

HELPDESK RESPONSE 23

Using EdTech to Support Effective Data Monitoring: A Curated Resource List

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About the EdTech Hub Helpdesk

The Helpdesk is the Hub's rapid response service, available to FCDO advisers and World Bank staff in 70 low- and lower-middle-income countries (LMICs). It delivers just-in-time services to support education technology planning and decision-making. We respond to most requests in 1–15 business days. Given the rapid nature of requests, we aim to produce comprehensive and evidence-based quality outputs, while acknowledging that our work is by no means exhaustive. For more information, please visit <https://edtechhub.org/helpdesk/>.

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1. Document purpose

This list curates resources on the use of EdTech to support the effective monitoring of educational outcomes, such as learning, reporting, and attendance. Resources shared are both tools and initiatives that can be adapted to support effective educational monitoring.

- Tools are defined as any specific technology that can be applied to an education challenge (e.g., an app, a learning platform, or a radio or TV programme).
- Initiatives are defined as the application of a tool to a particular setting (i.e., the use of an educational app in a specific country).

Given that adapting existing initiatives to specific contexts can often be problematic, this list has outlined resources that address specific Mozambican programmatic needs within the education sector. The resources listed have one or more of the following characteristics, they:

1. highlight systems that have expanded distance learning effectively;
2. exemplify good practice of quick adaptation during crises;
3. are mobile-based, in light of high mobile phone coverage in Mozambique (see Table 1);
4. have educational relevance (by focusing on foundational literacy).

Each example identifies the challenges a resource addresses, includes the necessary prerequisites for the resource to be viable, considers pros and cons, and includes details of costs and impact assessment data where possible.

2. Background

Scarce data collection and monitoring of educational outcomes are common in low- and middle-income countries (LMICs). This means that education providers in LMICs are often operating blind ([↑Uwezo, 2014](#)). However, EdTech may have an important role to play in facilitating easier collection of data. This is especially relevant now that COVID-19 has led to the rapid adoption of online and distance learning whilst schools are closed. Nevertheless, data collection is only one step in moving towards the substantive goal of using data to strengthen systems and improve learning. This document focuses on data collection and the monitoring of educational outcomes, with the understanding that embedding data usage in education systems is a longer-term ambition.

There are numerous opportunities and avenues for effective monitoring of educational outcomes. Self-reported data can be obtained from teachers, pupils, and parents, and can also be independently reported by enumerators in the form of household surveys and school-based surveys. This data can be collected at the classroom, school, district, and / or national level. It can be actively solicited, allowing data senders to be more reactive or proactive, relying on data senders to submit the data themselves.

Various devices and modalities can be leveraged for active data collection and monitoring. Once data has been harvested, how it is aggregated and the types of visualisation required to make it digestible must be determined. Dashboards that automatically update visualisations based on the latest data can be a useful tool to visualise a situation in countries in 'real time'. Dashboards may be a worthwhile investment if there is limited capacity for data analysis. They can also be public-facing to parents and pupils, enabling them to provide accountability for improved services.

Table 1. The digital context in Mozambique

Population (million)	31, 255, 435
Households with a mobile phone (% total population)	62.8
Mobile phone coverage (% total population)	72.0
Households with a radio (% total population)	35.6
Households with a TV (% total population)	25.5
Access to electricity (% rural population)	27.9
Literacy rates (% 15–24 population)	70.9
Internet users (% total population)	20.9
Facebook users (% total population)	8.4

Source: Adapted from World Bank, USAID, UNESCO, Internet World Stats and NapoleonCat, Stats datasets

The data listed in Table 1 illustrates the following factors to take into consideration regarding the digital context in Mozambique.

- Mobile penetration and network coverage are good; this means that basic phone interventions are feasible. This provides the rationale for including mobile-based interventions as a criterion in the development of this list.
- Radio and TV ownership is low when compared to other countries in the region. Therefore, a mobile learning intervention via a basic phone will likely be accessible to more learners compared to radio and TV broadcasts.
- Access to electricity in more remote areas is low. This may require the use of alternative power sources, like solar, for education programming.
- Internet penetration is still quite low compared to other countries in the region, despite data being relatively cheap.¹ Therefore, modalities requiring high-connectivity will not be appropriate for reaching rural communities.

¹ For more information on mobile internet connectivity in sub-Saharan Africa, see:

<https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/Mobile-Internet-Connectivity-SSA-Factsheet.pdf>

3. Overarching observations on the effective monitoring of educational outcomes using EdTech

The following section details reflections related to EdTech supporting monitoring educational outcomes.

- Literacy is increasingly used to mean—or be interchangeable with—digital literacy; however, the two are distinct and must be treated accordingly. In particular, digital school assessments need to test actual literacy, not digital literacy.²
- Digital literacy on the part of the assessors cannot be assumed. Any tools used for monitoring need to be user-friendly, making them as accessible as possible. Digital products should be designed with the end-user in mind. Making use of existing user platforms and devices is vital, and appropriate and effective training is crucial.
- Making use of existing devices, such as basic phones for assessment / monitoring, in a “Bring Your Own Device”-type fashion is prudent.
- Deployment of assessment technology, such as a smartphone preloaded with a mobile data collection app and solar charger, might be necessary—depending on the type and volume of data required. Device contracts drawn up between implementing partners and enumerators are good practice for outlining responsibilities.
- Using open-source educational monitoring resources can contribute to the scalability and sustainability of monitoring systems and initiatives.³ This is an important consideration when adopting a long-term approach to using data to strengthen systems.
- If multiple modes and platforms are being utilised, aggregating and visualising the data is critical for ease of analysis. Additionally, it is important to ensure that multiple modes and platforms are compatible.
- Leveraging and building on existing data collection efforts creates efficiencies.
- Giving respondents the ability to choose local languages is critical. Platform interfaces should be available in languages other than English and Portuguese for Mozambique.
- Interactive Voice Response (IVR)⁴ is recommended for reaching marginalised groups due to its potential for use by enumerators or respondents with low literacy skills, or those who only have access to a basic mobile phone. Recordings can be made in any language or dialect.
- Finally, new digital developments to facilitate monitoring or assessment should heed the Principles for Digital Development.⁵

² UNESCO defines digital literacy as “the ability to define, access, manage, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy.” For more information on digital literacy, see: <http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf>

³ For more information on open source processes, see:

<https://digitalprinciples.org/principle/use-open-standards-open-data-open-source-and-open-innovation/>

⁴ “IVR is an automated telephony system that interacts with human callers through the use of voice and touch-tone key selections.”. For more information, see: <https://www.twilio.com/docs/glossary/what-is-ivr>

⁵ To find out more about the Principles for Digital Development, see: <https://digitalprinciples.org/>

4. Resources to support effective EdTech-enabled monitoring of educational outcomes

The following section discusses various initiatives with linguistic, educational, or technological relevance to the Mozambican context. They are separated into initiatives monitoring learning, teacher and student absenteeism, and gender-based violence.

4.1. Monitoring learning

The following resources focus on the use of EdTech to monitor learning outcomes.

4.1.1. Mobile-based assessments: Botswana

Key facts

Partners	Center for Global Development, University of Oxford, University of Colombia, RTI International and Young Love
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Device	Basic Phone
---------------	-------------

Modality	IVR
-----------------	-----

Source	↑Angrist, et al. (2020)
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The Center for Global Development (CGD) has been piloting mobile assessments using IVR and Short Message Service (SMS). These assessments have tracked learning outcomes for students accessing content that is made available via radio, TV, and virtual learning environments (VLEs). Radio and TV can allow for the tracking of basic data, e.g., how many TV / radio sets are tuned in, but they cannot collect data on what the learning outcomes are once the content has been consumed.

In the pilot, Young Love, a non-governmental organisation, worked in partnership with the Ministry of Basic Education in Botswana to collect over 10,000 phone numbers from schools in four of the country's ten regions prior to mass school closures ([↑Angrist, et al., 2020](#)). Since schools have been closed, caregivers and students have been invited to participate in remote learning interventions via radio and TV, rolled out as a randomised controlled trial in partnership with Columbia University and the Jameel Poverty Action Lab (J-PAL). Participants were contacted via SMS and IVR and asked questions on the content. The pilot has so far reached 2,250 children.

Commonly used early-grade assessments of reading and mathematics (such as Uwezo, discussed in 4.1.3.) are typically administered orally in person. These assessments are, therefore, suitable for adaptation to phone surveys. By contrast, assessments with written instructions implicitly test children's ability to read, and technology-based assessments test children's ability to use technology on top of the reading assessment. As such, oral assessments which move beyond dependence on basic literacy or digital literacy can reach a wider audience.

[↑Angrist, et al.'s \(2020\)](#) paper is the first published study on phone-based assessment of children's learning. Assessment by phone is a nascent field of research, and much will be learned during the

current COVID-19 crisis and beyond. The intervention cost around \$10,000 which equates to around \$4.40 per child. This included the full cost of phone calls to the households, which covered airtime, staff time, the questionnaire design and piloting. When compared with the 2011 Progress in International Reading Literacy Study (PIRLS), in Botswana, the costs were around US\$250,000 and about 4,000 students participated, yielding a cost of US\$62.5 per child — this intervention demonstrates good value for money ([†Angrist, et al., 2020](#)).

In addition to ongoing work in Botswana, Angrist and colleagues intend to undertake similar research in Sierra Leone and Tanzania.

Table 2. Advantages and disadvantages of mobile-based assessment in Botswana

Advantages	Disadvantages
IVR and SMS platforms already exist in Mozambique, making this type of assessment quick to roll out.	IVR and SMS, in particular, are limited with regards to how much information can be relayed / solicited. It is harder to use this type of technology to assess foundational literacy than it is for mental arithmetic, for example.
IVR and SMS can support multiple languages and dialects and can be accessed by those with low / no literacy.	SMS requires a degree of literacy.
IVR and SMS can both be set up to be free to the end-user, preventing the associated costs being a barrier to entry.	Whether donors, governments, telecom companies or other partners, someone must bear the airtime costs for IVR and SMS, which may not be sustainable long-term. The cost implications for IVR are greater than those for SMS.
The platform allows for real-time data analysis. Every time a question is answered, whether by IVR or SMS, the dashboard will update.	Dashboards can be automated to an extent, though regular maintenance of dashboards is required.
Any mobile phone can be used to deliver the assessment.	
Only mobile network coverage is required, and an SMS can be sent and received even when coverage is low.	

Relevance for Mozambique

It would be straightforward and quick to implement similar foundational literacy testing via SMS and IVR in Mozambique (please see Appendix 3 for examples of IVR and SMS surveys implemented in Mozambique). However, unlike Botswana, radio and TV penetration in Mozambique is relatively low compared to other countries in the region (see Table 1). So, SMS and IVR assessment or monitoring might need to be adapted for the modalities most used by Mozambican students to access remote learning (e.g., paper materials). This type of evaluation could be used to track learning outcomes in a school environment and would allow for results to be independently verified in real time.

4.1.2. All Children Reading: Senegal, Malawi, and Rwanda

Key facts

Partners USAID and Human Network International

Device Basic Phone

Modality SMS

Source [↑All Children Reading \(no date\)](#)

In Senegal, Malawi, and Rwanda, Human Network International introduced a cloud-based system for data collection, analysis and dissemination. The DataWinners platform enabled organisations to digitise paper questionnaires.⁶ In Senegal, directors of 9,500 schools learned how to submit students' standardised test results via SMS using basic mobile phones. These SMSs were received by the platform and aggregated into a dashboard, allowing for real-time oversight. The test results were accessed by data administrators and regional and district officials for verification. Local school-district officials recorded data for 658,133 students.

The costs included a monthly subscription to the DataWinners platform of \$299 per month with an annual subscription, or \$399 per month with a monthly subscription. Additional costs include the price of each SMS at bulk cost and workshops to train both the school directors and data administrators on how to use the platform.

Advantages and disadvantages for the Mozambican context are discussed in Table 3 below, together with All Children Reading's work in the Philippines.

4.1.3. All Children Reading: Philippines

Key facts

Partners USAID and Education Development Center (EDC)

Device Basic Phone

Modality SMS

Source [↑All Children Reading \(no date\)](#)

In the Philippines, EDC used SMS to enable the transmission and analysis of student National Achievement Test (NAT) scores at the school level. This helped school leadership become better informed about NAT data to guide decisions about addressing student learning gaps. School administrators and teachers also received pre-formatted SMSs that provided a simple analysis of their unique NAT results in Grade 3 reading. Closing the feedback loop in this manner incentivised school administrators and teachers to keep sending in their data, as they could see it was being actioned and would be shared back with them for their own use. The project initially served 900 teachers in 50 schools in Mindanao. Initial results were promising and the Department of Education requested that the programme be scaled throughout other USAID-funded education programmes, to reach more than 1,200 schools. With the support of the Philippines Department of Education, the data-sharing intervention was integrated into EDC's larger USAID-funded Basa Pilipinas project in Mindanao which

⁶ For more information on DataWinners, see: <https://www.datawinners.com/>

supports the Philippine Government's early grade reading programme and aims to improve the literacy of one million students.⁷

Table 3. Advantages and disadvantages of All Children Reading's SMS-based mobile data collection

Advantages	Disadvantages
SMS data collection platforms already exist in Mozambique and so similar work could be implemented quickly.	The DataWinners platform was a proprietary platform, not open-source, which meant monthly subscription fees were required. ⁸
Any mobile phone can be used.	SMS requires a degree of literacy.
The platform allows for real-time data analysis. Every time an SMS report is submitted the dashboard will update.	The platform was not free to end-users. This might have served to limit participation or delay results being received if the sender needed to add more credit.
Only mobile network coverage is required, not connectivity, and an SMS can be sent and received even when coverage is very low.	

Relevance for Mozambique

It would be reasonably straightforward and quick to implement similar test result harvesting via SMS in Mozambique to furnish both the Ministry of Education (MoE) with real-time data to aid decision making as well as allowing donors to better allocate their funding to under-performing schools, for example. Given that this system only requires access to a basic phone, there would be no need to distribute smartphones and data bundles, but training the data senders would take time; the data senders for All Children Reading were school administrators and teachers. The data can be reviewed on submission and verified to check for duplicate submissions. Furthermore, parameters can be added to help control data submission errors, such as an accidental extra digit being added. This process could be augmented with random school inspections to ensure that false data is not being submitted. However, it must be noted that there are constraints and challenges related to reviewing the data effectively. One of these challenges is discussed in 8.3.1. around high turnover of MoE staff.

4.1.4. Twaweza (Uwezo and Sauti za Wananchi): Kenya, Tanzania, Uganda

Key facts

Partners	William and Flora Hewlett Foundation, DfID, SIDA and Wellspring Foundation
Device	Smartphone (Uwezo)/Basic phone (Sauti za Wananchi)
Modality	Mobile data collection app (Uwezo) / IVR (Sauti za Wananchi)

⁷ For more information on the Basa Pilipinas project, see: <https://www.edc.org/basa-pilipinas>

⁸ DataWinners is no longer running, but there are many organisations offering similar products, such as [GeoPoll](#), [Viamo](#) and [Africa's Talking](#). Appendix 3 contains examples of IVR and SMS surveys conducted in Mozambique.

Source [↑Twaweza.org \(2018\)](https://www.twaweza.org/2018)
[↑Twaweza.org \(no date\)](https://www.twaweza.org/)

Twaweza aims to enable children to learn, empower parents to advocate for better quality education services, and to advocate for governments to be more transparent and responsive. Twaweza's flagship programmes include:

- Uwezo—an annual citizen-led assessment to assess children's learning levels across households in Kenya, Tanzania, and Uganda.
- Sauti za Wananchi—A nationally representative IVR mobile phone survey.

Uwezo was a five-year initiative that aimed to improve literacy and numeracy among children aged 6 to 16 years in Kenya, Tanzania, and Uganda. Uwezo monitored basic literacy and numeracy levels across at least 50 per cent of the districts in Kenya, Tanzania, and Uganda through a digital household survey. The survey process and findings aimed to create greater awareness among parents, students, local communities and the public at large of children's actual reading, writing, and arithmetic levels. This increased awareness was intended to encourage parents' advocacy for better education services and to incentivise governments to focus on learning outcomes and improve education quality. Uwezo aimed to contribute to a 10 per cent increase in basic literacy and numeracy competencies, and also pursued a wider goal of understanding what worked best in large-scale assessment, communicating evidence, and influencing citizen action.

Sauti za Wananchi is a nationally-representative IVR mobile phone panel survey of Tanzanian, Ugandan, and Kenyan citizens. Survey data is gathered on a monthly basis to both inform citizens of public opinion and to support policymakers to be more responsive to the needs of their citizens. Sauti za Wananchi provides data on a range of topics from a representative sample of 2,000 respondents. To ensure participation, sampled households were given mobile phones and solar chargers. Twaweza provides monthly reports and makes their full dataset available online.⁹

Table 4. Advantages and disadvantages of Twaweza's mobile data collection surveys

Advantages	Disadvantages
The household survey approach allows for more accurate national literacy rates to be generated as children not in school are also assessed, preventing inflation of national literacy rates. The digitisation of the forms speeds up the process and removes transcription errors.	Large-scale surveys can be expensive, labour intensive and time-consuming. Smartphones and tablets need to be provided, along with solar chargers. Training is required for enumerators.
The large sample size serves to raise awareness of Uwezo's work and helps to drive engagement with the findings.	Those without mobile network coverage were excluded from the Sauti za Wananchi survey.
The data collected can serve multiple functions.	
The data is widely accessible to view and analyse.	
The monthly IVR surveys are less expensive to conduct in comparison to sending enumerators to collect data.	

⁹ For more information, including key findings from Mobile survey results from Uganda in November 2018 collected from 1,878 respondents, see:

<https://www.twaweza.org/uploads/files/SautiUg-EducationWeb.pdf>

Relevance for Mozambique

A large-scale household survey using early grade reading assessment (EGRA), for example, with enumerators equipped with smartphones, is a substantial undertaking. It would not be as quick to conduct due to the mass recruitment and training of enumerators required, alongside the travel requirements. However, lessons could be taken from the Digital School Census in Sierra Leone (see example 4.2.1.), which was completed on a very tight timeline. It would be worth considering partnering with other implementing partners or donors undertaking similar large-scale household surveys. This would include the Demographic Health Survey (DHS), UNICEF's Multiple Indicator Cluster Surveys and the [World Bank's \(2015\)](#) Service Delivery Indicators.

Conversely, as discussed above, IVR surveys could be deployed relatively rapidly in Mozambique. There would need to be some initial investment of time in selecting respondents and creating phone number databases.

4.1.5. FunDza: South Africa

Key facts

Partners FunDza Literacy Trust and Turn.io

Device Smartphone

Modality WhatsApp

Source [turn.io \(2019\)](#)

FunDza's goal is to promote reading and writing amongst teens and young adults. They have launched an initiative that leverages WhatsApp, the country's most-used communications platform, as a way of connecting with their learners. WhatsApp allows FunDza to offer new reading content, and there are plans to add reading challenges and competitions in the future to help drive engagement levels. The user needs to message "hello" to 0600 54 8676 on WhatsApp to unlock the content, which includes local stories, plays, blogs and poems all written for a young South African readership.

Turn.io uses machine learning and behavioural science to help FunDza monitor teen and young adult engagement and learning outcomes. This is especially important in a country where, according to the 2016 National Reading Survey, only 14 per cent of adult South Africans identify as committed readers of books. In addition to collecting passive data on what content is being consumed, quizzes can be embedded in the content to track comprehension and learning outcomes. Data on rates of engagement and learning outcomes will be available later this year.¹⁰

Table 5. Advantages and disadvantages of FunDza's use of WhatsApp

Advantages	Disadvantages
Accessing reading and writing material via mobile facilitates microlearning on the go without having to carry a heavy book.	Users need access to both a smartphone and data bundle. This is a significant barrier to entry and excludes the most marginalised.

¹⁰ For more information contact Lieze Langford, turn.io's Business Manager, lieze@turn.io

WhatsApp is a widely used platform in South Africa and so digital literacy should not be a barrier to access.	Familiarity with WhatsApp cannot be assumed and so there might still be a need to train new users.
The ability to embed questions makes the content interactive and allows for the tracking of comprehension and learning outcomes.	Those with vision problems might not be able to comfortably read from a small screen, and so accessibility requirements should be considered, whilst acknowledging these requirements should be considered for all EdTech initiatives.
FunDza have attempted to make the programme as user friendly as possible, with a clear method of accessing the information.	Learners might not want to use a social media platform for educational purposes.
The set-up and ongoing costs are low as this leverages a device that the learner already owns and there is no associated airtime / data bill for the donor.	

Relevance for Mozambique

Given the current low volume of internet users in Mozambique, this case study is perhaps less relevant than other examples. However, it may still be applicable amongst older, upper secondary learners who potentially have greater access to online platforms. Furthermore, application of this example could also be extended to teacher education and professional development initiatives. Moreover, smartphone penetration will continue to increase given that they are becoming cheaper and more widely available. This has happened quickly in other countries such as Kenya, Ghana, and Nigeria (Bahia, et al., 2019). Data costs in Mozambique are already relatively low. Therefore interventions that leverage WhatsApp and Facebook, for example, are still worth considering if smartphone ownership and access grows in the near future, or to reach specific subsets of learners.

4.1.6. Tusome: Kenya

Key facts

Partners	USAID, DfID, RTI International, WERK, Worldreader, and Dalberg — Global Development Advisors
Device	Smartphone
Modality	Mobile data collection app
Source	↑Piper, et al. (2018)

Tusome aims to improve primary literacy outcomes for approximately seven million children in grades 1–3 in Kenya. Tusome utilises monitoring in different aspects of its programme, including teacher coaching and assessment, inspection, and the monitoring of learning outcomes. Other programme elements included revising digital and print-based teaching and learning materials, creating training manuals, and preparing tablets with the Tangerine mobile assessment tool.¹¹

Tangerine is a mobile data collection platform designed for use on tablets and smartphones. It is primarily used to record students' responses in oral early grade reading and mathematics skills

¹¹For more details on the Tangerine mobile assessment tool project, see the further reading section and visit: <https://www.rti.org/impact/tangerine-mobile-learning-assessments-made-easy>

assessments, specifically EGRA and Early Grade Mathematics Assessment (EGMA), and Snapshot of School Management Effectiveness (SSME) for administering classroom observation. Classroom data collected using Tangerine offers insights about what is working for teachers and students. MoE Curriculum Support Officers use tablets to conduct classroom observations and student assessments. This data is used to evaluate the quality of programme implementation and student learning. It allows MoE decision-makers to track progress and make informed judgements and adjustments when needed. In the project's final year, the Kenyan government will take over full management responsibilities for Tusome. This nationwide expansion demonstrates both scale and sustainability.

Table 6. Advantages and disadvantages of Tusome's app-based mobile data collection platform

Advantages	Disadvantages
The Tangerine platform is open source, meaning it is available to use for free.	Open-source software relies on a community to continue to invest in it to keep it updated and bug-free.
The platform supports multiple languages which means it can accommodate local languages.	It is unclear whether the platform interface itself can be displayed in Portuguese and other local Mozambican languages.
The platform allows for real-time data analysis providing a good overview of what is going on in all schools, remote or otherwise.	The platform requires access to a smartphone or tablet; this relies on either beneficiaries owning and using their own phone, or a mass disbursement of phones.
Tusome feedback data have been used at the country level to encourage the provision of greater instructional support to improve education quality.	Tusome did not fully utilise available classroom observational data to target instructional support.
Kenya tracked performance against benchmarks using simple but functional accountability and feedback mechanisms.	The platform requires connectivity to upload data, which relies on access to free wifi, an airtime bundle or the use of stakeholders' own mobile data to submit information.
Tangerine was developed specifically for use in an education context, unlike various other mobile data collection platforms that are designed for use across multiple sectors.	
Tangerine uses automatic skip patterns, range checks, and field validations to help reduce missing data and data errors.	
Tangerine allows daily synchronisation and data uploads directly from the data collectors. This functionality helps identify issues in data collection so that they can be quickly addressed during the collection process itself.	

Relevance for Mozambique

The Tangerine tool has been designed specifically for the education sector and has been used in 50 countries thus far. It could be a good option for data collection in Mozambique. As discussed above, a large-scale survey containing EGRA, SSMEs etc. involving hundreds or thousands of enumerators equipped with smartphones is a substantial undertaking. The initial set-up costs are high and the associated training would take time, given the low smartphone penetration depicted in Table 1. However, it is reasonably straightforward to send credit for data bundles to any mobile phone in Mozambique to ensure enumerators can always send in their data. This would require a database of enumerator phone

numbers disaggregated by the network. It can be done via the Mobile Network Operator website or IVR providers can assist. It would also be a prudent means of accessing foundational literacy data in real time, allowing for swift action to be taken regarding underperforming schools. Public-facing dashboards could also increase transparency, allowing parents to better understand and track school performance and advocate for improved services.

A Mozambican initiative, the Digital Platform for School District Supervision, collects data during school visits by district MoE Officers ([↑Ministério da Educação e Desenvolvimento Humano, 2019](#)). The initiative uses tablets and the data collected includes classroom observations, teachers' absenteeism, school management, and the GPS coordinates of schools. The data collection tool (an Android device) includes access by credentials and is connected to a synchronised database of users. Data is sent to the server and processed by a centralised dashboard. The survey builder uses Open Rosa¹² / ODK open-source tools. Though promising, the dashboard is not yet fully programmed to analyse and process the data collected.

Other organisations, such as Malaria Consortium as part of their upSCALE project,¹³ have issued health workers in Mozambique with smartphones preloaded with the CommCare app and solar chargers to enable them to submit their data in a timely fashion. Malaria Consortium is supporting the Ministry of Health to roll out this data collection platform nationally. Though linked to health, the upSCALE project demonstrates that the approach is potentially feasible, sustainable and scalable in Mozambique.

4.2. Monitoring teacher and student absenteeism

4.2.1. Digital School Census: Sierra Leone

Key facts

Partners World Bank

Device Smartphone

Modality Mobile data collection app

Source [↑Namt & Mai \(2019\)](#)

The Government of Sierra Leone wanted to launch a free education programme targeted at the most underserved communities, but they did not have up-to-date data on their schools, teachers, and enrollment rates to inform the targeting of the programme. The GPS coordinates of schools were not recorded, which meant they could not be accurately mapped. Original estimates suggested it would take a year to gather the necessary data from 11,000 schools through the tried and tested paper-based method. A non-digital route would require schools or enumerators to complete paper forms, these would then need to be collected. Data would need to be transcribed and manually entered into a database before cleaning and analysing it. The World Bank was asked to provide the necessary support to collect accurate enrollment, absentee and infrastructure data, GPS coordinates and visualisations, and create a teacher database, in less than three months. Open Data Kit (ODK) was the tool selected to transition to digital data collection.¹⁴ There were five key steps:

¹² For more information on OpenRosa, see: <https://enketo.org/openrosa/>

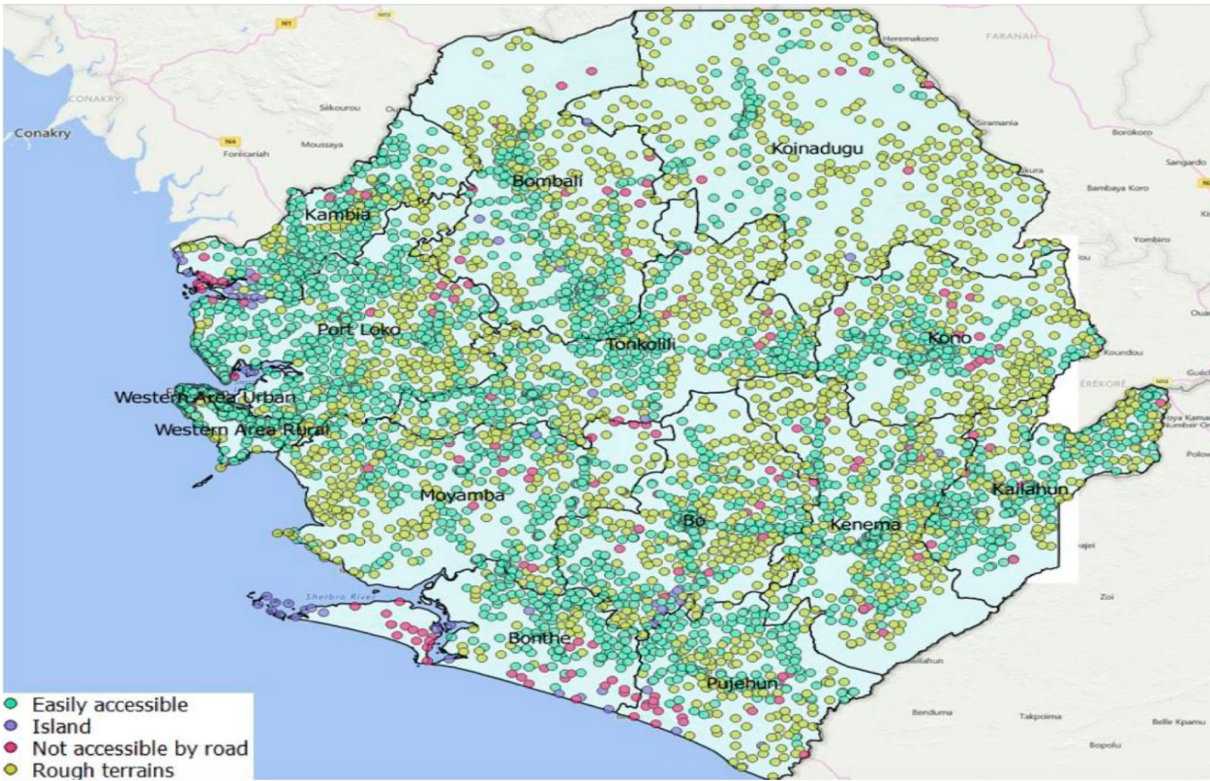
¹³ For more information on Malaria Consortium's upSCALE project, see: <https://www.malariaconsortium.org/upscale/>

¹⁴ For more information on ODK, see: <https://getodk.org/>

1. designing forms
2. procuring tablets and solar charger
3. training enumerators
4. collecting data
5. analysing and disseminating the data.

The total cost of the project was approximately \$200,000, or \$18 per school. The dataset was overlaid on poverty, transport and census data and these data sets were used to inform decision-making on where to construct new schools. The data was also used to inform textbook distribution and the effective deployment of new teachers by calculating optimal incentive levels for teachers to move to remote areas.

Figure 1. Distribution of primary schools by accessibility in Sierra Leone, 2017–2018. **Source:** [↑Namit & Mai \(2019\)](#)



Since this project, the Government of Sierra Leone has been working to ‘make school-level data more useful in decision-making’ ([↑EdTech Hub, 2020](#)). This includes the Sierra Leone Education Attendance Monitoring System (SLEAMS)¹⁵ which is a pilot project aiming to monitor teacher attendance at Sierra Leonean schools.

Table 7. Advantages and disadvantages of the Digital School Census project in Sierra Leone

Advantages	Disadvantages ¹⁶

¹⁵ For more information on SLEAMS and to see how SLEAMS’ data is presented, visit: <https://sleams.org/>

¹⁶ Limited information on the challenges of implementing this project in Sierra Leone was available. Therefore, disadvantages as they relate to the Mozambican context are not clear.

ODK is open source.

ODK was not developed specifically for the education system. Therefore it works well for this type of general data collection but might not work so well to record EGRA results or the data from other education-specific assessments.

Restrictions were added to the form to reduce errors in data entry.

The devices were locked to prevent misuse.

A cascade 'Training of the Trainers' model allowed 60 Ministry of Education officers to be trained over three days, who then trained 600 enumerators over a week with the World Bank providing monitoring and supervisory support.

Schools were reminded to compile their data in advance through radio announcements and direct phone calls which helped ensure it was ready for enumerators when they visited.

Data collection was closely monitored and daily statistics were shared between the core monitoring team. Weekly emails were also sent out to senior management with progress updates.

A customised dashboard was updated in real time and was made available to the core team. Data was analysed and customised tables and graphs were ready for the government within a week of the data collection exercise.

Relevance for Mozambique

As discussed above under the Twaweza example, this case study offers an example of a rapid and successful mass data collection effort. Sierra Leone, however, has a substantially smaller population and landmass than Mozambique. This means that a similar project in Mozambique would require a substantive effort to reach every school in the country and might need greater resources behind it to deliver at this greater scale.

4.2.2. 'Allo Ecole, ICT for Accountability in Primary Education: Democratic Republic of the Congo (DRC)

Key facts

Partners	DRC Ministry of Education, World Bank, Belgian Development Cooperation and VOTO Mobile
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Device	Basic phone
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Modality	IVR and SMS
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Source	↑World Bank (2016)
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'Allo École was devised to address::

1. The lack of effective communication between national-level primary education policymakers / administrators (the MoE) and provincial- and district-level departments of education.
2. The lack of transparency and accountability of service providers — teachers and school directors — to parents and students, which prevents citizens being able to provide feedback on education quality and advocate for improved service delivery.

Parents and teachers used basic mobile phones to access an education questionnaire either via SMS or IVR. Voice callers chose from one of four languages — French, Lingala, Tshiluba and Swahili — by pressing buttons on their keypad. They continued to answer multiple-choice questions (MCQs) using their keypad, or they had the option to leave a voicemail style open-ended response. SMS users received questions and typed in numerical or text-based responses to MCQs. After self-identifying as a teacher or parent, the user chose a topic or theme on which to provide feedback. For the pilot, the topics were: textbooks, school construction, and teacher and student absenteeism.

If using IVR, the teachers received an introductory message from the Minister of Education, and parents received a message from the coach of DRC's national football team. The intention for including these personalities was to make the hotline more engaging and to help encourage repeat callers. The platform captured responses to the questions and results were aggregated by question across respondent category and response content. A dashboard provided visualisations to the Ministry of Education to help facilitate the analysis of results.

For each IVR call or SMS received, the system generated a ticket that back-office staff then responded to via a voice call to the complainant to advise them of the actions being taken or an SMS. The IVR / SMS platform helped to transform a hierarchical, top-down system of primary education provision in the DRC into a horizontal one as it amplified the voices and needs of teachers and parents. 'Allo École was introduced to 311 schools in total through training sessions and Information, Education and Communication (IEC) materials such as posters. In the first month that the platform was available, 1,465 parents and 1,230 teachers provided feedback. Most respondents left feedback on school construction (61%), followed by textbooks (27%), and teacher or student absenteeism (12%). When asked about other areas on which they might like to provide feedback, 57% of those surveyed cited teacher quality, and 33% said school fees.

It took a total of six months for the platform to become operational. The Ministry of Education has since assumed responsibility for the ongoing costs of the platform and back-end management. Costs are detailed in figure 2 below, including the additional considerations for mobile network operators (MNOs).

Figure 2. 'Allo Ecole running costs. **Source:** [World Bank \(2016\)](#)

Resource	Pilot Phase 1	Pilot Phase 2	Roll Out
Technical Infrastructure • Server • Connectivity at MNOs • Call tariffs • SMS costs • Connectivity in back office	• Hardware purchase: \$5,000 • Hosting & maintenance: \$2,100/month • MNO Connections: Up to \$1,000 per MNO excluding labor • Cost per minute: \$0.1 • Cost per SMS: \$0.02 • Back-office connectivity: \$300/month	• Hosting & maintenance: \$2,100/month • MNO Connections: \$1,000/month • Cost per minute: \$0.1 • Cost per SMS: \$0.02 • Back-office connectivity: \$300/month	• Hosting & maintenance: \$2,100/month • MNO Connections: \$1,000/month • Cost per minute: \$0.1 (discounts on volume should be explored) • Cost per SMS: \$0.01-\$0.015 • Back-office connectivity: up to \$500/month
Human Resources • Platform back office operations • Feedback response reporting to schools and population	• 55 days from contractors • 1 staff person equivalent from DRC government for 6 months	• 25 days from contractors • 2 staff person equivalent from DRC government for 1 year • 1 half-time equivalent civil society coordinator	• 5 staff person equivalent from DRC government • 1 half-time equivalent civil society coordinator in each location

Table 8. Advantages and disadvantages of the 'Allo Ecole platform**Advantages****Disadvantages**

Users reported that the platform was easy to use.

This system relies on end-users proactively reporting. For this to work, parents and teachers must understand the incentive to engage and believe that their feedback will be taken into account. Otherwise, there is little to no incentive to contribute.

Users overwhelmingly preferred IVR to SMS responses (93% of teachers and 82.5% of parents).

IVR is more expensive than SMS and therefore less sustainable for the donor or government to continue to fund if the platform is always free to the end-user.

The ticketing system raised the government's accountability and encouraged a response to each piece of feedback.

If the complaints are not responded to each time, there is a chance that the parent / teacher will not call in again.

The project was sustainable due to the government assuming responsibility for running it.

Based on surveys conducted after training sessions, 95% of parents and 86.5% of teachers said they found 'Allo École easy to use. This demonstrates that the platform met user needs.

Over 99% of parents and just under 80% of teachers said they would continue to use 'Allo École, and more than 99% thought it would have a positive impact on the state of education. This demonstrated that the platform was meeting a need.

Relevance for Mozambique

As discussed above, given the penetration and coverage of the modalities, setting up a similar IVR / SMS platform in Mozambique would be possible. Further, both IVR and SMS are more inclusive modalities for

those with limited access to technology, and low to no foundational and digital literacy. Further research on what motivates teachers and parents in Mozambique to continually engage in reporting school issues is recommended as the right type of feedback loop or incentive is what will drive engagement. This could take the form of a public-facing dashboard sharing school performance data, a phone call from an MoE representative acknowledging the complaint and explaining what actions are being taken, or a push IVR call a few weeks later with a summary of all reports received in the last month to demonstrate to callers that others are using the service and the data is being reviewed.

4.2.3. USAID Addressing Education in North-East Nigeria (AENN)

Key facts

Partners USAID, FHI 360 and Viamo

Device Basic phone and smartphone

Modality IVR and SMS

Source [↑Viamo \(2019\)](#)

AENN is an education in emergency project located in Borno and Yobe, two fragile states affected by Boko Haram with large populations of internally displaced persons (IDPs). The goal is to both ensure equitable access to certified basic education for both boys and girls, and to address poor service delivery. One of the main components is to increase the state education authority's capacity to better plan, manage and oversee their education services by giving them access to real-time data, which is especially critical given the volatile security context. Viamo is implementing the monitoring and evaluation components, led by FHI360. Viamo has worked with both the State Agency for Mass Education (SAME) and State Universal Basic Education Board (SUBEB) to establish key indicators and data visualisation needs. It has also set up data hubs in both Yobe and Borno and developed digital dashboards. These dashboards give decision-makers access to real-time information on sector performance. There are three sets of data indicators which form the basis of three linked dashboards:

- **Humanitarian and development related indicators.** Sourced from secondary sources such as the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the International Organisation for Migration (IOM), these dashboards and datasets contain the most up-to-date and aggregated data of the majority of humanitarian partners working in conflict-affected areas.
- **School safety and Early Warning System (EWS) Data.** An aggregation of the data collected through bi-weekly IVR phone surveys that go out to teachers and headteachers.
- **AENN programmatic data.** A collection of monthly survey tools set up with education authorities to monitor schools and NFLCs (Non-Formal Learning Centres) that track outputs and outcomes. These are conducted during monthly school visits using smartphones.

The data that is being collected for each dashboard includes pupil enrollment in both schools and NFLCs disaggregated by gender; teacher absenteeism; infrastructure assessments to include the state of the classrooms and WASH facilities; security of staff, students, and schools as a whole; community activity; population movements; partner presence; and social-emotional learning. The overarching dashboard operates both online and offline, enabling remote users to access the AENN dashboards from anywhere.

The dashboards are also optimised for mobile phones given that not all stakeholders have access to computers.¹⁷

Figure 3. Screenshot of Education Sector Partner Presence. **Source:** AENN dashboard

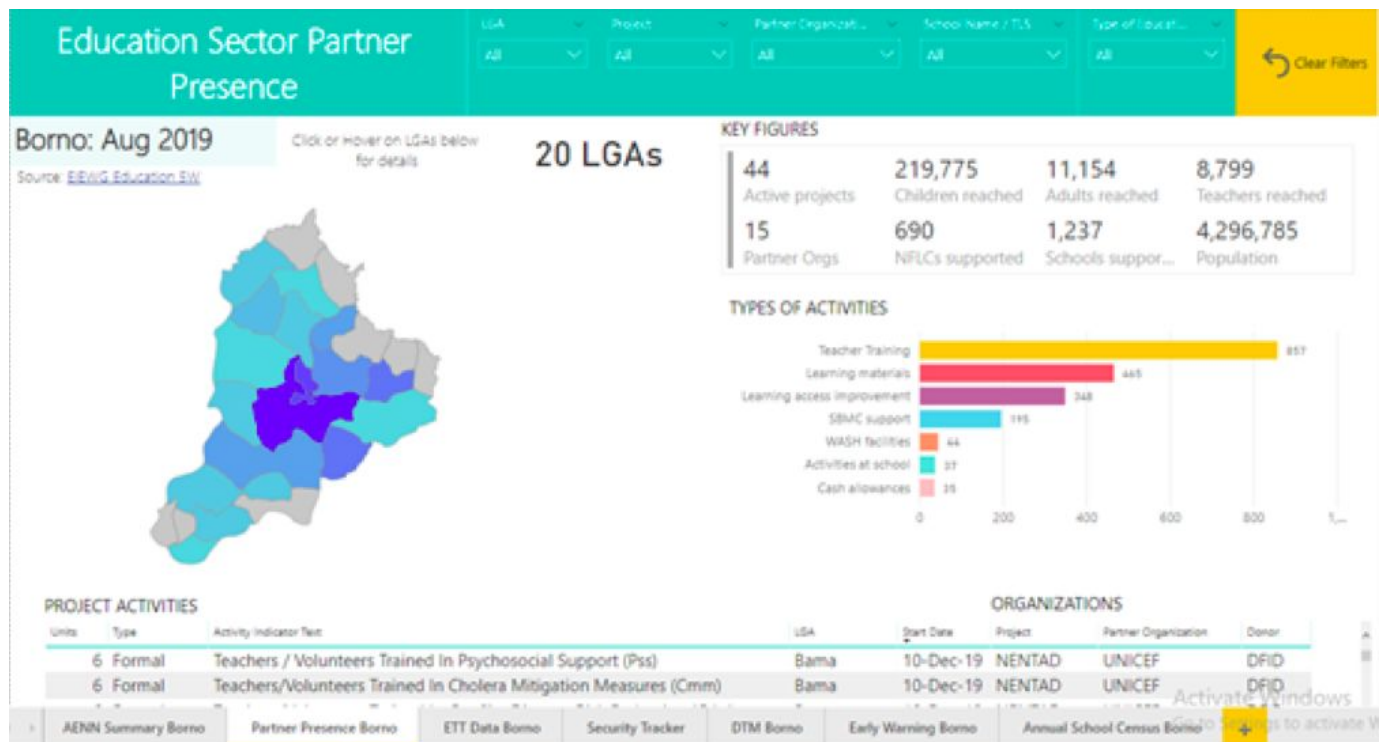
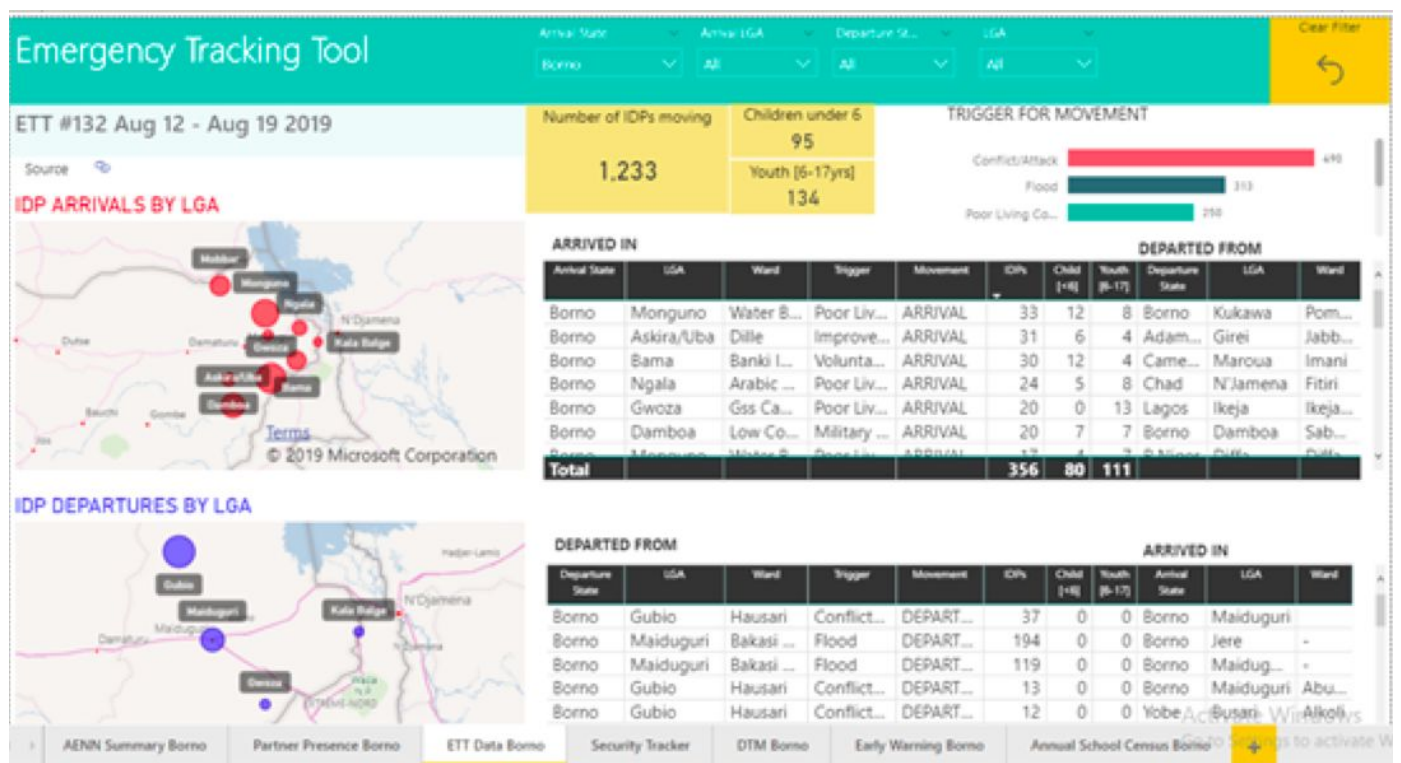


Figure 4. Screenshot of Emergency Tracking Tool. **Source:** AENN dashboard



¹⁷ For more information contact viamo.io, Lydia Odeh, Director of Programmes, lydia@viamo.io

Table 9. Advantages and disadvantages of the AENN data collection project

Advantages	Disadvantages ¹⁸
This project aggregates multiple data sets from various agencies, providing one dashboard for viewing numerous data sets on different tabs.	Given that so much data from different sources is being aggregated it requires a significant investment of time and money at the outset, and a lot of consultation with all of the relevant stakeholders.
The dashboards have been optimised for use in low-connectivity settings and are also optimised for use on smartphones.	
The dashboards have been designed to be easily modified so new indicators can be added, ensuring they will not need constant, and expensive, updates.	
The dashboard design process was consultative.	
A monthly review meeting was established between relevant stakeholders to help build synergy across the various agencies and to cultivate a culture of dashboard review.	

Relevance for Mozambique

This case study illustrates what can be achieved in a context where safety and security are concerns and mobile phone coverage and connectivity is poor. The multiple modality approach accommodates teachers who only have access to a basic phone and no connectivity. It also presents a great opportunity for the MoE in Mozambique to evaluate what data they need and aggregate it all in one place for evidence-based decision-making. Lessons learned could also be applied to Mozambique's conflict-affected northern regions where the safety and security of inhabitants is a significant risk.

4.3. Reporting Mechanisms for Gender-Based Violence (GBV)

4.3.1. Go Girls Connect!: Eswatini

Key facts

Partners	The Open Society Initiative for Southern Africa (OSISA), World Education, Bantwana and Cell-Ed
Device	Smartphone
Modality	App that has integrated IVR
Source	↑Bantwana World Education Initiative (no date)

¹⁸ Given that the AENN project is relatively new, limited information on the challenges of implementing this project in North East Nigeria was available. Therefore, disadvantages as they relate to the Mozambican context are not clear.

Go Girls Connect! is a digital adaptation of the Protect Our Youth (POY) programme, funded by USAID under the DREAMS (Determined, Resilient, Empowered, AIDS-Free, Mentored, and Safe) Innovations Challenge programme in Eswatini. Go Girls Connect! leverages mobile technology to build digital literacy and empower girls with life skills to navigate challenging gender norms. The programme is delivered over mobile phones directly to girls, which is augmented with in-person monthly club sessions. It is an interactive programme which aims to build resilience and decrease risks that make girls vulnerable to dropping out of school, such as early marriage, teen pregnancy, and HIV. Cell-Ed adapted the POY curriculum for the Cell-Ed digital learning platform. Go Girls Connect! incorporates a digital early warning system for girls to self-screen when at-risk of dropping out of school. It also incorporates a digital self-screening tool to enable girls to identify themselves as victims of GBV. These digital tools are linked to robust on-the-ground response protocols to provide the key support and services required to keep girls in school and access post-abuse services where needed.¹⁹

Table 10. Advantages and disadvantages of the Cell-Ed platform

Advantages	Disadvantages
The Cell-Ed platform accommodates users with lower literacy levels as IVR is integrated with the app. The user can receive an IVR call as they work their way through the app.	This IVR integration could present synchronicity issues if the call is not placed immediately.
The platform has been optimised for use on low specification smartphones / feature phones.	Girls may not have access to a smartphone or feature phone, and socialised gender norms around ownership of mobile phones may also serve to prevent girls' access. ²⁰
The GBV reporting tools are being adapted for use in Zimbabwe, demonstrating increasing scale.	Data bundles might be unaffordable for the target demographic.

Relevance for Mozambique

Much like the FunDza example discussed above, this type of implementation might not be appropriate for immediate adaptation in Mozambique. However, this tool — an app integrated with IVR — has the potential for powerful engagement with learners, as an app — unlike IVR — can incorporate multimedia. An app can also sit on the phone and even if the user does not have a current data bundle they can still access content. Data bundles could also be provided to ensure those with smartphones can download the app. As smartphone penetration increases in Mozambique, this will become increasingly relevant.

¹⁹ For more information about Go Girls Connect! contact Cell-Ed, Jennifer Johnson, Strategic Partnerships, jenniferj@cell-ed.com

²⁰ See this EdTech Hub piece for more information regarding gender equity: [Your Questions Answered: Using Technology to Support Gender Equity, Social Inclusion and Out-Of-School Learning](#)

5. Summary of resources

Table 11. Summary of resources and their respective relevance to the Mozambican context

	Description	Relevance to the expansion of distance learning	Relevance to support quick adaptation	Device and modality relevance	Educational relevance (literacy)
4.1.1. Mobile-Based Assessment: Botswana	Mobile assessments conducted via IVR and SMS to track learning outcomes from content that has been consumed on platforms such as TV, radio and VLEs.	Piloted in Botswana, reaching 3,000 children so far.	Similar pilots are also being rolled out in Sierra Leone and Tanzania.	This project uses basic phones and IVR and SMS, all readily available in Mozambique, so participants could choose the modality they preferred.	Low literacy levels required due to oral focus.
4.1.2. All Children Reading: Senegal, Malawi and Rwanda	A cloud-based system for data collection, analysis and dissemination.	9,500 schools reached via SMS with recorded data for 658,133 student tests in Senegal, Malawi and Rwanda.	Use of basic mobile phones meant data was quickly collected and available for analysis.	Basic phones were used which were readily available, coupled with SMS as the teachers were literate.	SMS requires a degree of foundational literacy. Supports an EGRA in the Philippines to improve the literacy of one million students.
4.1.3. the Philippines		Reached more than 1,200 schools in the Philippines for analysis of student National Achievement Test (NAT) scores.			
4.1.4. Twaweza / Uwezo: Kenya, Tanzania, Uganda	Annual citizen assessment to assess children's learning levels.	Hundreds of thousands of households reached.	Data collection is labour intensive and time-consuming.	Smartphones were given to trained, literate enumerators.	Survey aimed to raise awareness of literacy and numeracy levels.
4.1.5. FunDza/ Turn.io: South Africa	Initiative leverages WhatsApp to connect with readers and writers.	No data available yet, but could be scalable given existing WhatsApp usage.	n/a	Smartphones were used as penetration is reasonably high in South Africa.	n/a
4.1.6. Tusome: Kenya	Designed to improve primary literacy outcomes by straddling different aspects of monitoring, including teacher coaching and assessment, inspection, and the monitoring of learning outcomes.	Approximately seven million Kenyan children reached in grades 1–3.	Nationwide expansion demonstrates both scale and sustainability.	Smartphones were provided to trained, literate enumerators.	Focus on literacy.
4.2.1. Digital School Census: Sierra Leone	Data collected around accurate enrollment, absenteeism and infrastructure data, GPS coordinates and pictures	11,000 schools reached across the country.	Data collected in less than three months due to digitised	Smartphones were provided to trained, literate enumerators.	n/a

	as well as the creation of a teacher database.		collection methods.		
4.2.2. 'Allo Ecole: DRC	Data collected around textbooks, school construction and teacher and student absenteeism.	Thousands of teachers and parents submitted reports.	The platform was up and running in less than six months.	Basic phones were used to accommodate low smartphone penetration. Both IVR and SMS were offered so those of no / low literacy could access IVR.	n/a
4.2.3. AENN: Nigeria	Data collected around pupil enrollment, school construction, teacher absenteeism and security. Customised dashboards aggregating multiple data sets with visualisations.	Hundreds of teachers submitted bi-weekly mobile surveys.	Mobile surveys were up and running in less than three months.	Basic phones were used to accommodate the poor mobile network coverage and low smartphone penetration. IVR was used to avoid teachers having to send multiple SMS.	n/a
4.3.1. Go Girls Connect!	Data collected on school dropouts and GBV.	No data available yet, but could be a scalable solution.	The platform has already been created and could be rolled out in Mozambique very swiftly after content is contextualised and translated.	Smartphones are required to access the Cell-Ed app, but the GBV reporting tool could be adapted to IVR.	n/a

6. Further resources

6.1. Education Data For Decision Making (EdData II)

↑[Mulcahy-Dunn, et al.'s \(2016\)](#) final report of a twelve-year electronic data collection project implemented by RTI using the open-source mobile assessment tool Tangerine (discussed as part of the Tusome project above). As of 2016, more than 30 organisations had used Tangerine to conduct assessments in more than 50 countries, in 100 languages. As a result, the report shares some compelling lessons learned.

6.2. Evidence for Gender and Education Resource (EGER)

The Population Council's Girl Centre and Echidna Giving²¹ initiative was launched in April 2020 and is the first freely available database to help the global gender and education community make informed decisions to drive better education programming for boys, girls, and communities around the world. Through the use of interactive dashboards, the EGER illustrates gaps, as well as what is being done to meet the greatest needs. It also outlines both available evidence and evidence gaps. The EGER also shows country-level indicators for key gender and education outcomes, including literacy, completion rates and school-related gender-based violence. Additionally, in late 2020, the EGER will launch a Girl's Education Roadmap.²² This will include opportunities for strategic investments.

6.3. Learning to Improve Learning

From 2007 to 2013, the Hewlett Foundation's Quality Education in Developing Countries initiative aimed to help answer the question, "what can we do to improve student achievement?" ↑[The William & Flora Hewlett Foundation \(2014\)](#) report describes the initiative, which supported eleven school-level approaches to improving early learning, accompanied by ten rigorous evaluations. The grants spanned India and five countries in Sub-Saharan Africa: Kenya, Uganda, Mali, Senegal, and Ghana.

6.4. Mobile Education Alliance

This USAID database²³ has landscape reviews and other resource materials compiled by various members of the mEducation Alliance community. Of particular note are resources dedicated to EdTech in the midst of COVID-19, education in emergencies, and digital literacy for children.

6.5. Bringing Learning to Light: The Role of Citizen-Led Assessments in Shifting the Education Agenda

↑[Plaut & Jamieson Eberhardt's \(2015\)](#) report assesses the potential for non-traditional assessments to play a role in monitoring learning, as well as advocating for more focus on educational outcomes. R4D evaluated the efficacy of citizen-led assessments that took place in India, Mali, Senegal, and Kenya, Tanzania, and Uganda.

²¹To access the database, see: <https://egeresource.org/data-visualization/>

²² For more information, contact GIRL Center, Stephanie Psaki, Director, spsaki@popcouncil.org

²³To access the database, see: https://www.meducationalliance.org/?page_id=59

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8. Appendices

The following sections cover a recent educational needs assessment conducted in Mozambique, a table summarising the various devices discussed in this piece and their related modalities, and further examples of educational monitoring within Mozambique.

8.1. Appendix 1: UNESCO Education Management Information System (EMIS) Needs Assessment

UNESCO (2019) conducted a needs assessment with the stakeholders responsible for the EMIS of Mozambique in 2019,²⁴ and established a steering committee of heads of departments from all Ministry of Education and Human Development (MINEDH) stakeholders. The recommendations for the improvement of the EMIS included the following:

- The harmonisation of data sets, data structure, sources and data formats are required to improve education statistical systems.
- A clear roadmap of the measures that should be provided to overcome detected duplications.
- Processes should be simplified and include new data needs and indicators as recommended by the National Strategy for the Development of Education Statistics.
- There is a need to align the collection of educational data to SDG4²⁵/CESA²⁶ 16–25 and the requirements to monitor the indicators of the newly-developed ICT Policy in Education.
- The EMIS platforms should allow access through multiple devices including mobile devices.
- The EMIS architecture should be strengthened at different levels (from national to provincial to district level).
- The capacities of MoE staff to operate the EMIS should be strengthened.

Engaging with the established steering committee and aligning with these principles will be invaluable.

8.2. Appendix 2: Devices and their associated modalities

Table 12. Devices and their associated modalities

Device	Modality
Basic phone	IVR SMS USSD
Smartphone	IVR SMS USSD

²⁴ See the full report here:

<https://unesdoc.unesco.org/ark:/48223/pf0000367858?posInSet=5&queryId=a01396c1-e73d-4afb-be5b-55e90b725819>

²⁵ For more information, see: <https://sustainabledevelopment.un.org/sdg4>

²⁶ For the full report, see:

<http://www.education2030-africa.org/index.php/fr/ressources/395-continental-education-strategy-for-africa-cesa-2016-25>

	WhatsApp Chatbots Web VLEs Apps for data collection (e.g., ODK, Kobo Toolkit, Tangerine)
Tablet / Laptop	IVR (tablet) SMS (tablet) USSD (tablet) WhatsApp Chatbots Web VLEs Apps for data collection (e.g., ODK, KoboToolkit, Tangerine)
Broadcast Media	Radio TV (and) Telephone hotlines via IVR or SMS

8.3. Appendix 3: Further examples within Mozambique

8.3.1. Aprender a Ler: Mozambique

Key facts

Partners USAID and EdTech Center

Device Smartphone, basic phone and radio

Modality Mobile data collection app, VLE app, radio and SMS

Source [↑EdTech Center @ World Education \(no date\)](#)
[↑USAID \(2017\)](#)

From 2012 to 2016, World Education implemented this USAID programme in the northern provinces of Nampula and Zambézia. With the goal of improving early grade reading outcomes for students in grades 1–3, World Education leveraged radio, TV and smartphones to augment training, coaching, and overall school-community support for reading. Key facets:

- **Mobile data collection** — Staff members from local education institutes (district officials, teacher trainers, etc.) were trained on the use of smartphones for data collection. Using the Magpi app²⁷ (a data collection platform), digital forms were installed on each phone and staff members were able to monitor teacher quality by conducting Rapid School Assessments (RSAs). The data collected through the forms was sent to a web-based server to be downloaded, analysed and then used to aid decision-making.
- **Radio programmes** — Solar powered radios were pre-loaded with content and used to help teachers with both local language and Portuguese read-aloud books. The radios were also used

²⁷ See more details about the Magpi app here:

https://home.magpi.com/?utm_expId=.c3IkYR4_SFcm42fP0iD86w.0&utm_referrer=https%3A%2F%2Fwww.google.com%2F

in reading clubs outside of the classrooms to enable pupils to practise reading. Additionally, local radio stations broadcasted programmes to inform the parents and community about reading and their roles and responsibilities in ensuring their children attended school and practised reading at home.

- **Audio-visual support** — Smartphones were pre-loaded with audio-visual tools to help teach the phonics-based element of the programme. An android application was developed that showed letter cards while playing the correct sound of the letter being shown. Aside from the phonics app, the phones also included videos where teachers demonstrated the use of classroom resources. The backend data, both active and passive, allowed them to track both progress and attainment as the intervention progressed.
- **SMS Messaging** — SMS messaging was used to invite stakeholders to training sessions and to remind them to participate. The SMS also included motivational messages in which specific schools and clusters were complimented on their positive results from an assessment or educational tips on the use of the classroom resources. The use of SMS proved to be a simple and effective way of sharing information when needed.

Table 13. Advantages and disadvantages of Aprender a Ler's multimodal approach

Advantages	Disadvantages
This project did not assume radio or phone ownership and provided some of the necessary devices.	Achievement gaps between girls and boys persisted due to socialised gender norms.
Social Behaviour Change (SBC) approaches were integrated to maximise impact.	The transfer of key people, such as educators moving schools midway through the programme having been invested in and trained up, had an adverse effect on the programme.
The Magpi platform is open-source.	The Magpi app was not developed specifically for education.
Buy in from MINEDH officials was crucial in tackling chronic issues such as absenteeism.	

8.3.2. Interactive voice response mobile survey analysis of COVID-19: Mozambique

Key facts

Partners	World Bank, UNICEF and Instituto Nacional de Saúde (INS)
Device	Basic phone
Modality	IVR
Source	↑World Bank (2020)

Viamo undertook the MozPulze wave 1 survey in response to the COVID-19 pandemic. The findings were based on an analysis of 2438 complete responses. Responses were collected using IVR and sampling was done by random digit dial. Interviews were conducted between 22 and 26 May 2020. The data was weighted to the correct population distribution of age, gender, and region. The results reflect a

nationally-representative sample. In terms of languages, Portuguese dominates, with 94.3 per cent of all initiated calls taking place in Portuguese.

Figure 5. Sample questions. **Source:** MozPulse wave 1 Results Report

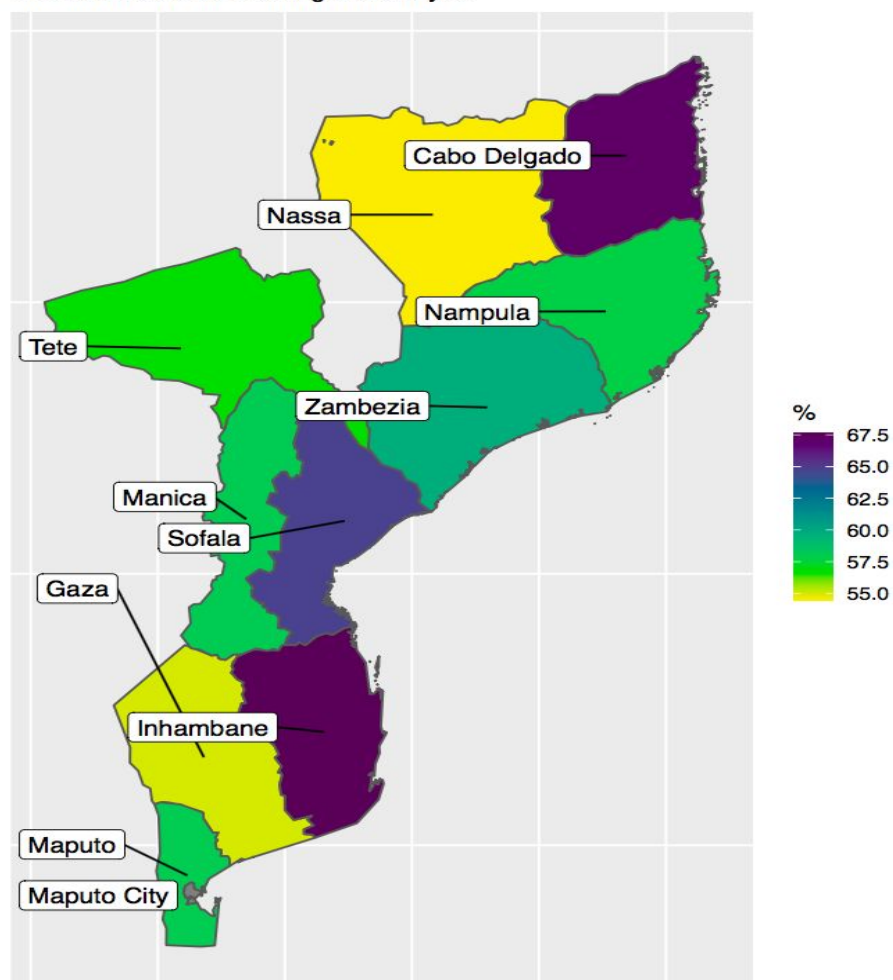
When it comes to knowledge about Covid-19 symptoms, awareness of Government guidelines, and what to do if suspecting infection, we asked the following questions:

- Q5. Which of these are the main symptoms of coronavirus?
 - Press 1 for dry cough, fever and shortness of breath
 - Press 2 for loss of hearing and itchy skin
 - Press 3 for none of these
 - Press 4 if you don't know
- Q6. Does the government recommend that people frequently wash their hands with soap and water or ashes?
 - Press 1 for Yes
 - Press 2 for No
 - Press 3 If you Don't know
- Q7. Does the government recommend that people wear a mask when they go outside?
 - Press 1 for Yes
 - Press 2 for No
 - Press 3 If you Don't know

Figure 6. Perceived danger visualisation. **Source:** MozPulse wave 1 Results Report

Perceived Danger, Mean (Weighted)

Source: Responded 'Very dangerous' to Q11: In your opinion, do you think catching coronavirus would be dangerous to you



8.3.3. SMS mobile survey analysis of cyclone Idai — Mozambique

Key facts

Partners GeoPoll

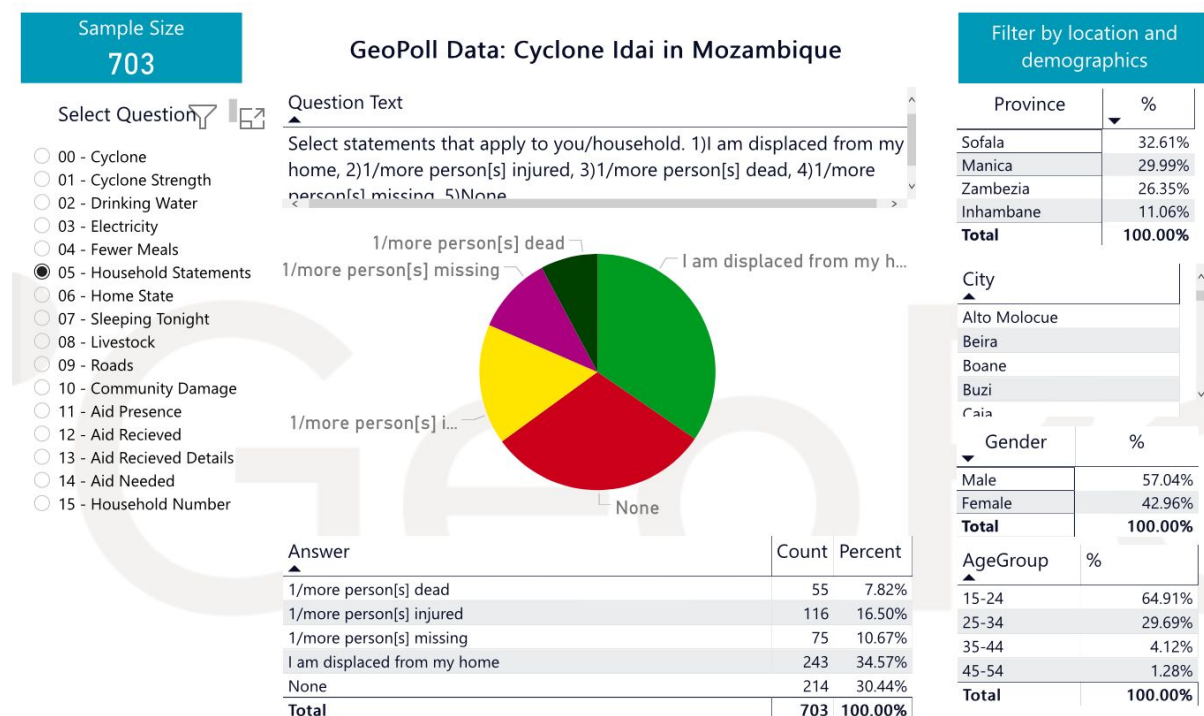
Device Basic phone

Modality SMS

Source [↑Becker \(2019\)](#)

In order to support the humanitarian response following Cyclone Idai in Mozambique, Malawi, and Zimbabwe, GeoPoll deployed an SMS survey to the regions hardest hit in Mozambique to gather on-the-ground data. Data covered infrastructure damage, food security, and the aid needed most by communities.²⁸ Though this does not relate directly to the monitoring of educational outcomes, the use of SMS in Mozambique to deliver this survey offers some interesting insights.

Figure 7. Data visualisation of Cyclone Idai impact in Mozambique. **Source:** GeoPoll data



²⁸ For GeoPoll dashboards see: <https://www.geopoll.com/blog/cyclone-idai-data-mozambique/> and <https://www.geopoll.com/blog/on-the-ground-data-from-mozambique-shows-concern-over-cholera/>

8.3.4. Mobile survey analysis of COVID-19: Mozambique

Key facts

Partners	GeoPoll
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Device	Basic phone
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Modality	IVR
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Source	↑Elliott (2020)
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GeoPoll also conducted a remote study in 12 countries in sub-Saharan Africa on the effects coronavirus is already having on people throughout the region. Respondents for this study were recruited from the GeoPoll database and have been placed into an ongoing panel.²⁹ Again, although this survey does not relate directly to the monitoring of educational outcomes, the use of IVR in Mozambique to deliver this survey offers some interesting insight into the kinds of organisations with the necessary infrastructure to deliver similar work in Mozambique.

Areas that are covered in this study include:

- The biggest concerns and perceptions of risk surrounding coronavirus.
- Preventative measures e.g., social distancing and handwashing practices.
- Changes in food market operability and food security.
- Changes in consumer habits, including purchasing food and nonessential items.
- Levels of trust in governments and the commercial sector.
- Information sources on COVID-19 and changes in media consumption.

²⁹ For the dashboard see: <https://www.geopoll.com/blog/report-covid-19-coronavirus-africa/>

Figure 8. Data visualisation coronavirus data in sub-Saharan Africa. **Source:** GeoPoll data

Results Dashboard

