

Integrating ECCE in Uganda's EMIS

Elena Georgalla & Caroline Jordan

Context and opportunities >>>

The current Ugandan Education Management Information System (EMIS) is weak in its capacity and limited to the collection of basic statistics, rather than being the tool for management and planning that it was originally intended to be. Data for educational institutions are collected by multiple sources and are often incomplete and inaccurate. In the absence of adequate regularisation and computerisation, data is therefore not fully incorporated into the planning and monitoring processes of the Government. Both the EMIS unit under the Planning Department of the Ministry of Education and Sports (MoES) and the BTNET unit under the MoES collect information and collate data on the education sector, but neither system provides comprehensive data on intervention programmes, completion rates, trainee and instructor profiles etc.

Early Childhood Care and Education (ECCE), mostly in the hands of the private sector in Uganda, has been largely excluded from management information systems to date and any data collected tends to be incomplete, unreliable, and not disaggregated by district. However, as a key indicator of progress towards Sustainable Development Goal 4, and a focus for MoES, ECCE data is urgently needed. In its current state, Uganda risks under-reporting achievements in ECCE. In recognition of current EMIS weaknesses, it is understood that the MoES is considering a revitalisation of EMIS in the coming years. It is our strong recommendation that the inclusion of ECCE forms a part of this reform.

Efforts to collect data on ECCE in Uganda have been led primarily by UNICEF, often linked to emergency humanitarian response in districts most affected by large refugee influxes. UNICEF partnered with UNHCR and the Office of the Prime Minister to support the collection of data on ECCE enrolment within refugee settlements and their host communities, particularly in Yumbe, Adjumani, and Kiryandongo. This forms part of the government's ReHoPE strategic framework which integrates refugee emergency response into the districts' emergency plans and ensures that 30% of beneficiaries for each intervention come from the host community. Although still at very early stages, there is potential for this Early Childhood Development (ECD) data collection to set a precedent for effective integration of ECCE into EMIS. We recommend that the MoES closely monitors these efforts to inform potential future scaling.

This paper aims to look at existing management information systems in the region and draw learning that can inform the integration of ECCE in a more responsive national Ugandan EMIS. The paper will look at existing technology options. It doesn't seek to promote one technology provider over another, but to see where and how technology has been an enabler, and to suggest different options for ECCE data collection, management and dissemination that could be adopted ahead of, or in line with, a fully integrated EMIS for Uganda.

Five case studies from across the East African region are presented below:

1. Uganda | EduTrac
2. Tanzania | Global ED*ASSIST
3. South Sudan | SSSAMS
4. Rwanda | ECD mapping
5. South Africa | Annual ECD Survey

The tried and tested– EduTrac >>>

EduTrac is a mobile phone-based school management information system that has been piloted in primary schools in Uganda by UNICEF and the MoES since 2011. The Ministry is using EduTrac to monitor data on priority indicators that need to be collected on a frequent basis beyond the annual school census. It provides an opportunity to react in real time to changes at school level.

This SMS-based system runs on the open source platform RapidPro that manages real-time data collection using basic mobile phones and a simple user-friendly online interface.

Aim: Frequently collect and disseminate school level data in real time that can be used at decentralised or central levels to identify bottlenecks at the school level, respond to needs and improve planning for education.

Strength: Minimum technology requirements; already used widely across Uganda; real-time data collection.

Technology requirements: SMS-based. Basic mobile phone device.

Internet connection required? No internet required for data collection. Internet is required to view and manage data.

More information: <https://www.rapidsms.org/projects/edutracs/>

Currently rolled out across primary schools nationwide, the system collects quantitative data on pupil and teacher attendance, progress on the curriculum implementation, reported cases of violence against children, number of school management committee meetings and availability of latrines and water points in schools, among others. Head teachers, Primary-3 and Primary-6 teachers, members of school management committees, and other selected groups respond to periodic prompt questions via SMS, which are free of charge to users from any mobile provider in the country. This data is then verified, aggregated and disseminated on a password protected online dashboard. District Education Officers (DEOs) are supported by a district trainer to monitor use

of EduTrac within schools and to access the dashboard and act on the data arising from EduTrac, responding to the needs of each school in a timely manner.

EduTrac is being used as a tool in the education office for school supervision, follow-ups, planning, and informing Local Government and it is fully compatible with the existing Ugandan EMIS. With support from the Global Partnership of Education, it was envisioned that EduTrac would be entirely managed by the MoES by 2015. Despite this not having materialised yet, EduTrac remains an indispensable complementary tool to EMIS. To date, it has reached thousands of schools, and it is gradually being scaled nationwide.

How could it work for ECCE in Uganda?

EduTrac has the advantage of offering a tried-and-tested “indigenous” solution for ECCE centres that is already operational nationwide in Uganda, is to read and compatible with the national EMIS. Unlike primary or secondary schools, ECCE centres are less likely to have computers on their premises. Therefore, a mobile-phone based solution is more realistic and scalable. Equally, the existing system that enables information to be funnelled upwards from schools via the District Education Offices is in line with the administrative organisation of ECCE centres. An introduction to EduTrac and provision of training could potentially be linked to ECCE centres’ registration processes. With a high number of private sector ECD providers, the training could be provided by the private sector rather than DEOs and consideration would need to be given on how to incentivise participation. A limitation of this model is that it currently only collects numerical data, thus is restricted in the type of information that it can provide.

The custom-made solution - Global ED*ASSIST >>>

FHI 360’s Global ED*ASSIST is a decentralised but integrated digital EMIS. It includes a suite of open source, mobile applications that allow users to collect, analyse and report on school data. This data is then uploaded to a platform and integrated into the national EMIS, or can be used to meet immediate needs in districts and schools.

EQUIP-T, a DFID-funded project implemented by Cambridge Education in partnership with FHI360, is providing technical assistance to the Tanzanian government to establish an integrated, national EMIS based on the Global ED*ASSIST approach. EQUIP-T has devised a tablet-based system for data collection, management, and information to address serious data collection challenges including a largely paper-based system, delayed data transmission, and inaccessibility of remote areas. Headteachers across Tanzania were provided with tablets equipped with FHI 360’s School Information System (SIS) to enable them to record real-time data on their school, teachers, and

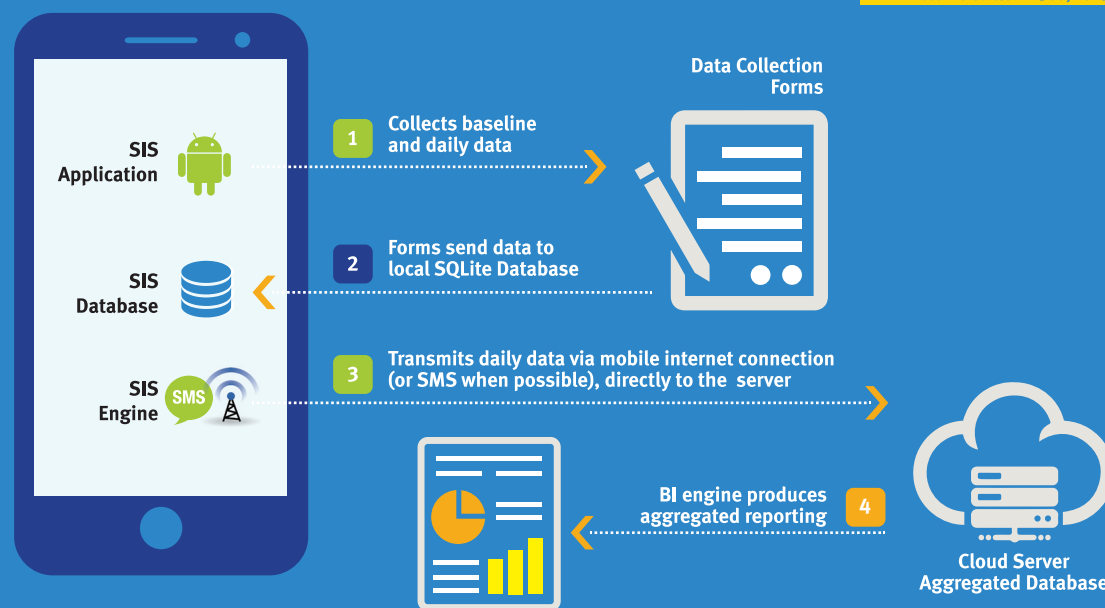
Aim: Collect, analyse, and report on school, teacher, and student data that can help strengthen school management and quality improvement, build integrated EMIS and facilitate government to make planning and resource allocation more accurate.

Strength: Records and shares real-time data on a variety of indicators including daily school information and EMIS information. Data can be transferred when students/teachers move. Strengthens school based evaluation and planning.

Technology requirements: Smart phone or tablet. **Internet connection required? Yes.**

More information: <http://www.fhi360bi.org/user/tanzaniaSIS/>

students (note that SIS is also compatible with mobile phone devices). SIS has the capacity to transmit entire databases in real-time via mobile internet or SMS. The system also enables offline data transfer (data uploads automatically when the device connects to the internet), automatic report generation, and communicates directly with the central EMIS. In line with the principles of Value for Money, in addition to data collection, the tablets also serve other purposes including as an avenue for video-based teacher training.



SIS has been piloted in seven regions and 4,500 schools. The Government of Tanzania has now committed to national rollout of the system. In 2019 the whole primary system will be connected. Education information will be accessible by all administrative levels in the Tanzania education system via the Web or portable devices, dramatically improving access to accurate and timely data for informed decision making at every level.

How could it work for ECCE in Uganda?

This tablet based model provides a comprehensive management information tool that has demonstrated impact at scale within government structures in Tanzania. In Uganda, a similar solution could be used for EMIS with functionalities designed specifically for ECCE. The model could be piloted first with ECCE in order to meet the urgent need for data, and then scaled to broader EMIS functions. Implementation of this solution would require significant funding and capacity building for users. In most existing cases, this has come from international donors. It provides a comprehensive solution that could set a precedent for successful integration of ECCE into a revitalised Ugandan EMIS.

The individual data solution - South Sudan School Attendance Monitoring System (SSSAMS) >>>

SSSAMS collects, stores, analyses, and disseminates a wide range of disaggregated school, teacher and student data and information. This digital data management system was set up initially under the DFID funded Girls' Education South Sudan (GESS) programme as a system to enrol and measure attendance of students, register schools and to monitor the cash transfers and capitation grants distributed to students and schools. It has since been used to monitor teacher incentive payments and has capacity to support and improve education management at both decentralised and central levels. SSSAMS is currently used nationwide across South Sudan with over 6000 private and public schools registered, including 398 pre-primary centres.

Aim: Collect, store, analyse and disseminate a wide range of individual school, teacher and student related data and information.

Strength: Uses multiple approaches to collect individual data, including offline. Records and shares near real-time data on a variety of indicators including daily school information and storing documentation.

Technology requirements: SMS basic mobile phone and website access.

Internet connection required? No internet required for data collection. Internet is required to view and manage data.

More information: <https://sssams.org>

In response to an environment with poor infrastructure and connectivity, SSSAMS is using several offline methods of data entry and data maintenance. This includes data providers sending mobile phone messages to a SMS gateway, uploading and processing of formatted Excel sheets, entering data through separate offline data entry programmes, and using web forms on the SSSAMS web pages. Whilst SMS data providers are typically members of the school, e.g. teachers, the other methods are normally completed by GESS team members. This may be in collaboration with a local government official, but, on the whole, data quality assurance is heavily reliant on external project staff.

Data is presented on a public website (which can be made private with passwords) and provides relevant stakeholders, e.g. school management, government, or community, with fast, visual representation of data trends. All technology components used are freeware and therefore reliable and without extra cost.

How could it work for ECCE in Uganda?

The lessons learned from four years of operating a nationwide digital management information system, are well worth considering for the context of ECCE in Uganda. SSSAMS provides disaggregated data and documentation to both decentralised and centralised stakeholders. The advantage of this is that all information is collated in one data management database. For example, in Uganda's ECCE sector this could include inspection reports, registration certificates, Annual Census, caregiver qualifications, as well as enrolment and attainment data. However, key learning points coming from GESS are to consider the following before embarking on such a system: What data is needed? By whom? How often? Is it needed in digital format? Who has internet access to get the data from the system. How will people be motivated to provide the required data?

MoES should carefully consider the above questions in the context of what data is needed for ECCE and for which purposes. Furthermore, the Ministry should consider what will incentivise the data providers to share and update their data; especially as the majority of ECCE providers are from the private sector and thus have limited accountability to the Government. Linking the data collection process to initial registration, allocation of funds (by a non-government organisation if appropriate), and/or qualification or assignment of ECCE teachers could incentivise timely data provision.

The smart mapping solution- Rwanda ECD Mapping >>>

In 2017 Rwanda's Ministry of Gender and Family Promotion (MIGEPROF) with support from UNICEF commissioned Esri, an international company specialising in GIS, to conduct a mapping study of all ECD service providers for children aged 0 – 6. The mapping captured geographic locations of ECD service providers across the country as well as qualitative and quantitative indicators, all presented in an interactive digital map available on a public, password-protected website.

Pre-defined quality parameters captured information on early learning, nutrition, health, WASH and child protection components in each of the ECD services. The tool also captures

Aim: Map all ECD providers nationwide and provide geographic locations as well as a searchable database of qualitative and quantitative ECD service provider indicators.

Strength: User friendly representation of ECD service providers. Allows multiple stakeholders quick access to data and analysis of ECD.

Technology requirements: Website, GIS and tablet/smart phone.

Internet connection required? Yes.

More information: https://www.unicef.org/rwanda/about_19664.html

information on the providers (e.g. private, NGO etc), service delivery (e.g. centre based, home based etc), teacher qualifications, beneficiaries, and financing.

An online digital mapping tool was designed to present a visual mapping of the ECD services with an overlay of qualitative data collected in the mapping assignment. The digital mapping tool is currently hosted on an online cloud platform, accessible through Esri website. Users can interact with the map to filter and analyse the data. For example, it can show access and equity gaps in the service provision.

A team of Esri enumerators worked with MIGEPROF and stakeholders to systematically identify and visit all ECD services across the country and collect data face-to-face with ECD service providers. The blended team of professional enumerators and community-known government officers ensured as best as possible that ECD providers were aware of the data collection process and were willing to share information.

How could it work for ECCE in Uganda?

As Uganda has a high number of unregistered ECCE service providers, a comprehensive mapping of ECCE service providers across the country would provide a better understanding of the scope of services and the children who are benefiting from ECCE. It could form the basis of a more comprehensive ECCE MIS that would build upon the initial mapping information. This would also align with existing efforts within the Ministry to map primary schools, Teacher Training Colleges, and Cluster Coordinating Tutor coverage.

By adding attributes to the data from regular data collection, ECCE service providers can be displayed on a map and filtered by up-to-date characteristics. For example, the distribution of ECCE centres that have no water, that are privately owned, that have facilities for children with disabilities. For MoES, the application of GIS in ECD mapping can provide a user-friendly method to improve allocation of resources and efficiency in the delivery of services. It can also become an attractive and more tangible tool for Districts to use in their reporting, and to factor in planning.

Annual snapshot - South Africa's survey for Early Childhood Centres >>>

South Africa holds an annual survey for Early Childhood Education schools and centres. It is obligatory for all centres, public and private, to complete the survey and non-compliance is an offence (Act No. 84 of 1996). To establish that schools have accurately completed the survey and to identify any fraudulent irregularities, a sample of the survey data is physically verified at source in selected schools and centres (2-3% of institutions) by visiting officials from the Government's Provincial Education Departments (PEDs).

The survey aims to collect a complete count of learners and personnel as well as details pertaining to learners, resources, and school equipment. It is disseminated to headteachers across the country who receive both soft and hard copies of all documents and return the survey to their respective district office, either electronically or in paper form. Along with the survey, centres receive a comprehensive set of guidelines explaining how the survey should be completed to

Aim: Provide annual qualitative and quantitative information on status of ECD services. This in turn informs the national EMIS database used to guide education policy-makers and drive decision-making and planning at Provincial Education Departments.

Strength: Simple and accessible solution; requires individual teachers to complete educator section of survey; comprehensive set of guidelines received along with survey; verification processes; non-compliance punishable by law.

Technology requirements: Desktop computer or laptop. Manual paper completion possible.

Internet connection required? Data collection can be conducted offline.

More information: <https://www.education.gov.za/Portals/0/Documents/Publications/NATIONAL%20GUIDELINE%20ON%20ECD%20Survey%202014.pdf?ver=2015-01-29-160409-553>

ensure the data entered is accurate and best describes the situation prevailing on the survey date. Whilst the principal form on school data is completed by the headteacher, each and every practitioner (both state-paid and other) must complete an educator form which, in addition to biodata and professional information, inherently collects details about the teacher's level of computer literacy.

The ECD Survey of South Africa only collects information for ECD centres which have a reception class, known as Grade R, i.e. the grade immediately before Grade 1, that are attached and not-attached to primary schools. Data for independent sites without Grade R is not included in routine education statistics publications linked to EMIS. Attending to ECD centres without a Grade R (e.g. nurseries) falls under the remit of the Ministry of Social Development. It is this ministry that holds details of all other registered ECD centres

(primarily GPS coordinates and contact details) but which, however, do not form part of any official government publication.

Responsibility for running the annual ECD survey rests with the EMIS Directorate of the Department of Basic Education (DBE), in collaboration with provincial EMIS units. Data collected from the survey forms part of the national EMIS database and is used to inform policy-making. (PEDs) also use the data for planning and decision-making purposes.

How could it work for ECCE in Uganda?

Without utilising any complex technology, South Africa rolled out a simple solution that effectively harmonises mapping of registered ECD centres and data collection with the national EMIS. This model is limited to annual update of information and requires administrative support to input paper based responses. For this solution to work in Uganda, the registration of ECCE centres must first take place or preferably, happen concurrently with data demands. This would be managed at the district-level. A starting point could be to only begin by mapping and collecting data for registered ECCE centres following South Africa's example. Even though the penalisation of non-compliance with the requirement to complete the survey might be seen as an extreme approach, it speaks to the need for incentivisation. In the case of Uganda, incentives could be given that relate to registration for those centres that have not registered and other incentives for those that have.

Recommendations >>>

Drawing from the case studies we would suggest that the MoES in Uganda should:

1. Adopt one integrated EMIS system that covers all levels of education according to Uganda's 1992 White Paper and recognition of Education for All. Whilst lots of technology providers exist and have viable solutions, it is recommended that the Ministry adopt one integrated EMIS system which includes ECCE. One system may have multiple functions and 'add ons' but it should avoid different personnel collecting the same data from the same service providers.

2. In line with the proposal of the ECCE Policy Review project to introduce a Pre-Primary Department at the MoES, an opportunity lies in establishing an ECCE data collection unit that sits within this Directorate to oversee the process of integrating ECCE into the existing EMIS and to coordinate data collection. It is important to ensure that such a unit is staffed with competent personnel and that sustainable, cost-effective mechanisms have been developed to facilitate rapid and accurate data collection.
3. Align the integration of ECCE in EMIS with the process of centre registration. The survey commissioned by the ECD Policy Review project found that nearly 50% of ECCE centres in Uganda are not registered. Many of the models described in the case studies above require pre-registered data providers – typically in registered institutions. The exercise of registering pre-primary centres is fundamental to facilitate mapping and ongoing data management. Registration can be designed to complement national EMIS and be managed on a digital database.
4. Invite and facilitate donor support. Celebrating and highlighting Uganda's successes and opportunities in ECCE and EMIS in general is vital for attracting international donor support. Identifying a champion for ECCE within the government would further enhance this by nurturing strong political will. Experience from other countries shows that with adequate external assistance Ministries of Education with incipient EMIS systems can generate Annual School Census reports and good response rates within two or three years. However, in the absence of ongoing external (donor) support and strong political will linked to a commitment to measure progress, such results may slip.
5. Build mutually beneficial partnerships between stakeholders. The case study models achieved success through invested partnerships between technology providers, development partners, government, and beneficiaries. This often requires significant capacity building and advocacy. In the interest of sustainability and affordability, it is beneficial to work in partnership rather than to use the technology providers (e.g. mobile phone networks) simply as service providers. Designing digital databases with the end users (e.g. DEOs, teachers) from the outset will help ensure the model is fit for purpose.
6. Whilst technology can speed up data collection and can include inbuilt data verification, most of the case study models included a blend of programme staff (experienced enumerators) and local government conducting the school orientation, data collection, verification, and input. NGOs can be encouraged to support data collection, particularly in rural inaccessible areas with high concentrations of NGOs.
7. Questions would be raised around who is best suited to report in ECCE centres. The owner or head teacher in each ECCE centre could assume this role. However, it would be recommended for the MoES to set specific criteria for the selection of this person to avoid misreporting or fraud, especially as most ECCE centres are privately-owned and run.

References

- Cambridge Education. (2017). Report on the existing ECE models and implementation status of the ECD policy provisions. Kampala: MoES.
- Kagitcibasi, C., Bekman, S. & Goksel, A. (1995). Multipurpose Model of Non-formal Education: The Mother-Child Education. Coordinators' Notebook No. 17.
- Ministry of Education and Sports SME Division, Education Planning and Policy Analysis Department. (2017). The Education and Sports Sector Annual Performance Report. Financial Year 2016/17.

Early Childhood Care and Education Think Piece Papers

A Set of ECCE Topics for Consideration in Uganda

