Background Paper

Education Governance in Sub-Saharan Africa

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Secondary Education in Africa:

**PREPARING YOUTH
FOR THE FUTURE
OF WORK**

Secondary Education Governance in Sub-Saharan Africa

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Section 1: Introduction

Improving secondary education in Sub-Saharan Africa (SSA) has gained attention especially after the remarkable development in primary education across the continent driven by the Millennium Development Goals (MDGs) and the Education for All (EFA) movement. The major increase in access to and completion of primary education has led to a strong demand for secondary education. Additionally, there is currently an increasing demand for more well-educated and skilled school graduates to meet the job market needs in both formal and informal sectors. Moreover, more students in SSA countries now aspire to pursue higher education. These developments have raised a flag in several SSA countries for the need to provide quality secondary education. Although the responses to these demands varied among the various SSA countries, there are efforts across the region to enable more students to enroll in and successfully complete secondary education.

However, SSA governments are facing several challenges in achieving their objectives for secondary education. Among these are the lack of funding, lack of necessary infrastructure in rural areas, lack of enough qualified and motivated teachers and education officers, the difficulty of implementing and institutionalizing effective accountability systems, the need for constant monitoring and evaluation, and the challenges of reaching specific populations and integrating students with special needs. Dealing with these various challenges requires sound planning, prioritization and innovative solutions that achieve excellent results in a reasonably short time and can be implemented with limited budgets and be sustained overtime.

This paper addresses the status of and developments in secondary education governance in SSA and provides some lessons learned from success stories across the region and recommendations on how to strengthen governance of secondary education. More specifically, the paper focuses on accountability as an integral component of governance as well as how technology can be used to strengthen governance of education systems. When addressing these two aspects of governance, the authors discuss how building capacity can enhance governance of secondary education in SSA countries.

However, there is more to be investigated in this area given the fact that many reform and improvement efforts are still in their early years and require continuous evaluation to ensure they meet their targets and achieve their intended objectives. More specifically, impact assessment studies of projects that have been implemented for a number of years should be conducted. These studies should focus on the value added by the various interventions and identify opportunities for further improvement and innovative solutions to problems.

1.1. Definitions of education governance

Governance, in general, refers to structures and processes that are designed to ensure accountability, transparency, equity and inclusiveness, empowerment, and broad-based participation. It also refers to the norms, values and rules of how public affairs are managed in a transparent, participatory, inclusive and responsive manner. Governance has been defined in several ways but for the purposes of this paper, the authors will adopt definitions provided by international organizations and development agencies. For example, the UNDP, the World Bank and OECD, among others, define governance as the exercise of authority or power in order to manage a country's economic, political and administrative affairs (UNESCO, 2017a). More specifically, the World Bank views governance as 'power relationships,' 'formal and informal

processes of formulating policies and allocating resources,' 'processes of decision-making' and 'mechanisms for holding governments accountable.' (World Bank, 2009). Accountability is a key aspect of good governance and is one of the two topics addressed in this paper.

Governance is sometimes equated with management. Therefore, it is important at the outset of this paper to clarify what management is and how it relates to governance. Management refers to the planning, implementation and monitoring functions in order to achieve pre-defined results. This encompasses processes, structures and arrangements designed to mobilize and transform the available resources to achieve concrete outcomes. Individuals or groups of people are given the authority to mobilize these resources to achieve these desired outcomes according to parameters set by governance systems (UNESCO, 2017c).

Education governance refers broadly to authority and decision making within an education system. It is the capacity of the education system to transform inputs into outcomes, which includes how effective, transparent and with what level of participation, accountability and integrity key functions are performed. More specifically, according to the Network of Experts in Social Sciences of Education and Training (NESSE, 2018):

> *"Education governance is concerned with how the funding, provision, ownership and regulation of education and training systems is coordinated, and at what level; local, regional, national and supranational."*

Education governance is largely dependent on strong institutional capacity to (i) develop and implement evidence-based education policies and programs that are well integrated in wider national development strategies, (ii) set goals, standards and incentives and hold key actors accountable; (iii) effectively manage at all levels, from individual schools to system-wide functions, and (iv) publish accurate and timely data needed for policy-makers, managers and the citizenry including to hold key education actors accountable. (UNESCO, 2017c). Lewis and Pettersson (2009) concur by arguing that good governance in education requires enabling conditions such as the existence of standards, information on performance, incentives for good performance, and, most importantly, accountability.

These four aspects are key for effective education governance. However, such institutional capacity is usually lacking in many countries, especially in developing regions such as SSA. Education governance consists of multiple layers from the central down to the community level with various actors and stakeholders holding varying degrees of power, authority, influence and accountability. Whilst governments, in many countries, still play the most significant role in coordinating education, the distribution of responsibilities has been changing in response to calls for greater efficiency, effectiveness, accountability and democracy. New actors, such as households, communities, and private organizations, are becoming increasingly involved in many different aspects of education governance, calling for increased attention by governments to equity, participation and transparency (NESSE, 2018).

1.2. History and status of education governance in SSA

Despite the impressive economic growth witnessed across the region in the past decade, SSA governments and ministries of education continue to lack sufficient capacity and resources to provide schooling to sectors of the young population. Capacity is a key issue for the success of

education reform and it is in this void, that international non-government organizations have played a significant role in supplying funds and resources.

Currently, SSA continues to experience the fastest population growth of any region of the world at about 2.7 per cent in 2018 and the region currently hosts eight of the world's top 10 countries with the youngest populations. It is expected that the region will be home to all top 10 countries with the youngest populations by 2050 (The World Bank, 2015). As the African population continues to see robust growth and the number of young people grows, the pressures on ensuring more SSA youth enter and continue through education becomes more challenging. At the opposite end of the spectrum, the sharp increase in the number of skilled youths unable to find work in the formal sector that matches their skills creates on the one hand, opportunities for entrepreneurship to develop, and on the other hand, real challenges in terms of a demographic disaster (Roubaud & Torelli, 2013). Across the region, governments are grappling with the challenges posed by the growing mismatch between investments in education and the availability of real employment opportunities for graduates. The failure to resolve this issue is likely to see SSA governments failing to take advantage of the present youth demographic dividend.

Many studies demonstrate clearly that the three dominant factors determining access, dropout and learning in SSA are family income, area of residence (urban versus rural), and gender, in that order of importance. Although there have been significant achievements in the education of girls in SSA in both primary and secondary education since the 1960s, the literature from international organizations such as UNESCO and the World Bank Group clearly suggests there is still a shortfall in the number of girls accessing education as well as transitioning into secondary education.

Sustainable economic growth, at both macro and micro levels, cannot be achieved when significant portions of the younger population are not able to learn and scale up their skills. In this context, efforts and progress at prioritizing education reforms across the region stand challenged. Education governance thus appears to be central in the strategy to nurture SSA youth that is well-trained and employable in today's globalized digital economy, as well as the large informal sector, which will provide employment for the vast majority of the population in SSA in the next decade.

1.3. Rationale for this paper

The Education for All movement and a push to meet the Millennium Development Goal 2 of universal primary education by 2015 have successfully led to a significant increase in the number of students entering and completing primary education in SSA, and expansion of the education system (UNESCO, 2016, p. 7). The framing of access to primary education as a fundamental human right, along with support from international organizations, non-government organizations and government initiatives has meant governments in SSA have worked hard to ensure more female youth and youth of all social groups can access primary education. The substantial increase of students completing primary education has resulted in an increased demand for secondary education, and in turn for SSA governments to find effective means of meeting these demands (Bregman, 2008).

Many SSA governments have prioritized expanding access to a full cycle of basic education including lower secondary (Lewin, 2007, p. 1) and a few, such as Ghana, are currently providing free upper secondary education. SSA governments are aware of the value of educational attainment for all as an essential strategy for national development and economic growth, which can only be

enhanced by a labor force that is knowledgeable and skilled above the primary level. However, providing secondary education to a sizable number of students, especially those living in rural areas, requires significant resources in order to build and operate enough schools and hire and retain enough qualified teachers.

Besides allocating more resources to secondary education, it is imperative that existing resources are used efficiently, thus freeing up some resources for expanding secondary education. This can be achieved by enhancing accountability at all levels of the system and among all actors, namely the government, schools, teachers, and the community. Building and strengthening institutional capacity is also necessary for effective development and implementation of educational policies. Collection and use of data is key for good education governance and for measuring progress towards achieving intended goals.

1.4. Objective and scope of the paper

This paper addresses the issue of education governance in SSA in an attempt to shed light on the status of and developments in this area with a focus on lessons learned from various efforts across the region and recommendations on how to strengthen governance of secondary education. The paper is intended to serve as a background paper on secondary education governance in SSA which will be used to contribute to a more comprehensive publication on secondary education in SSA and the future of work. The paper addresses two key topics under secondary education governance.

Section 2 covers accountability as an important aspect of education governance. This section presents definitions of accountability and justifies the need for accountability in education. It addresses the role of the various actors in the system i.e. government, schools, teachers, and the community, and provides examples and case studies of how accountability can be enhanced. Section 3 looks at the need for enhancing institutional capacity to collect and use educational statistics, and how effective use of data can support education governance. In section 4, the authors identify several specific actionable recommendations based on the discussions in sections 2 and 3. These recommendations are expected to help policy makers in SSA countries, depending on the local context, implement improvements in the governance of their secondary education systems at central, provincial, and local levels. This section also includes a summary of the paper and a discussion of future research.

2.1. Definition of accountability

Although accountability in education is defined in several ways, most definitions share the same main principle. For example, Stecher and Kirby (2004) define accountability as "the practice of holding educational systems responsible for the quality of their products-students, knowledge, skills and behavior" (p 1). UNESCO's latest Global Education Monitoring Report provides a definition that is anchored in the same principle: "Accountability is a process, aimed at helping actors meet responsibilities and reach goals. Individuals or Institutions are obliged, on the basis of a legal, political, social or moral justification, to provide an account of how they met clearly defined responsibilities" (UNESCO, 2017c, p. xii).

Similarly, accountability is defined by the World Bank as "… the processes by which the education system holds itself responsible for delivering the appropriate services and meeting its goals for educating students" (World Bank, 2008, p. xi). Lewis and Pettersson (2009, p. 4) also focus on achievement of outcome when stating "accountability refers to the act of holding public officials/service providers answerable for processes and outcomes and imposing sanctions if specified outputs and outcomes are not delivered." Therefore, in simple terms, the main principle of accountability is 'responsibility for achieving specific pre-determined outcomes'.

The definition provided in UNESCO's 2017 GEMR above clearly states the importance of responsibility for goal achievement but it also highlights the importance of responsibility of all actors, individuals and institutions. Accountability in education is important at all levels of the education system from the central government, to local education authorities, and schools as well as local communities including students and families. This is clearly highlighted in the Incheon Declaration that calls for "coordinated partnerships at all levels and across sectors" (2016, p. 60). Even within schools, there is accountability at the level of school leaders, middle managers, and teachers.

Another view of accountability highlights the relationships between the different stakeholders involved. According to the World Bank report (2008, p. 37), there are three kinds of accountability: a) *upward accountability*, which refers to the obligation of the school system to report to those above school management such as district managers, local authorities, or the Ministry of Education; b) *downward accountability,* which is the obligation of school leaders and teachers to learners in the form of providing quality education that helps learners achieve learning targets and meet standards; and c) *outward accountability,* that is the responsibility that the school system has to community members including parents and those organizations that contribute to school fees.

Accountability is not limited to a single actor; achieving education goals is often a collective responsibility, and this requires efforts by all actors at all levels to ensure the achievement of stated objectives. In fact, the relationship among individuals or institutions is crucial for any accountability system to function and achieve its objectives. For instance, if schools are responsible for providing supportive learning environments, they rely on governments to provide the necessary resources, and teachers to respect professional norms and follow best practices, and students to behave appropriately (UNESCO, 2017c, p. xii). It is, therefore, important to ensure accountability at all levels of the educational system and positive relationships among the various actors in the system.

In many SSA countries, accountability systems are in their early years of development. Although, many systems have reporting mechanisms in place between schools, local authorities and the Ministry, the lack of information flow, the lack of reliable consistent data, and the lack of institutional capacity negatively affect accountability in the system. Most accountability systems focus on the inputs of education such as teacher attendance, facilities, materials, etc. However, few systems in SSA focus on accountability for the outputs of the system, i.e. student achievements and grades. This represents a major shortfall for accountability systems in education (Stecher et al., 2010).

2.2. Why accountability matters

The Incheon Declaration emphasizes the importance of establishing or further developing legal and policy frameworks that promote accountability and transparency in order to successfully achieve Sustainable Development Goal 4 (SDG 4) -ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. While governments look for solutions to education challenges and develop appropriate policies to achieve the intended objectives, the public wants to know who is responsible for achieving these objectives. When systems fail to achieve the intended objectives, the public calls for someone to be held responsible. The former Director General of UNESCO, Irina Bokova, clearly highlights the risks associated with the lack of accountability by stating "The lack of accountability risks jeopardizing progress, allowing harmful practices to become embedded in education systems" (UNESCO, 2017c). Similarly, accountability features in the Continental Education Strategy for Africa as both a pillar and a guiding principle (2016). This is also echoed by many education scholars and senior government officials (Barber, 2017; Augustine et al., 2009; Rothstein & Eek, 2009; Adams and Kirst, 1998).

Around the world in general and in Sub-Saharan Africa (SSA) in particular, civil society is demanding that education systems be accountable for accomplishing their role. This applies at all levels of the system from ministry staff, to local authorities, principals, teachers, parents, and students. Communities need to know whether students are learning and whether what they are learning is equipping them with the knowledge and skills necessary to join the labor force. (World Bank, 2008, p. xii). This aspect of accountability is not fully developed in several SSA contexts. For example, although Parent-Teacher Associations (PTAs) have been created to hold schools accountable in Kenya, there is no direct relationship between PTAs and local Boards of Governors. Teacher absenteeism is another major challenge for many education systems in SSA and many countries in the region are struggling to ensure that teachers show up in class, let alone teach effectively.

2.3. Framework

According to the findings of the GEMR 2017, governments play a central role in achieving accountability because governments are the primary duty bearers of the right to education. Schools also have an important responsibility in the education system, as they interact directly with the main beneficiaries of education. Therefore, schools should be held accountable by governments, parents, students and community members. Teachers should also be accountable as they have primary responsibility for providing high-quality instruction and manage the teaching and learning

process. Parents and students are accountable for student attendance, effort and behavior at school. Parents are accountable for reporting underperformance and raising concerns for non-delivery of services or lack of quality. This section addresses how accountability by the various actors (government, schools, teachers, and parents and students) can enhance governance and improve education.

2.3.1. Government

Governments have the primary responsibility for education and, therefore, should play a central role in ensuring efficient, equitable and effective management and financing of public education. This requires establishing an effective accountability system which, according to Brewer et al. (2007), should include the following: 1) performance indicators to measure achievements; 2) training of school teachers and leaders as well as officials in the ministry and local education authorities; 3) a detailed school accountability plan including how the school would collect and maintain data for evaluation purposes; and 4) public engagement which is key for a successful accountability system. These elements are also reflected in the GEMR 2017.

For accountability systems to function properly there must be strong commitment at all levels in the system including the central government. Ministry staff need to be accountable for meeting the requirements of their jobs; the education system should be accountable for educating students to a defined level of competency; and the system should be financially and academically accountable to parents and the community for doing its job (World Bank, 2008). Once commitment is made, adequate resources become essential for the effectiveness of the system. The various actors involved in the implementation of the system need the skills to fulfil their responsibilities, which makes capacity building important. Once the system is rolled out, transparent and relevant data on the strengths and weaknesses of the systems at all levels should be available (Rothstein & Eek, 2009).

To achieve effective accountability, education systems should have clear reporting relationships with specific reporting requirements according to specific timetables. This should be complemented by effective decision-making and information sharing mechanisms at all levels. The education system should have clear objectives and standards, in addition to mechanisms for measuring the achievement of these objectives and standards. Rewards and sanctions mechanisms should be put in place and implemented for performance at both the system and individual levels.

Engagement of the public is key for achieving effective accountability. The public voice should be heard and members of the public involved in policy-making and system-design. This will enhance public support to education. The education system should provide to the public data on performance of the whole system, schools, and students so that parents and civil society organizations understand how the system is achieving it objectives. De Wolf and Janssens (2007) argue that effective accountability systems should have clear performance indicators for schools to be accountable and for parents to be effectively informed. Pupils and parents can use data related to performance in these indicators for school choice, and schools can use these data as benchmarking information. An effective accountability system should provide data to the public. When data related to performance in these indicators are made public, this encourages the involvement of pupils, parents and the whole community and provides them with instruments to contribute more effectively to school improvement.

- *How accountable are governments in SSA?*

It is not easy to understand how accountable governments are in SSA as the definition of accountability varies by context and language. However, there are a number of examples that clarify how different governments in SSA countries view and approach accountability. Many political leaders commit to major improvements in education during their electoral campaigns. However, in many cases, these commitments are not fulfilled. The difficulty of holding a leader accountable for commitments in education is that education improvements usually take a long time to materialize and one government term might not be long enough to assess whether improvements have been made. One exception to this is the abolition of school fees, which has been promised and implemented by several leaders in SSA countries such as Uganda (for primary education) and Ghana (for secondary education). Abolition of school fees is a straightforward commitment that the public can assess. However, this might create challenges in other aspects of the education systems such as student-teacher ratio if the system is not able to hire and retain enough teachers.

Uganda: Sector-Wide Approach

The Ministry of Education and Sports in Uganda has put in place a number of strategies and mechanisms to ensure accountability and transparency in managing the education system. The Ministry introduced an accountability tool to ensure that performance of the education system is assessed against policies and objectives. The Annual Performance Report of the Ministry of Education and Sports in Uganda gives an account of Ministry actions and their results at the input, process and outcome levels. It also provides some analysis of challenges; discusses factors affecting the achievement of goals; and contains budget performance information (Uganda MOES, 2016).

The Ministry also implemented a Sector-Wide Approach (SWAp) to strengthen partnerships of all stakeholders in the system, and promote accountability and transparency. The SWAp aims at harmonizing interventions of all stakeholders and removing duplication and overlap, reducing transaction time and cost, enhancing transparency and accountability in the system, and promoting a holistic and forward planning and funding approach to education activities. To implement the SWAp effectively in Uganda, the Ministry developed the institutional framework outlined below:

1. Top management including the Minister of Education and Sports, ministers of state, and senior management officials have the power to make decisions and approve policies.
2. An Education Sector Consultative Committee (ESCC) has been established to build consensus between the government and other actors on what constitutes acceptable progress in the system. These actors include private sector and private providers of education services including the Federation of Non-State Education Institutions, teacher associations, civil society organizations and foundations. The ESCC convenes on a bimonthly basis and acts as an early warning system when performance standards are not met.
3. Departmental working groups have been established at the lowest level of policy formulation. These groups oversee the process of consultation with stakeholders at the department level (e.g. primary, secondary, teacher education, TVET, etc.) which promotes transparency and accountability.
4. An Education Funding Agency Group (EFAG) has been established to bring together all donors who provide financial and technical support to the education sector to improve

coordination among these donors. EFAG holds a monthly coordination meeting and sometimes invites the Permanent Secretary to clarify issues of concern or interest.

5. Education Sector Reviews (ESRs) are conducted by the government biannually to assess the strengths and weaknesses of the education sector in light of the goals set for the system.

6. The Ministry created the Monitoring and Evaluation Committee which meets regularly and reviews all reports, proposals and other deliverables. This committee has the power to prevent weak plans and reports going forward to senior management, or approving them to the next level. The Committee is chaired by the Director of Policy and Planning.

The SWAp adopted by the Ministry of Education and Sports in Uganda is strengthening accountability and transparency in the education sector by engaging all stakeholders in planning and monitoring performance of the system. This is also connected to provision of funding by donors. In adopting the SWAp to strengthen transparency and accountability the Ministry of Education and Sports developed a number of mechanisms and tools to monitor performance and expenditure on education. These include statutory audits, sector-wide audits, financial tracking studies, periodic performance reports, routine monitoring, and the display of funds released. To ensure the availability of consistent and reliable data on the performance and expenditure in the system, the Ministry established the Educational Management Information System (EMIS) linked to all districts.

There is strong evidence on the positive impact of SWAp on education governance and accountability in Uganda. According to Eilor (2004) the introduction of SWAp has widened the participation of planning, policy formulation, and monitoring and evaluation to include all stakeholders of the system. The implementation of SWAp has also necessitated a reformulation of communication and capacity building strategies at the Ministry making it a more results-oriented organization. Penny et al. (2008) also indicate that Uganda has demonstrated significant improvements in its education system after adopting SWAp including provision of more learning materials and improvements in school provision and facilities. However, they argue that the quality of teaching and learning may continue to be low and inequities in access and outcomes remain a challenge for Uganda.

Although adopting the SWAp improved several aspects of education governance in Uganda, there are still several weaknesses in the Education system in Uganda. For example, teaching quality and teacher absenteeism are two main areas that still need to be addressed in Uganda (UNESCO, 2014). Skilled educators are still in high demand in the education system and wages for teachers and coordinators are still low. Pupils in poor areas perform poorly on standardized tests, and results from econometric analysis suggest that substantial gains in student performance in poor communities can be achieved by improvements in school facilities, the quality of teaching, and the knowledge base of teachers (Tsimpo, et al, 2017). Thus, it can be argued that SWAp focuses on one level of governance but does not address issues in other levels in the system.

In 2008, the government of Uganda established the National Education Accounts (NEA) program as part of the National Education Accounts Project, which was initiated to cover the gap in the education financing. The program was implemented in Uganda from 2008 to 2014, and studied the education finances in all levels of education and covered the financing of General Administration. It used a systematic approach in data collection, processing, analysis and reporting (UNESCO and GPE, 2016). More information about NEAs are in the case of Senegal below.

Senegal: National Education Account

Like many other SSA countries, Senegal struggled with financing education and enhancing accountability in the education system. To address these issues, the government of Senegal developed a National Education Account (NEA) with support from UNESCO's Capacity Development for Education program (CapED), and technical assistance from UNESCO's International Institute for Educational Planning (IIEP). This was part of a wider program to operationalize SDG4 (UNESCO, 2018). NEA is a comprehensive information system that helps produce reliable and transparent data on education spending from all sources, including government, household and external funding across all education levels (Global Partnership, 2017). The 2016 results of NEA in Senegal indicate that education spending in the country is steadily rising and is almost evenly shared between public resources and households (48% each) with the remaining 3-4% provided by donors. The results also show a remarkable rise in the number of students passing their secondary school exams from 20,475 in 2009 to 54,571 in 2016.

NEAs track and classify multiple data from key funding sources - public funds, private spending and external funding - into a common framework which allows for better targeting of educational resources, improved policy decisions, and monitoring of progress towards SDG4 (UNESCO, 2017). NEAs are important as they enable countries to better monitor the financial flows in their education systems. By tracking financial flows, governments can make informed decisions regarding the allocation of resources to areas most in need and improve education efficiency and equity. This information is also vital for other stakeholders such as donors, civil society organizations, households and school organizations. This ensures system-wide accountability.

The Government in Senegal was able to use the outcomes of NEA in formulating future education plans. The information on the education sector's fiscal structure allowed Senegal to estimate financial projections of its education sector plan (PAQUET - 2013-2030) and prepare a better allocation of financial resources taking into account equity, quality and transparency.

There is a growing recognition of the need for quality financing data to support decision making in the various efforts to achieve SDG 4. Monitoring of implementation plans, including financial expenditures, is critical to the success of these plans. NEAs can offer considerable insight into the tracking of resources to illuminate where, how and by whom education is funded and who benefits. Without NEA, these vital questions related to equity and quality go unanswered (UNESCO, 2018).

Developing a National Education Account and publishing its data regularly improves transparency. Government, teachers and communities will be able to access the published data on how resources are used in an annual report. It is worth noting that capacity building at government and local levels is necessary for successful implementation of NEAs. In the case of Senegal UNESCO provided comprehensive capacity development for the NEA, including the analysis of all types of financing streams. UNESCO also helped strengthen existing data collection and analysis tools and develop new ones to capture all spending on education down to local government and school levels.

NEAs were also launched in Uganda and Lao People's Democratic Republic, which highlights the strong potential these information systems can have on improving educational planning and policy. NEAs are in the pipeline in five more countries in Africa and Asia – Zimbabwe, Vietnam, Nepal, Guinea, and Cote d'Ivoire, which indicates that this effort is gaining momentum and is supporting countries in tracking funding and expenditure on education, thus further enhancing accountability (UNESCO, 2016).

2.3.2. Schools

Teaching, learning, skill development and assessment take place at schools. Therefore, ensuring that schools are accountable for achieving the objectives of the education system is of paramount importance. There are a number of challenges to achieving accountability at schools in SSA countries: 1) schools in many SSA countries implement policies and decisions made by the central government, and have no authority to make decisions that best suit their local context; 2) financial resources available to schools are usually rare and cover only operational costs, which makes it difficult for schools to implement any improvements to education services they provide; 3) community expectations of schools are high and are sometimes not aligned with what schools can provide; and 4) if schools cannot hire and retain good teachers who come to school every day, it is most likely that schools fail to provide quality education to the students in the community (Barrera-Osorio et al., 2009).

- *How can we make schools accountable?*

There have been several attempts in SSA countries to make schools accountable for delivering quality education to their students. Some of these efforts have fallen short of achieving this ambitious goal whereas others have been relatively successful. Success of these efforts can be attributed mainly to the approach of collecting information and disseminating it to parents as a way of promoting accountability at schools. The following are a few examples.

Uganda: school profiles

Uganda launched a major reform effort for its Ministry of Education in 2001. This included the overhaul of its Education Management Information System (EMIS). One aspect of the reform was to provide feedback from EMIS in the form of "school profiles." These profiles provided information about school services and student performance. Cameron et al. (2006) indicate that these profiles have been well received by headmasters and have provided useful input in the headmasters' discussions with parent-teacher associations and elected officials. The profiles have also been credited with positively altering the community mind-set regarding education provision. Additionally, school profiles reasserted a form of soft vertical accountability by signaling to schools how much the central government knew about them (World Bank, 2011). School profiles are currently called report cards and focus on a number of aspects including teacher absenteeism (UNESCO, 2017).

Nigeria: school report cards

In Kano state in Nigeria, School communities receive school report cards that show basic information about their schools. The reports included easy-to-interpret graphs that showed how school-specific indicators compared with local-area and statewide data. These multidimensional reports are generated targeting different issues and different users. The dissemination included radio debates in which specialists discussed the indicators and what they meant and informed the public about the availability of information from the EMIS. Although there is no clear evidence of education improvement as a result of introducing these cards, anecdotal reports suggest that the information was being used by stakeholders and increased transparency in the management of the system. It also helped strengthen the almost nonexistent accountability links between the communities and schools as well as between the central and local governments (Winkler and Herstein 2005). There is no recent evidence that these report cards are still being used by Kano state in Nigeria.

Namibia: school self-assessment system

In the northern regions of Namibia parents and school councils are involved in the writing of their own report cards and school improvement plans. The system was designed to foster school-level discussion on school climate, management and planning, teacher attitudes, availability of inputs, continuous assessment, parental activities, and school support for parental involvement. A team of inspectors use the same indicators to provide an alternative assessment. The school report cards are disseminated to a school management team made up of teachers, parents, and supervisors. Findings from the school assessment are also summarized at the regional levels and used as a diagnostic tool for management at these levels. Anecdotal reports suggest that the initiative succeeded in mobilizing parents, communities, and schools to participate in the work and management of their schools. It also helped contribute to the creation of meaningful and common standards of performance and expectations (World Bank, 2011).

Ghana: School Performance Appraisal Meeting (SPAM)

The School Performance Appraisal Meeting system in Ghana brings together major stakeholders at various levels in the delivery of quality education. The meetings are organized to discuss results of nation-wide assessments of Math and English as well as tests of literacy and numeracy. Problems affecting the delivery of quality education are collectively analyzed, strategies to address them are identified, and realistic targets are set to improve school performance for the next academic year (Cameron et al. 2006).

2.3.3. Teachers

Qualified and motivated teachers are extremely important for any successful education system. In SSA, one of the major challenges to education systems is hiring and retaining qualified teachers who come to class every day and teach effectively. This has implications on reform efforts or policies enacted since teachers' low performance can significantly impact student outcomes even when other aspects of the system are positive. Ballard and Bates (2008) observe that it is important to hold teachers accountable for students' learning to take place. Once adequate measures are put in place to hold teachers accountable, their attitude towards their duties improves and, invariably, quality instruction and improved learner attainment are guaranteed.

This is clearly manifested in teacher absenteeism which represents a major deterrent to education improvement efforts in the region. Teacher absenteeism rates are high in many SSA countries, with rates in rural and remote areas much higher than those in urban ones (UNESCO, 2017c). A study that collected estimates of teacher absenteeism in nine developing countries (using surprise visits to a nationally representative sample of schools in each country) found, on average, 19 percent of all teachers absent on any given day. The highest rate registered was 27 percent in Uganda (Chaudhury et al. 2006). Several efforts have been made by SSA countries to address this challenge. The following are a few examples.

Gambia: tracking teacher attendance via mobile phones

The Ministry of Education in the Gambia in partnership with the World Bank and a local technology firm have implemented a mobile phone platform for the collection and dissemination of basic data on teacher absenteeism and tardiness. Basic mobile phones are disbursed across the country districts to head teachers. An agreement has also been reached with a mobile services provider which has allowed the creation of a Closed User Group at a cost of USD 2 per user per

month. Head teachers are using this platform to send data on key attendance indicators on a daily basis to a computer server which reduces the challenge of tracking and consolidation of data and makes the information available in real time to district officials (ADEA, 2015).

Uganda: text messaging system to track teacher attendance

Teacher absenteeism rates in Uganda range from 20% - 30%, which costs the Ugandan government US$ 30 million every year for paid services that are not delivered. A cost-effective initiative measuring teacher absence was necessary to enhance teacher accountability. A number of counties in Uganda have teamed up with the mobile phone manufacturer Nokia and Plan International to introduce a simple text messaging system that enables pupils to monitor and report teachers' absence. When a teacher fails to attend class, students can anonymously send free text messages to Plan International which subsequently forwards them to the district education officer and district inspector of schools. These two representatives follow up on the missing teacher (ADEA, 2015).

South Africa (Western Cape): Human Capital Leave Management System (HCLMS)

The Western Cape Education Department in South Africa has implemented the Human Capital Leave Management System (HCLMS) at most of its schools. This is an online, electronic system that captures educator attendance. All schools on the system must file their report before 10 am every day. Educators and schools have to confirm these 'digital' records as soon as possible by routing documentary evidence to the head office. These documents go via the district if needed. The system allows educators to check on the leave they have taken as well as the number of days that they can still take via the Internet or their cellular phones (ADEA, 2015).

2.3.4. Parents and students

Although parents and students are the beneficiaries of education services, accountability of these actors is also important for the success of education improvement efforts. Students are expected to attend school on time and behave according to agreed norms. Parents are also expected to ensure that their children attend school and behave appropriately. This is clearly stated in the 2017 GEMR: "Parents are responsible for the attendance, effort and behavior of younger students, while older students take on these responsibilities for themselves" (p. 85). More importantly, parents and students should understand that they have a stake in the education system and that they should voice any concerns to and raise any issues with the relevant authority. For example, students should report teacher absenteeism, and parents should raise any concerns they might have on quality of teaching and their children's performance in teacher-parent meetings and/or school council meetings. This understanding is well-established in developed countries whereas in the SSA region, the understanding of parents and students regarding their responsibilities and need for accountability is still evolving.

Although the authors were not able to identify efforts to enhance parent and student accountability in SSA countries, this issue has been addressed by a number of countries around the world in the form of introducing compulsory education. Many countries including South Africa enforce compulsory education by taking legal action against parents for students not attending school. An analysis of 34 countries with truancy laws shows that over one-third of countries have enacted laws stipulating fines, and almost one-third of laws stipulate jail time for parents of truant children. For example in England, parents of children who fail to attend compulsory education regularly

may be prosecuted by the local authority whereas parents of students who do not attend compulsory education in South Africa can be sentenced to six months in jail (UNESCO, 2017c).

2.4. Enhancing accountability and participatory governance through technology

Accountability is key for good governance and is an integral component of an effective education system. Therefore, it is imperative that accountability is enhanced at all levels of the system. Use of technology can support and facilitate initiatives aimed at improving accountability. Among the models that ensure effective governance and management in secondary education is a governance system that collects school data to inform analysis, policymaking and implementation (Ahmed, 2000). Technology can help foster effective education in three main ways: (1) increasing transparency, accountability and reducing corruption (Salatin & Fallah, 2014, p. 251); (2) enhanced accurate decision making based on data collection, and: (3) enhanced delivery and access of public goods and services (Magno & Serafica, 2001, p.1). Technological solutions can also improve accountability of school management by providing feedback and greater efficiency in managing information (Baker, 2005, p. 29).

The introduction of mobile phones and the internet in SSA provided opportunities for greater communication in the region and enabled several countries to implement leapfrogging projects in communication such as providing mobile phone service for remote areas where landlines were not available. This use of technology can enhance accountability at various levels of the system. For example, teacher absenteeism in remote areas can be tracked and reported using mobile phone messaging services as in the cases of Gambia and Uganda discussed above. Reports on school performance can also be made available to the public using the appropriate means of technology.

2.4.1. Using mobile phone platforms to improve accountability

A number of promising mobile phone platforms have emerged around the region with the purpose of addressing problems within school management and administration, including the example of Gambia described above. Below are three notable platforms that were developed to improve communication between schools and parents:

Allo Ecole

Allo Ecole! ("Hello, school!") is an accountability platform launched in the Democratic Republic of Congo in 2016. Allo Ecole! was developed with the purpose of addressing the communication gap between education beneficiaries and the school management and the decentralized administrative structure of the Ministry at the provincial and district levels (Babs, 2017). Communication within the education governance apparatus is limited to reports without benefit of real-time feedback and data from the community. This in turn hampers policymakers within the MOE to implement policies and action to improve the quality of education.

The Allo Ecole! project was devised by the Basic Education Support Project (PROSEB), an investment operation of the World Bank in DRC, with funds from the Belgian Development Cooperation, and done in collaboration with the Ministry of Primary, Secondary and Professional Education. Moonshot Global Consulting partnered with VOTO Mobile to work with the Ministry of Education to develop the platform. The platform enables teachers and parents, with any simple mobile phone, to provide feedback on the availability and use of textbooks, absent teachers and

state of school construction by using SMS and interactive voice response (IVR). Allo Ecole! makes a voice call to a database of phone numbers and can answer questions by pressing numbers or leaving voicemails. Parents can also send short messages (SMS) from a toll-free short code '178'. Allo Ecole can work in four languages being: French, Lingala, Tshiluba and Swahili.

The pilot was set up in 311 schools: 208 schools in two districts of Kinshasa (156 in N'Sele and 52 in Ngaliema) and 103 schools in Tshikapa, Kasai province (Babs, 2017). Following the release of Allo Ecole!, over 5,000 responses were submitted in the first month and 8,000 calls made after four months to the Ministry's Communications Department (Amelina, 2017). Feedback on the platform was collected from 1,465 parents and 1,230 teachers (Babs, 2017). From the feedback, 61% of responses related to school construction, followed by 27% on textbooks and 12% on teacher or student absenteeism. Surveys following the training sessions confirmed the success and potential of the platform with survey respondents giving high approval. According to the survey, 99% of respondents agreed that the platform will have a positive impact on the state of education, and 99% of parents and 80% of teachers confirmed they would use the platform. Importantly, 93% of parents and 82.5% of teachers preferred using IVR responses to SMS (Babs, 2017). When respondents were asked about other school matters of interests for which they could provide feedback on, 57% mentioned quality of teachers and 33% mentioned tuition fees.

As Allo Ecole! was only recently established, additional research and analysis is required to determine the impact of the platform. However, the positive feedback from respondents indicates the high potential of the platform in closing accountability gaps within the education system. Following the success of the pilot, the Minister issued a decree appointing a senior director to serve as Coordinator of Allo Ecole! Client service consultants have been attached to each department for six months to learn to use the technology (Amelina, 2017).

EduTrac

EduTrac is a mobile phone based data collection system used in Uganda that operates using an open software program to function as a real-time and simple to use information management system. EduTrac was developed with the aim of improving the delivery of education by promotion of accountability and administrative efficiency of school systems by enabling communication between local communities and the government. Text messages from users are mirrored to a web-based dashboard, which allows education administrators in the central government to identify problems at the school level, and to effectively plan on how to address those problems in the short and long term. Education staff are sent biweekly or monthly texts to confirm that education and administrative processes are going well. For instance, head teachers may receive questions to confirm whether the school has received its grant allocation for the term. Teachers may receive texts asking what themes they covered in the month.

EduTrac crowdsources data from parents, teachers and school leaders to allow the government education administrators to see and respond to challenges at the school level. The platform allows the education administrators to collect data on teacher attendance, enrollment, school infrastructure and delivery of textbooks, and for this information to be included into the annual data collected by the Ministry of Education for its EMIS. The data is collected around 18 indicators that include student and teacher attendance, delivery of school materials, school maintenance, and collect receipts of government grants. Education staff with mobile phones, such as head teachers and school management committees, were chosen to be reporters with one reporter responding on each indicator.

EduTrac was developed to be easily adaptable and used for multiple purposes. The interface is simple enough to be compatible with all types of mobile phones (Winthrop et al, 2016, p. 60). EduTrac is a scalable technological tool, thanks to its use of an open access platform which makes EduTrac easily adaptable and usable for multiple purposes. EduTrac helps the Ministry to reduce costs on training and its easy design and usability increases the chances of education stakeholders adopting the program. EduTrac was piloted in 229 primary schools in four districts of Uganda with the support of UNICEF Uganda and the Ministry of Education. Following the initial pilot in 2011, by the end of 2015, use of EduTrac expanded to 3,500 schools with 10,000 registered users (Winthrop et al, 2016, p. 61). In 2015, EduTrac was launched in the Central African Republic through the Ministry of Education.

Sematime for Schools

Sematime is a Kenyan SMS service provider launched in 2011 by Boniface Githinj, a student of computer science at the University of Nairobi. Sematime was developed by Githinj to make parents more involved in their children's school performance. Schools send a spreadsheet of mobile phone numbers to Sematime's web-based platform. In turn, schools can use the platform to send mass or customized text messages. This permits schools to communicate with parents in a way that is quick and cost effective. Schools use the service to invite parents to school meetings and keep them up-to-date about emergencies (Winthrop et al, 2016, p. 62). In addition, the service is used to distribute exam results, report cards, send payment requests, fee balances and general notifications to parents.

The platform is free to use for parents, while schools pay for each text message sent. Schools can purchase bulk credit at lower rates than offered by other mobile phone carriers (Winthrop et al, 2016: p. 62). At present, Sematime is used in over 1500 schools and by 2,000 organizations, comprising small and medium-size businesses that use the service primarily to send bills and invoices via SMS to large groups (Vutagwa, 2014; Winthrop et al, 2016, p. 62).

The growth of technological based solutions, such as mobile platforms, is an example of 21st century tools helping to monitor and evaluate education systems and allow for a wide mobilization of beneficiaries, through cooperation between the government, international non-governmental organizations and the private sector. Digital platforms such as eNota and PurcAl Mobile are helping parents be involved in their children's education. Other technological platforms such as Allo Ecole!, EduTrac and Sematime are helping to improve or supersede traditional engagement practices such as management committees, parent-teacher conferences and school councils, which are not always accessible for all.

For schools and school districts where such practices were not well established, these technological tools have effectively helped schools to 'leapfrog' to greater accountability. For the Ministries of Education, and the district level education staff, these technology platforms appear to offer the chance of closing those communication gaps between education beneficiaries and help inform policymakers when implementing policies and action plans to improve education. These tools demonstrate how governments and education actors can utilize low-cost technology to grant education beneficiaries a voice with teachers, school administrators and policymakers while reducing costs. Evaluations will need to be conducted to rigorously assess the impact of these systems on accountability and education quality. The potential of these mobile platforms to be effective lies in their accessibility and simplicity: they only require a mobile phone, which large segments of the population already have in resource-constrained areas that often have no connection to the national electricity supply and lack internet connectivity.

2.4.2. Using social platforms to enhance accountability

A number of social platforms have been used to enhance accountability by collecting feedback from beneficiaries of health, education and other services and understand how they view the quality of these services. Platforms being used in the health sector, for example, could be adapted to schools and other parts of the education system. The following are a few examples.

Nigeria: MyVoice

Primary health clinics in rural regions of Nigeria have no standardized way of collecting patient feedback. This deprives the clinic management of gaining input on how to improve the quality of care and confines the ability of the federal and state policymakers to oversee the clinics. MyVoice was created by Reboot in partnership with the World Bank in 2014 in Wamba, Nigeria. MyVoice was piloted over a duration of nine weeks across 11 clinics managed by the Nigerian States Health Investment Project (NSHIP), and managed to register 60% of visitors. MyVoice helped to enable a direct path towards accountability in the public healthcare in Wamba, and the state, local and clinic management all responded with action. Service providers implemented action plans based on the feedback and addressed problems such as irregular hours and poor staff service. At the local government level, the Department of Primary Health adopted MyVoice and created protocols to guide and monitor responses from clinics to citizen feedback. At the state level, NSHIP looked at how to provide more resources to implement facility improvements. At the national level, NSHIP policymakers discussed ways of how to expand MyVoice and institutionalize citizen feedback.

Mozambique: Ntxuva Citizen-Reporting Platform

Based in Mozambique, Ntxuva Citizen-Reporting Platform was created in 2014 to collect information from citizens in underserviced urban areas about schools, hospitals, and social services. Ntxuva Citizen collects information from designated citizen-monitors and crowd-sourced reports via SMS, a mobile app, Web portal and voice interface in local languages. Information gained from the platform is forwarded to municipal service managers and government officials.

Multiple countries: U-report

A free SMS-based system that currently operates in Burundi, Democratic Republic of the Congo, Nigeria, Eswatini, Uganda and Zambia. U-report is targeted at young people and allows them to report on problems in their communities and to connect with community leaders, members of parliament and policy-makers for constructive change. U-report conducts a weekly SMS poll along with regular radio programs that will broadcast stories collected by U-report. Currently over four million people in 17 countries use U-report, with half being in Nigeria alone.

Mobile technology has improved communications channels between schools and education beneficiaries. Furthermore, it has allowed parents or guardians to be more involved in their children's student performance. Mobile platforms such as Allo Ecole! Edutrac and Sematime have shown the potential of technology in fixing the problem of accountability loopholes between education beneficiaries, schools and policymakers at the district and Ministry levels. Technology can help MOEs, district offices and schools to gain information from education stakeholders and feed that information to the upper echelons of the governance apparatus and education management to make informed policies and actions.

Section 3: Education Data

To ensure that African youth have a better quality of secondary education that will enable them to transit to tertiary education or skilled work, it is imperative that Sub-Saharan African governments ensure the collection of accurate, timely and good quality data to monitor and evaluate their secondary education system's current performance and learning outcomes.

African policy makers have been urged to use evidence based and data-driven research to inform development decisions and reforms (Beguy, 2016). Data has become a development cause embraced by a number of African governments, international donors and intergovernmental agencies. There is a clear understanding that robust data can help promote development, good governance and keep governments accountable for the public services they provide. The United Nations Development Programme has stated that, "Reliable data and monitoring and evaluation systems at the national and local levels are critical for designing evidence-based responses and targeting interventions" (UNDP, 2011, p. 238). As Jacob Bregman articulates:

> "*All decisions concerning secondary education must be informed by data about the secondary education systems current performance. Without comprehensive, accurate data, policymaking can be unduly influenced by personal biases of ministers of education or senior civil servants, vested interests of school owners or teacher unions, and anecdotal evidence offered by business interests, journalists and politicians.*" (2008, p. xiv)

Having school data on a range of variables such as grades, number of teachers and students, teacher and student attendance and school infrastructure, will allow education governance actors to see the current state of the secondary education system and to take appropriate action based on the evidence. As Bergman further states:

> "*Student performance data, if it is sufficiently detailed, can point to strengths and weaknesses in curriculum areas, show how intended curricula are being implemented in schools, and highlight differences due to gender, rural-urban location, or performance at different times of the year. Such information could be used to improve curriculum design, teacher training and the allocation of resources.*" (2008, p. xiv)

In the context of Sub-Saharan Africa, many countries continue to face challenges in producing regular, timely and quality statistical data. Some of these challenges stem from not enforcing data system frameworks, poorly maintained systems and poor human resource capacity within system teams. Overall, the strength and weaknesses of data systems vary across the region. There are stable data collection systems in Lesotho, Malawi, Mozambique, Namibia, South Africa and Zambia. These countries possess provisions for the legal enforcement of their national statistical frameworks and accountability over them (UNESCO, 2014, p. 21). Countries such as Tanzania, Eswatini and Zambia are making progress but with assistance from external donors. There have been recent innovative approaches taken in Kenya with the introduction of a Unique Learner Code. In less developed SSA countries, such as Congo, Guinea-Bissau and South Sudan, research has shown that there has been a lack of sufficient secondary education data to analyze school performance and inform government policy actions. School systems in many less developed SSA countries struggle to ensure consistent annual data on student results needed to scrutinize their

performance, and in turn making it difficult for education bodies to identify 'dysfunctional' schools. Furthermore, not all schools keep sufficient records of numbers of students, girls, minorities and disadvantaged groups.

Recent research has shown that in the past decade, ministries of education in the region have taken steps to improve their capacities to collect school information and established education management information systems (EMIS). There is still some way to go to ensure that the information is analyzed in evaluations for policymakers in order to take appropriate actions in response. SSA governments need to have information dissemination strategies in place, as Cassidy states, "A supply of better data is not enough to insure meaningful data use" (2006, p. 11).

This section will focus on the collection and use of secondary education data. It will begin by discussing the importance of data collection, followed by progress and challenges within Sub-Saharan Africa.

3.1. The value of data

In this digitalized global economy, data has become extremely valuable, helping to explain why five of the top six companies by market valuation are data-related companies. However, while companies are seeking to gain as much data as possible - even through the purchase of it - governments and the development sector have been lagging. It is argued that having better data is a prerequisite to achieving important measureable frameworks such as the Sustainable Development Goals. It is hoped that all 17 goals, 169 targets and 232 indicators can be achieved in all countries by 2030; this therefore places an important emphasis on monitoring statistics and targets to measure progress (Slotin, 2018).

The gathering of more data in the public sector has not always translated into increased funding from domestic and external sources. Part of the issue stems from the short-term thinking of politicians and policymakers who lack patience for the results. Data and statistics are often viewed as a long-term process and systems investment that competes with other priorities that have an immediate impact (Slotin, 2018). Indeed, developing a robust data system is a complicated investment, and involves many levels of stakeholders, but it does pay off. Once the data architecture is in place, that data can be collected consistently and timely to inform policymakers.

Data is one of the means by which public stakeholders and beneficiaries hold their governments to account for the services they provide. It is for this reason that some governments may choose not to place a high value on investing in data collection and analysis - they would rather not know. While companies use data to enhance profits by better targeting customers, data for governments means facing the true extent of the work or lack of work.

In the context of Sub-Saharan Africa the collection, use and availability of public related data is very limited. There are large data gaps in a wide range of subjects. The World Wide Web Foundation's Open Data Barometer published a third edition report released in April 2016 that covers 92 countries and ranks them based on three open data criteria. Globally, there is much work to be done to ensure government data (e.g. health, education and legislation) is more accessible, however as indicated in the Africa Regional report, Sub-Saharan Africa countries lag behind other

regions of the world (Open Data Barometer, 2016). In 2012, the United Nations Economic and Social Council listed 52 sets of minimum indicators to measure gender equality. The indicators include educational attainment (completed upper secondary), youth female unemployment and literacy levels. A report by the non-profit Bread for the World found that Sub-Saharan Africa was missing 82.3% of the necessary gender data on those indicators (Bread for the World, 2015). Countries with the most missing data on women's equality include Guinea-Bissau, Somalia and South Sudan (Bread for the World, 2015).

The lack of data is a major cause for concern as it makes it impossible to monitor and judge the scale of issues in education, health and poverty. Furthermore, it makes it difficult to determine whether response-strategies are having an effect. It is for this reason that the World Bank rates developing countries' statistical capacity with an index that tracks whether they measure social and economic issues and how often.

3.2. Importance of data in education governance

As with any public service, good quality data is essential for national governments and institutions to accurately plan, fund, monitor and evaluate their activities (Beguy, 2016). One of the fundamental responsibilities of educational governance is ensuring good performance, effectiveness and accountability (Selwyn, 2015, p. 54). Policy actions taken by SSA governments and education bodies to improve learning outcomes in the secondary education system need to be informed by data-driven and evidence-based research decisions. This requires good quality data that is comprehensive, reliable and collected in a consistent and timely manner. Capturing statistics at the macro and granular levels helps to increase accountability for improving educational quality and attainment, and becomes a vital part of policy action and review.

Data driven planning is more impactful and efficient for an education system as it reduces system cost by better allocating resources and determining where additional staff are required. The World Bank SABER Report (2014) argues that when enrollment data only become available nine months after the start of the school year there is no time for the central ministry or local government to allocate teachers to reduce the student-teacher ratio. Furthermore, the regular updates of school data such as budgets can help reduce the potential of financial mismanagement or corruption.

Data driven decisions help identify and target areas of inequity in the education system. Student enrollment figures are insufficient in effectively monitoring the quality and parity of education. SSA governments are obligated to ensure inclusive education as called for in the Sustainable Development Goals (Goal 4) and Convention on Rights of the Child. The lack of data collection primarily in lower-income SSA countries fails to highlight education disparities between students - the level of gender parity and equality.

Scrutiny of the UNESCO Institute of Statistics databases by the Learning Metrics Taskforce shows that SSA countries have failed to collect basic statistical data (Moon & Villet, 2016, p. 1). The taskforce has urged countries to focus on equity and inequalities within countries, observing socioeconomic status, urban versus rural residence, gender, language, ethnicity, citizenship status, and youth with disabilities. These social groups are covered in national level data, which is not disaggregated sufficiently by ministries and statistical bodies then presented to the United Nations

Box 1: UIS Education in Africa Portal

In March of 2017 in Dakar, at the triennial meeting of the Association for Development of Education in Africa (ADEA), the UNESCO Institute of Statistics (UIS) launched its Education in Africa portal (uis.unesco.org/en/topic/education-africa) to support Sustainable Development Goal 4 and the Education 2030 agenda.

The UIS is the official data source for Sustainable Development Goal 4 monitoring. The Education in Africa portal presents a range of data and statistical products, ranging from cross-nationally comparable indicators disaggregated by gender, to a selection of analytical publications and a new series of country profiles showing key indicators for each target global education goal.

The portal shows a unique set of indicators reflecting the conditions across the region, for instance access to clean water, electricity, textbooks and separate toilets for girls and boys. The UIS developed these indicators following consultations with national representatives. To help provide a regional overview, the portal also shows UNESCO atlases on policy themes that include Education 2030, literacy, out-of-school children and gender disparities. Users of the portal can also filter the data through interactive maps and charts.

As UIS has led various initiatives to improve the availability and quality of data from countries in the region, including four projects as part of UNESCO's Capacity Development for Education (CapED). These projects help develop action plans to improve the quality and use of data to monitor SDG 4 at the national, regional and global levels.

(Archer, 2014). The Taskforce recommended that countries consider 'assessment as a public good' with tools, documentation, and data made freely available (UNESCO & Brookings, 2013, p. 12). To address this problem, the Taskforce called upon the private sector to assist by offering 'innovative assessment tools, new technologies to make data collection more individualized and efficient, open source measures as public goods, and new ways of efficiently collecting and analyzing assessment data that are feasible in low-resource environments' (UNESCO & Brookings, 2013, p. 35).

3.3. Data Systems

Data systems are designed to collect, compile, collate and analyze school level data (variables include students, teachers, facilities, finance, and school locations). These systems are often called education management information systems (EMIS). An EMIS does not just consist of one database or online open-source platform on a computer, laptop or tablet, but rather is a:

> "comprehensive system that brings people, practices and technology to provide quality education statistics in timely, cost-effective, and sustainable manner, at every administrative level, and to support selected operation functions." (Bernbaum & Moses, 2011, p. 19-20)

Advancements in computer software and web-based platforms in the past two decades have allowed for EMIS to be more accessible, affordable and efficient. EMIS tools are primarily open-source for large systems, thus allowing multiple individuals from the MOE and education district offices to each individual school to contribute information. EMIS can be accessed through installed software or web-enabled tools (see box 2), increasingly on laptops and smaller devices, such as netbooks and tablets that require less electricity and requirements for cooling and security (Bernbaum & Moses, 2011, p. 21). Mobiles or smartphones are capable of transmitting data through SMS, GPRS or applications. Mobile phones are invaluable particularly for schools in rural areas without electrification. EMIS programs have been simplified and can be used on software such as Excel, Access or MySQL.

Cloud technology represents perhaps the latest advancement in management information systems (MIS), and is used by many private and public entities for its many advantages over older MIS. Cloud computing can be defined as the use of a virtual network of remote servers hosted on the internet rather than a local server or a computer, and can be shared by different users. Cloud computing has become increasingly utilized due to the increased use of electronic devices including laptops, smartphones, and tablets and the desire to synchronize information between multiple devices. Cloud-based management information systems (MIS) offers four key advantages over current management information systems using standard servers, these being (a) broad network access to databases from multiple locations; (b) minimal training for personnel; (c) lower costs due to resource pooling; and (d) stronger data processing and computer capacity (Almajalid, 2017, p. 4).

In EMIS, software development comprises a core part and one that is error-prone if there is lack of sufficient technical expertise. Sometimes the heavy focus on software development occurs at the cost of efforts to train statisticians and planners (UNESCO UIS, 2017, p. 32). The advantages of cloud computing could help address these problems due to the minimal training required to operate. Cloud based MIS are already used in many higher education institutions across the world and secondary schools for instance in the United States, and have the potential to become increasingly used in secondary education institutions across the world, due to the ability of cloud computing to save costs and improve efficiency (Almajalid, 2017, p. 4).

Box 2: OpenEMIS

In 2010, UNESCO established an initiative called OpenEMIS in partnership with Community Systems Foundation (CSF), with the purpose of helping countries upgrade data collection on schools, teachers and staff and spot inequities from early childhood to upper secondary schools. The initiative created a royalty-free open source EMIS to allow database administrators to integrate with financial and census data and is customizable to meet specific education system requirements. The system comes with various features such as:

➢ Analyzer - Visualize data in tables and graphs
➢ Monitoring – Monitor indicators against school plans
➢ School – Manage students and staff in a single school
➢ SMS – Collect education information via SMS
➢ Survey – Collect survey data offline on mobile devices

In December 2016, OpenEMIS launched a mobile friendly version of the web application to make the system more easily accessible for school administration. The system has been used in approximately 7000 schools in Jordan and has helped improve the overall accuracy and reliability of national education statistics. OpenEMIS has currently been implemented in Belize, Grenada, Jordan, Lesotho, Malaysia, Maldives, Uzbekistan, Turks and Caicos Islands, and St. Vincent and Kitts.

Source: United Nations. "OpenEMIS Proves Easy to Use with Mobile Friendly Version." United Nations - Jordan. (2017, May 15)

3.4. Progress of education data collection in Sub-Saharan Africa

As mentioned earlier progress on improving data systems across the region is mixed, however there are positive signs of best practices. SSA governments have largely succeeded in establishing education management information systems and have put in place policies for the timely collection and dissemination of statistical data. Furthermore, many SSA countries have succeeded in building up the capacity of statistical and planning offices, and fostered a culture of collaboration between participating bodies in their respective national statistical systems. Above all, many countries recognize the importance of including data analysis in their policy implementation plans and ensuring a culture of quality (UNESCO, 2014, p. 21). Below are examples from nine countries across the region that give some indication of the differing levels of progress:

Eswatini

The recognition of EMIS as a separate entity has reduced reliance on the central statistical office (CSO) for education statistics (UNESCO, 2014, p.19). Eswatini's Ministry of Education and Training also has a well-designed longitudinal (collection of repeated observations of the same subject over different points in time) database with error checking.

Kenya

The Ministry of Education tested an online National Education Management Information System (NEMIS) in 2017 across 600 schools in order to track students' performance and ascertain an accurate figure on the number of students enrolled. Following the trial, the Ministry has begun rolling out the platform nationwide. Students in primary and secondary schools will be registered and assigned a six-character Unique Personal Identifier (UPI) for life that will track their performance. The introduction of the UPI followed the challenge of the Ministry to ascertain accurate figures on the number of students enrolled in primary and secondary education. A mismatch in enrollment rates was identified in the 2014 Basic Education Statistical Booklet; the mismatch was primarily caused by schools registering 'ghost' candidates to increase funds from the Ministry. In 2016, the Ministry of Education began investigating inflated primary and secondary enrollment figures in the areas of Nairobi, Kiambu, Kajiado and Machakos (Daily Nation, 2016).

Guinea-Bissau

UNICEF worked with the Ministry of Education in Guinea-Bissau from 2013-2017 to provide support to the implementation of Education for All program funded by the Global Partnership for Education (GPE). One of the three objectives of the program was to strengthen management and technical capacity at the Ministry of Education and local Directorates of Education. To improve the efficiency of education planning, the EMIS architecture was developed and training was provided to ministry staff in planning and analysis skills. In addition, support was provided in installing the software and training ministry officers on how to use it. Cascade training was then given to 45 sectorial statisticians, who then trained 1,800 school directors on how to fill out the EMIS questionnaires (UNICEF, 2016). However, this support has not lead to continued improvement in EMIS. A 2017 World Bank SABER report gave a status of "latent" for the 'Assessment of School and Student Performance', stating that school inspections were 'not conducted regularly' and that Guinea-Bissau lacks 'regular assessment of school performance, and assessments are not used to inform pedagogical or operational adjustments' (World Bank, 2017, p. i). Finally, the report added that 'there are no provisions for sharing and reporting of standardized test results'. This example points to the difficulty especially in low resource settings of maintaining and regularly employing EMIS systems in policy design and monitoring.

Mozambique

In Mozambique, the government has taken steps to address one of the problems stifling monitoring and evaluation processes for the country's EMIS, which faces budgetary constraints (Trudano, 2006, p. 7). From 2009, the government has succeeded in reducing restrictions on budgetary allocations for producing statistics by allocating more resources to EMIS, particularly for hardware: computer work stations are connected to high speed Local Area Network and servers are well maintained (UNESCO, 2014, p.31). An examination of Mozambique's EMIS found that at the national level, information from the system has helped to generate targets and objectives for

policy frameworks in the Ministry of Education and Culture. The Ministry has also used the EMIS to monitor progress towards achieving their objectives for primary and secondary education at the national level. However, there are some limitations with using EMIS to support the planning process at the provincial level due to funding issues (Trucano, 2006, p. 8).

A peer review of Mozambique's EMIS by ADEA found that the government has demonstrated good practices particularly in the area of reporting quality commitment, accountability and funding. Regarding reporting quality commitment, there are policy frameworks and procedures in place, but should better conform to international quality standards. With reporting accountability, it is obligated by law that statistics are produced and disseminated within the year (four months after data collection) (Ndakala et al, 2014, p.12).The Ministry has "invested heavily in ICT for information management at all levels" (Ndakala et al, 2014, p. 18). Recommendations from the peer review stated more work needs to be done to further strengthen the above areas. In education information reporting, the review stated that the government needs to increase data coverage and "incorporate revised geographical codification for rural and urban areas in data disaggregation," and "incorporate data on learners with special needs, ICTs and finance" (Ndakal et al, 2014, p. 40).

Senegal

Senegal has established itself as one of the continent's leading countries in terms of investing in information communication technology. The government of Senegal has recognized ICT as an important engine for economic expansion and modernization. The government has achieved notable success with the development of its EMIS, which is centrally managed for collecting educational statistics at all levels of education. In addition, the government has set up a National Education Account[1] for tracking and recording financial expenditures and donor contributions related to education, and for managing examinations and human resources (Souter et al, 2012, p.12).

South Africa

The region's most developed country has a strong EMIS and national statistical system, with comprehensive and well-defined data reporting through all levels. EMIS is securely decentralized through IT tools at the provincial level to ensure a strong data production chain. Furthermore, South Africa has a good practice of releasing its school data from pre-primary to post-secondary to the public (UNESCO, 2014, p. 34) and participates in international tests such as PIRLS, TIMMS and SACMEQ.

Tanzania

The Ministry of Education and Culture implemented a two-phase Secondary Education Development Program (SEDP) in Tanzania. Phase I was implemented from 2004 until 2009 and focused on improving access with equity, quality, management and delivery of secondary education. Phase II, which started in 2010 with support from the World Bank, focused on providing capacity building and technical assistance in the Ministry of Education, Science and Technology (MoEST) and other relevant entities to implement current and future reforms, in addition to upgrading school infrastructure, improving the quality of teaching, and ensuring adequate financing to schools. The capacity-building component of the program aimed at

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[1] See Section 2 for details on National Education Accounts.

strengthening institutional capacity for planning, management, delivery, monitoring and supervision of education, which are critical functions to improve the quality and efficiency of education service delivery. This component also included an EMIS Development Plan (2004-2007) expansion of their EMIS. The plan set important activities that the Ministry needs to ensure take place, which included (a) capacity building and institutionalizing of EMIS; (b) development of the software system; (c) hardware procurement of computers and installation of data collection software; (d) program management and monitoring (MoE Tanzania 2004, p.20).

Following the EMIS Development Plan, the Tanzanian government has worked with international donors to improve its EMIS. Between 2014 and 2016, the Prime Minister's Office of Tanzania collaborated with FHI 360 to implement the Education Quality Improvement Programme in Tanzania (EQUIP-T) project with support from the Department for International Development (DFID). The aim of the project was to improve integration of school data from seven of Tanzania's poorest regions using K-Mobile, FHI 360's geographic information system. The two-year project managed to map all 5500 schools in the seven regions and trained the staff of the Prime Minister's Office in the use and maintenance of K-Mobile. According to FHI360, the mapping exercise helped improve the capacity of the government to budget and plan for future EMIS efforts. Due to poor internet connectivity in these regions, FHI360 uses its School Information System (SIS) from its m360 mobile suite (open source mobile application that allows users to collect, analyze and report school data) which is able to transmit entire databases in real time via mobile internet or SMS. FHI360 expects its system to potentially support more than 25,000 schools and 10 million students.

Uganda

A shortage and lack of recruitment of district inspectors due to limited government funding has meant schools have not undergone yearly inspections, which are necessary for compiling data for national school inspection reports by the Department of Education Standards (DES) (Nangonzi, 2018). Schools' inspections are vital to ensure school standards and teaching quality are monitored and improved and that teachers receive constructive feedback. In response, the Ministry of Education, with funding from the Global Partnership for Education and the World Bank, introduced a three-year e-inspection project called Integrated Inspection System (IIS) as part of the Uganda Teacher School Effectiveness Project in November 2016 and piloted it in 1000 schools in 46 districts (Nangonzi, 2018).

The IIS allows school inspectors to collect data related to teaching and learning, and management of the school by using mobile tablets and uploading onto the IIS. The tablets have two programs installed: a head teacher's management tool and a teaching/learning observation. The inspectors make observations of at least three teachers during lessons. At the end of the inspection, the inspectors meet with the principal and complete the outcomes of the inspection onto the tablet. The inspectors also meet with teachers to share their feedback. Finally, inspectors produce a summary of their findings, review them with the principal, and leave a copy of agreed recommendations (Nangonzi, 2018).

Upon departure, inspectors record the school's location on Global Positions System (GPS) and submit the information on the IIS. Two and half years after the launch of the IIS project, the collected data has identified an increase in absenteeism of teachers. Despite the positive signs of

this project, issues remain regarding the size of unit costs for inspection grants and money arriving late. Pairs of inspectors need to hire transportation, make phone calls and photocopy feedback reports all on a tight budget of 30,000 Ugandan Shillings (US$8) (Nangonzi, 2018).

Zambia

The Ministry of Education made institutionalizing EMIS a priority through the Performance Action Framework plan, which set out to improve information gathering for efficient resource management and strengthen education policy implementation. In partnership with USAID and AED (formerly the Academy of Education Development), the MOE managed to increase response levels for EMIS and ensure quality of data was stronger. Districts, which felt long ignored, were pleased to receive increased focus for attention and resources (Bernbaum & Moses, 2011, p. 28). Provinces and districts managed to devise ideas on improving data collection and use. With the stronger EMIS data gathered, the MOE was able to improve student-teacher ratios in rural schools and to analyze teacher attrition to inform incentives and policies to retain teachers in underserved areas. In addition, EMIS was integrated with Payroll and Establishment Control System so that teachers and schools funded by the MOE can be crosschecked (Bernbaum & Moses, 2011, p. 28; UNESCO, 2014, p.19).

Box 3: Review Frameworks in Sub-Saharan Africa

EMIS has become a necessary element in the education systems of many countries and is recognized as a vital way to improve countries' quality of education, and this has been stressed through regional intergovernmental bodies in the region. The Association for the Development of Education in Africa (ADEA) initiated the National Education Statistical Information Systems (NESIS) in 1991, to encourage member states to establish national information systems and build human capacity in statistical collection including through internet and web facilities. ADEA has conducted a thematic review mechanism to review SSA countries' EMIS systems, at times in partnership with regional intergovernmental organizations such as the Southern African Development Community (SADC), which runs its own technical committee on EMIS.

In October 2017, Education Ministers from eleven ECOWAS[1] member countries attended a meeting in Abidjan organized by ADEA in Africa. The forum explored the idea of a region-wide EMIS peer review process to improve the quality of data for decision making in line with recommendations from EMIS experts. The UNESCO Institute of Statistics, as part of its mandate to evaluate the quality of data produced by national statistical systems, has created the Education Data Quality Assessment Framework (Ed-DQAF) and conducted reviews of several EMIS systems in SSA countries.

3.5. Challenges of data collection in Sub-Saharan Africa

Improvement in data collection in the region is largely mixed. The quality and strength of the systems vary country; however, policy and legislative changes are required to further strengthen EMIS by closing data gaps, improving data coverage, ensuring the decentralization of national EMIS at the provincial level, and better securing the capacity of EMIS staff (UNESCO, 2015,

p.19). Common problems with sustaining credible EMIS, as noted in Malawi and Uganda, were lack of sufficient funds for EMIS; misalignment of activities and unrealistic EMIS goals; inconsistent leadership overseeing EMIS staff and missed integration opportunities (Abdul-Hamid, 2017). Noted challenges include that hard data generated by EMIS were not being factored into the decision making of the MOE and District offices (Bernbaum & Moses, 2011, p. 37). The main challenges can be summarized under the following four categories: weak data systems; human resource constraints; non-use of education data; and issues in education data reporting:

3.5.1. Weak data systems

A paper from the UNESCO Institute of Statistics has highlighted how EMIS teams in less developed SSA countries suffer with chronic weak systems. These systems lack thorough implementation of functions such as 'data entry control, import-export, data consolidation, consistency checks and data extraction'. In some cases, other functions such as 'data entry control, estimation and imputations, projections or archiving facilities', either do not exist or are not consistently checked (UNESCO UIS, 2017, p. 31).

Some of the recurring challenges of EMIS in the region include the organization of databases which often involve the use of simple database software, spreadsheets and communication by email. In some cases, databases are not electronically linked between the districts, provinces and the central EMIS office, with the disadvantage being that sometimes information can only be accessed at the head EMIS office thus preventing provinces and districts from conducting their own analysis. In other cases, servers for the EMIS were located in another country and the EMIS unit had to request the company to extract and produce national statistical outputs (UNESCO, 2017, p. 32).

3.5.2. Human resources

The implementation of EMIS is not cheap and therefore maintaining funding after the expiry of the projects was another challenge. A recurring challenge across the region is the high turnover of qualified EMIS staff in the Ministry, particularly planning directors. This largely has to do with low salaries making it difficult to attract and retain qualified personnel.

Capacity support within MOE represented another problem, as technologies involved in EMIS require technical expertise that is not always available within the government or from local contractors (Bernbaum & Moses, 2011, p. 47). In the case of Uganda, there was difficulty in sustaining the quality of data and response levels, which resulted in continued support from international agencies such as USAID (Bernbaum & Moses, 2011, p.25). Many MOEs in the region, such as in Ghana, Eswatini (also known as Swaziland), Liberia, Mali, Namibia, South Sudan and Zimbabwe have relied on technical assistance of consultants to perform some of the crucial EMIS tasks.

An additional issue noted in the research was the lack of clarity as to which government department had the purview to hire EMIS staff. For example, in Zambia, either the Ministry of Finance or the President's Office did the hiring of EMIS staff. This resulted in positions being vacant for long periods of time (Bernbaum & Moses, 2011, p. 37).

3.5.3. *Non-use of education data*

Despite the continued challenges, progress in the production of education data has improved across the continent and many ministries in SSA countries have strong EMIS systems. There is a growing understanding that the collection of education data is intended to improve policymaking, and increase transparency and accountability of education systems. However, evidence has shown that data have not been consistently utilized by senior officials and policymakers within ministries of education. The non-use of data can occur when there is a lack of capacity to make data available or because senior ministerial staff choose not to use data that contradict official views or out of fear it will damage their credibility or subject them to heavy pressure from the executive branch of government. The common problems in this area can be summarized under the following five points:

A. *Lack of reliable data* – Even when Ministries succeed in collecting data, it might not be reliable enough and can result in policy makers relying on spotty evidence or individual opinions. This is why international assessments such as PISA and TIMSS are important, they can help collaborate or expose discrepancies between the data collected and the assessment results of the PISA and TIMSS exams, though such exams are limited in scope. For instance, Germany and Norway considered themselves among the top performers in education until the PISA results in December 2001 were worse than expected (Burns, Koster & Fuster, 2016, p. 135). Before 2001, Germany and Norway standardized methods of assessment. As a result of their PISA results, the two countries initiated a critical re-assessment of their education systems and placed a strong emphasis on improving national tools and procedures to monitor quality at all levels of the education system.

B. *Overwhelming data* – If there is a large amount of data and a lack of capacity in EMIS teams to interpret and filter the various sources to check for discrepancies and to analyze the data, there is potential that the data may not be used. The collection of too much data and evidence can be counterproductive as it obscures information pertinent to decision-making or renders it unusable. Lack of sufficient resources and capacity can affect timely analysis within the data-use cycle. The non-use of data is most likely prevalent in districts with small EMIS teams due to lack of capacity and heavy workloads. Hiring additional analysts can be difficult due to restricted budgets (Burns, Koster & Fuster, 2016, p. 135). To avoid this issue, ministries should eliminate bulk feedback reports by selecting a set of key indicators and produce provincial and district profile sheets.

C. *Disregard of data* – Evidence has shown that even when data has been collected and analyzed, senior Ministry staff may choose to ignore it. This is a problem noted by ADEA in their peer review reports. Also for instance, in Uganda, it was noted by an evaluation report into Educational Quality Improvement Program (EQUIP) projects, that there was limited use of reports from EMIS by senior staff in policy analysis and management of school units in Uganda (2011, p. 28). As mentioned before, staff maybe worried that if the data conflicts with claims of more senior officials there might be distrust of the analysis or EMIS staff's jobs could be vulnerable.

D. *Misuse of data* – The needs of education data vary based on the level of education governance. Sometimes data may be poorly collected or inaccurately interpreted and ultimately does not provide useful answers for decision-making. This can be a result of conducting analysis on a narrow set of indicators because these are the most used and sought for by heads in the ministry. This can mean omitting contentious indicators, such as learning outcomes of ethnic minorities and female students. These actions can therefore

affect strategic thinking and long term plans for developing the country's education system. In order to have a clear indication of the progress such as teacher and student attendance records and learning outcomes indicated by grade results, the EMIS needs to allow for comparisons between data collected from previous years and in different places.

E. *Abuse of data* - Data may also be manipulated and selected to produce favorable results. For instance the selective publication of test results and data to allow schools or a district to appear better than they actually are may occur (Burns, Koster & Fuster, 2016, p. 135). Although the research has not discovered any specific examples of this, ministries of education are not immune from these problems and from individuals that can violate their responsibilities.

3.5.4. *Education information reporting*

Ministries in the SSA region need to dedicate more effort to make sure that education data and statistics are available to education stakeholders. These stakeholders should be identified and engaged as they can support the EMIS process. In the evaluation of the EQUIP2 project in Zambia it was noted that 'EMIS data acquired increased credibility and were accessed frequently by the entities outside of the MOE (donors, NGOs, civil society) for their particular needs (Bernbaum & Moses, 2011, p. 122).

Data produced by an EMIS should be available to parents, teachers associations and non-governmental organizations so that they can press for improvements. The data needs to be presented in a way that is easily digestible and should be widely disseminated via the internet, mass media, ministry websites, annual educational statistical reports and electronic databases (World Bank, 2016, p. 51). Uganda's Ministry of Education and Culture website is a good example, with various sections for reports, policies, a list of schools and a separate webpage on EMIS; it also includes data related materials.

When education ministries and data systems do collect data, it is not always disaggregated to indicate secondary students in urban and rural areas, learners with special needs or factor in gender. These are important in order to see where the Ministry needs to provide more support.

3.6. Summary

In summary, data collection is a valuable resource for governments and must be treated as such. Data is needed in education policy design, and to plan, monitor and evaluate progress of activities. Since it is the responsibility of education governance actors to monitor and ensure good student performance, MOE officials and policymakers need to ensure they have accurate, consistent and timely information to point to strengths and problems emerging in the system. Furthermore, when policy actions are to taken by education governance actors to improve learning outcomes and address problems, they need to be informed by data-driven and evidence-based research decisions. By capturing statistics at the macro and granular levels, this helps to increase accountability for improving educational quality and attainment, and becomes a vital part of policy action and review.

The overall status of the quality of data collection and use in the region is mixed but overall, the research suggests that most SSA countries have understood the importance of education data collection and its use, but suffer from political and financial constraints. More SSA countries now have data systems thanks in part to donor support. There have been positive examples of improvements in data collection and of education information from data systems informing policy design and action in the cases of Kenya, Uganda, Senegal and Zambia. However, lack of follow-up research makes it difficult to know how impactful the improvement programs and the use of the data have been.

There is still some way to go to ensure that school data is sufficiently collected, and utilized by policymakers. To help ensure robust mechanisms of collection and use, SSA governments should prioritize the following five key areas: (1) ensuring sufficient financing of EMIS systems; (2) upgrading EMIS hardware and software, (with a recommended focus on cloud-based tools and services to help save costs); (3) recruiting and retaining quality staff; (4) institutionalizing EMIS with all education stakeholders including schools and districts, the Ministry and parents as well as non-governmental organizations; and (5) ensuring the analysis and utilization of data. SSA governments need to work hard to make data systems institutionalized through the ministries, district offices and among secondary education stakeholders. This will help strengthen the necessary culture of data monitoring and utilization, and ensure that the value of this data goes beyond annual reports. In the final analysis, even if the data systems are strong and the information is presented to the education governance actors, ultimately it will not matter if it is not used to inform policy, improve monitoring and increase accountability.

Section 4: Conclusions, recommendations and further research:

Sub-Saharan Africa (SSA) is a region full of youth who, if provided with quality education, can make significant contributions to their countries' economies. After the remarkable developments in primary education across the continent driven by the Millennium Development Goals and the Education for All movement, there is a strong demand for secondary education. Well-educated and skilled secondary school graduates are in demand to meet the job market needs in both the formal and informal sectors. In addition, more students in SSA countries now aspire to pursue higher education. This complex situation in a developing region with limited resources creates challenges for governments. Although the responses to these demands vary among the various SSA countries, there are efforts across the region to enable more students to enroll in and successfully complete secondary education. Accountability and good governance are key for meeting the demand for quality secondary education. However, enhancing accountability at all levels of the system requires resources, planning and coordination, use of technology, reliance on data, and building institutional capacity.

The following are recommendations to address accountability and education data issues. These recommendations are meant primarily for governments and policy-makers but can also be useful for donors, international organizations, and other actors in education. Although some of these recommendations can be implemented by countries with reasonable resources allocated for improving education governance, other countries might find it challenging to implement these recommendations because of limited resources. In this case, implementation of these recommendations incrementally or in pilot phases can be a sensible approach to test potential favorable outcomes without committing large resources.

4.1.Recommendations for enhancing accountability

1. **Government**
   1.1.Develop a national education plan with clear targets including a sector-wide approach to accountability in the education sector. If a plan already exists, conduct a review of the existing approach to accountability to address any issues or fill any gaps.
   1.2.Clearly identify the standards that will be utilized to measure achievement of planned targets.
   1.3.Ensure buy-in and support from as many constituencies as possible by engaging representatives from all system levels in the planning process.
   1.4.Engage the public by communicating the benefits of the plan clearly to the community and stakeholders via media and technology means.
   1.5.Clearly explain the role each actor in the system plays in achieving good governance.
   1.6.Adopt the National Education Account for your education system. If NEA already exists, conduct a review of the existing system to identify areas for improvement.

2. **Schools**
   2.1.Enhance accountability at schools by adopting one of the following systems:
      2.1.1. School profile system that captures data on quality of school services and student outcomes.

      2.1.2. School report cards that capture data on school performance compared to other schools in the district and to the national average.

      2.1.3. School self-assessment to be done at the school level with support from local and central government.

  2.2. Disseminate school profiles/report cards/self-assessment outcomes to the public.

  2.3. Discuss outcomes of school profiles/report cards/self-assessment in radio and TV programs as appropriate.

  2.4. Consider introducing rewards to encourage performance in schools.

3. Teachers

  3.1. Enhance teacher attendance by introducing a tracking system using mobile phones.

  3.2. Encourage school leaders and district officials to monitor and report teacher absenteeism by introducing rewards for effective monitoring and reporting of absenteeism data.

  3.3. Leverage mobile and internet technologies in rural and remote areas to enable accurate and timely capturing and reporting of teacher absenteeism data.

  3.4. Collaborate with local mobile and internet service providers to establish cost-effective data reporting mechanisms.

  3.5. Consider introducing sanctions and rewards related to teacher absenteeism, teaching quality, and student outcomes.

4. Parents and students

  4.1. Establish/activate compulsory education laws.

  4.2. Educate parents about the importance and benefits of compulsory education and the consequences of not sending their children to schools.

  4.3. Encourage parents and students to report teacher absenteeism and non-compliance in other areas via the systems established in item 3 above.

4.4. Recommendations for collection and use of education data

There is a great deal of literature on how Sub-Saharan African countries can improve the collection of school data, accountability and school management. Numerous organizations including the African Union, ADEA, ECOWAS, World Bank Group, UNESCO Institute of Statistics and SADC have produced comprehensive policy recommendations. In order not to replicate all of the recommendations provided by these organizations here, the following policy recommendations echo and compliment some of the most pertinent recommendations.

1. Funding of data systems

  1.1. Governments must make data collection a funding priority as many of the challenges within the EMIS derive from lack of funding. Allocating sufficient funding for EMIS, particularly in the area of capacity, training, software maintenance and the data collection process (e.g. surveys and questionnaires) is necessary. SSA governments will need to improve budget allocation to expand statistical activities, training of staff and dissemination of data.

  1.2. SSA governments need to increase domestic funds to EMIS and consider experimenting with pay-for-performance agreements with donor funding.

1.3. For international donors and development agencies seeking to support EMIS systems in the region, these agencies should develop projects that target specific areas of EMIS systems, as opposed to covering broad areas. The primary areas of attention should be:

    1.3.1. (1) Training of EMIS staff:

        1.3.1.1. Regular training of district, regional staff on how to operate computerized systems.

        1.3.1.2. Training EMIS staff how to brief central officials and policy makers/ stakeholders.

    1.3.2. (2) Software development and maintenance:

        1.3.2.1. Provide funds for updating software and purchase of new computers within every five to seven years.

        1.3.2.2. MOEs should consider looking into cloud-based EMIS as a way to free up IT resources.

    1.3.3. (3) Data collection methods:

        1.3.3.1. Purchase of computer equipment and updates for data collection software.

1.4. SSA countries with weak systems or lack of funds should consider using donor supported management systems such as OpenEMIS.

2. Utilization for decision making

2.1. EMIS staff at the head office must ensure they produce annual monitoring briefs of secondary education at the national level. EMIS staff in district/ regional offices must ensure they produce annual monitoring briefs of secondary education in the district.

2.2. EMIS staff should organize quarterly brief meetings to brief senior central officials/ policymakers at the MOE and education stakeholders to report on progress, trends and or raise concerns.

3. Human capacity

3.1. MOEs should devise a strong human resource strategy for retention of EMIS staff through competitive packages or stricter contracts. Succession plans need to be created for when staff members depart.

3.2. Responsibility of hiring EMIS staff must be kept within the MOE to ensure it can recruit and replace EMIS staff when necessary.

3.3. EMIS staff should consist of staff with a wide knowledge base on education and be made familiar with the country's education system and the policies and laws that govern it.

3.4. EMIS needs to have staff with technical skills to maintain the software and hardware of the system.

3.5. EMIS staff should be able to make decisions on behalf of the MOE in certain cases to avoid delays.

3.6. MOEs in countries with severe budget constraints should consider recruiting local technical experts or companies to bypass having to train new EMIS staff from scratch.

3.7. MOE's should consider recruiting international experienced experts/ consultants to help train current staff.

4. Data systems

4.1. When procuring MIS providers, MOEs should clarify in the invitation to tenders that information from the MIS should be accessed within the country and not from outside.

4.2. MOEs should consider cloud-based EMIS service providers in their bidding process. These systems can reduce overhead and are more flexible for distributed entities, as they can be accessed online and data can be stored on vendor's servers. Furthermore, these systems do not requiring reconfiguration of existing physical IT hardware or the need for data centers. MOE's should consider the below two options for the infrastructure of their cloud-based EMIS:

    4.2.1. (1) *Public cloud* – The entire IT infrastructure is hosted on the servers of a cloud vendor (e.g. a company or low-cost shared data center). Thereby allowing flexibility and scalability as services and tools can added or removed instantly.

    4.2.2. (2) *Hybrid cloud* – This allows some of the systems to be run on-site (e.g. the head EMIS office), while the application is run via a public cloud vendor.

4.3. EMIS functions should be decentralized across districts and provinces, but data should be accessible through a single server for ease of data extraction.

4.4. Create an interactive online portal or SMS system that makes students' grades and performance accessible to students, parents or guardians.

4.5. MOEs should create an SMS-based service that provides notifications of examination results.

5. **Timeliness of data**

5.1. Collection of data should be collected through the school census and must be mandated through legal policies and with strict deadlines.

5.2. Ministries must strengthen or put in place regulations regarding compliance of rules on data collection. There should be linkages of rewards of sanctions for non-compliance.

5.3. Data entry and processing should be automated to ensure timely publication of accurate, reliable and relevant education statistical data across MOE sub-sectors and government agencies.

5.4. Consider conducting data collection questionnaires online or reduce the size of questionnaires to reduce delays in response time.

5.5. MOEs must ensure yearly inspections of all schools before annual reports.

5.6. MOEs should eliminate bulk feedback reports by selecting a set of key indicators and produce provincial and district profile sheets.

6. **Equity units on gender, ethnicity and disabilities**

6.1. To fulfil obligations of states to Sustainable Development Goals, upper-middle and lower-middle income SSA countries should create units within the EMIS to ensure education equity and fairness by analyzing data on gender, ethnicity and disabled students. These units should compare information with current data and census statistics to detect any discrepancies between the number of these groups in an area and the number enrolled in schools in that same area.

6.2. For lower-income SSA countries, instead of creating whole units for analyzing of gender, ethnicity and disable students, this function can be assigned to an individual or small team working alongside the central statistical office and other relevant government agencies and Ministries.

6.3. EMIS annual reports should include performance of recognized minority groups and disaggregate performance of girls and boys to monitor their progress and see where further supported is required.

7. **Unique Learner Number**
   7.1. Assigning learners a unique number and registering them to a central national database can help in ascertaining accurate enrolment numbers and track learners' performance as they progress through the education system.
   7.2. Data analytical tools should be integrated with the central national database to better analyze pertinent indicators such as grades, subjects and enrollments over time.
   7.3. The central national database should include the record of achievement of each student and should be accessible to teachers.

8. **Peer Review of EMIS**
   8.1. SSA countries that have not already participated in peer review mechanisms (e.g. Ed-DQAF) such as those conducted by ADEA should participate and fully cooperate with the analysts. This should be conducted at least every five years to observe improvements and areas of attention.
   8.2. EMIS peer reviews should be done with the inclusion of all government agencies involved in EMIS (e.g. central statistical office), in addition to school associations and teachers' unions.
   8.3. SSA governments should consider participating in international assessments such as PISA, TIMSS, and SACMEQ to help add an additional level of scrutiny of learners' performance and corroborate the school data. International assessments can also help build capacity of countries' assessment processes, test development, analysis and drafting of technical reports on student performance. Furthermore, international assessments allow countries to compare their performance with other countries and attract more political and media attention than local assessments, and encourage the public to hold their MOEs to account.

4.5. Further research

Since the implementation of most policies and reform efforts require qualified personnel, it is important to forecast the need for well-trained education officers, planners, policy analysts and statisticians in local, provincial and central levels of the education system in the short, medium and long term. This can inform the plans for staff training, development, and succession as well as the undergraduate and postgraduate program offerings in colleges and universities in the region.

Community engagement and support is a critically important factor in the success of education policies and reforms. Therefore, research on current levels of community engagement and ways to improve this engagement can be useful in planning future policies and programs. In addition, evaluations of the effectiveness of current EMIS in improving accountability and the quality of learning and other outputs should be undertaken.

Finally, sharing research findings, case studies, success stories and new policies among SSA countries can be useful for learning, planning, and resource allocation. Regional or sub-regional meetings and conferences can be useful venues for sharing lessons learnt and outcomes of research studies. Establishing a repository of research studies that is accessible by ministries of education and other relevant stakeholders in SSA can be worthwhile.

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