily pertains to studies related to language and curriculum, in which sustainable development, peace education, and citizenship for instance are explored in terms of student learning.

Of the three means of implementation included in the SDG targets for education, teachers and educators (SDG4.c) receives the most attention (owing largely to the literature on teacher education), followed by effective learning environments (SDG4.a), which primarily comprises research on school facilities. There is very little research by scholars based in sub-Saharan Africa on scholarships for enrolment in higher education or vocational education and training (SDG4.b).

Figure 25 Mapping education research by scholars in sub-Saharan African against the education Sustainable Development targets



5 What are the key lessons for investing in the visibility of research by scholars based in sub-Saharan Africa?

The African Education Research Database demonstrates the existence of a sizeable body of valuable education research on education by researchers based in the region. This analysis has revealed notable research strengths in this literature, including research on language and curriculum, teachers and teaching, and equitable and inclusive education, at the primary, secondary and higher education levels. However, this evidence base does not appear to be sufficiently recognised or utilised by national, regional or global actors. Low visibility and accessibility continue to impede the impact of research from the region.

This analysis indicates national-level gaps in the educational research agenda for some countries that need urgently addressing. For example, 30 sub-Saharan African countries published fewer than 20 articles within this selection of articles from the African Education Research Database between 2010 and 2018. While this might be partly due to the limitation of our focus on publications in English, as noted, it is not expected that including other languages (notably French or Portuguese) would significantly change the pattern.

The analysis also reveals instances of misalignment between the global and regional policy priorities and the education research being published. For instance, despite being a priority in the African Union's CESA 16-25, early childhood education receives very little attention.

Our findings highlight key priorities for future investment. This will not both strengthen education knowledge systems within sub-Saharan Africa, and provide a strong foundation for policy impact:

1. Increase funding to education research by scholars based in sub-Saharan Africa, particularly focused on under-researched areas identified in the database associated with national, regional and global policy priorities (such as early childhood education; and conflict).
2. Promote dialogue between policymakers and researchers based within sub-Saharan Africa to identify further policy-relevant research related to education priorities.
3. Direct funding towards equitable partnerships between South-South and South-North institutions and researchers, driven by policy-relevant research agendas originating from within the region.
4. Support training and capacity development for researchers and institutions within sub-Saharan Africa on:
    - applying for competitive research grants
    - publishing in reputable journals
    - developing strategies for research impact, with a focus on successful engagement with non-academic stakeholders.
5. Develop research capacity particularly for countries with fewer publications, including through promoting regional collaborations and networks.
6. Target support towards female researchers in sub-Saharan Africa, linked to systemic barriers to girls and women in education, to promote gender equality and a more inclusive research community.
7. Continue efforts to catalogue and promote education research from sub-Saharan Africa by maintaining the African Education Research Database hosted by an organisation based in the region.

6 References

References included in this list are those cited within the Report. For fuller information of all publications included in the database, see: https://essa-africa.org/AERD

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Endnotes

[i] (Kiunguyu, 2019)
[ii] While existing databases, such as AfricaBib, catalogue research literature about Africa across a range of disciplines the African Education Research Database is the first to focus exclusively on education by researchers based in sub-Saharan Africa.
[iii] Impact factor is a metric used to indicate the frequency with which the average article in a given journal is cited per year. This measurement is used to rank journals according to how influential or widely read they are, as an indication of importance within a given research field. For the purposes of this analysis, impact calculations were used from SCImago (https://www.scimagojr.com/).
[iv] Forthcoming reports based on analysis of the interview data focus on researchers' priorities (Mitchell et al., forthcoming) and their experiences of international research partnerships (Asare et al., forthcoming).
[v] Gross enrolment data include students whose age differs from the official age band for a grade, such as late or early enrollers, students who repeat a year or who are progressed beyond their age range. Net enrolment data tend only to include children within the official school age range for each grade level, as determined by national or subnational system policies. See https://datahelpdesk.worldbank.org/knowledgebase/articles/114955-how-can-gross-school-enrollment-ratios-be-over-100
[vi] Differences in the ranking of countries between Figure 14 and Figure 15 reflect different number of coding references for phases or for keywords associated with thematic areas.
[vii] Information was unavailable on the gender of 120 authors.

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