Mission report for review of DHIS2 for EMIS

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1. Executive summary

The primary objectives of this review were to assess the relevance, effectiveness and sustainability of the University of Oslo's (UiO) District Health Information Systems 2 (DHIS2) for Education Management Information Systems (EMIS). The review draws on current knowledge on the digitalization of EMIS, covering country based on global components of the UiO platform. The review approach consisted of initial documentation reviews, attendance at a weeklong DHIS2 for EMIS Academy reviewing the Academy approach and getting feedback from a range of stakeholders and other interested parties. In addition, there was a mission to one of the implementing Countries (Uganda), and peer reviews of findings through a review committee. It was conducted between April and July 2022. The product being reviewed, “DHIS2 for EMIS” is an open source/public good product which means all software is free of charge, and any applications developed are made available to the user community free of charge also.

1.1 About DHIS2

District Health Information Systems 2 (DHIS2) for Education Management Information Systems (EMIS) utilises the DHIS software platform used in over 70 countries worldwide in the health sector for the education sector. The purpose of the system is to support the collection, analysis, visualisation and individual and aggregated data from schools and other learning institutions and to provide a robust/flexible EMIS platform. Drawing from experience with national level Health Management Information Systems (HMIS), DHIS2 aims to offer a stable, scalable and customisable Education Management Information System (EMIS). It is being piloted in five Countries (The Gambia, Uganda, Togo, Mozambique, and Sri Lanka) through a NORAD/GPE supported initiative, and a sixth country, (Eswatini) through a UNICEF programme. DHIS2 for EMIS is part of a University of Oslo (UiO) research project, organised by the HISP program.

The DHIS2 platform is very well-established, evolving from the development of DHIS in 1994 with considerable resources input from the health sector, has meant that the platform has been developed, over time, with a strong set of analytical and reporting tools. The DHIS2 for EMIS implementations started with an initial two country pilot project, supported by NORAD, in 2019-21 and this was increased to a five country pilot programme from 2021-23. A sixth pilot country programme is supported separately by UNICEF.

The DHIS2 platform is supported through a network of local partners (currently 326 support staff in 17 countries plus 123 staff at base in University in Oslo). This “local” support provides this platform with advantages over some of the competitor programmes. Instead of expensive international technical consultants, this platform and developments are supported by highly trained local staff that can provide training and development assistance. Based on their experience in the health sector globally they are hoping to move towards some standardised reporting in education globally and where practical an out of the box EMIS comprehensive core solution.

The landscape where the programme operates is rapidly developing into one where we have moved from an annual census type exercise collecting core data on each school into a multifaceted data collection with multiple data sources, collected over various time periods needing to be combined to provide a richer data environment on multiple aspects of education delivery, quality, student achievement, asset management and much more.

The current and initial pilot exercises have established the effectiveness of the platform to support annual EMIS exercises and proven the interoperability with several external data sources. It is currently piloting individual student tracker applications and termly data collection. It is currently being used in monthly low level data collections through mobile phones and collection of data using Android tablet computers.

The product has many similarities to other key EMIS products including OPEN EMIS, StatEduc2 and m360 SIS, all of which aim to support an increasingly complex education data environment.

1.2 Summary of key findings

The key findings from this review are reported in relation to the relevance, effectiveness and sustainability of DHIS2 in the countries it is currently being piloted in.

1.2.1 Relevance of DHIS2

DHIS2 compares favourably to other platforms in relation to cost-effectiveness, configurability and system capacity. The platform being easily configurable to any data need, with all software free and multilingual, is a huge advantage of DHIS2 in comparison to other platforms. DHIS2 within the six pilot countries has been developed in a relatively short period for the level of functionality being displayed. The tool has shown good capabilities for linking with multiple external data sources and high levels of analytics and reporting through dashboards. This has included using GPS data on schools to provide geographic map-based output of analysis.

With the Covid-19 pandemic, the strong link with health platforms also made DHIS2 particularly relevant and an asset. With shifts in funding globally, it is likely that there will continue to be greater emphasis on health compared to education, with the connections between DHIS2 for EMIS and the health platform being a potential advantage over other platforms.

The below figure presents an overarching SWOT analysis of the DHIS2 platform and how it compares to alternatives.

Fig 1: Swot Analysis DHIS2/Alternatives

STRENGTHS: • Open Source (as most products now) • Strong Support Network • Online training already available • Strong Community of Practice • Significant investment by Health partners beneficial to Education Partners • Push for standards	**WEAKNESSES:** • Perceived as a Health Data Solution only. • Low marketing and knowledge within UiO/HISP as a viable education platform. • Need for working examples covering full spectrum of common EMIS applications e.g. report cards, attendance, etc. • Need for early transfer to Government ownership and robust support and funding plan going forward. (all EMIS products)
OPPORTUNITIES: • Low cost EMIS solution for many countries • Option to develop global data model	**THREATS:** • Lack of promotion leads to lack of knowledge of product advantages in Education Donor Community and

and out of box EMIS Solution • Develop once, use many approach should be used to demonstrate key enablers for EMIS e.g. attendance tracking, school maintenance, report cards etc. • Bring EMIS Community together and develop international reporting standards as achieved in health. • Opportunity to build demonstration tools incorporating widely used building block tools for areas such as data collection using tablets, mobiles etc. Examples include Kobo Collect, ODK etc.	current market advantages being lost • Non-adoption based on existing (financial) commitments to less capable products, with perceived financial losses if existing platforms are discontinued

1.2.2 Effectiveness

DHIS2 has a number of key strengths. Foremost is the support network, which enhances the effectiveness of the platform across all pilot countries. The use of local trained support units to support a global product is common practice in many areas is unique. The close relationship with the UiO Masters programme, which channels international business and software graduates into this network, often in their home countries, gives DHIS2 for EMIS a unique advantage.

The review found that a large number of education staff have undertaken training within the pilot countries, but remain reliant on HISP technical support. Gambia is an example of a country leading the way in running and maintaining DHIS2 relatively independently. The local leadership in Gambia has been incredibly supportive, and the team in The Gambia was keen to establish ownership. For this reason, Gambia would likely serve as a promising example for a more in-depth case study on how handover could take place.

More work is to be done on shifting to a learner centered EMIS, though there are some emerging positive stories from multiple pilot countries. In The Gambia and Uganda, student-centered data, such as student and teacher attendance, is being piloted. Uganda is also working on integrating safeguarding data alongside education data. Capturing school register data electronically on a periodic basis was discussed but not yet done in practice in Uganda or Gambia. It is however possible, as is the case in countries where student percentage attendance is linked to stipend support such as Pakistan. (Girls Only).

1.2.3 Sustainability

Sustainability is considered through two core lenses: financial sustainability and capacity within the system to continue to implement DHIS2. Whether this approach will prove sustainable at the end of the NORAD programme is difficult to answer definitively. There will certainly be a robust, country specific EMIS developed and freely available. What is not clear is whether the ownership and day to day maintenance will have moved to governments and whether the day-to-day costs of hosting and providing internet communications will have been supported directly by governments.

Although a significant number of Government staff has had basic DHIS2 training, most appear to be users rather than developers. It is possible to envisage a model where Government staff stay as users and HISP's provide development and maintenance activities and this would be sustainable providing the Government or NGO programmes can resource this. (The level of support should be low once the tools are developed and training rolled out.) Once effective EMIS functionality is developed effective annual, termly or monthly collections can progress without any further major changes. All that will be required are the annual support costs.

1.3 Suggested priorities for existing and future programmes

Priority area 1: Clarity around an international strategy

Based on the evidence gathered in this review, there is a need for country specific programmes but with a clear international strategy. The product needs much more exposure at the high-end donors (World Bank, GPE, UNICEF, UNESCO) level, all of which should develop the Community using and developing DHIS2 for EMIS. It would benefit from standardised reporting (as is seen internationally in health) and a set of standard set of monthly school level data collection and reporting being led by the international donors. A robust core common data structure common across all Countries and users would aid the sharing of applications.

Priority area 2: A hybrid approach, attracting other donors

Given the flexibility of the tool, it is suggested in the review that a possible hybrid approach could potentially develop whereby, additional NGO's either individually or collectively, through areas like an overarching refugee programme, develop specific applications using DHIS2 which are used in conjunction with core EMIS data collecting and reporting tools designed by the Government. The NGO's would provide the programme infrastructure, but would benefit from the availability of local education data. This in turn would support the local initiatives such as school feeding programmes. The local HISP Network is ideally positioned to support and coordinate this approach. It is recommended that NORAD generate a series of in-depth case studies that highlight the benefits of DHIS2 to attract further support.

Priority area 3: Proof of concept and marketing DHIS2

A further recommendation area is around developing a fully functioning proof of concept. This could include:

- Using add-on tools to collect data through tablets and mobiles (improve data quality, save on double entry etc.), with successes widely publicised
- Use the six pilot countries as a basis for the development of a common core data structure/more out-of-box EMIS.
- Examples of an app being used by other pilot countries (e.g. the report cards)
- Working example of more than one donor supporting different districts through the same app
- Promotion of the success of the of the DHIS2 for EMIS pilot
- Awareness raising through marketing communications

Priority area 4: Development of sustainability plans

There is a need to work with each individual country to develop sustainability plans to ensure the continuation of DHIS2. Although all countries may face similar challenges with funding ongoing costs such as the internet, each country has unique needs in relation to human resource capacity development. In Gambia, this is already well developed, but less so in other contexts.

Creating a sustainability plan for Gambia first will likely help guide the development of plans for other countries, with Gambia serving as one of the best examples for capacity building within government, and political will.

Priority area 5: increasing the demand-side for EMIS
To support with sustainability, it is recommended that a focus is placed on building up the demand for EMIS amongst both governments and parents. Products such as school report cards help to drive demand from parents. Areas such as maintenance needs reports or teacher development needs reports can drive demand within government. These efforts will help strengthen local ownership.

2. History and background

2.1 Background to DHIS2 for EMIS Review

NORAD is funding a programme at the University in Oslo (UiO) to pilot the software platform District Health Information Systems 2 (DHIS2) for Education Management Information Systems (EMIS). The programme aims to explore how education could benefit from the success and widespread use of DHIS2 in health, testing whether this could add sustainability to digitalisation of EMIS.

The agreement runs from 1. January 2021 to 31st December 2023 with a total budget of NOK 30 million (£2.53m) and is implemented by the UiO Health Information System Programme (HISP). Partner countries include Uganda, Mozambique, the Gambia, Togo and Sri Lanka. Uganda and the Gambia were also part of a preceding pilot, running from 2018 to 2020. The programme is testing DHIS2 for EMIS in a limited number of districts and is not meant to fund national scaling of the software. (NB Use of this platform at scale has already been proven in the health sector).

The programme includes the following outcomes:
Build knowledge to address sustainability of EMIS strengthened through implementation and participatory innovation.

- Critical mass of people built for running and maintaining DHIS2 for EMIS with a focus on key education ministry staff at national and district level.
- Enhancing the DHIS2 platform to fully support the shift to learner centred EMIS.

NORAD is in the process of defining portfolios for education investments for more holistic and strategic management. As part of this, NORAD needs to assess and decide whether and how to continue to support EMIS going forward. This programme review will provide input to a decision on the way forward for Norwegian support to digitalisation of EMIS.

2.2 History and overview of DHIS2 for EMIS and HISP Network

The original DHIS software started development in South Africa in 1994. Over the years it has developed into a robust platform for developing any data applications with a strong set of analytical reporting tools, dashboards and GPS apps. The initial EMIS programme commenced in 2018, initially in two countries: The Gambia and Uganda. The initial DHIS2 software was adapted to include core EMIS/school census data. Following a programme review, the project was extended to cover the period 2021-2023. With the Covid 19 pandemic, the software was adapted to support education when schools were closed, particularly in identifying students requiring support. This adaptation included a SMS-based monthly monitoring application used in

all Gambia schools. The application is viewed as a proof of concept for data collection outside of school closures.

As the programme evolved it became apparent that the initial education data model would no longer suffice, and additional improvements were made. This included capturing data at the pupil level, which dramatically increased the resources required for data entry and server capacity etc. However, despite the logistical and capacity related challenges, these changes moved the EMIS development closer to emerging trends for EMIS internationally, where tracking of teaching and student performance is considered vital. In The Gambia, a dedicated app was developed for pupil and teacher attendance.

During the EMIS implementations, the effectiveness of the HISP network was proven. The Network teams were able to deliver effective of EMIS implementations in a very short time based on their existing knowledge and understanding of the core product design. There was, however, an initial limited understanding of specific education data needs as distinct from health data needs.

In addition to the HISP Network, the on-line community of practice, which was already used internationally by DHIS2 users in health and is widely subscribed to, was starting to be used for EMIS development discussions. Having subscribed to this service for this review, it appears to be a well-used forum, however, it could benefit from some form of filter or streaming so individual threads can be followed more readily.

Following a review of the initial phase of the programme, a second phase was supported covering a 36-month implementation period from 1st Jan 21 to 31st Dec 23. The number of countries supported was scaled up from the original two (The Gambia and Uganda) to include a further three (Togo, Mozambique and Sri Lanka)

In 2021 follow a competitive tender situation, a UNICEF supported bid to select a new core EMIS system for Eswatini selected DHIS2 for EMIS, hence a sixth pilot country. The UNICEF programme is being monitored through UNICEF Regional Office for Eastern and Southern Africa in Nairobi.

This second phase of the programme is building on phase 1 to demonstrate new education data needs areas like school report cards, termly survey activities and introducing new areas for reporting including gender violence tracking. The flexibility of the tool is being put to good use in various proof of concept developments like the portal for the Africa Union.[1]

During the Academy there was a good opportunity to investigate the HISP Network. The HISP Network operates from 17 locations globally plus a core unit based at University in Oslo. The locations and numbers in each HISP are outlined in the table below.

[1](https://academy.demos.dhis2.org/au-emis/)

Table 1 – HISP Staffing levels as at April 2022

HISP	No of Staff
HISP Sri Lanka	20
HISP West/Central Africa	15
HISP Vietnam	17
HISP Uganda	24
HISP Tanzania	20
HISP South Africa	73
HISP Malawi	8
HISP Ethiopia	3
HISP Colombia	3
HISP Indonesia	19
HISP Kenya	6
HISP Pakistan	4
Saudigitus (Mozambique)	30
HISP Rwanda	26
HISP Nigeria	9
HISP Indi	34
HISP Bangladesh	15
	326
HISP UiO: 133	133
- On-site: 55	
- Remote: 78	

2.3 Existing knowledge landscape around digitalisation

Definition of an EMIS

"An EMIS can be defined as 'a system for the collection, integration, processing, maintenance and dissemination of data and information to support decision-making, policy analysis and formulation, planning, monitoring and management at all levels of an education system. It is a system of people, technology, models, methods, processes, procedures, rules and regulations that function together to provide education leaders, decision makers and managers at all levels with a comprehensive, integrated set of relevant, reliable, unambiguous and timely data and information to support them in completion of their responsibilities'."[2]

2.3.1 Environment/landscape

Traditionally EMIS data has come from an annual collection exercise/census with the classical administrative counts (such as enrolment, teachers, and supplies). Occasionally it is augmented by population data or other similar data needed to create the access and flow indicators of an education system (such as gross enrolment ratios, net enrolment ratios, estimates of completion ratios for each level).

[2]UNESCO. 2008. *Education for All by 2015: will we make it? EFA global monitoring report 2008.* Paris: UNESCO. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000154743

This “Backbone” EMIS filled a basic need of numbers of schools, teachers, enrolment annually, but did little to support the management and development of education and planning. Maintenance, dropouts, teacher development, parents’ needs, and many other areas were not catered for. Traditionally, all public schools are surveyed, and private schools vary depending on funding availability, relationships between State and Private sectors and availability of up-to-date records of private schools etc.

In some countries, there are different education systems based on religion and there may be overlapping systems with for example students attending both Qur’anic and secular schools. With the introduction of initially the Millennium Development Goals and subsequently the Sustainability Development Goals (SDG4 for education), the need for more detailed and linked data became necessary. These include:

- The need to measure Learning Outcomes over time for a student (as well as grade progression) to identify issues early
- The need for accurate population data by age, gender and geographic region (e.g. by District) to look at gross and net enrolment
- Capturing data on language spoken by children, particularly in early learning

This, linked with rapidly increasing pupil populations, subsequent rise in schools, and urbanisation, has put pressure on EMIS to evolve. The worldwide trend for instant access to data through phones and laptops has also influenced EMIS development. What we are now seeing are a range of EMIS Software packages each used in multiple Countries and a move away from local EMIS systems. (See 2.4 below). The evolving systems are all web based. They differ in the way they were developed, in configurability, in quality of tools available and in how they are supported. This mirrors what happened in the Health Sector with a global move to standard packages like DHIS.

2.3.2 The Evolving Approach to Digitised EMIS

There are a series of different platforms that are emerging due to the complexity of the data needs. The core platforms currently in operation include:

- m360 SIS (formerly Global ED*ASSIST)
- OpenEMIS
- Stateduc 2.0
- DHIS2

In addition to DHIS, a number of additional, freely available open-source tools are being harnessed to collect data using tablets and/or mobiles either through the free app or using SMS. The below table outlines the tools and associated links.

Table 2: open source tools with links

Product	Link
Rapidpro	Welcome to the RapidPro Community
Shiny	Shiny (rstudio.com)
Rapidsms	Home (rapidsms.net)
Tangerine	Tangerine is an offline first mobile data collection — Tangerine (tangerinecentral.org)
Kobo Toolbox	KoBoToolbox | Data Collection Tools for Challenging Environments
ODK	ODK-X

These tools are being used to develop individual subsystems, often for more regular data collections that feed the main EMIS Platform. The flexibility of DHIS2 with its use of API's to link to external programmes mean that these additional tools can be harnessed to support a useful set of add-ons for areas such as tablet and mobile data collection, form data collection, scanning, GPS etc.

2.3.3 Where Digitised EMIS is Headed

As with other areas of society, the evolving trends in effectively capturing and sharing data is changing the way information is utilised in delivering services, identifying trends and effectively using scarce resources. Education data is no exception. We are seeing developing countries moving closer the standards available in developed countries in terms of on line information availability. Mobiles and tablets are breaking down the barriers to collecting even in areas with poor availability of power and poor communications networks. Data is being collected off line and the devices are charged and data uploaded, and downloaded where power and comms are available.

More needs to be done however. A recent World Bank report states that in lower-income nations, the share of children who are unable to read a simple sentence by age 10 was 53% before the Covid pandemic and now could reach 70%.

The World Bank's 2021 World Development Report states that "innovations resulting from the creative new uses of data could prove to be one of the most life-changing events of this era for everyone. (…) the transformations emerging from the data revolution could touch all aspects of societies and economies."[3] This also holds true for Monitoring and Evaluation work in International Development.

2.3.4 Academy Review Stage

"The Academy" was an event held in The Gambia in late April 2022 (see Annex 5 for Academy Agenda and Annex 4 for the workshop delegate list). The main objectives for the Academy Review Stage were to meet with a range of delegates to understand their interest or involvement with DHIS2 for EMIS. To listen to, and review all of the presentations made, to fully understand UiO and HISPS current and planned activities regarding DHIS2 for EMIS and to understand the support, community of practice and training support available. All of there were achieved. It was the only opportunity to discuss with all six pilot countries, their experiences to date and plans going forward.

2.3.5 Field Study Stage

During the Academy workshop meetings were held with the Uganda HISP to arrange an agenda for the Uganda Field Study visit (10/5/22 – 13/5/22). The agenda included four key elements:

- Travel to one District implementing DHIS2 for EMIS and meet with the core staff involved. To review the use of the system live in Districts and to assess if there are any issues with the technology or staff understanding or capacity to operate the system on a day to day basis.

[3]World Bank (2021). *World Development Report 2021: Data for Better Lives.* World Bank. https://www.worldbank.org/en/publication/wdr2021#:~:text=World%20Development%20Report%202021%3A%20Data%20for%20Better%20Lives%20explores%20the,individuals%2C%20businesses%2C%20and%20societies.

- Meet with a number of local NGO's who need access to education data or have interests in building capacity in education in Uganda. This included NGO's working with the very large refugee populations in Uganda
- Meet with interested parties in the various Government Education departments who are promoting DHIS2 or using data produced for their areas of expertise (inc Gender and Child Protection and Education Statistics
- Meet with members of the local HISP Unit to discuss the EMIS environment, the current roll out, opportunities and threats.

2.3.6 Further Areas for Investigation

The final stage in the review process was to consolidate and review all of the evidence gathered in The Gambia and Uganda and prepare the review. Some additional areas of research were followed up on including GPE support, Kobo Collect tools, Robust EMIS pilot info among others. The review looked at a range of published articles on the current and future EMIS environment and trends. It also looked at how DHIS2 could leverage additional freely available public domain software tools

3. The relevance, effectiveness and sustainability of DHIS2

3.1 Overview of country experiences of DHIS2

Consultation with representatives from the six pilot country governments and the supporting HISPs identified satisfaction with the programme across all interviewed stakeholders. Stakeholders commented on the capabilities of the platform, capacity building activities and support being made available through the Community of Practice and HISPs.

From discussions held with representatives from each of the six participating countries at the DHIS2 for EMIS Academy (The Gambia, 25-29 April 2022). There was consensus from all participating countries that what is being delivered offers a high level of functionality and reporting compared to what they have used in the past. The Gambia, due to its small population and numbers of schools, teachers and pupils, has provided an excellent test bed for a national implementation, including a move towards use of tracker for individual students and teachers. Representatives from The Gambia were proud of their demo showing what it has achieved, including GPS tagging of all schools. Although a relatively small Country with a low number of schools compared to other countries, this is a good achievement.

All six pilot countries started physical implementation. The UNICEF representatives and Government representatives from Eswatini gave fully details on their competitive bid and how and why DHIS2 was selected. They are happy with their implementation even though they have had some delays partly due to Covid 19 travel restrictions etc. In general, there was satisfaction with UiO and HISP support during Covid-19 restrictions and their help in continuing development and roll out remotely and providing on-line capacity building through YouTube.

3.2 Relevance of DHIS2

This section will explore the relevance of DHIS2, responding to the following core guiding questions of the review:

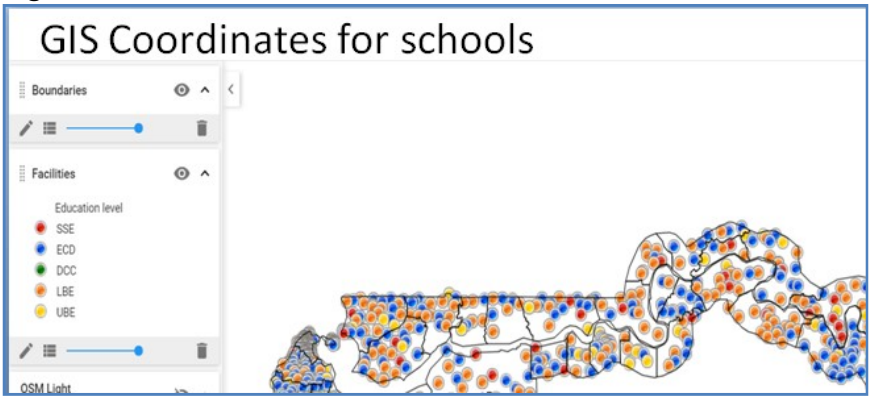
- Is the DHIS2 platform relevant in the implementing context (on district and national level) and for recipient country's priorities, especially in comparison to use of other alternative platforms in country?
- What is the added value and challenges of the DHIS2 platform compared to other options for digitalized EMIS in low-income contexts? Please include a description of other alternative software platforms.
- Interoperability: To what degree has the pilot managed to promote interoperability of different data sets (HR, exams, financial, logistics etc)?

3.2.1 Relevance of DHIS2 compared to other available platforms

DHIS2 is a well-developed platform that has proven to be quickly and effectively adaptable for use in an EMIS context. It has the same, or in most cases more, functionality than alternatives, especially in terms of analysis and reporting. It has a number of advantages over other platforms, including being equally as effective at District and National levels, with economies of scale possible when scaled up nationally. As new surveys can be designed and implemented effectively, DHIS2 is quickly and easily configurable to local data needs, with this adaptability ensuring relevance to any given context. Historic EMIS can also be imported into new systems, ensuring interoperability.

One of the factors in favour of the DHIS2 platform and its relevance is its widespread use in health, which has resulted in excellent local capacity in terms of skills and resources.
The platform also includes features that have an advantage over other systems, such as a range of out of the box tools with a very wide set of capabilities, such as GPS and tracker options. These features are unavailable in many other products.

Figure 2: The Gambia GIS coordinates for all schools



3.2.2 Added value and challenges of DHIS2 compared to other options for digitalized EMIS in low-income contexts

The below table outlines the core added values of the DHIS2 compared to other platforms.

T*able 3: value add of DHIS2 compared to other platforms*

Area	Description of value add
Cost effectiveness	The low cost of ownership relative to competitors is likely due to the significant amount of research and development that was invested through the health sector since 1994. This has meant the platform has been tried, tested and adapted through many iterations prior to use in education, meaning the cost for setup are lower than platforms that require more build time.
	Software and add-on tools are all free to download with no license costs.
	Applications from other contexts are free to reuse
	Training materials are available online and have already been developed, meaning the only costs in training would potentially relate to translation of materials
Configurability	The platform is easily configurable to any data need, with all software packaged multilingual. This makes DHIS2 a key asset in implementing non-traditional EMIS applications.
	The architecture of DHIS2 developed for tracking individuals in health is not widely used in education but would be valuable in areas such as teacher professional development monitoring.
System capacity	As in DHIS2 everything is web based, a highly competent central IT support team and suitable funding is all that is required.
	The hardware and software requirements are minimal. As the platform is internet based, all that is required at a District Office level is a low-cost PC or tablet, in addition to a printer and internet connectivity.
	Significant local capacity to support DHIS2 exists through HISPs and in Government and local health organizations. Where capacity building is required free on-line materials are available.

The challenges faced by DHIS2 are similar to those faced by other platforms: ensuring the platform is sustainable through government ownership. Once initial development and installation costs are met the ongoing costs are mainly staff, hosting and comms which is likely to be similar for whatever package is used. Potential in country experience of DHIS2 in health may be of benefit here. The low spec requirements to support DHIS2 at District level should offer opportunities to reuse existing resources.

The current support/training model for DHIS2 consists of a number of strong elements which provide significant regional level of support. Other products such as OpenEMIS share similar models; however, DHIS2 has advantages in the extensive HISP network and the level of likely in

country expertise likely to exist within Governments from the many years the platform has been used in health.

Benefits of DHIS2 include:

- An active of a Community of Practice[4]
- An extensive HISP Network (326 HISP employees in 17 countries plus 123 staff at base in UiO (See Section 4.4)
- An open source/public good model
- Free Sharing of Apps developed by others
- On-line training available through YouTube
- Strategic pilot developments supported by HISPs

3.2.3 Interoperability of different data sets

The review identified some examples of interoperability taking place. For example, the dashboard in Gambia includes examinations results for Grade 7, with some early work in Gambia on the fusion of health and schools data resulting from Covid-19.From a functionality perspective, the platform has the ability to load and link any two data sets but historically the unique identifiers needed (e.g. school codes or unique student identifiers) are often different in different systems, or updates not carried out effectively across systems e.g. new schools, and work will be required to link initially. In Uganda, exam passes at Primary 7 are linked in to EMIS data as a measure of school performance. Sri Lanka potentially has significant linked data (based on their PowerPoint presentation). Generally there are new data insights when data sets are linked and more examples should be encouraged in the pilots. In all pilots, historic EMIS data is being uploaded to provide trend analysis. In most countries District level population data by age and gender is included in EMIS systems to measure net and gross enrolment.

3.3 Effectiveness of DHIS2

This section will explore the effectiveness of DHIS2, responding to the following core guiding questions of the review:

- To what extent is the programme producing knowledge to address sustainability of digitized EMIS (outcome 1)?
- To what extent is the programme building a critical mass of human capacity for running and maintaining DHIS2 for EMIS (outcome 2)?
- To what extent is the programme contributing to expanding the DHIS2 platform to enable a shift to learner centred EMIS (outcome 3)?

3.3.1 Knowledge production to address sustainability of digitalized EMIS

There is currently limited evidence that knowledge production to address sustainability of digitized EMIS is happening, and there needs to be an increased focus as the end of the pilot nears. During the Uganda field trip this was explored in more detail, with a few options that could be investigated. These included:

- A model where multiple NGOs, each with distinct District responsibility, roll out a core set of EMIS tools/reports as well as bespoke applications to their project e.g., refugees in schools, camps and settlements.

[4](URLhttps://community.dhis2.org/)

- Need to increase the transfer of ownership to Government – most of the 6 pilots are still very reliant on HISP for development, hosting, implementation and support
- Use of existing funding such as GPE Systems Capacity Grant to strengthen local capacity
- The need for a physical plan and timeline for Government taking responsibility for various core activities. (All 5 projects).

3.3.2 Building a critical mass of human capacity for running and maintaining DHIS2

A large number of education staff within each of the pilot countries has undertaken training. However, most are reliant on HISP technical support and have not yet taken full ownership. One possible exception to this is Gambia. Gambia leads in adoption of running and maintaining DHIS2. The local leadership in Gambia has been incredibly supportive, and the team in Gambia were keen to establish ownership. For this reason, Gambia would likely serve as a promising example for a more in-depth case study on how handover could take place.

The lack of transfer of ownership is not necessarily a failure of the programme, however, as ownership goes hand in hand with national systems, and the pilots were never meant to be to scale. If DHIS2 were implemented for a national system then it is likely that it would be owned by Government IT (with more IT Specialists). Given the ease with which the platform supports development and the number of Governments using it for Health (37 in Africa) then it should not be a major concern. There are clear indications that the Government staff is heavily involved in the design of systems and surveys, but not yet on running and maintaining them.

3.3.3 Expanding DHIS2 to enable a shift to learner centered EMIS

Gains in this area are less well-established than other aspects reviewed. Historically, EMIS systems have not recorded attributes of individual students, but rather collected aggregated data such as numbers in age bands per class or grade. Identifying individual students remains a challenge. Students may have the same name as another student in their grade, and students can often be unaware of their date of birth. The resources associated with tracking individual students are high, but the potential benefits for tailoring education more towards child needs is substantial. One potential starting point that would navigate towards learner EMIS could be tracking teacher professional development.

There are possibilities for use of standardized tests to allow schools and students (such as Early Grade Mathematics Assessment EGMA or Early Grade Reading Assessment EGRA), though these come with a significant cost. In The Gambia and Uganda, other student-centered data, such as student and teacher attendance, is being piloted. Uganda is also working on integrating safeguarding data alongside education data. Capturing school register data electronically on a periodic basis was discussed but not yet done in practice in Uganda or Gambia. It is however possible as is the case in countries where student percentage attendance is linked to stipend support such as Pakistan (Girls Only). There are emerging signs of data being used to monitor learning outcomes of schools and some use of trackers in Gambia and Uganda. In Uganda the proposed new “Robust EMIS” system currently being piloted should capture student level data. It is too early to tell if this will be successful.

3.4 Sustainability of DHIS2

This section will explore the sustainability of DHIS2, responding to the following core guiding questions of the review:

- Is it likely that the knowledge, capacity and platform built by the programme will be used after NORAD's funding is withdrawn? Which factors are influencing this?
- What is needed to strengthen long-term local ownership and commitment to digitalization of EMIS? Is this feasible through the current programme model with UiO?
- How successful have UiO and DHIS2 been in establishing partnerships with key actors in pilot countries? How can UiO and HISP groups strengthen these partnerships?
- Has the use of DHIS2 in the health sector aided the piloting of DHIS2 in the education sector? If yes, how? If any, what influence does this multisector approach have on relevance and sustainability?

3.4.1 Likelihood of knowledge, capacity and platform being used after NORAD's funding withdrawal

During the conference, discussions were held with the principal representatives from UiO (Terje Sanner and Kirsten Braa), in addition to other UiO and HISP staff. The aim was to understand the capabilities and support funding for DHIS2 for EMIS, the capacity built, successes, and issues with the pilot roll out and plans moving forward. It was not possible to determine the numbers of education staff trained as only training in DHIS2 as a platform is recorded. Based on numbers on the DHIS website (https://dhis2.org/academy/), approximately 25,000 individuals have gone through the DHIS2 Fundamentals course. In addition, there have been more than 60 PhD graduates and 500 Masters Graduates embarking on research associated with DHIS2 implementations in more than 60 countries[5]. A number of selected graduates have gone on to set up or work for HISP networks.

There is a strong likelihood of the knowledge, capacity and platform being used in all contexts after funding has been withdrawn. As the systems have been developed, including capacity building of education IT teams, the costs for continuing the programme will be much lower going forwards. In Uganda, due to the trialing of "Robust EMIS", it is likely that learning from DHIS2 will be transferred, but it is currently too early to say to what extent, or which platform will ultimately be scaled nationally. To help determine whether the five countries would be able to continue to fund the ongoing platform costs, and other costs associated with human resource, country specific sustainability plans are required.

The only country reviewed where future costs and system ownership was discussed was Uganda. There is no clear picture of what will happen due to the awaited pilot of the new internal developed EMIS system. Uganda did however request a detailed cost model of the roll out costs for DHIS2 at $1.86m (see Annex 7 Doc 2. (Copy of National Budget_Scale of DHIS2-EMIS to 176 Administrative Units(14369).xlsx)).

The biggest factor in all countries impacting sustainability is funding for the internet costs. In Uganda, this was costed at $211,000 per annum. Although it is likely that government will fund where necessary to allow the system to continue to be used, it is unclear whether this is being factored into national budgets and development plans. In Sri Lanka, where the economy has recently suffered a collapse, there is likely the highest risk of the platform being discontinued due to limited funds to support it.

[5] https://www.mn.uio.no/hisp/english/about/facts/index.html

Aside from the financial constraints, there have been attempts to build system capacity to and knowledge development after Norad has withdrawn funding. For example, The Gambia and Uganda have competent EMIS teams who are capable of managing the day to day running of the system, and planning surveys as required. Uganda is looking to proceed with “termly” surveys, with rollout to secondary level, which will likely result in additional data which they will be able to support and deliver.

3.4.2 Strengthening local ownership

The current programme model has proven the suitability of the tool and been used to develop core functionality for education data and is now expanding to peripheral data needs. If more NGOs were to integrate DHIS2 into their programmes, this would act as a catalyst to develop a universal data model for education and a range of education specific tools that all countries could use (e.g. student and teacher attendance tools, school maintenance inspections, school report cards, student dropout tracking etc.). This is a very long-term goal but standardization and best practice between DHIS2 user countries should be achievable. New models of partnerships between government and NGOs may be needed.

To strengthen local ownership, there may also be a need to develop the demand side for data. Products such as school report cards help to drive demand from parents. Areas such as maintenance needs reports or teacher development needs reports can drive demand within government.

UiO have already expressed a willingness to support an “out of the box” EMIS or at least a standard data model and are working with other partners such as African Union to use the tool for international monitoring (see https://academy.demos.dhis2.org/au-emis/). UiO certainly see the potential for DHIS2 for EMIS. At present, this is predominantly viewed through a health lens. Although there is a case for building on the success of the health tools, there needs to be a clearer identity and focus on the education tool. This should include a lead person in each HISP for education implementation, distinct produce brochures, case studies and marketing materials.

Communities of practice and sharing between countries would also strengthen long-term ownership and commitment to digitalization of EMIS across low-income contexts. This could be in the form of quarterly DHIS2 for EMIS newsletters and less frequent remote meetings.

3.4.3 UiO and DHIS2 success in establishing partnerships with key actors in pilot countries

The establishment of partnerships with key actors could be categorized as emergent. GPE were very supportive of DHIS2 and happy for capacity building in government to potentially be supported through their capacity grants. The representative had a clear understanding of the bigger EMIS picture and competing products, and was very supportive of DHIS2. Internal reviews of DHIS2 for EMIS were comparable with the other key systems such as StatEduc2, OpenEMIS and m360.

In The Gambia and Uganda partnerships are developing with key actors such as the African Union. It has also been reported that the UNICEF East and South Africa Regional Office is closely following the rollout in Eswatini with interest. This should be viewed against the backdrop of UNICEF, UNESCO and UIS already having heavily invested in their own platforms.

Gambia, Uganda and possible the other pilot countries have a good working relationship with GPE, who are in a position to actively support capacity building in EMIS. In Uganda, there is a positive relationship between the HISP, the local NGOs and the government to support refugees, which is a relationship that could be expanded further.

It is likely that there will be opportunities to work with these partners and also in Uganda's case with their own very ambitious "Robust EMIS" development and share data to use Educ2' range of dashboard and web reporting tools. HISP groups seem to have a good understanding of the key players, and key issues in each Region and are trying to engage with all the key players. They already have a good reputation to build on. They could improve the situation by having an Education data lead at each of the HISP's and try to present at the global Development and international EMIS events run by the likes of UNICEF and UNESCO.

In addition to existing partnerships, there were also representatives present at the conference from non-pilot countries who demonstrated an interest in the platform. Discussions were held with a representative from Save the Children India, Sierra Leone and from Nigeria. All were excited by what had been presented, and were keen to move forward with programmes in their home countries. They all liked the power of the tool to support EMIS and the wide range of analytics and reporting that are available in the existing package. The availability of support through the HISP network already in each of their countries plus the fact that each country was already using the software in their health sectors added to the desire to move forward in this direction.

3.4.5 How has the use of DHIS2 in the health sector aided implementation in education

DHIS2 in the health sector has been highly beneficial to the rollout of DHIS2 for EMIS. The high level of funding for data in health has contributed enormously to the development of the quality product and range of tools (health funding for 2019 to UiO/HISP Network was $22m). One of the biggest benefits of DHIS health programme in 70 countries is the local capacity already within countries/Government for developing and supporting DHIS2 applications.

In addition to the benefits that preexisting funding and platform development, the reputation of health and the large user base also created an excellent foundation for education. Excluding the legal data sharing constraints there are natural partnerships between health and education such as HIV prevalence in schools, mitigating for the impact of Covid 19 on teaching and school access, etc. are all good examples. However, it is arguable that this should not be the core focus of DHIS2 for EMIS, which deserves its own educational support education leads in HISPS and individualized/targeted marketing for education. The recommendation would therefore be to continue to build off the excellent reputation of DHIS2 for health, and to capitalize on areas that complement one another, but to ensure sufficient focus on education is maintained. It is recommended that UiO realign their platform support to change the mindset from health only.

3.5 Overarching considerations

Based on the evidence gathered in this review, there is a need for country specific programmes but with a clear international strategy. The product needs much more exposure at the high-end donors (World Bank, GPE, UNICEF, UNESCO) level, all of which should develop the Community using and developing DHIS2 for EMIS. It would benefit from standardised reporting (as is seen

internationally in health) and a set of standard set of monthly school level data collection and reporting being led by the international donors.

The below table outlines the key overarching considerations in assessing the overall relevance, effectiveness and sustainability of DHIS2.

Table 4: overarching considerations on DHIS2 relevance, effectiveness and sustainability

Analytical question	Key considerations
What are the key requirements for a successful deployment of DHIS2 in terms of resources, training, political will, costs etc.?	This is starting to emerge from the six pilots. Cost of ownership and local support are two key factors. Local inputs to design are key. This is created in partnership with locally based development. Having an effective working system is something local staff have pride in. Clear leadership and ultimately system ownership from Government is vital as is local ownership and use of the data produced. This then spreads across the education sector to planners, economists, maintenance staff, teachers and parents.
How does the product fit into the overall EMIS strategy in the country/region?	EMIS strategies are evolving from local platforms and annual census to systems that are web based and highly flexible with more regular data collections. There is a move towards existing platforms and away from countries' own developments, but cost and level of expert support have historically been issues. There is a growing demand for more frequent data for maintenance planning and tackling emerging issues and disasters. The flexibility of this product and the availability to add external data capture tools like SMS help here. The quality and flexibility of reporting is vital in communicating results effectively. The product dashboard and GPS capabilities work well here.
What are the strengths/weaknesses of the system in this location (including competitors)?	Primarily this is down to cost and availability of local support. Need for a sustainably funded development plan. Strong development teams with local ownership will
How well does the software meet the overall needs for information for the region/country?	The flexibility of DHIS2 and the range of support, presentation and analysis tools available should mean most pilots should achieve their goals. The availability of local dashboards for data mining, combined with appropriate data safeguards is working well. GPS is a useful addition in low-income countries where geography impacts on resources like water, electricity and staff resources.
How well does the software meet the specific needs for information for the location,	There is always a need for local data priorities. Locally designed termly data collections that meet local education challenges means limited resources

Analytical question	Key considerations
(District/School)? What important data is missing which could be easily added?	can be effectively managed. This software has a good pedigree in working in developing countries worldwide.
What are the constraints for getting effective timely data flows from schools to Districts	The main constraints are funding, security and communications. In some areas where DHIS2 will operate local security concerns mean internet and phone signals are not available/switched off by Government. Local data capture on tablets, with data uploaded when possible needs to be used. Security of tablets and phones along with charging solutions can be problematic. There are solutions however such as charging devices using survey vehicles and inverters but this can be costly.
When support stops how sustainable is the EMIS system likely to be. (Likely survey and communication cost issues).	It is more likely to be sustainable if there are few changes to the data collected year on year. It is likely to be more sustainable if other third party support such as NGO's, links with other programmes e.g. supplying equipment which can also be used to run DHIS2. Staff turnover within Government (e.g. trained IT staff moving to jobs in more senior Ministries such as finance can be an issue. An in-house IT unit in Government with ownership of EMIS may help

3.5.1 Cost of implementation and rollout

A key issue for any EMIS IT system is the cost of implementation, support and roll out. As with most of the competing systems, DHIS2 is web based. As such, each district requires only basic IT to use the core system. All competing systems therefore have similar implementation costs (computer/laptop, printer and internet connectivity plus usually connection charges).If paper-based surveys are to be used, there are printing and distribution costs of the questionnaires and training of all staff/enumerators involved. Again, costs should be similar across platforms.

The open source, free to use approach is common to a number of similar EMIS tools available. This review looked at three in the document review.[6]All offer sharing of applications developed for one country with all others at no cost.

Where costs are likely to differ is in training and support. The HISP model, where resources are put into local salaries for local staff rather than international TA, should be lower. Similarly, the availability of online training and community of practice should make training costs lower. Local capacity, combined with a good set of development tools, should make DHIS2 cheaper and quicker to make changes and develop apps. It was also clearly demonstrated how quickly DHIS2 can be configured reducing development costs.

As part of the review, I was provided with a very comprehensive and detailed cost model for Uganda to roll out to all 176 Districts and 52,000 schools would cost (all costs) for first year

[6](Annex 7): m360 SIS (formally Global Ed* Assist (Doc 14); Open EMIS (Doc 15) and Stateduc2 (Doc 16)

US$1.85m.[7]Again, this would be a similar cost across all products, however DHIS2 development of EMIS annual data and termly data systems plus Uganda portal arealready complete, meaning the cost is lower than it would be in a new country (see next section).

Roll out costs to Districts can be very small and flexible, however, in low-income countries, there are persistent issues with reliable Internet, power and security. These constraints, however, are becoming less pronounced, especially where there is some reason for external support to infrastructure, such as in refugee camps, larger district centres etc. This would make refugee NGO partnerships a good option to pursue.

The flexibility of the DHIS2 model (in common with some other systems) to support data dissemination via the web (to cheap android tablets or smart phones) and similarly support the same mechanisms for data capture using free tools such as Kobo Collect mean options available for regular data capture (e.g. school pupil and teacher attendance) and distribution of low level community feedback such as school report cards.

4. The relevance, effectiveness and sustainability of DHIS2 in Uganda

Initially, Norad's Uganda work involved two districts, before being expanded further through funding from Kixs/GPE. There are now four districts supported in total, which includes ten out of 179 Administrative Areas. This constitutes 5.6% of all Administrative Areas. DHIS2 for EMIS includes Basic Education, covering pre-primary (Early Childhood development) and P1-7. The Ministry of Education and Sport (MoES) has an existing Teacher Management System (TMS) which covers all private teachers. It allocates a unique Uganda Teacher Service Number to all teachers.

4.1 The relevance and effectiveness of DHIS2 in Uganda

The current education challenges that an effective EMIS could support were discussed with Ugandan Government officials. One of the main challenges noted relates to pupil school readiness due to a lack of nursery and ECD places. Other issues include consistency of education for pastoralist children (those engaging in work related to cattle and agriculture), and education for refugees. Like many education ministries they are finding it difficult to plan and allocate resources effectively due to lack of data. The last full EMIS in Uganda was 2017.

The current implementation of DHIS2 is assisting in planning student performance as it links to the Uganda National Exam Board results at grade P7 (used for student promotion to secondary level), with candidate numbers used to link to students. Cumulative passes of examinations at these grades are used as performance indicators for schools.

Due to perceived weaknesses in existing EMIS systems in Uganda, the education ministry has been developing their own in house EMIS solution through their Government ICT Department. The application, called "Robust EMIS" is soon to be rolled out as a pilot. It is an ambitious

[7](See Annex 7 Doc)

undertaking aiming to capture student level attributes. Although as yet un-tested, conversations with ministry planners and managers appear to be in favour of Robust EMIS given the amount of development funding that has been spent to date. The DHIS2 implementation was initially supported as a pilot in basic education due to the lack of data from any source. There are now plans to extend the DHIS2 pilot to secondary education to allow a comparison across both sectors with Robust EMIS. Running both systems in parallel would have little cost impact as they would operate over the same network and utilise the same IT kit. There is also a pilot underway for a new termly data collection programme through DHIS2.

It may be that there is an effective solution using both packages as DHIS2 already has very effective analysis and reporting tools and training modules available on their use. DHIS2 should be able to import all data captured in Robust EMIS. The same infrastructure for computers and networks/internet to District level can be used by both packages.

The scale of the EMIS in Uganda is significant. There are approx. 8.85 million children in primary school in Uganda catered for by 800 private schools and 142 government schools. Universal primary and secondary education is free in Uganda. Schools are supported through Capitation Grant allocations. An approximate allocation of the Capitation Grants is 45% on books, 25% on Sports Facilities, 15% on Admin and 15% on Management. The Capitation Grants and School Facility Grants currently calculated in DHIS2. Teacher salary and other costs are paid directly from Government. There are active Parent Teacher Assoc. and School Management Committees. School maintenance is managed at the District Level. A remaining pilot aim is to support these groups through school report cards which are currently being developed in DHIS2.

4.2 Cost effectiveness and financial sustainability

A key policy being pursued by HISP Uganda is providing sample implementations and assessments of DHIS2 for EMIS to show the capability of the product and potential costs for roll out. A quotation has been provided to the Government of Uganda for scaling up the existing pilot (10 admin Districts) to all 176. (Annex 7 Key Doc 2).[8]

Table 5:Sample Uganda Costs Year 1 Start Up Costs

Sample Uganda Costs Year 1 Start Up Costs	YEAR 1
Item Description	**Amount US$**
1. District level Set-up Costs	704,560
2. Central level Training of Trainers - MoES Staff to support rollout and implementation	24,830
3. Thirteen Regional District Orientation and End User Training (District Education teams together with District leadership)	573,915
4. School administrators orientation conducted at district level	490,880
5. National Level to District Support Supervision, Data Quality Assessment & Feedback Session	31,366
6. District to School level Support Supervision Data Quality Assessment & Feedback Session	31,680
Total USD	**1,857,231**

[8] (National Budget_Scale of DHIS2-EMIS to 176 Administrative Units(14369).xlsx)

Table 6:Sample Uganda Costs Annual Recurrent Costs/Total 2 Years

Sample Uganda Costs - Annual Recurrent Costs	Annual Cost
Item Description	**Amount US$**
1. District Costs: Data collection tools, equipment maintenance and replacements	408,880
2. Refresher End User Data Use Trainings	141,450
3. National Level to District Support Supervision, Data Quality Assessment & Feedback Session	31,366
4. District to School level Support Supervision Data Quality Assessment & Feedback Session	31,680
Total USD	**613,376**
Total Cost Year 1 & 2	**2,470,607**

As part of the EMIS roll out to the 10 Districts, a Uganda Dashboard has been provided which will be available if data is made available either through a further roll out of DHIS2 or if Uganda's planned new national tool "Robust EMIS" can provide data.[9]
HISP Uganda has also created (in 24 hours) a demo website for the African Union. The site shows the capabilities of DHIS2 to a wide and influential audience.[10]

4.3 Uganda sustainability model

Two levels of EMIS have now been created for Uganda; the annual school census type with historic data imported for the last two years available, and a new termly data tool which has been designed and is being piloted.11 Therefore, the task of rolling out nationally is reduced to training and survey support. A quote to do this for all districts in Uganda ($2.47m) has already been provided to the Government (see 5.3 above). Uganda has, for the last four years, been developing its own new core National EMIS system which is about to start early pilots (Robust EMIS). The Government has not yet funded the same missing costs of equipment, internet connectivity, training, and survey support. N.B. This would be the same costs and equipment used if DHIS2 were to be rolled out and could be used by both systems.

There is a lot of support in Uganda for DHIS2 (in Health) and the new Minister for Education is moving from Health. In the short term a possible course of action for Uganda HISP would be to work with the NGO's and the support for refugees to roll out refugee solutions to a number of (new to DHIS2) districts on the understanding these Districts also operate EMIS. UNHCR may be interested in supporting the rollout, training and specialist development leaving only the district training and EMIS survey support costs.

There is an opportunity to work with Government on Robust EMIS and initially import pilot data to demonstrate DHIS2 analytics and reporting. Government needs to look at the cost and effectiveness of all options available to them.

[9]Uganda Dashboard Url emisuganda.org (Username hisp.fallan - Password Dhis@2022)
[10](https://academy.demos.dhis2.org/au-emis/Username: au.demo Password: Demo@2022).
[11](See Annex 7 key docs 23 (Primary tool revised April 15th.docx) and 24 (ECCE Revised tool April 15th.docx)

4.4 Other considerations

During the visit, there was the opportunity to join an NGO workshop and discuss with NGO's present (noted below).

- Ronalo Nyanzi – Save Uganda
- Andy Ronald – UNHCR
- Isaish Waswa – International Rescue Committee

The focus of the workshop was on refugee learners. Uganda is one of the largest refugee-hosting nations in the world, with over 1.5 million refugees (as of 30 Nov 2021)[12]. All attendees were aware of DHIS2 and interested in how it could be utilised to support feeding programmes and tracker apps which will assist in tracking individual refugees between camps and supporting programmes such as school feeding.

We discussed the concept of individual NGO's supporting DHIS2 for EMIS in the distinct Districts they are working in, along with the NGO's providing the same level of EMIS support as is currently being offered in the Uganda Districts piloting DHIS2. The concept was favourably received.

5. Review conclusions

5.1 Overarching conclusions across all pilot countries

Overall conclusions from discussions with key stakeholders and presentations at The Academy are as follows:

- DHIS2 implementation is progressing in 6 pilot countries. Covid-19 has slowed the pace of the implementation, but all six countries are moving forward. Sri Lanka may have issues due to the political problems they are currently experiencing.
- HISP Uganda should aim to make Eswatini EMIS an exemplar case as it is a pilot for UNICEF and being closely monitored regionally and internationally. It will also serve as a case study to see how EMIS projects are coordinated across donors, sharing developments and ideas. There should be opportunities to provide specific reporting requirements for UNICEF management/UNESCO or UIS which would act as a catalyst for future projects. Possible opportunities for SDG reporting.
- Good support and capacity building for EMIS pilot applications has already been established. We are seeing effective face-to-face training through the "Academy" approach being delivered by HISPs and UiO, established online training availability and a functioning and well used community of practice. The Community of Practice is for all users internationally and is an open discussion forum. As such it would benefit from a filter mechanism to allow users to follow specific streams only as at present individual discussions are difficult to follow.
- There is a need in all five NORAD pilots to promote Government ownership before end of the current programme. Staff within Government need to either develop capacity to take over some of the technical support and maintenance or Government funding will be required to pay HISP's to provide support going forward. At present the design

[12]UNHCR (2021) https://data.unhcr.org/en/country/uga

lead/needs assessment is coming from Government and the development and support mainly from HISPs. This is true for each of the pilots.

- It would be a useful exercise for the NORAD programme to develop a sustainability plan to clarify, for each pilot Country, who will physically host and pay for hosting and communication costs, for the EMIS service. This needs to be ring-fenced in departmental budgets. In addition, processes for regular (annual) updates of data such as annual exam results, and other functions that will need to be maintained in the EMIS system at the end of the pilot need to be documented and transferred. The one plan can be completed for each of the five pilot countries with potentially different solutions in each. This should be implemented soon to allow time for all handovers to take place. Some pilot country staff may need further training to take ownership of software support and development. (Not necessarily Education Dept. staff)
- More exposure needed amongst the international education community on both the work and results of DHIS2 for EMIS. Presentations at international donor forums and events such as UKFIET[13] would be beneficial to long term use of the platform for EMIS.
- At present, DHIS2 is understandably still seen as a Health Stats tool. It is embedded in slide presentations, and even in data models which talk about health in schools, school vaccination programmes and the like. UiO, as the DHIS2 lead, need to do more to establish separate brand and specialist support in EMIS data with an education focus. I think it would be beneficial for the future growth in the EMIS market if there was, for example, an EMIS lead at each HISP with up-to-date knowledge of all international EMIS work/projects on the DHIS2 platform. There leads could then develop EMIS specific knowledge on EMIS specific key topics such as out of school children monitoring, learning achievement (EGRA/EGMA), teacher continuous career development, support to parent/teacher groups or school management committees etc.
- Opportunity to do more with demonstrators of capability for peripheral activities such as tablet data collection (e.g.Kobo Collect), GPS use in identifying issues, report card exemplars, etc. More use of software building block tools would support product acceptance.

5.2 Conclusions of the Ugandan pilot implementation

Uganda was a good choice for a review of DHIS2 for EMIS. The local HISP not only leads in the Uganda roll out but also that of Eswatini and The Gambia. In addition, Uganda is in receipt of GPE funding for the pilot of the GPE 2025 Operating Model (See Key Doc 33). It has developed its own, ambitious “Robust EMIS” package that is currently being piloted. Although many of the people (both Government and NGO) perceive this as competition for DHIS2, it could also be perceived as an opportunity in allowing the two systems to support one another (if Robust EMIS goes ahead). The $22m annual investment in DHIS2 and its well-established reporting and analytical tools should be utilised by Uganda irrespective of whether Robust EMIS is implemented.

Strategically DHIS2 for EMIS in Uganda is having an impact. It is operating as an annual data collection EMIS successfully in 4 Districts (10 admin areas). It is well liked and being used effectively at local level. Internet connectivity is causing some minor challenges. It has also developed two “Termly” data collection instruments; ECCE and Primary – (Key Docs 23 and 24)

[13] www.ukfeit.org

that it is currently piloting which if successful will provide useful timely data especially on attendance and drop out. Going forward there are plans to pilot it at the secondary level which I think is a useful pilot development and should be supported before the end of the programme. The pilot is proceeding very well and new areas such as supporting the population of refugee learners should be explored to potentially bring in new stakeholders and also show the benefits of flexibility in data collection and use. This would be outside of the programme but could overlap.Uganda HISP is doing a good job supporting The Gambia and eSwatini as well as preparing small demos like the one for the African Union.

6. Annex

Annex 1 ToRs

Terms of Reference for review of DHIS2 for EMIS

Background

NORAD is funding a programme at the University in Oslo (UiO) to pilot the software platform District Health Information Systems 2 (DHIS2) for Education Management Information Systems (EMIS). The programme aims to explore how education could benefit from the success and widespread use of DHIS2 in health, testing whether this could add sustainability to digitalisation of EMIS. The agreement runs from 1. January 2021 to 31st December 2023 with a total budget of NOK 30 million and is implemented by the UiO Health Information System Programme (HISP). Partner countries include Uganda, Mozambique, the Gambia, Togo and Sri Lanka. Uganda and the Gambia were also part of a preceding pilot, running from 2018 to 2020. The programme is testing DHIS2 for EMIS in a limited number of districts and is not meant to fund national scaling of the software. The programme includes the following outcomes:

1. Build knowledge to address sustainability of EMIS strengthened through implementation and participatory innovation.
2. Critical mass of people built for running and maintaining DHIS2 for EMIS with a focus on key education ministry staff at national and district level.
3. Enhancing the DHIS2 platform to fully support the shift to learner centred EMIS.

NORAD is in a process of defining portfolios for education investments for more holistic and strategic management. As part of this, NORAD needs to assess and decide whether and how to continue to support EMIS going forward. This programme review will provide input to a decision on the way forward for **Norwegian support to digitalisation of EMIS**.

Objectives and Review Questions

The objectives of the review are to assess the relevance, effectiveness and sustainability of UiO's programme, with reference to the current knowledge landscape on digitalization of EMIS. Please note that sustainability refers to a long-term aim of nationally owned scaling, operation, maintenance, development, and use of the platform. Review questions include:

Relevance

- Is the DHIS2 platform relevant in the implementing context (on district and national level) and for recipient country's priorities, especially in comparison to use of other alternative platforms in country?
- What is the added value and challenges of the DHIS2 platform compared to other options for digitalized EMIS in low-income contexts? Please include a description of other alternative software platforms.
- Interoperability: To what degree has the pilot managed to promote interoperability of different data sets (HR, exams, financial, logistics etc)?

Effectiveness

- To what extent is the programme producing knowledge to address sustainability of digitized EMIS (outcome 1)?
- To what extent is the programme building a critical mass of human capacity for running and maintaining DHIS2 for EMIS (outcome 2)?
- To what extent is the programme contributing to expanding the DHIS2 platform to enable a shift to learner centered EMIS (outcome 3)?

Sustainability

- Is it likely that the knowledge, capacity and platform built by the programme will be used after NORAD's funding is withdrawn? Which factors are influencing this?
- What is needed to strengthen long-term local ownership and commitment to digitalization of EMIS? Is this feasible through the current programme model with UiO?

- How successful have UiO and DHIS2 been in establishing partnerships with key actors in pilot countries? How can UiO and HISP groups strengthen these partnerships?
- Has the use of DHIS2 in the health sector aided the piloting of DHIS2 in the education sector? If yes, how? If any, what influence does this multi-sector approach have on relevance and sustainability?

Please note that the review will not consider efficiency or impact of the UiOprogramme.

Scope

The review will cover country-based and global components of the UiO programme. It will also reference available literature on digitalization of EMIS.

The review will be conducted over the course of up to 24 days. This includes 5 days for an inception report, 7 days travel, 10 days write-up and 2 days review in line with feedback from NORAD and a reference group.

Methodology

The consultant will develop an inception report subject to approval by NORAD. The inception report will summarize some main lessons on relevance and sustainability in digitalization of EMIS, with special reference to the DHIS2 platform. The inception report will also outline the methodology and approach of the review in more detail, including destinations of country visits. This will be based on a desk review of available literature and programme documentation from the UiO programme.

The main report will be based on interviews with relevant in-country personnel and UiO staff, and further review of programme documentation. It will include observation and quality assurance of the use of DHIS2 for EMIS in selected programme districts. The consultant will also conduct observation and quality assurance at national level where relevant, to inform conclusions on ownership and commitment.

The final report should have an executive summary. It should also be ready for online publishing through NORAD's webpage. Methodological challenges and potential limitation in findings and conclusions must be included in the report. All findings and conclusions must be backed by reference to evidence (source) and their magnitude/representativeness commented. EDT will follow internal routines and procedures for quality assurance prior to submission to NORAD.

Relevant representatives from the UNESCO Institute for Statistics (UIS), UNICEF and the Global Education Monitoring Report (GEMR) team will be invited to form a reference group to provide feedback and guidance on the review. The reference group will provide advice for the inception report and be consulted on the first draft of the main report.

Roles and responsibilities

The consultant should have a minimum of 8 years' experience and have documented experience with EMIS in low-income countries. The consultant should also have technical expertise in digitalization of EMIS. Experience working in Africa south of Sahara is desirable.

NORAD's section for education is responsible for the review. Lena Sømme is the main contact person and will provide review and approval of the inception report and the final report. EDT will communicate directly with the University in Oslo to get access to archives/documents and arrange in-country visits. UiO will also be provided opportunity to comment on the inception report and final report prior to approval. EDT is responsible for coordinating the logistics of the review, including country visits.

NORAD will provide a short management response to the final report containing comments and plans for follow-up.

Timeline and deliverables

Inception report: due by 22nd April
Draft report: 3rd June
Final report: 15th June

A detailed work plan with timeline, including country visits, will be part of the inception report.

The payment will be made after approval of the final report by NORAD.

Annex 2 Work Plan

		Draft Daily Plan	Day
Mon	11/04/2022	REVIEW All Project Docs and Web info. Draft Work plan. Prep	1
Tue	12/04/2022	Review Materials to date. Prep initial questions for UiO	2
Thu	14/04/2022	Draft Report Structure, research aims and UiOQuestions,LeaseReference Group. Request Country reports and base info	3
Thu	21/04/2022	Prepare Draft Inception Report and distribute for comments	4
Fri	22/04/2022	Final Inception Report Prepare and Distribute (Report Deadline)	5
Tue	26/04/2022	Banjul Workshop Day 2	6
Wed	27/04/2022	Banjul	7
Thu	28/04/2022	Banjul ? District Visit	8
Fri	29/04/2022	Banjul	9
Mon	02/05/2022	Eid-al-Fitr Write up Banjul findings	10
Tue	03/05/2022	Eid-al-Fitr Finalise and Distribute Banjul findings	11
Fri	06/05/2022	Plan Uganda Research based on Banjul findings and feedback	12
Tue	10/05/2022	Kampala	13
Wed	11/05/2022	MayugeDistrict Visit/NGO Workshop Visit	14
Thu	12/05/2022	Kampala Government Visit	15
Fri	13/05/2022	Kampala Government, NGO and HISP visits	16
Mon	16/05/2022	Review and analyse findings. Plan report	17
Tue	24/05/2022	Prepare Draft Report	18
Thu	26/05/2022	Prepare Draft Report	19
Wed	08/06/2022	Finalise and Submit draft report for comments to NORAD and Review Committee	20
Mon	20/06/2022	Comments back/Review	21
Tue	28/06/2022	Modifications to report	22
		Review by Review Committee	
Fri	22/07/2022	Report finalise and Submit	23
Fri	29/07/2022	Meeting on Final Report Due	24

Annex 3 Interviewee List

Discussions held during review

Ref	Name	Surname	Organisation	Topic
Prior to Academy				
	Lena Olsen	Sømme,	NORAD	Review Scope
At Academy (Gambia				

1	Alpha	Bah	The GambiaMoBSE	Progress With DHIS2
2	EMILIO	Mosse	Saudigitus Mozambique	Progress With DHIS2
3	TERJE	Sanner	University of Oslo	DHIS2 for EMIS roll out
4	LENA	Sømme	NORAD	Inception Report, Donor support for DHIS2
5	KIM	Frost	University of Oslo	DHIS2 for EMIS roll out and training
5	BJØRNAR	Valbø	University of Oslo	DHIS2 for EMIS roll out and training
6	EDEM	Kossi	HISP WCA	Togo
7	PATRICK	Omiel	HISP Uganda	Uganda and eSwatini roll out
7	KNUT	Staring	University of Oslo	DHIS2 for EMIS roll out and training
8	JEAN LUC	Yameogo	UNICEF Data Must Speak	UNICEF perception of DHIS2
9	GASITHA	Arambawaththa	MoE Sri Lanka	Progress With DHIS2
10	PRABHATH	Ariyaratne	MoE Sri Lanka	Progress With DHIS2
11	Prof. KRISTIN	Braa	University of Oslo	Company finance, structure, HISP Network
12	MFANKHONA	Nkambule	MoET	eSwatini selection process and progress
12	NELSIWE	Dlamini	MoET	eSwatini selection process and progress
12	VICTOR	Nkambule	UNICEF	eSwatini selection process and progress
13	MARGARET	Irving	GPE	GPE support capacity grants and platforms
14	PROSPER	Behumbiize	HISP Uganda	Uganda progress and strategy. Plan visit
14	MONICA	Amuha	HISP Uganda	Uganda progress and strategy. Plan visit
15	TERWASE	William	MoE Benue State, Nigeria	Nigeria's Interest
15	MOHINI	Venkatesh	Waliku - Save the Children,India	Interest in Platform
15	ADAMA	Jean Momoh	MBSSE, Sierra Leone	
Uganda Visit				
16	ABDUL MALIK	Muwanga	Programme Office	MoST
17	TIMOTHY	Etemu	Chief Admin AssitantMayuge District	Use of DHIS2 in Mayuge District
18	JALIYA ALLEN	Nabirye	District Education Officer, Mayuge District	Use of DHIS2 in Mayuge District
18	RONALD	Baligeya	District Planner, Mayuge District	Use of DHIS2 in Mayuge District

18	VALENTINE	Irrangamu	District Auditer, Mayuge District	Use of DHIS2 in Mayuge District
18	OLIVER	Nantabo	Data Clerk, Mayuge District	Use of DHIS2 in Mayuge District
19	RONALO	Nyanzi	Save the Children, Uganda	Opportunities and Constraints on implementing DHIS2 in Uganda.
19	ANDY	Ronald	UNHCR	Opportunities and Constraints on implementing DHIS2 in Uganda.
18	ISAISH	Waswa	International Rescue Committee	Opportunities and Constraints on implementing DHIS2 in Uganda.
20	HAJATI SOPHIA	Safina	MoESSenior Education Officer, Pre - Primary	Impact of DHIS2 on Pre-primary
21	MUSA	Birungi	MoESSenior Education Officer, Primary	Impact of DHIS2 on Primary
22	ROGERS	Mpagi	MoES Statistician	Impact of DHIS2,Robust EMIS
23	CLEOPHUS	Mugenyi	MoES Commissioner Basic Education	Expanding DHIS2 Programme
24	EDISON	Nsubuga	Save the Childen	Expanding DHIS2 Programme
25	MONICA	Amuha	HISP Uganda	Expanding DHIS2 Programme
26	PROSPER	Behumbiize	HISP Uganda	Expanding DHIS2 Programme
Review Committee				
27	MARK	Hereward	UNICEF	Review of Inception and Final Reports
28	PIERRE	Chapelet	UNESCO	Review of Inception and Final Reports
29	OLIVIER	Labé	UNESCO	Review of Inception and Final Reports

Annex 4 Academy Workshop Delegate List

Name	Surname	Company	Country	Interviewed
Donor/NGO (21)				
SHEM	Bodo	ADEA	Cote d'Ivoire	
OSWALD	Rutayisire	ADEA	Cote d'Ivoire	
ADOUMTAR	Noubatour	AU-IPED	DRC	
LUKMAN	Jaji	AU-IPED	DRC	
NDEBAN	Joof Ndong	UNESCO	Senegal	
JEAN LUC	Yameogo	UNICEF Data Must Speak	United States	8
LENA	Sømme	Norad	Norway	0,4
RONALD	Nyanzi	Save the Children	Uganda	Uganda
ANGELO	DE SOUSA Herminio	UATAF	Moçambique	
MOHINI	Venkatesh	Waliku - Save the Children	India	15
MAHESH	Nalam	Waliku - Save the Children	India	
YASSIN	Bagal	UNFPA	Sudan	
WUNICHE SULAHU	Zakaria	PMI/VECTORLINK	Gambia	
ARSENE	Tianhoun	Catholic Relief Services	Burkina Faso	
ANDREW PAUL	Kawongo	ZOA International	Uganda	
DIANAH	Nakasujja	AVSI FOUNDATION	Uganda	
WILLIAM TOX	Kerango	Finn Church Aid	Uganda	
OKWIR	Martin	BRAC Uganda	Uganda	
VICTOR	Nkambule	UNICEF	Eswatini	12
MARGARET	Irving	GPE	United States	20
NUHA	Jatta	UNICEF	The Gambia	
Government (67)				
CLEOPHUS	Mugenyi	MoES	Uganda	23
ABDUL MALIK	Muwanga	MoES	Uganda	16
MFANKHONA	Nkambule	MoET	Eswatini	12
NELSIWE	Dlamini	MoET	Eswatini	12
ALVES ÂNGELO	Moreira	MINEDH	Moçambique	
GASITHA	Arambawaththa	MoE	Sri Lanka	9
PRABHATH	Ariyaratne	MoE	Sri Lanka	10
KOSSI	KPOMÉGNI TSALI	MoE Togo	Togo	
YAWO	KEKELI DZEGLE	MoE Togo	Togo	
TERWASE	William	MoE Benue State	Nigeria	15
MUSA	Suso	MoH	The Gambia	

MODOU	Njie	MoH	The Gambia	
LAMIN	Jammeh	MoH	The Gambia	
BABOUCARR	Ceesay	MoH	The Gambia	
LAMIN	Jawara	MoH	The Gambia	
ARMANDO	Sanyang	Ministry of Health	Gambia	
ALPHA	Bah	MoBSE	The Gambia	1
SEEDY	Jallow	MoBSE	The Gambia	
SULAYMAN	Cham	MoBSE	The Gambia	
FATOUMATA Kah	Kah	MoBSE	The Gambia	
OUSMAN Saine	Saine	MoBSE	The Gambia	
YAHYA .	Njie	MoBSE	The Gambia	
HALIFA	Faye	MoBSE	The Gambia	
EBRIMA	Jallow	MoBSE	The Gambia	
ABDOULIE	Njie	MoBSE	The Gambia	
BASSIROU	Toure	MoBSE	The Gambia	
ABDOULIE	Bachaa	MoBSE	The Gambia	
MUSA	Sarr	MoBSE	The Gambia	
GIBRIL	Jarjue	MoH	The Gambia	
LAMIN	Jatta Bah	Immigration Department	The Gambia	
MARIAMA	Chow	MoBSE	The Gambia	
ESSA	Marong	MoBSE	The Gambia	
LAMIN	Fatajo	MoBSE	The Gambia	
MOMODOU	Cham	MoBSE	The Gambia	
FATOU	Jallow	MoBSE	The Gambia	
PAUL	Mendy	MoBSE	The Gambia	
SOHNA	Foon-Chore	MoBSE	The Gambia	
EBRIMA	Saidy	MoBSE	The Gambia	
SANG	Gomez	MoBSE	The Gambia	
MOMODOU	Jeng	MoBSE	The Gambia	
ANDREW	Gomez	MoBSE	The Gambia	
ANNA NANCY	Mendy	MoBSE	The Gambia	
EBRIMA	Joof	MoBSE	The Gambia	
MARABATOU	Badjie	MoBSE	The Gambia	
CLAUDIANA	Cole	MoBSE	The Gambia	
LOUIS	Moses Mendy	MoBSE	The Gambia	
ADAMA	JimbaJobe	MoBSE	The Gambia	
ABDOULIE	Sowe	MoBSE	The Gambia	
ANSUMANA	Demba	MoBSE	The Gambia	
LAMIN	Ceesay	MoHERST	The Gambia	
MALLEH	Sabally	MoBSE	The Gambia	
LAMIN	Jawara	MoBSE	The Gambia	
ALIEU	Bouy	MoBSE	The Gambia	
SALOUM	Kinteh	MoBSE	The Gambia	

TUNKANG	Conteh	MoBSE	The Gambia	
SOHNA	Jallow	MoBSE	The Gambia	
BASSIN	Badjan	MoBSE	The Gambia	
BINTA	Bojang	MoBSE	The Gambia	
Prof. HERBERT	Robinson	University of the Gambia	The Gambia	
Prof. PIERRE	Gomez	University of the Gambia	The Gambia	
Dr. MBEMBA	Hydara	University of the Gambia	The Gambia	
Hon. BADARA	A. Joof	MoHERST	The Gambia	
Dr. AHMADOU	Lamin Samateh	MoH	The Gambia	
Who	Who	National Assembly Select Committee on Education, ICT and Training	The Gambia	
Who	Who	National Assembly Select Committee on Education, ICT and Training	The Gambia	
ADAMA	Jean Momoh	MBSSE	Sierra Leone	15
MOHAMED	James	MBSSE	Sierra Leone	
HISP (13)				
PROSPER	Behumbiize	HISP Uganda	Uganda	14,26
MONICA	Amuha	HISP Uganda	Uganda	14,25
PATRICK	Omiel	HISP Uganda	Uganda	7
EDEM	Kossi	HISP WCA	Togo	6
YAYRA	Gomado	HISP WCA	Togo	
AANYO	Ahiagno	HISP WCA	Togo	
JERRY	Aziawa	HISP WCA	Togo	
PAMOD	Amarakoon	HISP Sri Lanka	Sri Lanka	
ZEFERINO	Saugene	Saudigitus	Moçambique	
EMILIO	Mosse	Saudigitus	Moçambique	2
ALFREDO	Muchanga	Saudigitus	Moçambique	
ALUKA	Terpase	HISP Nigeria	Nigeria	
BARNABAS	Akumba	HISP Nigeria	Nigeria	
UiO (6)				
KNUT	Staring	University of Oslo	Norway	7
TERJE	Sanner	University of Oslo	Norway	3
Prof. KRISTIN	Braa	University of Oslo	Norway	11
SOPHIA	Kousiakis	University of Oslo	Norway	
KIM	Frost	University of Oslo	Norway	5
BJØRNAR	Valbø	University of Oslo	Norway	5

Annex 5 Academy Workshop Agenda

AGENDA
DHIS2 for Education Academy
Date: 25-29 April 2022

DAY 1: DHIS2 for Education introduction & country implementat

08:00-09:00 Registration
Opening Ceremony - Welcome Remarks by MoBSE and MoH
Introduction of participants and delegates
Introduction to HISP and DHIS2 for Education
Remarks Norad and GPE
Coffee break
Global perspective and the new shift - The Gambia
The Gambia DHIS2 for EMIS journey
Eswatini DHIS2 for EMIS journey
Uganda DHIS2-DEMIS journey
Sri Lanka DHIS2 for EMIS journey
Mozambique DHIS2 for EMIS journey

DAY 2: Data Use & lessons learned from the DHIS2 in the health s

08:30 Cross-sector Health and Education ***Spotlight:*** *Sri Lanka - learning from health and adapting to education* ***Spotlight:*** *Uganda - capacity building and leveraging on health capacity to supp*
Panel: Health & Education sector learning
Coffee break
Designing for data use driven by local needs *Data needs and challenges for different levels of education management* ***Spotlight:*** *Uganda (Aggregate, Districts)* ***Spotlight:*** *Gambia School Report Cards*
Use of EMIS data in education planning and monitoring UNICEF Data Must Spe
Panel: Implementation and data use at different levels of the education system
Gender Equality and Social Inclusion - *Capturing and Using good data for quali*
14:00-15:00 Lunch
Panel: Funding and support - *How can we leverage existing resources?*
16:30 Wrap up and use case bazaar

DAY 3: EMIS STATISTICS (AGGREGATE)

Participants: Technical DHIS2 training

Session
08:30 *Joint session:* Review of DHIS2 features for EMIS
Introduction to dashboards and DHIS2 core dimensions
Coffee break
Working with pivot tables and the use of org unit groups

DAY 3: PARALLEL STRATEGIC SESSION

Participants: Colleagues not participating in DHIS2 training

08:30 *Joint session:* Review of DHIS2 features for EMIS
10:00 Roundtable: Integration / interoperability between systems (as a way to sup sector / cross department synergies).
Roundtable: Options and opportunities for Cross Sectoral Synergies.
Coffee break
Innovative solutions brought into the DHIS2 platform - Save the Children and Wali
Roundtable: Aggregate vs Individual level data collection
14:00-15:00 Lunch
Roundtable: What data is missing (global/national/regional/district)

DAY 4: Individual level data (learner and teacher) - EMIS Tracker ar

Participants: Technical DHIS2 training

08:30 *Joint Session:* EMIS Individual Data Model
Tracker data capture
HISP Saudigitus (Mozambique) EMIS app
Coffee break
Review of dashboards based on tracker data
Working with individual data outputs (ER/EV)

DAY 4: PARALLEL STRATEGIC SESSION

Participants: Colleagues not participating in DHIS2 training

08:30 *Joint Session:* EMIS Individual Data Model
Roundtable: Building an Education Community of Practice (the people/netw sustainability
Coffee break
Roundtable: How to succeed? Implementation strategies
Roundtable: IPED Strategic Plan & CESA
14:00-15:00 Lunch
Roundtable: Funding and Scaling - How can we leverage existing resources a

Day 5: Half-day workshop

08:30 Summary of conference lessons learned
DHIS2 for Education - Way Forward
Bilaterals

Annex 6 Academy Workshop Final Communique

Communique from DHIS2 for EMIS Academy in Banjul

WE, the country representatives, and partners who are members of DHIS2 for EMIS present at the DHIS2 Academy held at the Kalimba Hotel, The Gambia, from 25th to 29th April 2022.

RECOGNIZING the importance of data in promoting evidence-based decision making in policy, planning, monitoring and assessment;

NOTING the need to have a strong Education Management Information System (EMIS) under Ministries of Education to facilitate the provision of quality education data to inform the implementation of Education Sector Plans and strategies;

AWARE of ongoing EMIS initiatives at the global, continental, and national levels aimed at strengthening the management and use of data for decision making and meeting set commitments and frameworks;

OBSERVING the successes of using DHIS2 in the health sector, noting promising development in the education sector and the need to use these experiences in the education sector;

RECOGNIZING the critical role of regional institutions like the African Union Commission in facilitating adoption of the DHIS2 by education ministries;

NOW HEREBY COMMIT to make every effort to collectively take forward and facilitate the implementation of the following through our plans and programmes:

1. National EMIS harmonization process

a. Promote participatory harmonization process with the educational sector in the government on data collection tools, indicators, and data needs for the implementation of the SDG 4, the AU-CESA 16-25 and regional and national plans

b. Initiate a harmonization process with the partners to align their reporting needs into the government system

c. Development and alignment of the national policies and standards

d. Develop a resource mobilization plan

2. Capacity building

a. Institutionalize capacity building at all levels and promote the DHIS2 Academy model to include education use cases at each level

b. Encourage universities and other training institutions to use digital government tools to teach students and deploy them to the field

c. Undertake Training of Trainers to facilitate cascaded training to sub-national levels

d. Conduct blended training using existing Regional Centers of Excellence

e. Develop shared global, continental, regional and national resources for everyone to use

3. Develop and package appropriate messages to put forward the case for using DHIS2 for EMIS

a. The platform is flexible and can easily be customized to user needs
b. Provide granularity in data analysis, from national, subnational down to the school level
c. Empower local stakeholders and community by enhancing data use
d. Supported by a strong ecosystem of practitioners

4. Addressing the missing data

a. Utilizing DHIS2 for EMIS to fill the gap of missing data at every level from global, national, subnational, and school and community level through strengthening collection and data transportation processes
b. Learn from the 20 years of experience of DHIS2 in the health sector to avoid the same failures (leapfrog)

5. Leveraging cross sector linkages

a. Develop a more robust understanding of social sector challenges
b. Support triangulation of data collected by different actors
c. Promote efficient use of available resources through sharing and clustering

6. Strengthen the DHIS2 Academy community of practice and create national community of practices

MADE this 29th Day of April 2022 and endorsed by 113 participants:

Ministries of Education

Ministry of Basic and Secondary Education MoBSE, The Gambia 70 participants from 7 regional directorates, 14 HQ directorates
Ministry of Higher Education Research and Technology MoHERST, The Gambia
Immigration Department, The Gambia
Gambia Teachers Union, The Gambia
West African Examination Council, The Gambia
Bureau of Statistics, The Gambia
Ministry of Health, The Gambia
University of The Gambia
Ministry of Education, Benue State (Nigeria)
Ministry of Education and Training, Eswatini
Ministry of Education and Human Development, Mozambique
Ministry of National Education, Senegal
Ministry of Basic and Senior Secondary Education, Sierra Leone
Ministry of Education, Sri Lanka
Ministry of Education and Sports – Basic Education, Uganda

Partners

Pan-African Institute of Education for Development, AU-IPED
Association for the Development of Education in Africa, ADEA
Global Partnership for Education, GPE
Norwegian Agency for Development Cooperation, Norad
UNESCO, Dakar
UNESCO, The Gambia
UNICEF, The Gambia UNICEF, Eswatini
UNICEF HQ

NGOs

UATAF Mozambique
Save the Children Uganda
Save the Children – Waliku
Catholic Relief Services
PMI/VECTORLINK
HISP Centre, University of Oslo

HISP Nigeria HISP Uganda
HISP West and Central Africa
HISP Mozambique (Saudigitus)
HISP Sri Lanka

Annex 7Documents and Presentations Reviewed

Ref	Title	Link/Notes	Used	Public Private
Web Links				
Web 1	Link to Robust EMIS (Uganda)	https://emis.go.ug/	Used	Public
Web 2	Link to AU Website	https://academy.demos.dhis2.org/au-emis/ Username: au.demo Password: Demo@2022	Used	Public
Web 3	Link to Gambia Demo	https://emis.dhis2.org/demo/dhis-web-commons/security/login.action Demo Log in Username: emis-demo Password: Emis@2020	Used	Public
Web 4	Link to Kobo Collect Site	*https://www.kobotoolbox.org*	Used	Public
Web 5	Link to DHIS2 Community of Practice	https://community.dhis2.org/c/implementation/education/44	Used	Public
Web 6	Link to Uganda Dashboard	https://emisuganda.org Username hisp.fallan Password Dhis@2022	Used	Public
Powerpoint Presentations Reviewed				
Link to Presentations (PPT and Tech) – Shared product folder				
Day 1 - Country Implementations _ approaches (8 files)				
PPT 1	1. ESWATINI Presentation.pptx	NB **Needs assessment by UNICEF DHIS2 chosen**. New because new indicators, Real time data needed. **Inspector assessment tool**. Good Roll out with lots of functionality, Interesting set of challenges.	Used	Public
PPT 2	2. Global Perspective EMIS.pptx	Nil	Used	Public
PPT 3	3. Introduction_HISP presentation_EduAcademy.pptx	Collaboration UiO/Uni Western Cape. 1994 NORAD. List of HISP Groups Slide Info on Training and Capacity Building. **Community of Practice.**	Used	Public
PPT 4	4. Mozambique_EMIS Academy Presentation	Pilot (soon 2 provinces. More a wish list. **Daily teacher attendance and teacher effectiveness**. Was very centralised	Used	Public
PPT 5	5. Sri Lanka_DHIS2 for EMIS SL (2).pptx	**Lots of Individual Systems NB High level web based EMIS.**https://nemis.moe.gov.lk/ Quality systems. Was OPENEMIS 4.2m student records, typical modern challenges. Ambitious roll out	Used	Public
PPT 6	6. The Gambia DHIS2 for EMIS Story.pptx	Good timeline slide inc COVID break. **Good dashboards inc GIS**. Performance monitoring	Used	Public
PPT 7	7. Togo_DHIS2_ Education English Version	Configuration Phase just starting. **Interoperability with Stateduc**.	Used	Public
PPT 8	8. Uganda_Implementation of DHIS2-EMIS	Good roadmap graphic, lack of unique learner identifiers.	Used	Public
Day 2 - Data Use _ Cross sector collaborations (8 files)				
PPT 9	1. Cross-Sector Synergies Learning from He	Public	Used	Public

PPT 10	2. Design for data use based local needs	Good slides on what is data use and what are data challenges. Good slides mapping needs at different levels. Very good ppt.	Used	Public
PPT 11	3. Gambia School Report Card DHIS2 4 Education Academy 2022.pptx	Data Use case. Think too technical and too many pictures – Tanzania one better.	Used	Public
PPT 12	4. Learning From Health _ Adapating to Education_Sri Lanka experience.ppt	Good slide MoE and lessons from Health.	Used	Public
PPT 13	5. MoBSE Inclusive Education_Data Presentation for dhis2 v2.pptx		Used	Public
PPT 14	6. Mozambique UATAF SBiS Academy Presentation.pptx	She belongs in school project – very good report on project	Used	Public
PPT 15	7. Norad_220426 Data and inclusive education.pptx	Note.	Used	Public
PPT 16	8. UNICEF HQ_Data Must Speak.pptx	Multi Country initiative to enhance the use of EMIS data. Vert technical	Used	Public
Day 3 - Roundtable (1 file)				
PPT 17	Waliku Innovation in DHIS2-2.pptx	Not much value to report	Used	Public
Day 4 - Roundtable (3 files)				
PPT 18	1. Mozambique University collaboration norpart-Banjul.pptx		Used	Public
PPT 19	2. Presentation on AU IPED Strategy.pptx		Used	Public
PPT 20	3. UNESCO_DHIS2 workshop final version (2).pptx		Used	Public
Day 5 - Way Forward				
	<Empty>		N/A	N/A
Technical Day 3 & 4 - Training Materials (DHIS2 for EMIS Academy) Folder (11 files)				
Tech 1	01_Pivot Tables in DHIS2.pdf	Very thorough training materials. Good use of local server	Used	Public
Tech 2	Data Visualizer - Guide Companion.pdf			Public
Tech 3	Data Visualizer - Scope.pdf			Public
Tech 4	Defining a data collection tool - presentation.pdf			Public
Tech 5	EMIS - Program Indicator Analysis.pdf			Public
Tech 6	EMIS - Tracker - Overview, Data Model and Terms.pdf			Public
Tech 7	Learner guide.pdf			Public
Tech 8	Learners guide - data element creation.pdf			Public
Tech 9	Learners guide - Dataset creation.pdf			Public
Tech 10	Learners Guide to Data Visualizer.pdf			Public
Tec	Maps presentation.pdf			Public

h 11				
Documents Reviewed				
	File Name			
Doc 1	The Role of Education Management Information Systems in Supporting progress ... - Global Partnership for Education, UNESCO - Google Books_file		Read	Public
Doc 2	Copy of National Budget_Scale of DHIS2-EMIS to 176 Administrative Units(14369).xlsx	28/04 17:31	Not Used	Private
Doc 3	EMIS-Buyers-Guide-EN-fin-WEB.pdf		Read	Public
Doc 4	Norad_DHIS2 Education Pilot 2018-2020 ANNEXES.docx		Not Used	Public
Doc 5	Participant list_DHIS2 for EMISAcademy_Banjul April 2022.xlsx		Used Annex 7	Public
Doc 6	Reimagining our futures together_ a new social contract for education - UNESCO Digital Library.pdf		Read	Public
Doc 7	Reimagining our futures together_ a new social contract for education;executive summary - UNESCO Digital Library.pd		Read	Public
Doc 8	Re-imagining the future education management information systems, beyond head counts_ leveraging data systems to support inclusive and effective learning for all - UNESCO Digital Library.pd		Read	Public
Doc 9	Screenshots.docx		To Use	
Doc 10	ScreenshotsDHIS2.docx		To Use	
Doc 11	Status-of-Education-Management-Information-System.pdf		Read	
Doc 12	Sustainable Development Goal 4 and its targets.pdf		Ref	
Doc 13	Technical Sheet - m360 SIS.pdf	28/4 13:07 email	Used Ref	Private
Doc 14	Technical Sheet - OpenEMIS.pdf	28/4 13:07 email	Used Ref	Private
Doc 15	Technical Sheet - StatEduc2.0.pdf	28/4 13:07 email	Used Ref	Private
Doc 16	Final Agenda DHIS2 for EMIS	Used as Annex 5	Used	Public
Doc	Official leaflet on DHIS2		Read	Public

17	(Paper Only)			
Doc 18	Final_Joint Communique DHIS2 for EMIS 2022.pdf	Used as Annex 6 email 9/5 18/09	Used	
Doc 19	List of Uganda Districts		Ref	
Doc 20	Copy of DHIS2-DEMIS Data Dictionary.xlsx	Annex 8	Used	
Doc 21	EMIS-REVIEW-TASKFORCE-REPORT.pdf		???	
Doc 22	Training report- In country Customisation training for MoES& Partners .docx		???	
Doc 23	Primary tool revised April 15th.docx	Email 12/5 06:31	Ref	
Doc 24	ECCE Revised tool April 15th.docx	Email 12/5 06:31	Ref	
Doc 25	Draft EMIS Policy (Uganda)		To Read	
Doc 26	Uganda ITAP Report to the Board (Independent Technical Advisory Panel for GPE)		Ref	
Doc 27	Requirement Analysis Ugandaement analysis Country Template (GPE Template)		Ref	
Doc 28	REQUIREMENT ANALYSIS UGANDA-WORD 2.8 Clean Copy.pdf		To Read	
Doc 29	DHIS2 web pages.pdf	Internal Resource	? Use	
Doc 30	Inception Report2.docx	Final Inception Report	Ref	
Doc 31	Terms of Reference, Review of DHIS2 for	Final ToR – Annex 1	Used	
Doc 32	Intro to HISP groups - history and approach.pptx	Kirsten email 30/4	Ref	
Doc 33	2020-12-GPE-OperatingModel-StrategicPlan-presentations.pdf		Ref	
Doc 34	Adam et al_2021_The use of 'building blocks' to develop digital platforms for education in.pdf		Used	Public
Doc 35	Sustainability of EMIS.pdf		Not Used	Public

Annex 8 Sample Data Dictionary

Field Name
School Contact Info
A.1. District
A.2. County/Municipality
A.3. Sub-County/Division
A.4. Parish/Ward
A.5.a. School
A.5.b. Physical Address
A.6. P. O. Box Town
A.7. E-mail Address
A.8. Website Address
A.9. Contact Telephone
A.10. Fax Number
A.11. Min. Pub. Service Code
A.12. Reg/ License No.
School Status
B.1. Status of Operation of School
B.2. Founding Body
B.3. Source of Funding
B.4. School Type
B.5. Day / Boarding school
B.6. Registry Status
B.7. Distance to Nearest Primary School
B.8. Distance to DEO's Main Office
B.9. Inspections Conducted by DIS Last Year
B.10. Urban /Rural
B.11. Founding Year
B.12. Highest Class in School
Enrolment/Pupil Nos
C.1. Enrolment
C.2a. New Entrants to P1
C.2b. Repeaters
C.2c. Enrolment by Nationality
C.3. Orphans
C.4. Pupils with Special Learning Needs
C.5. Physical Streams
C.6. Pupils with Adequate Seating and Writing Space
C.7. Pupils that transferred into Your School
C.8. Pupils who sat exams at the end of each term (first term)
C.8. Pupils who sat exams at the end of each term (second term)
C.8. Pupils who sat exams at the end of each term (thrid term)
D.2. Teaching Staff – Reason for Leaving School
D.3. Non Teaching Staff Information
Infrastructure/ Buildings

E.1.Infrastructure/ Buildings
E.2.Infrastructure/Buildings Under Construction (Classrooms)
E.2.Infrastructure/Buildings Under Construction (Computer lab)
E.2.Infrastructure/Buildings Under Construction (Latrine Stances)
E.2.Infrastructure/Buildings Under Construction (Libraries)
E.2.Infrastructure/Buildings Under Construction (Office)
E.2.Infrastructure/Buildings Under Construction (Staff Rooms)
E.2.Infrastructure/Buildings Under Construction (Store Rooms)
E.2.Infrastructure/Buildings Under Construction (Teachers' Houses)
E.2.Infrastructure/Buildings Under Construction (Workshops)
E.3 Existing Sanitation Facilities (Hand-washing)
E.3 Existing Sanitation Facilities (Latrine stances)
E.3 Existing Sanitation Facilities (Urinal stances)
E.3 Existing Sanitation Facilities (Washrooms stances)
E.4 Major Water Source
E.5 Distance to Nearest Main Water Source
E.6 Major School Energy Source
Teaching Materials
F.1. Teaching materials (Guides)
F.1. Teaching materials (Periods in a week)
F.1. Teaching materials (Textbooks)
HIV/AIDS
G.1. HIV/AIDS cases registered and supported by this school
G.2. HIV/AIDS information(Assemblies)
G.2. HIV/AIDS information(Debate)
G.2. HIV/AIDS information(Drama)
G.2. HIV/AIDS information(Guidance and Counseling)
G.2. HIV/AIDS information(Peer to peer education)
G.2. HIV/AIDS information(Talking compound)
Sports Equip
H.1.Bibs for Netball Available
H.1.Bibs for Netball Needed
H.1.Cross bars Available
H.1.Cross bars Needed
H.1.Discus Available
H.1.Discus Needed
H.1.Foot Ball(s) Available
H.1.Foot Ball(s) Needed
H.1.Football Field Available
H.1.Football Field Condition
H.1.Football Goal Posts Available
H.1.Football Goal Posts Condition
H.1.Hand Ball Court Available
H.1.Hand Ball Court Condition
H.1.Hand Ball Posts Available
H.1.Hand Ball Posts Condition

H.1.Handball (s) Available
H.1.Handball (s) Needed
H.1.High jump stands Available
H.1.High jump stands Needed
H.1.Javelin Available
H.1.Javelin Needed
H.1.Netball Field Available
H.1.Netball Field Condition
H.1.Netball Goal Posts Available
H.1.Netball Goal Posts Condition
H.1.Netball(s) Available
H.1.Netball(s) Needed
H.1.Short-put Available
H.1.Short-put Needed
H.1.Volley Ball Court Available
H.1.Volley Ball Court Condition
H.1.Volley Ball nets Available
H.1.Volley Ball nets Needed
H.1.Volley Ball Posts Available
H.1.Volley Ball Posts Condition
H.1.Volley Ball(s) Available
H.1.Volley Ball(s) Needed
H.1.Whistles(s) Available
H.1.Whistles(s) Needed
H.2. SNE Sports equipment(s) in the school
H.3.Participation in extracurricular (Actual Expenditure)
H.3.Participation in extracurricular (Budget)
H.3.Participation in extracurricular (Participants)
PP. B.1.Type of Center
PP. B.2.Founding Body
PP. B.3.Gender Type
PP. B.4.Registry Status
PP. B.5.Distance to Nearest ECCE Center
PP. B.6.Distance to DEO/MEO main Office
PP. B.7.Inspections Conducted by DIS/MIS Last Year
PP. B.8.Urban/Rural
PP. B.9.Founding Year
PP. B.10 Monitoring visits conducted by DEO/ MEO
PP. B.11 Distance to the sub county/ town council/division
PP. B.12 Monitoring and support supervision visits by SASs/ TCs
PP. C.1.d. Center attached to a primary school
PP. C.1.d. Primary School attached to the center (Address)

PP. C.1.d. Primary School attached to the center (Name)
PP. C.1.d. Primary School attached to the center (Telephone)
PP. C.1b. Enrolment
PP. C.1c. Enrolled in P.I. the previous year
PP. C.1c. Enrolled in top class the previous year
PP. C.2. Orphans
PP. C.2. Orphans(Day Care centers)
PP. C.3. Special Learning Needs
PP. C.3. Special Learning Needs(Day Care centers)
PP. C.4. Refugees and internally displaced children
PP. C.5 Integrated services offered (Birth Registration)
PP. C.5 Integrated services offered (Birth Registration) - YesNo
PP. C.5 Integrated services offered (Child protection)
PP. C.5 Integrated services offered (Child protection) - YesNo
PP. C.5 Integrated services offered (Community dialogue on Nutrition)
PP. C.5 Integrated services offered (Community dialogue on Nutrition) - YesNo
PP. C.5 Integrated services offered (Deworming)
PP. C.5 Integrated services offered (Deworming) -YesNo
PP. C.5 Integrated services offered (Immunization) - YesNo
PP. C.5 Integrated services offered (Parenting education)
PP. C.5 Integrated services offered (Parenting education) - YesNo
PP. C.5 Integrated services offered (V. A supplement) - YesNo
PP. C.5 Integrated services offered (V.A supplement)
PP. D.1. Additional School Responsibility
PP. D.1. Highest Level of Education
PP. D.1. Highest teacher qualification
PP. D.1. Name
PP. D.1. Sex
PP. D.1. Type of Training Last Year
PP. D.1. Year of Birth
PP. D.2.Care giver Staff – Reason for Leaving School
PP. D.3.Support Staff Information
PP. E.1.Infrastructure/ Buildings (Care givers houses)
PP. E.1.Infrastructure/ Buildings (Care givers houses)- Required
PP. E.1.Infrastructure/ Buildings (Classroom)
PP. E.1.Infrastructure/ Buildings (Classrooms)- Required
PP. E.1.Infrastructure/ Buildings (Latrine Stances)
PP. E.1.Infrastructure/ Buildings (Latrine Stances)- Required
PP. E.1.Infrastructure/ Buildings (Office)

PP. E.1.Infrastructure/ Buildings (Office)- Required
PP. E.1.Infrastructure/ Buildings (Others)
PP. E.1.Infrastructure/ Buildings (Others)- Required
PP. E.1.Infrastructure/ Buildings (Resting Space)
PP. E.1.Infrastructure/ Buildings (Resting Space)- Required
PP. E.1.Infrastructure/ Buildings (Sick Bay)
PP. E.1.Infrastructure/ Buildings (Sick Bay)- Required
PP. E.1.Infrastructure/ Buildings (SNE Latrine)
PP. E.1.Infrastructure/ Buildings (SNE Latrine)- Required
PP. E.1.Infrastructure/ Buildings (Store Rooms)
PP. E.1.Infrastructure/ Buildings (Store Rooms)- Required
PP. E.2.Existing Latrine Rooms/Stances
PP. E.3 Major Water Source
PP. E.4 Hand washing facilities and items
PP. E.5 Distance to Nearest Main Water Source
PP. E.6 Major School Energy Source
PP.G.1.Playing equipment and facilities (Balancing Beam (Seesaws))
PP.G.1.Playing equipment and facilities (Balls)
PP.G.1.Playing equipment and facilities (Climbers)
PP.G.1.Playing equipment and facilities (Jigsaws)
PP.G.1.Playing equipment and facilities (Merry-go-round)
PP.G.1.Playing equipment and facilities (Playing grounds)
PP.G.1.Playing equipment and facilities (Sand pitch)
PP.G.1.Playing equipment and facilities (Skipping Ropes)
PP.G.1.Playing equipment and facilities (Sliders)
PP.G.1.Playing equipment and facilities (Swimming pool)
PP.G.1.Playing equipment and facilities (Swings)
PP.G.1.Playing equipment and facilities (Used Tyres)
PP.G.1.Playing equipment and facilities (Water area)
PP.H.2.a.CMC members are trained
PP.H.2.a.Functional CMC
b) First Name
c.) MPS Payroll Computer Number
d) Sex
e) Year of Birth
f) Main class attached to
g) Highest Level of Education
h) Highest teacher qualification
i) Date of First Posting
j) Date of First Appointment

k) Additional School Responsibility
l) MPS Salary Scale
m) Type of Training Last Year
n) Training in Sports & physical Education
o) Training in Sanitation Promotion

Abbreviations

ADEA	Assoc for Development of Education in Africa www.adeanet.org
CESA	Council on Educational Standards and Accountability
DHIS2	District Health Information Systems 2
EMIS	Education Management Information Systems
GPE	Global Partnership for Education
HISP	Health Information Systems Programme
HMIS	Health Management Information Systems
IPED	Integrated Post-Secondary Education Data System
KIXS	Knowledge and Information Exchange programme
MoES	Ministry of Education and Sports (Uganda)
NGO	Non Governental Organisation
NORAD	Norwegian Agency for Development Coorporation www.NORAD.no
Save Uganda	Save NGO
SDG's	Sustainable Development Goals
SMS	Short Message Service (Mobile phone text)
TA	Technical Assistance
UATAF Mozambique	www.uataf.org
UiO	University of Oslo
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund.
Waliku	Waliku is a natural integration into existing organizations in the education, health and child welfare sectors www.waliku.org