ON CALL

USING MOBILE PHONES TO PROVIDE LEARNING IN EMERGENCIES

unicef | for every child

UNICEF OFFICE OF RESEARCH – INNOCENTI

The Office of Research – Innocenti is UNICEF's dedicated research centre. It undertakes research on emerging or current issues in order to inform the strategic direction, policies and programmes of UNICEF and its partners, shape global debates on child rights and development, and inform the global research and policy agenda for all children, particularly for the most vulnerable.

UNICEF Office of Research – Innocenti publications are contributions to a global debate on children and may not necessarily reflect UNICEF policies or approaches.

The Office of Research – Innocenti receives financial support from the Government of Italy, while funding for specific projects is also provided by other governments, international institutions and private sources, including UNICEF National Committees.

The findings, interpretations and conclusions expressed in this paper are those of the authors and do not necessarily reflect the views of UNICEF.

Extracts from this publication may be freely reproduced with due acknowledgement. Requests to utilize larger portions or the full publication should be addressed to the Communications Unit at: researchpublications@unicef.org.

Suggested citation: Kan, S., Dreesen, T. and M. Valenza, *On Call: Using Mobile Phones to Provide Learning in Emergencies*, UNICEF Office of Research - Innocenti, Florence, Italy, 2022.

ACKNOWLEDGEMENTS

1. INTRODUCTION

The COVID-19 pandemic disrupted education systems around the world, resulting in an unprecedented emergency with school closures affecting 1.6 billion learners (Azevedo et al., 2021). This brought to light the need for resilient education systems that can provide education during emergencies and school closures (UNICEF, 2021). The challenge of reaching and educating children when schooling is interrupted is not new for education in emergencies (EiE) practitioners who develop and implement programmes in complex crises with limited resources. As of mid-2021, more than 84 million people were forcibly displaced around the world, of which 42 per cent (an estimated 35 million) were children under the age of 18 (UNHCR, 2022). Over the last two years, it has become evident that, for remote learning, using technology that families own and use regularly greatly reduces barriers to accessing an education and increases the take-up of remote learning activities (UNICEF Regional Office for South Asia, 2020).

One tool that many families own is a mobile phone.[1] Low-cost basic mobile phones can be used in humanitarian settings to support remote learning and are critical where access to connectivity and higher-cost devices such as laptops are limited. The portability of mobile phones, combined with their communication features, offers multiple uses in EiE. This report explores the use of mobile phones in EiE settings by combining a review of the existing literature with feedback from, and interviews with EiE practitioners on two critical questions:

1. How can basic mobile phones be used to support EiE learning programmes and teacher training?

2. What are the key practices undertaken by education practitioners to improve the equity and safety of mobile phone-based education programmes?

Implementing an education programme would be incomplete without a learning assessment. Moreover, can mobile phones themselves be used to measure learning in EiE settings? While this question lies beyond the scope of this report, it is investigated in the second report in the series: *On Call: Using mobile technologies to measure learning in emergencies*. The complementary report outlines the key implementation steps and uses of mobile devices to support learning assessment needs in emergencies.

In addition to this report, an interactive dashboard[2] of case studies was developed to provide practitioners with examples of how mobile phones have been used in education for tutoring, supporting learning and training teachers. The dashboard can be used to filter case studies by various use, application, geography and education settings.

---

1 In this paper, basic mobile phones are phones with the capability for text messaging and phone calls, usually without other advanced features.

2 The interactive dashboard can be accessed at: https://public.tableau.com/app/profile/sophia7587/viz/OnCall_16551164862120/OnCall?publish=yes.

2. USING MOBILE PHONES FOR LEARNING DURING EMERGENCIES

Basic mobile phones have multiple features that can be used to support learning, while also being low-cost, widely available and portable. Basic mobile phones have features such as calling and text messages that can be accessed without data packages which in many situations are prohibitively costly. In 2019, around 97 per cent of the world's population lived within reach of a mobile cellular signal (ITU, 2019). The GSM Association, an industry organization that represents mobile network operators, estimates that by 2025, 70 per cent of the global population will have a mobile subscription. In sub-Saharan Africa, subscription rates is estimated to increase from 46 to 50 per cent (GSMA, 2022). Access to mobile phones is widespread and increasing rapidly, which makes them a practical tool to support learning in emergencies. However, there remains large inequities in within-country ownership, especially in sub-Saharan Africa, where just 47 per cent of the population has access to electricity. Mobile phone learning programmes therefore require consideration of those without access to technology and electricity (UNICEF, 2021). Thoughtful implementation can help students leverage mobile phones to continue their studies and minimize learning loss by connecting them with teachers, providing access to learning materials and by complementing other remote learning materials and programmes (e.g., paper-based or broadcast media).

Even the most basic mobile phones have a variety of features to facilitate learning, including:

- phone calls,
- text messages,
- voice messages and
- radio.

In slightly more advanced (yet still basic) phones, additional features might include data storage of audio and video recordings. Each feature can be used alone or in combination with others to create customized learning. Phone calls and text messages are particularly useful for tutoring, sending nudges and providing a platform for teachers to network with peers and to stay in contact with caregivers. Voice messages are useful for communicating with caregivers and students who cannot read. Most mobile phones can access AM/FM radio, which can deliver educational content.

The rest of this report is structured as follows. Section 3 aims to outline how to determine whether mobile phones can support EiE and what combination of methods is most applicable for the given community's educational needs. Section 4 provides an in-depth guide on the key considerations needed for implementing each use case. Section 5 reviews issues around equity and safeguarding and Section 6 summarizes the key takeaways and lessons learned.

3. DECIDING IF AND HOW TO USE MOBILE PHONES TO SUPPORT LEARNING IN EMERGENCIES

The first step to integrating mobile phones in an EiE learning programme is an assessment of the learning situation. Prior to selecting learning tools, a clear learning goal is needed. The next step is a review of whether mobile phones are an appropriate tool, given the learning needs and local learning infrastructure. The third step is to incorporate equity and safeguarding measures. For all steps, it is critical to work with local authorities and partners. Working with community leaders throughout the implementation process is key to making relevant, practical and sustainable decisions. Each step is presented below.

STEP 1. ASSESS THE LEARNING NEEDS OF CHILDREN AS WELL AS THE MOBILE PHONE LANDSCAPE OF THE LOCAL COMMUNITY TO DESIGN A LEARNING PLAN.

Each emergency and learning disruption is unique. Understanding the needs of students, teachers and parents is critical for forming an effective and practical education strategy. Equally important is an understanding of the mobile phone infrastructure: who owns phones, what types of phones are being used and any reasons they are not used. Key questions, as part of the assessment, include:

- **What are the learning needs of the children?** Collaborate with community members to rapidly assess the education background of children to determine their learning needs and develop leaning goals. Prioritize needs and objectives, given the available resources.

- **What is the capacity of the learning ecosystem?** Are there trained teachers or facilitators to tutor and support children's learning? Do caregivers have experience supporting their children to learn, and what are the caregivers' own literacy levels?

- **Where can learning happen and what existing resources are available?** Are there schools or learning centres where teaching can take place in person? If teaching needs to occur remotely, what learning materials and resources are available?

- **Are mobile phones available for families, and how developed is the supporting infrastructure?** Basic mobile phones are relatively inexpensive everywhere. However, access may be limited both across and within households. Understanding who has phones, how phones are used and shared within the household and family members' technological literacy are important in planning an appropriate programme. A technology assessment should also include identifying partnership potential of private-sector mobile network operators (MNOs).

STEP 2. CAN MOBILE PHONES BE USED TO MEET CHILDREN'S LEARNING NEEDS?

An assessment of children's educational needs, outlined in Step 1, above, will help guide the selection of appropriate mobile solutions in Step 2. In this step, practitioners need to determine the best use case or combination of use cases for the use of mobile phones to meet the needs of students, caregivers and teachers. The three over-arching use cases for basic mobile phones are for tutoring, supporting learning (including for remedial education purposes)

and training teachers. How these are implemented is explored in more detail in Section 4, together with relevant case studies for each.

USE CASE 1: TUTORING

Mobile phones allow for real-time communication, through calls and texts, between educators, students and caregivers.
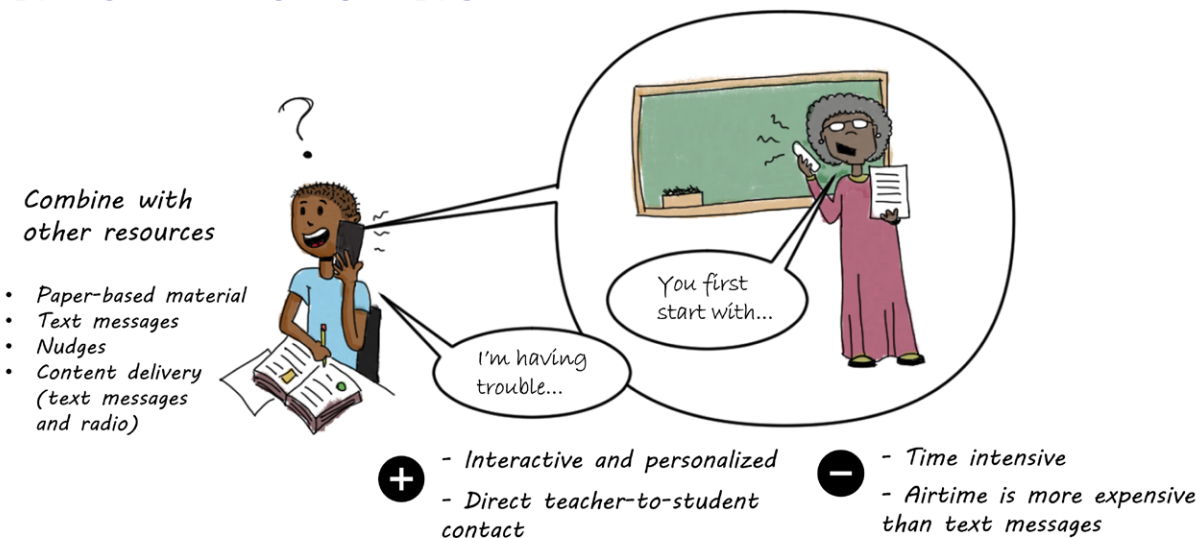
Tutoring via phone calls, also known as "telementoring," enables a teacher to give direct, individualized learning support. However, this approach requires careful planning and scheduling, as teachers need to allocate time for phone calls to multiple students each week. Phone calls can also be combined with other resources such as paper-based materials, text message tutoring, nudges to caregivers and content that can be accessed via mobile phones such as radio lessons. See more on phone call tutoring in Section 4, including examples from Bangladesh, India and Sierra Leone.

Tutoring via text messages is a useful method for supporting learners who already have basic literacy, numeracy and digital skills. Text messages can be used in several ways: teachers can text a learning exercise to a group of students, teachers and students can have a one-to-one conversation and students can text a photo of a completed exercise to the teacher. They also allow for on-demand tutoring

PHONE CALL TUTORING

Combine with other resources

- Paper-based material
- Text messages
- Nudges
- Content delivery (text messages and radio)

I'm having trouble...

You first start with...

+
- Interactive and personalized
- Direct teacher-to-student contact

−
- Time intensive
- Airtime is more expensive than text messages

TEXT MESSAGE TUTORING

Combine with other resources
- Paper-based material
- Phone calls
- Nudges
- Content delivery (text messages and radio)

+ - Interactive and tailored
- Potential to scale and automatize

− - Requires basic FLN skills
- Less engaging than phone calls

---

support with students simply texting their teacher or tutor to receive help. Text messages also offer flexibility to students such as children responsible for domestic chores or caretaking responsibilities (West, 2012). Case studies on text message tutoring from Botswana, India, Pakistan, South Africa and Uganda are presented in Section 4.
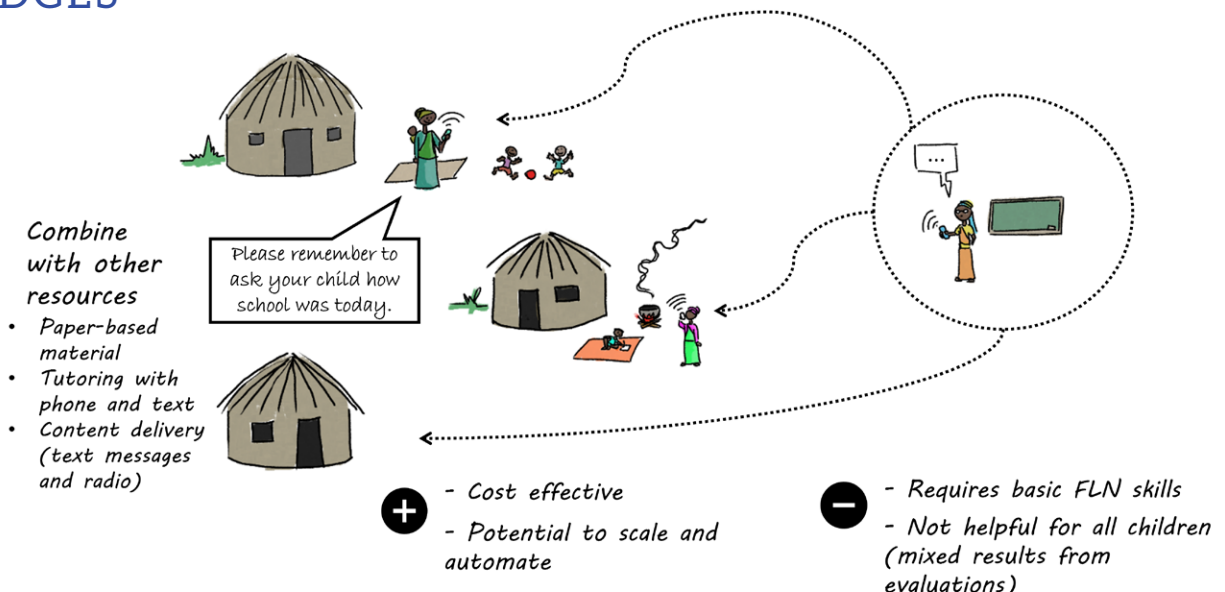
USE CASE 2: SUPPORTING LEARNING
Basic mobile phones can also be used to support an existing education ecosystem. Ways to support learning include nudges to caregivers to remind students to study, or through the delivery of learning content.

Nudges, typically sent by text, are reminders sent to caregivers to help them engage and support their children. In cases where additional support is needed or when caregivers do not have sufficient digital or literacy skills to read text messages, phone calls (although more time-consuming) and voice messages are helpful (Crawfurd et al., 2021). Case studies on nudges used in Botswana, Brazil and Sierra Leone are included in Section 4.

In addition to nudges, phones can be used to deliver learning content through audio recordings, text messages and radio programmes. Radio lessons can also be recorded and saved as audio files. One type of

NUDGES

Combine with other resources
- Paper-based material
- Tutoring with phone and text
- Content delivery (text messages and radio)

+ - Cost effective
- Potential to scale and automate

− - Requires basic FLN skills
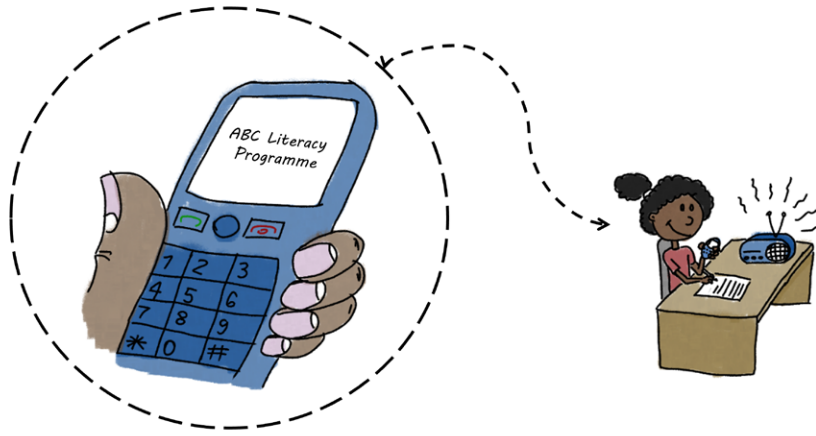- Not helpful for all children (mixed results from evaluations)

CONTENT DELIVERY

Combine with other resources

- Paper-based material
- Tutoring with phone and text
- Nudges

+
- Reach students in hard-to-reach and remote areas
- Adds flexibility, students learn when they have time

−
- Requires basic FLN skills or support
- Requires caregiver support (phone use and guidance)

programme that falls into this category are interactive voice response (IVR) systems. IVR allows someone to dial a number, which then provides automated prompts and pre-recorded audio content guiding the caller (Afoakwah et al., 2021). IVR case studies from Bangladesh, Philippines, Sierra Leone, Somalia, Tanzania and Uganda are included in Section 4.

USE CASE 3: TEACHER AND FACILITATOR TRAINING AND COACHING

Teacher and facilitator training and coaching is a critical component of implementing EiE programmes.

When face-to-face contact is limited, mobile phones offer a low-cost and effective channel of communication, allowing otherwise often impossible interaction.

Mobile phones can be used for training educators in a variety of ways, such as:

- conference calls,
- sending assignments via text messages and
- sharing content (audio recordings and radio lessons).

TEACHER TRAINING

Combine with other resources

- Paper-based materials
- Facilitator-led learning
- Nudges
- Content delivery (text messages and radio)
- Local academic institutions working as partners
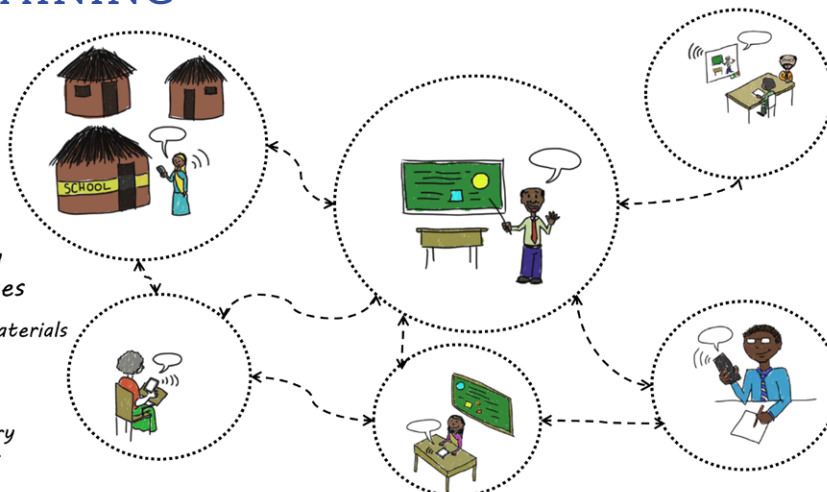
+
- Interactive and personalized
- Flexible modalities: conference calls, text messages and content transfer

−
- Requires basic digital skills
- Some uses may be cost-prohibitive (airtime)

If slightly more advanced phones are available, application such as WhatsApp can offer group chats and content transfer with minimal data requirements. Text messages are also particularly helpful for establishing peer-support networks and receiving coaching (see Section 4 for references to case studies from Jordan and Kenya).

STEP 3. REVIEW THE POTENTIAL CHALLENGES TO ACCESS TO EDUCATION FOR MARGINALIZED GROUPS AS WELL AS SAFEGUARDING OF CHILDREN.

Children who may have limited access to mobile phones include girls, younger siblings and disabled children. In some cultures, girls may have restricted access to mobile phones. In these cases, working with the teacher and launching an awareness campaign targeting caregivers may be helpful for explaining the education programme and the intended phone use. Younger siblings, especially girls, may have the least priority in competing for phone access with their older siblings and parents. Again, communicating with caregivers and keeping active phone use time to a minimum may help increase access. For disabled children, there may be a physical barrier in terms of using the phone, and these children will require extra support from their caregivers and teachers. Identifying and being aware of children who are disabled can help ensure that their needs are addressed. For many families, the cost of airtime may also impose a barrier to learning with mobile phones. In these cases, subsidization of airtime may be beneficial and may be accomplished by engaging MNO partners and donors.

In terms of safeguarding, training teachers, facilitators, caregivers, and students on appropriate phone use should be a key priority. Drafting key practices to safeguard children and ensure the inclusion of marginalized groups is critical for educator training and for enabling everyone to receive the same protocol. Community leaders should, moreover, participate in and provide feedback on safeguarding measures, outlined below.

ACROSS ALL STEPS. WORK WITH LOCAL AUTHORITIES AND COMMUNITY MEMBERS TO DEVELOP BUY-IN AND SOLICIT REGULAR FEEDBACK ON PROGRAMME DELIVERY.

Early involvement and partnership with local officials and stakeholders are important for understanding community dynamics and for identifying key leaders. Working with local authorities is also needed to:

- inform families,
- gather phone numbers and
- ensure support for mobile-based learning and from caregivers.

Decisions affecting a community must be shaped and owned by community members. Therefore, it will be critical to communicate and involve local stakeholders in designing an educational programme, from the feasibility assessment stage to programme delivery. Caregiver engagement is especially important when mobile phones are shared among several household members (UNICEF Regional Office for South Asia, 2020). Once an educational programme has been implemented, soliciting regular feedback will be paramount to creating a programme that meets the needs of those involved, considers the educational goals of everyone and is sustainable.

4. HOW TO USE BASIC MOBILE PHONES FOR LEARNING

This section describes in further detail the three main ways that basic mobile phones can be used in EiE settings:

- tutoring,
- supporting learning and
- teacher training.

Each section summarizes key lessons for success gathered from the existing literature and from interviews with EiE experts.

1. TUTORING

Phone calls or text messages, the core features of a basic mobile phone, allow for interactive communication between teachers and students. This is especially useful when teachers and learners cannot meet, and can complement existing remote learning programmes such as radio or TV broadcasts and paper-based learning kits (UNICEF Regional Office for South Asia, 2020). Call-based tutoring and text based tutoring are described below.

CALL-BASED TUTORING

Tutoring through phone calls has multiple benefits; it encourages continued engagement in learning and, if conducted well, enables students to receive highly customized one-to-one support from teachers in real time. Phone calls to children and their families also have the added value of providing them with psychosocial support during emergencies.

Key considerations when deploying phone call-based tutoring are:

a. **Engage the community.** In many cases, one mobile phone is shared by a whole family. When there are competing demands for the phone, close coordination is required between families and educators to ensure that the timing of calls is appropriate. It is crucial to make the importance of tutoring calls clear to families. In **India**, the NGO Pratham used phone calls to follow up with students (after sharing text messages with interactive text, video and audio learning materials during COVID-19 school closures). As children rarely had personal access to mobile phones, the timing of the calls and setting a schedule were key factors in being able to reach students (Banerji, 2021).

b. **Keep calls short and schedule times that work for children and families.** Delivering short lessons over the phone requires a different approach from delivering classroom-based lessons. Helping teachers and facilitators to learn new methods for delivering phone call-based learning is critical for creating short and engaging

lesson plans. Making individual calls to students also requires coordination between teachers, facilitators and families. Call schedules need to ensure that each child is reached regularly with a unique level of support. In **Sierra Leone**, tutorial phone calls designed by Rising Academies were used to complement an educational radio programme. Students received a weekly phone call, averaging 22 minutes. An evaluation of the programme across 25 government schools, however, found no significant learning gains after 16 weeks. Qualitative focus groups with children and parents and interviews with teachers found that this could have been caused by the timing of calls. For instance, children of working parents sometimes had to take calls in noisy locations like marketplaces or when they were tired, late in the evening after the parent returned home (Crawfurd et al., 2021).

c. **Recruit volunteers when there is a shortage of educators.** When teaching remotely, lesson plans can also be delivered by volunteers living outside the community. In **Bangladesh**, a phone-based tutoring programme recruited university students as volunteers. They conducted 30-minute weekly tutorials in maths and English. The time of the phone calls was prearranged, so that the volunteers could discuss the week's learning objectives with the caregivers, and then provide direct support to the student (Hassan et al., 2021).

d. **Combine calls with paper-based or broadcast media (TV and radio) methods and use the tutoring calls to provide psychosocial support.** Short phone call-based tutoring works well in combination with other learning content, especially because phone-based tutoring sessions are shorter than traditional in-person tutorials. In **Bangladesh**, for example, facilitators in an accelerated learning programme in low-income and flood-prone areas of the country conducted regular phone check-ins with students and families during school closures. The first few minutes of the tutoring calls were dedicated to psychosocial support and COVID-19 health information followed by 10–15 minutes of short lessons with students to assist them in using the

paper-based materials that had been delivered to families. This approach reached 70–80 per cent of learners at least three times a week. It helped learners and their families stay engaged and contributed to reducing dropout from the Alternative Learning Pathway programme (Chávez et al., 2021).

TEXT MESSAGE-BASED TUTORING
Tutoring with text messages can be an effective way to support students who already have a command of basic literacy, numeracy and digital skills. While phone calls require both the caller and receiver to be engaged for a set period of time, text messages offer greater flexibility and convenience for both the sender and receiver. However, the depth of engagement is less than that achieved through phone calls. The effectiveness of text messages can be boosted by call-based tutoring, paper learning packs and broadcast programmes.

Key considerations when deploying text message-based tutoring are:

a. **Consider student and caregiver basic literacy, numeracy and digital skills to understand whether text messages are appropriate.** In some cases, neither student nor caregiver will be able to read a text message. In other cases, they may be able to read the text, but unable to respond in kind. In these cases, voice messages may be more practical for communicating with families.

b. **Text messages can be used across diverse learning methods and programmes.** In **India**, during COVID-19 school closures, Pratham sent simple text messages or WhatsApp messages to families with learning activities that they could do with their children. Caregivers responded with voice, text, and video messages of what their children were doing based on the instructions that had been sent (Banerji, 2021). In **Pakistan**, UNESCO piloted a girls' literacy programme which used text messages. In total, 250 semi-literate girls across rural and semi-urban areas were provided with mobile phones to receive text messages in Urdu to then copy into workbooks. Over the course of

BOX 2. Mobile-Based Tutoring: Key Advantages and Drawbacks

	ADVANTAGES	DRAWBACKS
Phone call tutoring	• Simultaneous conferencing allows for personalized and interactive learning support and psychosocial support. • Direct interaction between teachers/facilitators and students.	• Calls must remain short to reach a large group of students individually. • Requires coordination and scheduling with families to reach children. • Time intensive for all parties, teachers, caregivers and students.
Text message tutoring	• Tailored instruction can happen when the teacher and student have time. This is particularly helpful when caregivers and children are busy with work and chores. • Automation: some text message-based programmes can be automated, or rely on specialized tutors who can respond to multiple requests at the same time. • Because text messages are typically cost effective or require low data use on apps such as WhatsApp, there is a potential to scale up text message programmes and even send messages in bulk.	• Receiving text messages requires basic literacy and digital skills, and some students and caregivers may struggle to participate. • Back-and-forth messaging requires frequent access to a phone which could be a challenge when multiple people are competing for one household phone. • Cost of sending messages could be prohibitive for both the sender and receiver.

the programme, literacy skills improved, though there was no comparison group with which to assess the effectiveness of the programme. While most families were doubtful of the mobile phone-based approach, by the end of the programme, 87 per cent were satisfied (Carlson, 2013). Some text-based tutoring programmes are user-demand-based. In **South Africa**, the instant messaging platform MXit hosted a math tutoring programme called Dr Math. The programme aimed to support children's math learning by connecting students with trained tutors during specified times. Students could text their questions during this period and the tutors responded to requests using a computer and keyboard and thus, were able to manage questions from multiple learners at once (Butgereit, 2007).

c. **Text messages present an opportunity to extend education and outreach to caregivers.** In **Uganda**, MobiLiteracy used inexpensive, basic mobile phones (for text and voice message) to deliver daily age-appropriate literacy activities and parental education activities to rural Ugandan parents and their first-grade children. Voice messages were used to compensate for parents' own low literacy skills as well as to promote phonics (Pouezevara & King, 2014).

d. **Consider additional ways to boost the impact of text message tutoring.** Tutoring through text messages can be a stand-alone programme. However, student learning may be improved if it is accompanied by other activities such as phone calls and nudges. In **Botswana**, the Teaching at the Right Level (TaRL) programme combined weekly text messages containing math problems along with follow-up phone calls to both students and their caregivers. An assessment of TaRL showed that text messages reduced the number of innumerate readers, and that the reduction was greater for students who received follow-up calls (Angrist et al., 2020).

2. DELIVERING NUDGES AND CONTENT FOR LEARNING

NUDGES
Nudges are reminders, which can be communicated through phone calls and text messages to students and caregivers to encourage studying at home. Even when children are already attending school, by engaging caregivers, nudges can help reduce dropout rates and improve attendance rates. During the COVID-19 school closures, motivational nudges, for example, helped reduce learning loss in Brazil (Lichand et al., 2021) and increased educational engagement in Sierra Leone (Crawfurd et al., 2021).

Key considerations when deploying nudges are:

a. **Work with educators to learn whether nudges are a useful tool to address the learning needs of the target population.** This will require an assessment of learning objectives and priorities, given that resources will be (more) constrained in an emergency.

b. **Consider student and caregiver basic literacy, numeracy and digital skills to identify an appropriate delivery channel.** Phone call nudges can be effective but time-consuming. Text message nudges may be more time and cost-effective but may not be appropriate if basic literacy, numeracy and digital skills are low. An alternative to the more resource-intensive phone call nudges might include creating voice messages that can be sent to multiple phone numbers at once. In some cases, text message nudges may be more effective when combined with phone calls. In Botswana, phone-based interventions combining text messages and phones calls during COVID-19 had a positive effect on learning gains and reduced innumeracy by 52 per cent (Angrist et al., 2020).

CONTENT DELIVERY

Even basic mobile phones can be used to deliver educational content. With slightly more advanced feature phones, teachers can use a Secure Digital (SD) card to upload audio or videos recordings and then playback content in front of students. In the Philippines (Carlson, 2013) and Tanzania (UNESCO, 2012), teachers connected their mobile phones to a TV set via a cable to incorporate video lessons into classroom-based teaching. Phones can also be used to deliver content through its radio function, allowing students to 'tune in' to a broadcasted educational programme. Radio programmes are also versatile. Students can 'tune in' at home, or a teacher can create a learning programme around the broadcast so that learning is guided and catered to student needs, also called interactive radio instruction (IRI) (Bosch, 1997) or interactive audio instruction. Radio instruction is an effective learning tool and studies show that combining studying alone with textbooks with radio instruction can double

the learning impact (Bosch, 1997).[3] Lastly, IVR, as mentioned previously, is a tool that combines radio content with phone calls for independent learning. IVR allows users to dial a toll-free number and follow a pre-recorded audio guide of learning content. IVR has been used, for example, in Bangladesh (Cotter et al., 2012) to teach English and in Ghana to train teachers (Afoakwah et al., 2021).

Key considerations when using data storage or radio for content delivery:

a. **Work with teachers and caregivers to understand whether data storage or radio are appropriate tools.** Using phones for content delivery is particularly useful for supplementing an existing educational programme. In EiE, using phones for content delivery is also helpful when material resources are limited or in-person teaching is not possible. As with other use cases, an assessment of basic literacy, numeracy and digital skills will be needed to understand how much assistance a child will need to access educational content.

b. **Ensure that access to content is not cost prohibitive.** While content can be saved to a phone for free, such as uploading data via a flash drive or SD card, content can also be transferred via text messages. Because the files require greater data size, it can become cost prohibitive for both teachers and students. In these cases, partnering with local MNOs may help reduce cost for educators and families. If cost is not a barrier, sending audio and visual content via text message is a quick and efficient approach to sharing educational content. In Uganda, caregivers of children in primary school Grades 1–2 were sent text messages containing audio programmes in English. Students received all letters of the Lugandan alphabet as well as 10 vocabulary words and one story per week (Pouezevara & King, 2014).

c. **Support caregivers to help guide their children.** Using phones to store data or access radio programmes may require support from parents and caregivers, who may in turn need

---

3   See also a report by the Education Development Center (2020) for how to implement IAI programmes.

digital literacy training. Training would require in-person demonstrations because different phones will operate differently. Depending on the number of students in the area, such training may be difficult to scale. Families will also need to negotiate how to share their phones with children. For playing back saved content, however, caregivers may have greater flexibility in terms of when their children listen or view content.

d. Ensure that content is engaging, relevant and interesting and can be broken down into segments. Packaging content into shorter segments is helpful for maintaining student attention and has the added benefit of being easily replayed. In Somalia, through the Somali IRI Project, teachers played broadcasted lessons for children in primary school Grades 1–5. Every day, students listened to a 30-minute programme that included a series of activities such as songs, poems, stories and interviews. The programme also used the same characters (fictional teacher and student) across the episodes so that listeners could follow and become familiar with the characters (Carlson,

2013). Lastly, in multilingual societies, using the correct language is a critical step in ensuring that learning content is accessible and relevant.

e. Consider using content to include psychosocial needs of children and their families. In addition to basic educational content, mobile phones present an opportunity to disseminate child protection messages as well as gender and inclusion messages to support children and caregivers. For example, in Sierra Leone, the Under the Mango Tree programme also addressed current problems related to Ebola, such as stigma, social exclusion, disabilities and sexual violence. The programme targeted both students and parents, with messages about positive parenting and the importance of education (Barnett et al., 2018).

f. Explore the range of learning possibilities using radio programmes. Radio programmes have been used in diverse settings, from formal school settings, to learning centres in refugee camps and as a remote learning tool. For example, a teacher may play the radio or a pre-recorded audio lesson via their mobile phone as part of a regular lesson. This scenario may be particularly helpful in settings where community members are recruited to serve as facilitators with limited formal training. This type of learning, as mentioned above, is called IRI, where teachers facilitate learning and discussion based on the content in the radio programme (Trucano, 2010), and has been an effective method in providing education to children in hard-to-reach areas. In Nigeria, Project TELA trained teachers to use radio programmes to help displaced children in refugee camps learn numeracy and literacy skills (Ensign and Udo-Udo Jacob, 2017). Radio broadcast has also been used to bring education to children during the Ebola outbreak in Sierra Leone as part of the programme Pikin to Pikin Tok (Barnett et al., 2018). Evaluations of radio-based learning have generally found positive learning outcomes. In Nicaragua, for example, Radio Mathematics Project, a math lessons on the radio in the late-1970s led to an increase in test scores (Jamison et al., 1981).

3. TEACHER AND FACILITATOR TRAINING AND COACHING

During an emergency, teacher and facilitator training will play a vital role in ensuring that children continue to learn.[4] Training is important for both newly recruited facilitators as well as seasoned teachers who need additional skills and knowledge on teaching during an emergency.

Key considerations for using mobile phones for teacher training:

a. **Assess the needs of teachers and facilitators to create a customized training programme.** In some situations, community members without any teaching experience will need to be trained as facilitators. Newly recruited facilitators can require training in basic pedagogical methodology as well as digital literacy skills. Even experienced teachers can require additional training or digital literacy skills to use mobile phones for teaching. Training should include how to introduce oneself, introduce the programme and learning objectives, how to relay lessons and how to follow up with students and caregivers as needed.

b. **Identify and find solutions to barriers to using mobile phones, especially in rural areas.** For some educators, the cost of airtime can be a barrier. Partnerships with local MNOs or donors can help reduce costs. In Zambia, a creative way to monetize distance learning was implemented, the Zambian Teacher Education College used mobile phones and print-based content as part of the primary schoolteacher's certification and provided mobile pay phones to each teacher. These phones could also be used to sell talk time, which allowed teachers to earn some money on their phone, which then covered the expense (call time) of participating in lectures via mobile phones (Burns, 2011).

c. **Radio programmes are an effective tool for professional teacher development, but the timing of the broadcasts is key to take up.** Broadcast radio programmes have been used in many regions to help teachers acquire additional teaching skills. In Guinea, Pas à Pas, a radio series, provided short (15- and 30-minute sessions) broadcasts on math, science and pedagogical approaches. The programme, however, was broadcast in the afternoon while the markets were also open, which led to low participation levels (Burns, 2011). Working with local stakeholders and leaders could have helped the programme avoid this scheduling problem.

d. **Ensure that training content and format are engaging and interactive.** Because audio-based programmes (both recordings and radio) provide one-way delivery, learners may be prone to 'tuning out.' To engage learners, apply interactive approaches such as trainer-led discussions both in-person or via conference call or text messages.

e. **Bulk text messages and WhatsApp are helpful tools when feature phones are available.** Bulk messages can be useful for sending information and training materials quickly and cheaply to a large number of educators. The Catholic University of Mozambique used bulk messages for professional development for teachers and facilitators living in rural areas without access to electricity or the internet (UNESCO, 2012). If feature phones are available, WhatsApp is a popular low-data messaging service that offers the flexibility of interaction, group chats and bulk messages. Group chats are useful for establishing peer-support networks, sharing lesson plans and planning logistics. At the Zataari refugee camp in Jordan, WhatsApp was used to help teachers learn English, create a forum for discussing the curriculum and to serve as a support group (Motteram et al., 2020). At Kakuma refugee camp in Kenya, an experienced teacher mentored small groups of teachers via WhatsApp, answering questions, offering advice and sharing tips (Mendenhall et al., 2018).

---

4   This study is intended to assist EiE practitioners assess whether and how mobile phones can be deployed as an educational tool in times of crisis. However, it is important to note that, when possible, emergency preparedness should be integrated in regular teacher and facilitator training. This is especially important for regions that are vulnerable to recurring disasters, such as annual flooding.

© UNICEF/UNI116172/VISHWANATHAN

5. EQUITY AND SAFEGUARDING

Educational equity is an immense challenge even under normal circumstances and in schools with plenty of resources. Emergencies can heighten the vulnerability of marginalized groups and deny children of their basic human right to an education. When using mobile phones in EiE settings, it will be critical to identify barriers to phone use for vulnerable groups such as girls, young children and children with disabilities. In some settings, it may not be common practice for girls to have access to a mobile phone, leaving them to fall further behind. In other cases, younger children may need to compete with older siblings and parents for access to a family phone. Disabled children will require special assistance as well as adapted content and delivery modes to use a mobile phone for learning. Working closely with local partners will be critical for identifying the barriers and addressing them in culturally appropriate ways.

However, in some environments, learning with mobile phones has the added benefit of reducing educational inequities. Because mobile phones can connect out-of-school learners with an education pathway, mobile phones are potentially powerful tools to help vulnerable children during emergencies. Students in hard-to-reach areas can use mobile phones to access educational content such as radio programmes. In the Dominican Republic, an IRI project called RADECO for children living in areas without schools showed that children learning via radio performed comparably well with students in formal schools, in reading, writing, and language in Grades 1 and 2 (Bosch, 1997). In addition to helping close the rural/urban equity gap, IRI can help reduce the achievement gap for girls. An analysis of several IRI programmes found that girls have performed as well as boys in science in Papua New Guinea and English in South Africa (Bosch, 1997).

In addition to educational equity, ensuring children are safe is a top priority in implementing a new learning tool (Brossard et, al. 2021). Some governments have limited the use of mobile phones in education because of fear of inappropriate use and abuse. While these concerns are valid, risks could be significantly minimized through proper safeguarding measures such as training teachers, caregivers and students on how to minimize these risks and what to do if they receive inappropriate messages. Training should also include how to configure devices (especially feature phones) to prevent and limit risky activities. Teaching the responsible use of mobile phones is now a core practice in many schools in North America, which replaced the practice of simply banning students from using them (West, 2012).

© UNICEF/UNI107945/ASSELIN
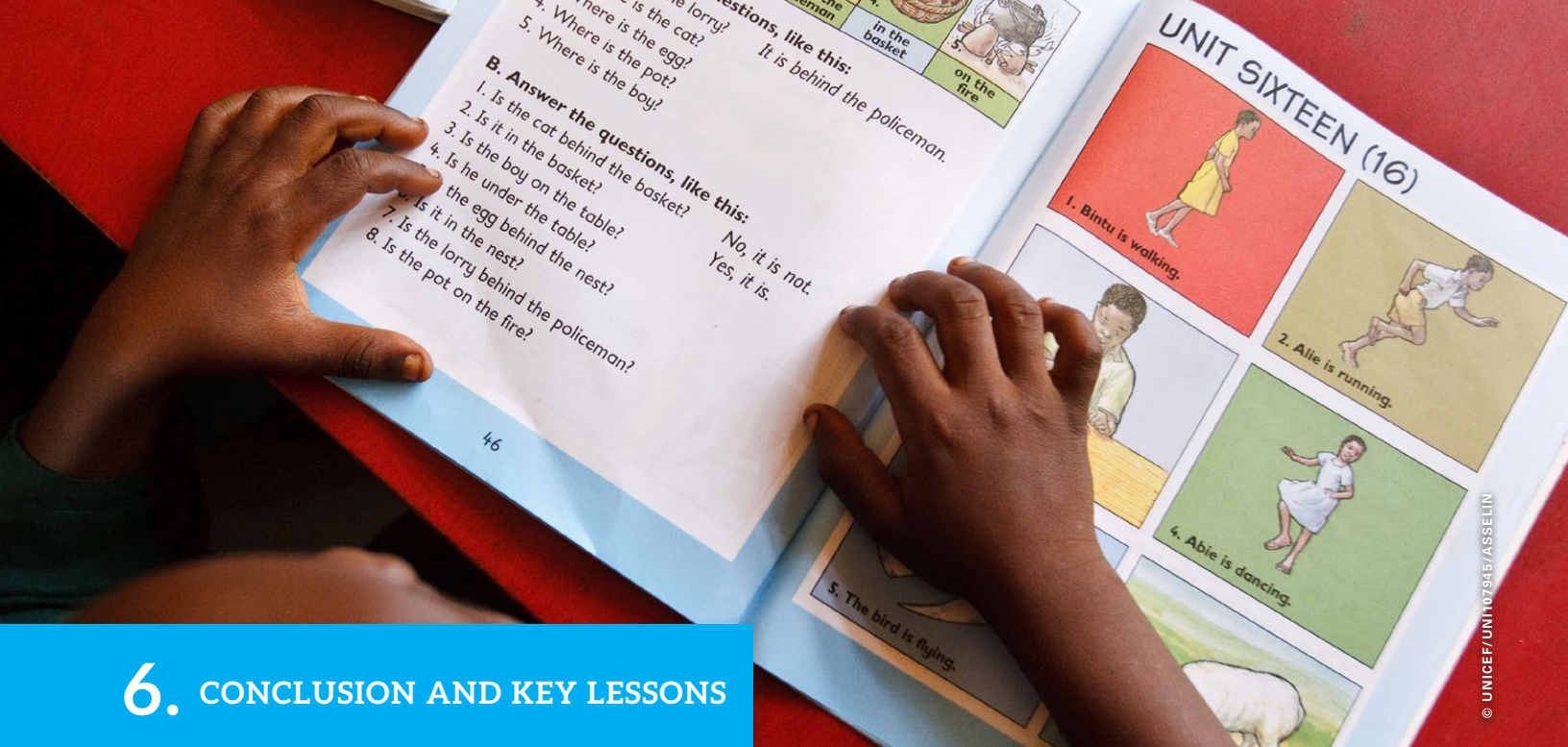
6. CONCLUSION AND KEY LESSONS

The ubiquity of basic mobile phones, even in low-resource settings, makes them a practical tool for EiE programmes. Mobile phones can supplement in-person learning by providing two-way interaction through phone calls and text messages. They can also be used to deliver content (via audio recordings or radio), or to nudge caretakers to provide learning support. Additionally, mobile phones can be used to train teachers and facilitators by providing information, communication, resources and a platform for group discussions and peer support.

This report outlined the four key steps for integrating mobile phones in an EiE learning programme are to:

1. assess the learning needs of children as well as the community's use of mobile phones;

2. evaluate whether mobile phones are appropriate for meeting children's learning needs;

3. review the potential barriers to mobile phone access and ensure that marginalized groups are included and children's safety is prioritized and

4. work closely with local authorities and community members to develop their engagement and receive regular feedback to improve programme delivery.

Mobile phones have a history of being deployed to reach children in hard-to-reach areas and in times of emergencies. They are a highly adaptable and multifunctional tool that can be integrated in an existing education programme, complementing in-person and remote learning channels. Some examples highlighting the customized ways in which mobile phones have been used in EiE include:

- In Bangladesh, where more than 477,000 school-aged Rohingyas live in refugee camps across Cox's Bazar, UNICEF worked with partners to support caregiver-led education by providing both paper-based resources and radio content over the phone (UNICEF, 2022).

- In Burkina Faso, UNICEF used a multi-targeted approach to help minimize the learning loss from COVID-19 school closures including scholarships, meals, school supplies and radio-based listening clubs. The listening clubs were guided by a community facilitator and groups of 5 to 10 children met to listen and complete exercises (UNICEF, 2022).

- In Ghana, Rising Academies, partnering with Viamo, launched a comprehensive mobile phone strategy for tutoring (foundational literacy and numeracy skills) and teacher training using

IVR and text nudges. Students in Grades 4-6 received IVR content based on recordings from an educational radio programme implemented in Sierra Leone (Afoakwah et al., 2021).

■ In Bangladesh, mobile phones were used to supplement a remote teacher-training programme that also relied on printed materials. Phones were used to conduct conference calls, calls using the speakerphone, nudges via voice and text messages to the trainees, as well as to ask questions and request materials. An evaluation of the programme found that the remote teacher training was as effective as in-person training (Pouezevara and Khan, 2007).

During the recent COVID-19-related school closures, mobile phones were used by teachers and facilitators to directly tutor students and to supplement paper-based resources. Identifying the most pressing needs of the learning community (including students, caregivers, teachers and facilitators) will be key in evaluating the appropriate set of learning interventions and tools and assessing whether, and how, using mobile phones can be leveraged. Additional literature, useful for EiE practitioners planning to incorporate mobile phones in their lessons, is outlined in Appendix 1.

© UNICEF/UN0563605/HOGSHOLT

REFERENCES

Afoakwah, Edmund, et al., 'Dialling up Learning: Testing the Impact of Delivering Educational Content via IVR to Students and Teachers in Ghana' EdTech Hub, 2021, <https://doi.org/10.53832/edtechhub.0051> accessed 11 September 2022.

Angrist, Noam, Peter Bergman and Moitshepi Matsheng, 'School's Out: Experimental Evidence on Limiting Learning Loss Using "Low-Tech" in a Pandemic', National Bureau Of Economic Research, 2021.

Azevedo, Joao Pedro, et al., The State of the Global Education Crisis : A Path to Recovery (English), World Bank, Washington, D.C., 2021 <http://documents.worldbank.org/curated/en/416991638768297704/The-State-of-the-Global-Education-Crisis-A-Path-to-Recovery> accessed 10 October 2022.

Banerji, Rukmini, 'Learning for All: Lessons from ASER and Pratham in India on the Role of Citizens and Communities in Improving Children's Learning', in *Powering a Learning Society During an Age of Disruption*, edited by Sungsup Ra, Shanti Jagannathan and Rupert Maclean, vol. 58, Springer Singapore, 2021, pp. 181–194.

Barnett, Sarah, et al., 'Redesigning an education project for child friendly radio: A multisectoral collaboration to promote children's health, education, and human rights after a humanitarian crisis in Sierra Leone', *BMJ*, vol. 363, 2018.

Bosch, Andrea, 'Interactive Radio Instruction: Twenty-Three Years of Improving Education Quality', *Education and Technology Notes*, vol. 1, no. 1, World Bank, Washington, D.C., 1997.

Brossard, Matt, et al., 'Digital Learning for Every Child: Closing the Gaps for an Inclusive and Prosperous Future'. G20 Insights Policy Brief, Task Force 4 Digital Transformation, September 2021.

Burns, Mary, 'Distance Education for Teacher Training: Modes, Models, and Methods', Education Development Center Inc., Washington, D.C., 2011.

Butgereit, Laurie, 'Math on MXit: Using MXit as a Medium for Mathematics Education', Meraka Institute, Pretoria, 2007.

Carlson, Sam, 'Using technology to deliver educational services to children and youth in environments affected by crisis and/or conflict', United States Agency for International Development, 2013.

Chávez, Cirenia, et al., 'Continuing learning for the most vulnerable during COVID-19: Lessons from Let Us Learn in Afghanistan, Bangladesh, Liberia, Madagascar and Nepal', *Innocenti Research Brief*, United Nations Children's Fund Innocenti Research Centre, 2021.

Cotter, Tanya and Tanim Ashraf, 'BBC Janala mobile service: A response to context and user experience', BBC Media Action, Bangladesh, October 2012.

Crawfurd, Lee, et al., 'Teaching and testing by phone in a pandemic', Working paper 591, Center for Global Development, September 2021.

Education Development Center, 'Learning at Home in Times of Crisis Using Radio: Interactive Audio Instruction Repurposing Toolkit', EDC, Boston, Mass., 2021.

Ensign, Margee and Jacob Udo-Udo Jacob, 'Where there is no school: radio and mobile technologies for education in crises and post-conflict societies', Peace Network, 2017.

GSM Association, 'The Mobile Economy 2022', GSMA, London, 2022, <www.gsma.com/mobileeconomy/wp-content/uploads/2022/02/280222-The-Mobile-Economy-2022.pdf> accessed 11 September 2022.

Hassan, Hashibul et al., '"Low-tech" distance education: A remedy of the learning loss due to the COVID-19 pandemic', *CDES Policy Brief Series*, Centre for Development Economics and Sustainability, Monash University, Melbourne, Australia, April 2020.

International Telecommunication Union, 'Measuring digital development: Facts and figures 2019', ITU, 25 , Geneva, May 2020.

Jamison, Dean, et al., 'Improving elementary mathematics education in Nicaragua: An experimental study of the impact of textbooks and radio on achievement', *Journal of Educational Psychology*, vol. 73, no. 4, 1981, pp. 556-567.

Lichand, Guilherme, Julien Christen and Eppie van Egeraat, 'Do Behavioral Nudges Work Under Remote Learning? Evidence from Brazil During the Pandemic', University of Zurich, Department of Economics, Working Paper no. 363, 2021.

Mendenhall, Mary et al., 'Expanding Teacher Support through Mobile Mentoring in Kakuma Refugee Camp: Benefits and Challenges', *Current Issues in Comparative Education*, vol. 20, no. 2, 2018.

Motteram, Gary, Susan Dawson and Nazmi Al-Masri, 'WhatsApp supported language teacher development: A case study in the Zataari refugee camp', *Education and Information Technologies*, vol. 25, no, 6, 2020, pp. 5731–5751.

Pouezevara, Sarah and Simon King, 'MobiLiteracy-Uganda Program Phase 1: Endline Report', Research Triangle Institute International, January 2014.

Pouezevara, Sarah, and Rubina Khan, 'Learning Communities enabled by Mobile Technology: A Case Study of School-based, In-Service Secondary Teacher Training in Rural Bangladesh', in *Innovative information and communication technology in education and its potential for reducing poverty in the Asia and Pacific region* (Appendix 11), Asian Development Bank, 2007.

Trucano, Michael, 'Interactive Radio Instruction: A Successful Permanent Pilot Project?' *World Bank Blogs*, World Bank, 11 May, 2010, <https://blogs.worldbank.org/edutech/iri> accessed 11 September 2022.

United Nations Educational, Scientific and Cultural Organization, 'Mobile learning for teachers in Africa and the Middle East: exploring the potential of mobile technologies to support teachers and improve practice', UNESCO, Paris, 2012.

United Nations Children's Fund, 'Reopening With Resilience: Lessons from Remote Learning during COVID-19', UNICEF, 2021.

United Nations Children's Fund, 'Education, children on the move and inclusion in education: Lessons learned and scalable solutions to accelerate inclusion in national education systems and enhance learning outcomes', UNICEF, New York, Florence, 2022.

United Nations Children's Fund Regional Office for South Asia, 'Guidance on distance learning modalities to reach all children and youth during school closures: Focusing on low- and no-tech modalities to reach the most marginalized', 2020.

United Nations High Commissioner for Refugees, Refugee Data Finder, UNHCR, 2022, <https://www.unhcr.org/refugee-statistics/#:~:text=Forcibly%20displaced%20people%20worldwide,84%20million%20at%20mid%2D2021> accessed 10 October 2022.

West, Mark, 'Turning on mobile learning: Global themes', *UNESCO Working Paper Series on Mobile Learning*, UNESCO, 2012.

World Bank, United Nations Educational, Scientific and Cultural Organization and United Nations Children's Fund, *The State of the Global Education Crisis: A Path to Recovery*, The World Bank, UNESCO, and UNICEF, Washington D.C., Paris, New York, 2021.

USE CASE	FUNCTION	RESOURCE TYPE	RESOURCE REFERENCE
Teaching	Mobile phones (using internet, smartphones, and tablets) for remote learning	Guide	UNICEF and World Bank, Mobile: Resource Pack to Support Remote Learning, 2022.
Learning support	Radio (interactive audio)	Toolkit	Education Development Center, Learning at Home in Times of Crisis Using Radio Interactive Audio Instruction Repurposing Toolkit: Summary, (2020).
	Radio (IRI)	Examples	Bosch, Andrea, Interactive Radio Instruction: Twenty-Three Years of Improving Education Quality, 1997.
	Radio (IRI)	Implementation guide: feasibility, cost, scale, sustainability, content, production and marketing	Anzalone, Stephen and Andrea Bosch, Improving educational quality with interactive radio instruction: a toolkit for policymakers and planners, (2005).
Teacher and facilitator training	Mobile phones and teacher training	Case studies	UNESCO, Mobile Learning for Teachers in Africa and the Middle East: Exploring the Potential of Mobile Technologies to Support Teachers and Improve Practice, 2012.

for every child, answers

unicef

Office of Research – Innocenti