Considerations & Options for Connected Education: COVID-19 Response

How to ensure refugees benefit from national virtual learning responses

This guidance is organized into three scenarios:

A) "Low Tech" Solutions are available:

Situation: The government is broadcasting programming over TV or radio.

B) Where some technology and hardware solutions are available:

Situation: The government is encouraging the use of a digital content platform to support virtual learning.

Situation: Partners have digital resources (tablets, computers, etc) within the schools.

C) Where there is No Tech to leverage:

Situation: There is no or very limited hardware or internet connectivity that can be made available.

A) "Low Tech" Solutions are available:

Situation: The government is broadcasting programming over TV or radio.

Where educational TV programming is being broadcast nationally, this is a great opportunity to engage children through a medium that appeals to them, though in the case of radio this will require more concentration than simply listening to music as is customary.

Those with radios or TV sets, and some radio-enabled mobile phones[1], will be able to avail of this opportunity provided the signals reach camps and settlements. If the signal does not reach, arrangements and corresponding investments would need to be made to support infrastructure upgrades and hardware to enable access. This could include the use of signal boosters, installation of loudspeakers, radio towers, etc. Please see this guide to getting started with radio.

Many families will not have their own radios or TV sets. For those without access, it may be possible for UNHCR or partners to either record these broadcasts, or ideally, obtain copies of these recordings

[1] Some mobile phones are also equipped with a preinstalled radio transmission including most models from Samsung, LG, HTC, and Motorola.

to distribute through the methods outlined below that make use of mobile phones or other available technology.

Option 1: Radio or TV programming could be distributed by Bluetooth, cellular messaging, or added to existing platforms in contexts where internet and data connectivity is scarce or unavailable.

Risks: Bluetooth only works over a certain distance[2], so it is imperative to ensure safe distances are maintained between individuals. If uploaded to platforms, individual devices would need to connect to these, and the same concerns over safe distances and transmission remain. Many low cost phones frequently utilized may have varying degrees of Bluetooth capability but lack the storage capacity necessary to optimize access to content.

Mitigation measures: Ensure no refugee or host community individuals are responsible for distribution. Transmit Bluetooth through a wall or other solid barrier. Schedule time for individuals to connect with a server and download content so that groups do not congregate. Use file compression resources to minimize storage utilization. Use the low cost SD cards that many individuals already possess to share media, devices permitting.

Option 2: Where individuals have smartphones, with or without data packages, they can make use of the FM receivers on their phones in conjunction with downloadable radio tuner apps, such as Next Radio and MyTuner. Please see this guide for requirements on how to listen to FM radio without data. Please note that currently no smartphones include AM antennae.

Where data and/or connectivity are available, they can use TV streaming apps to watch local channels. For example, one can download Forest TV or Free Africa to watch free African TV. Please check Google Play from your location to determine which apps are available near you.

Risks**:** Streaming data, even if the content is free, often utilizes a great deal of bandwidth. This can quickly drain the available data in purchased packages at an impractically high cost to users.

Mitigation Measures**:** Some services offer a low data mode option for streaming TV, similar to mobile devices, where some video quality can be sacrificed for the benefit of more streaming hours.

Option 3: Where there are limited resources, loud speakers could be used to play recordings of audio materials, for example, making use of mosque's public announcement systems, when not in broader use, or using other loudspeakers systems already in place through a camp or community.

[2] Bluetooth devices operate in three types: class 1 are the most powerful and can operate up to 100m, class 2 are most common and operate up to 10m, and class 3 are the least powerful and operate up to 1m.

Risks**:** In some areas, the use of religious facilities would need to be discussed with local authorities and community members to assess risks. It might create some community disturbance for other activities if there is a constant broadcast.

Mitigation Measures**:** Engage the community and local authorities on the frequency and what materials should be prioritized for use. It might be advisable to only have broadcasts during certain hours.

B) Where some technology and hardware solutions are available:

Situation: The government is encouraging the use of a digital content platform to support virtual learning.

Refugees often place a high value on mobile connectivity, utilizing technology to maintain contact with family and friends and access pertinent information on community sharing platforms such as Whatsapp or Facebook. While acknowledging this trend, it is also clear many barriers can hinder access to both technology and data for refugees. The options for maximizing continuity of education, where technology and connectivity are present are outlined below in a scenario where some families have access to mobile phones at home.

Option 1: Set up hotspots in various locations throughout the camp.

The hotspots could be set up by a UNHCR or local IT officer with a shared network. Devices that have Operating Systems and processing power which can be used as a server (i.e. a laptop) can be connected to these hotspots to provide access to educational resources, especially the ones designed for installation on such devices. Alternatively hotspots could provide broader internet access, however the need to make critical contact with family could create bottlenecks, and limited time dedicated to education, if time to access was limited.

Cost relative to the population and ability to ensure the signal is strong enough for users to access from their home would be critical considerations to avoid encouraging public gatherings where hotspot signals might appear strongest.

Risks: Theft or accidental damage to assets/ servers designated as hotspots would be a risk. In addition, hotspots might create a pull factor, attracting people to gather in locations where the signal is the strongest. This may go against social distancing protocols.

Mitigation Measures: Equipment could be tagged with transponders to limit theft and placed in predetermined safe spots to limit damage (for example a location that is out-of-reach or secured by a fence). It would also be advisable to speak with the community so they are aware of the function of the

equipment. To mitigate issues of group gatherings, it would be important to discuss with the community the importance of social distancing, and to agree on shared protocols for accessing hotspots, including limiting the time someone can spend at the hotspot, and that individuals must remain 3 meters away from one another. It would be advisable to note that failure to comply could result in the discontinuation of the hotspots. In addition, individuals could access the hotspots in intervals, with predetermined times when the network can be accessed, either using separate passwords for groups of people or turning the hotspot on and off could limit continual usage.

Option 2: Mobile Network Operators to host offline content platforms on local servers to connect to their base stations, enabling access to the server anywhere a 3G connection is connected to the tower. The base stations providing cells with network coverage already used for transmission of voice and data could be loaded with additional predetermined, aligned content that would be accessible across the network. This would need to be negotiated with Mobile Network Operators (MNOs). If agreed, it would provide a free way for users to access content during this time.

Risks: This depends on willingness from MNOs, but could be negotiated as only an interim measure while schools are closed. It is important to ensure the server that is used can support the volume of synchronous users expected (further guidance is available as needed). It also further requires individuals to have access to mobile devices to access the content. The difficulty of restricted access to SIM's for many, including biometrics and fingerprint registration requirements in Tanzania and Uganda, pose an additional barrier. Note that in the event an agreement were reached with an MNO, it would require all users to be on that network, possibly requiring additional SIMs.

Mitigation Measures: Outreach with partners to assess feasibility, highlighting that certain MNOs have already provided access (for example Vodafone provides access to the Kolibri platform through a similar function in Ghana, Tanzania and South Africa). Assess how many users are likely to use this service and procure a server that supports the higher threshold.

Option 3: Utilize bluetooth to send lessons and audio/visual files etc.

The radius range of Bluetooth capability is determined by the type of device and may make this approach difficult, as the average range for a mobile device is 10 metres. A brief analysis of whether commonly owned phones per context are considered bluetooth-enabled and to which specifications would be required to understand the efficacy of this solution. A file compressor to shrink files and ensure minimal data consumption would additionally be required.

Risks : Transmission distance is limited for cell phones, with a strong possibility older devices may have to be even closer to transmit signal for functionality. People trying to overcome this barrier by gathering and congregating is a difficult risk to assess.

Mitigation Measures: This solution could be tested relatively simply by UNHCR personnel using commonly owned phones in context.

Option 4: Utilize whatsapp to send lessons and audio/visual files, etc.

Whatsapp and other messaging applications provide an opportunity to share files across an infinite distance. In some locations, MNOs provide free use of WhatsApp as part of bundle subscriptions. Many partners are working with WhatsApp to help share accurate messages about COVID-19. By creating groups or classes, teachers would be able to send out targeted content to students and supporting resources to parents. They could even enable interaction by asking students to reply with responses to quizzes or questions asked in relation to the content.

Risks : Mobile numbers would need to be collected in order to support the creation of groups. If groups are used, members of the group would be able to see other students' phone numbers. These numbers however wouldn't be associated with names (unless already shared as part of someone's profile) or through their profile picture. Costs associated with the use of WhatsApp might also create limitations on access and use.

Mitigation Measures: Provide guidance to parents and students before phone numbers are collected, advising actors to use a generic image and remove any names from their profile (if they do not want their information more widely shared). Also review what operators' rates/deals are for using applications like WhatsApp and ensure this is communicated. Actors could also go to wifi hotspots to access functionality of WhatsApp without having to rely on data.

Option 5: Consider the use of optimized mobile learning apps.

In some locations, mobile apps have been created for students to access content, participate in assessments, or interact with teachers and peers. Some of these platforms are paid services, while others are free and designed to be used offline. For example, platforms like Ustadmobile provides access to thousands of pieces of digital content that can be downloaded and viewed on a mobile phone for free. Worldreader's Mobile App contains a library of thousands of digital books aimed at youth and adults. Eneza is also another App that serves as an interactive study tool for children across Africa. These tools can be provided for use to students, but are best maximized if guidance is given to help students find the right content to review.

Situation: Partners have digital resources (tablets, computers, etc) within the schools.

In several locations UNHCR or partners have invested in establishing digital labs in schools or community centers. While school-based models were initially imagined for this equipment, this often

means that schools have a limited supply of tablets or other hardware; during school closures other options could be explored to support home-based virtual learning. It is likely that the available resources will be insufficient to fully address the needs, and the ratio of students to available equipment should be taken into account when reviewing options or assessing equitability criteria for use.

Option 6: Loan tablets to teachers to support WhatsApp/Messenger class groups *(where students have access to tablets, mobile phones or other hardware).*

To enable teachers to continue to support their students, tablets or laptops could be distributed to teachers who would be responsible for sending daily videos, audio files, and/or exercises to students through WhatsApp or other messenger groups. By providing the teachers a tablet, they could more easily manage this process by selecting individual pieces of material from preloaded content sets. Then they could share these pieces of content, at timed intervals, by using features like web.whatsapp.com, to share these materials across groups.

Risks: There might be some security risks for teachers to have tablets/laptops in their homes, and/or there might be a risk of loss or damage to the device. Also there still might be students who don't have a phone or device to access the shared content.

Mitigation measures: Identify a replacement plan in the case that devices are lost or damaged. If donors have been involved in providing this equipment, ensure that the loan programme and the replacement plan are discussed with them, ahead of launch the initiative. Teachers could be provided with SIMs preloaded with credit to help them share files with the students. Also identify students/families who might not have access to a device.

Option 7: Establish a tablet loan system.

In some cases, operations might look into a loan system whereby families who do not have a mobile device to support learning are able to borrow a preloaded tablet from the school. Tablets could be returned to the school facility from time to time to enable charging and/or load additional content (depending on the device capacity), and or to enable other families to borrow the device.

Risks: Tablets might go missing or be damaged in the process. Also the battery life of tablets might mean that they only work for one day. If individuals have to continually bring them back to the school for charging, issues might emerge of too many people gathering in one environment. Also as tablets/computers are high touch ceramic surfaces, there is a serious risk that a loan program (where many families access a single device) could increase the spreading of germs. This risk warrants serious consideration and mitigation responses.