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# Pakistan Topic Brief: Providing Distance Learning to Hard-to-reach Children

Imdad Baloch, Tom Kaye, Saalim Koomar, Chris McBurnie

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Reviewers: Björn Haßler, Caitlin Moss Coflan

For enquiries please email [helpdesk@edtechhub.org](mailto:helpdesk@edtechhub.org).

<b>1. Introduction</b>	<b>4</b>
<b>2. The Pakistan context</b>	<b>6</b>
2.1. Education sector analysis	6
2.2. Pakistan’s COVID-19 educational response plan	7
2.3. Options to support alternative education in Pakistan	8
<b>3. Distance learning modalities</b>	<b>11</b>
3.1. Television	11
3.1.1. Using television to support learning	11
3.1.2. The use of television to support learning in Bangladesh	12
3.1.3. The use of television to support learning in Tanzania and other LMICs	13
3.1.4. The potential use of TV as part of Pakistan’s COVID-19 education response	14
3.2. Interactive radio instruction	15
3.2.1. Using interactive radio instruction to support learning	15
3.2.2. The use of interactive radio instruction to teach hard-to-reach and out-of-school-children in India	16
3.2.3. The use of interactive radio instruction to ensure continued learning in West Africa during the COVID-19 pandemic	17
3.2.4. The potential use of interactive radio instruction as part of Pakistan’s COVID-19 education response	18
3.3. Mobile phones	19
3.3.1. Using mobile phones to support learning	19
Table 3. Distance learning modalities and technologies	20
3.3.2. The use of phones to support learning during the COVID-19 pandemic	21
3.3.3. The use of phones to support learning prior to the COVID-19 pandemic	22
3.3.4. The potential use of mobile phones as part of Pakistan’s COVID-19 education response	23
3.4. Online learning	23
3.4.1. Using online platforms to support learning	24
3.4.2. The use of online learning to support learners in Nepal	24
3.4.3. Khan Academy	25
3.4.4. The potential use of online learning as part of Pakistan’s COVID-19 education response	25
<b>4. Recommendations</b>	<b>27</b>
<b>5. References</b>	<b>30</b>

## 1. Introduction

The COVID-19 pandemic has resulted in mass school closures across the world. It is expected that the closures in low- and -middle-income countries (LMICs) will have long-term negative consequences on education and also on broader development outcomes (UNESCO, UNICEF, World Bank, World Food Programme, 2020). Countries face a number of obstacles to effectively delivering alternative forms of education. Obstacles include limited experience in facing such challenges, limited teacher digital and pedagogical capacity, and infrastructure constraints related to power and connectivity. Furthermore, inequalities in learning outcomes are expected to widen within LMICs due to the challenges of implementing alternative modes of education in remote, rural or marginalised communities. It is expected that the most marginalised children will feel the most substantial negative impacts on their learning outcomes (Malik, 2020).

Educational technology (EdTech) has been identified as a possible solution to address the acute impact of school closures through its potential to provide distance education. In this light, the DFID Pakistan team requested the EdTech Hub develop a topic brief exploring the use of EdTech to support distance learning in Pakistan. Specifically, the team requested the brief explore ways to provide distance education to children in remote rural areas and urban slums. The DFID team also requested that the EdTech Hub explore the different needs of those who have previously been to school in comparison to those who have never enrolled, with reference to EdTech solutions.

In order to address these questions, this brief begins with an overview of the Pakistan education landscape. The second section of the brief explores how four modes of alternative education — TV, interactive radio instruction, mobile phones and online learning — can be used to provide alternative education to marginalised groups in Pakistan. Multimodal distance-learning approaches offer the best means of providing education to heterogeneous, hard-to-reach groups. Identifying various tools that can be deployed to meet the needs of specific population segments is an important part of developing a robust distance-learning approach ([Kaye, Groeneveld, Coflan & Haßler, 2020](#)). With this in mind, this section highlights examples of tools that could be used in Pakistan to support a multimodal approach that reaches the most hard-to-reach learners. The third and final section synthesises the article's findings, presenting recommendations to inform Pakistan's COVID-19 education response.

## 2. The Pakistan context

### 2.1. Education sector analysis

Pakistan has one of the largest and most complex education systems in the world. Approximately 41 million Pakistani students between ages 5 and 16 are currently enrolled in primary and secondary education. These education services are overseen by a combination of the federal Ministry of Education and the provincial governments. Table 1 provides an overview of relevant education sector statistics.

*Table 1. An overview of statistics relating to Pakistan's education sector (Source: Government of Pakistan, 2018; ASER Pakistan, 2019) <sup>1</sup>*

Area relating to the education sector	Statistic
Number of children in urban areas enrolled in school	14,975,711
Number of children in rural areas enrolled in school	25,709,408
Total number of children enrolled in school	40,685,119
Male : female ratio of children enrolled in school	56 : 44
% of Grade 5 students who can read a simple story in Urdu	59%
% of Grade 5 students who can read a simple story in English	50%
% of Grade 5 students who can do 2-digit division	57%

In addition to the 40 million children enrolled in school as noted above, UNICEF (2020) reports that 22.8 million Pakistani children are not enrolled in school. This is the second-highest number of out-of-school-children (OOSC) in the world. Of these 22.8 million children, 5.3 million are dropouts and 17.5 million children have never been to school (Academy of Educational Planning and Management, 2018-19, Pakistan's Social & Living Standards Measurement Survey, 2018-19). At the primary level, 32% of girls are out of school while 21% of boys are out of school (Human Rights Watch, 2018).

In addition to enhancing access, the quality of education received by those children who are enrolled requires improvement. As evidenced in Table 1, education outcomes are low, with only approximately half of students reaching basic levels of literacy by grade 5. Similarly, only just over half of students in grade 5 have obtained the competencies to execute basic mathematics functions. This is in part due to the limited hours of education received by children who do attend school and a lack of quality teachers.

<sup>1</sup> Various sources were reviewed to source data to support the analysis in this section. These sources often presented figures that were not consistent with each other. Where possible, figures from official sources have been used.

Recognising these challenges, Pakistan is prioritising improving both access to and quality of national education services. To enhance access Pakistan has prioritised policies and programmes aiming to provide free and compulsory education for children aged 5–16. To improve quality, the government has recently restructured national, pre-service teacher-education programming, reformed the examination system and enhanced basic school facilities. Despite these improvements, much remains to be done to continue to improve both access and quality. In particular, financing has been a challenge. Pasha (2018) notes that the country has spent an average of 2.2% of GDP on education over the past five years.

One of the main challenges Pakistan’s education sector must overcome is the disparity between different segments of the population. One example of this perpetuating disparity is in the difference in life outcomes of citizens in urban and rural areas. While the majority of the population resides in rural areas, most indicators related to life outcomes significantly favour those in urban areas. Table 2 highlights a few of the inequalities that persist between rural and urban contexts.

Table 2. Comparison of key indicators — Urban vs rural (Source: Pasha, 2018)

	Urban	Rural
Population	36%	64%
Literacy rate	76%	53%
Proportion of population with access to key services (e.g., health, education, etc.) and infrastructure	74%	18%
Average yearly income	PKR 7,510 (US\$ 45.5)	PKR 4,654 (US\$ 28.2)

Pasha (2018) highlights that inequalities also prevail between slums and more developed parts of urban areas. For example, immunisation, family planning and clean water facilities are often not available to families in slums. People in the bottom quintile of per capita income in urban slums have 50% less access to immunisation facilities. School infrastructure is also poorly designed and there are inadequate numbers of teachers. ASER Pakistan (2019) reveals that 40% of the poorest girls are out of school. These inequalities have proved to be a stumbling block for access, quality and equity in education.

## 2.2. Pakistan’s COVID-19 educational response plan

In Pakistan, the first case of COVID-19 was reported in the last week of February 2020. The government closed all educational institutions on 13 March 2020 to ensure the wellbeing and safety of children, teachers and parents, compounding the challenges faced by the system as outlined above. With learning outcomes in Pakistan already the

lowest in the region, the government quickly recognised that this closure had the potential to further negatively impact performance.

In an attempt to ensure some level of learning continuity both the national and the provincial governments began exploring how technology could support learning as an alternative medium. On 13 April 2020, the Federal Ministry of Education collaborated with the Ministry of Information and Broadcasting to launch the *Teleschool* initiative. Run by Pakistan Television Corporation (a state-owned broadcasting organisation), educational programming is broadcast via a dedicated terrestrial TV channel between 8 a.m. and 6 p.m. daily. In the Punjab, the School Education Department is broadcasting the *Taleem Ghar* television programme.<sup>2</sup> *Taleem Ghar* provides digital education content developed by the Punjab Curriculum and Textbook Board for grades K–12. Both initiatives have also been financially and technically supported by the World Bank, DFID and USAID. The Sindh Education and Literacy Department partnered with a local EdTech firm to deliver education online. Digital content has been made available on an e-learning app for primary grades in Mathematics, Science, Urdu and Sindhi languages.

More recently, on 4 May 2020 the Federal Ministry of Education released the National Education COVID-19 Response and Resilience Plan (K–12). The plan provides a framework of strategies and interventions for Pakistan’s education system to cope with the effects of COVID-19 (Ministry of Education and Federal Training, 2020). The framework aims to ensure continuity of learning for all children and facilitate the provinces to achieve the development goals outlined in each province’s education sector plan. The framework identifies a range of technology-based education interventions to support learners when schools are closed and after schools reopen. For example, content will be developed for multiple grades and subjects and made available on different platforms and modalities (TV, Radio, web based — blogs, video sites, applications accessible through smartphones etc.). The framework also sets a policy action to develop, implement and expand remedial / catch-up / Alternative Learning Pathways / NFE (Non Formal Education) programmes for children who fall behind due to closures or being out of school.

### 2.3. Options to support alternative education in Pakistan

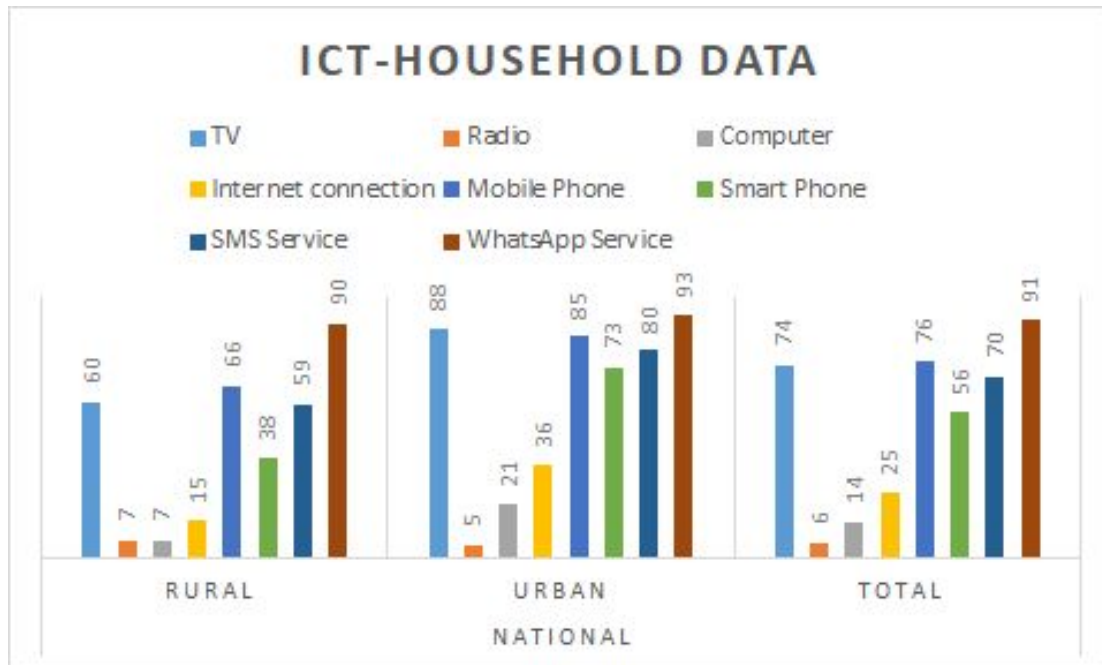
The most effective COVID-19 education strategies leverage multiple modalities to ensure ongoing service provision (Haßler, et al., 2020). Multimodal education approaches can widen access to learning opportunities, especially among marginalised communities. Well-designed distance-learning strategies identify very specific student population segments by the modality type available to them (e.g., students in remote areas who only have access to phones, students in urban centres who have access to internet, phones and radio). Strategies are then developed to provide responses that meet the specific needs of each group.

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<sup>2</sup> For more information on the *Taleem Ghar* initiative see Government of the Punjab (2020). This information is also available at <https://taleemghar.punjab.gov.pk/>.

In Pakistan, education providers have access to multiple modalities to support distance education delivery. As highlighted in Figure 1, more than 70% of Pakistan’s population can access TV and mobile phone services. Additionally, 56% of the population has access to a smartphone while 25% of the population has an internet connection. Households in urban areas have greater access to each of these modalities than those in rural areas. Notably, over 60% of rural households have access to TV and mobile phones.

Figure 1. Household ownership of different technologies in Pakistan<sup>3</sup>



It is important to note that these national averages hide some significant disparities. For example, in the Punjab, approximately 95% of the wealthiest quintile of households have access to television. This contrasts with the poorest quintile, where only 17% of households have access (Malik, 2020). While these national averages can help provide a guide to potential alternative education options, the design of any programme will need to be based on data that highlights local contextual factors. All Pakistani provinces have high-functioning EMIS systems that can be leveraged to help appropriately target responses (Malik, 2020).

The Government of Pakistan is currently prioritising the development of the country’s digital infrastructure. In 2018, Pakistan announced its first ever national digital policy known as ‘Digital Pakistan’. The policy aims to utilise the power of technology to enhance the outreach and quality of education, at all levels, across the country. As part of this initiative the government appointed a special assistant to the Prime Minister to explicitly support this initiative. In the last four years, Pakistan has made considerable progress in the ICT sector. For example, computer labs have been built in almost all high schools. Despite this progress, there is still much improvement required — a study on

<sup>3</sup> The statistics in this table come from the Pakistan Telecommunications Authority (2019a), the Pakistan Telecommunications Authority (2019b) and Miller et al. (2015).



the impact of computer labs in the Punjab discovered that “only IT teachers used computers during their teaching” (Qadir and Hameed, 2018).

### 3. Distance learning modalities

This section explores four different alternative modes of education — TV, radio, mobile phones and online learning. It looks at these four modalities to highlight how different tools might combine into a multimodal response to provide education to marginalised groups in Pakistan. The section provides examples of different tools that have supported distance education services in Pakistan, in other countries in South Asia, and across the world. These examples have been selected to highlight different options for providing learning to students in hard-to-reach areas. The section also highlights how different tools have been used to support both learners who have previously been enrolled in school and those who have never enrolled.

#### 3.1. Television

This section examines how television can be used to provide education services to hard-to-reach children in Pakistan. The section first provides a general overview of how television can be used to support distance education. It then focuses on case studies in Bangladesh and Tanzania, before providing suggestions about how TV can be used as part of Pakistan’s COVID-19 education response.

##### 3.1.1. Using television to support learning

Television can be used as a tool to support learning both inside and outside the classroom, and in both formal and non-formal settings. Publicly broadcasted educational television tends to target early years and primary-level learners. Examples of this include shows like *Sesame Street*, a US children’s TV show which now reaches children in more than 150 countries. Regardless of where it is broadcasted, *Sesame Street* focuses on education and social impact. Television instruction can also target older learners through university-level and beyond. *Telesecundaria*, an initiative that was started more than 50 years ago in Mexico, offers one example. *Telesecundaria* serves secondary school students in rural areas without access to local schools (USAID, 2020).

In response to the COVID-19 pandemic and the related mass school closures, countries such as China, Malaysia and Mongolia have begun to broadcast educational programming (Basic Education Coalition, 2020; CGTN, 2020; Munkhzul, 2020). While formal evaluations of programme effectiveness are not yet available, evidence suggests televised education content enhances learning more than if there were no learning resources present in households (USAID, 2020). In short, it is accepted that televised educational content can go some way towards providing some educational continuity for students impacted by the COVID-19 crisis.

##### *Box 1. Equitable TV Programming in India*

The Kheda Communication Project (1975–1990) aimed at exposing oppression in the contemporary social and economic system, mobilising communities to fight injustice

and promoting self-reliance amongst individuals and communities.<sup>4</sup> It provided 650 television sets across 400 villages and organised participatory programme-making to produce shows of interest to multiple age groups. Though dated, this exemplifies the potential for televised programming to address equity issues. Participatory programming which involves the voices of those hardest to reach will go some way to enhancing engagement from these particular groups.

### 3.1.2. The use of television to support learning in Bangladesh

The adaptation of *Sesame Street* beyond the show's original context includes *Sisimpur*, the Bangladeshi variant.<sup>5</sup> Launched in 2005, *Sisimpur* delivers education to young learners, both inside and outside the classroom. It reaches around two-thirds of preschool-aged Bangladeshi children who do not attend a formal school.

*Sisimpur* focuses on a broad range of subject matter, including literacy, numeracy and socio-emotional skills. *Sisimpur* also provides wider lessons on health and hygiene, disaster preparedness and financial empowerment. This context-specific, age-appropriate content promotes children's engagement in learning. A large-scale longitudinal study revealed that children who had regular exposure to *Sisimpur* demonstrated literacy, mathematics, and socio-cultural skills equivalent to children a year older (Lee, 2009). Furthermore, a BBC World Trust study in 2010 showed that *Sisimpur* was the most-watched children's programme on the state-owned network Bangladesh Television (BTV). When segmenting viewers by location, Mares & Pan (2013) found that 83% of children in urban locations and 58% of children in rural locations watched *Sisimpur*.

*Sisimpur's* reach has also been expanded to support the millions of Bangladeshi children who don't have access to a TV. Interventions have included providing training to childcare centres and bringing *Sisimpur* to remote areas with mobile screenings on vans and rickshaws (Sesame Workshop, 2020). These initiatives are promising as *Sisimpur* represents educational programming that is localised, valued and prevalent throughout Bangladesh. The learnings taken from ongoing initiatives to expand the programme's reach will be of value to those within the hard-to-reach populations of Pakistan. As initiatives to expand *Sisimpur's* reach are in their infancy there is no readily available data on their impact. However, *Sisimpur* exemplifies the potential of localised educational TV programming that is culturally-sensitive, age-appropriate and scalable.

The withdrawal of funds by USAID supporting the adaptation of *Sim Sim Hamara* (the Pakistani adaptation of *Sesame Street*) in 2012 due to allegations of corruption may present barriers to future roll outs in Pakistan (BBC, 2012; Boone, 2012; Bricklin, 2012). However, the fact that there is existing content, and that characters and stories have already been developed, presents an opportunity to scale this programming at pace. Furthermore, the low cost of the programme - reported to be around 16 cents per

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<sup>4</sup> Information on the Kheda Communication Project is available at <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=116100>.

<sup>5</sup> For more information on *Sisimpur* see Sesame Workshop (2020). This information is available at <https://sisimpur.org.bd/>.

person based on estimates from the Indian adaptation *Galli Galli Sim Sim* - means that this initiative has the potential to be quickly scaled at an affordable cost (Batada et al., 2016). Whether or not the programme's history presents a barrier too large to overcome, the evidence is strongly in favour of the production of context-specific programming to promote distance learning. Additionally, this style of educational TV can provide benefits to both children who have previously attended school and those who have not previously enrolled.

### 3.1.3. The use of television to support learning in Tanzania and other LMICs

*Ubongo Kids*, run by the NGO Ubongo, has reached more than 17 million viewers in 31 countries through its "edutainment" programming (Ubongo, 2020). As with *Sisimpur*, *Ubongo Kids* delivers programming on traditional subjects such as mathematics and science as well as covering broader issues including gender rights and financial literacy. *Ubongo Kids* is offered through multiple modalities with radio, app-based and paper-based materials supporting the televised content, enabling the programme's rapid expansion. A recent national survey of Tanzanian children reported that 1 in 6 children had viewed the locally-produced educational television programme (Watson, Hennessy & Vignoles, forthcoming). The prevalence of Swahili speakers has contributed to the programme's expansion, as ease of adaptation has allowed intra-regional scaling. In addition to Swahili, *Ubongo Kids* has also been translated into five other languages.

Ubongo has managed to assess its impact effectively through mobile surveys, control trials and audience tracking. Impact data from a 2016 trial suggests that children who watched *Akili and Me* (the Rwandan adaptation of *Ubongo Kids*) had significantly higher scores for counting, number recognition, shape knowledge, letter identification, colour identification, body-part recognition, health knowledge and vocabulary, relative to a comparison group (D. Borzekowski et al., 2019). Thus, *Ubongo Kids* had a positive impact on learning in this context.

*Ubongo Kids* plans to make toolkits available to caregivers and practitioners working in early childhood development to support home-based learning during mass school closures. The transfer of educational responsibility from schools to households means such toolkits can help support caregivers to facilitate a productive learning environment. While evidence of the programme's ability to support the hardest to reach is scarce, leveraging this type of intervention as part of a multimodal-delivery approach may help overcome issues of equity. In fact, Ubongo has worked to develop its own multimodal approach with resources also developed for radio, mobile use and print in order to reach 'rural, non-electrified communities' (Ubongo, 2020).

In addition to its scale, influence on learning outcomes and cross-country adaptation, *Ubongo Kids* is cost-effective. Experience broadcasting *Ubongo Kids* in Tanzania suggests per-person, per-year costs are approximately one cent. However, these figures are based solely on developing the content, with costs affiliated with purchasing technology, power or connectivity not included in this estimate (Watson, Hennessy & Vignoles, forthcoming; [Watson, 2020](#)).

### 3.1.4. The potential use of TV as part of Pakistan's COVID-19 education response

Existing TV ownership in LMICs is significant (Engle et al., 2011). Figure 1 (above) demonstrates that Pakistan is no exception, with national TV ownership at 74%, and 60% in rural areas. Thus, educational television programmes are a viable means of maintaining education provision during COVID-19-driven school closures. However, targeting hard-to-reach Pakistani children in remote areas and urban slums requires addressing equity issues. If approximately 40% of students in rural areas cannot access TV, existing intra-country inequalities could potentially be exacerbated. Hence, while educational television content can support distance learning in Pakistan, the way in which it is deployed must be targeted to the most marginalised to ensure programmes do not exacerbate existing inequalities.

Both *Sisimpur* and *Ubongo Kids* demonstrate the potential effectiveness of educational television in LMIC contexts. Both examples reinforce that adapting content to ensure it is linguistically and culturally appropriate is an important step in ensuring a positive impact on learning outcomes. Furthermore both offer a window into how programming can be scaled. Though broader questions of equity remain, both examples offer tentative approaches to overcome these issues. *Sisimpur* has offered mobile screenings using readily-available transportation while *Ubongo Kids* has the scope to deliver content offline and through radio and mobile transmission. As such, the producers of both these examples of educational programmes have acknowledged the need to do more to make programming available to those who are hardest to reach.

The evidence from *Sisimpur* and *Ubongo Kids* suggests that educational TV is a viable option for policymakers seeking to improve core learning and socio-emotional outcomes at scale in a cost-effective manner. Educational programmes can be developed into multifaceted tools inclusive of health information, awareness around disabilities, positive gender norms and more. The use of characters with disabilities, for example, can raise awareness and instigate children's acceptance of differences (Watson, 2020).

However, there are limited means to track whether and how much children learn from educational television programming. While it may be possible to gauge viewership, monitoring progress in learning would require additional resources, such as an online or SMS-based app to administer quizzes. Again, issues of equity also arise in relation to the tools used (such as a smartphone-based app or online platform) to conduct such monitoring and evaluation.

While using existing international programming is cost-effective, evidence suggests that televised educational content better promotes learner engagement when it is adapted to be context-specific. With a base of localised content already in place, Pakistan-specific adaptation of educational television content is recommended. *Teleschool* at the national level and *Taleem Ghar* in the Punjab, both referenced above, are examples of programmes that could be more widely rolled out. These programmes have the potential to reach nearly two-thirds of all children in Pakistan. Furthermore, establishing agreements with state-sponsored stations and networks to ensure greater access to

affordable airtime could help support a rapid rollout of broadcasting. Options to reinstate *Sim Sim Hamara* should be explored, given the successful track record of adaptations of *Sesame Street* globally.

Television instruction can offer a way of reaching a large number of learners while also turning a passive learning experience into an active one. However, while this mechanism can reach many users, and has been shown to improve learning outcomes if contextually appropriate, issues related to ensuring equity persist. To begin addressing these remaining challenges, it would be prudent to pair TV programming with online courses, paper packets, radio or other modalities to increase the opportunities for marginalised children to access learning materials.

### 3.2. Interactive radio instruction

This section examines how interactive radio instruction can be used to provide education services to hard-to-reach children in Pakistan. The section first provides an overview of how interactive radio instruction can be used to support distance education generally. It then focuses on case studies in India and West Africa, before providing suggestions about how interactive radio instruction can be used to support Pakistan's COVID-19 education response.

#### 3.2.1. Using interactive radio instruction to support learning

Educators can use interactive radio instruction to broadcast learner-centred, interactive educational content via the radio. Interactive radio instruction combines the use of radio broadcasting with materials that are used during or following the broadcast. Education providers have conventionally used interactive radio instruction to support teachers to structure and facilitate active learning in the classroom. However, in recent years, educators have turned to interactive radio instruction to deliver education to out-of-school children and to ensure continuity of learning during health crises (USAID, 2020).

*Box 2. What does an interactive radio instruction lesson look like?*

A typical 30-minute interactive radio instruction broadcast will follow a three-part structure. First, a radio teacher will explain a concept to listeners. Afterwards, radio actors will model and practically apply these ideas. The teacher will then suggest exercises for students to complete at home. Typical activities include quizzes, singing, role play and storytelling. During lessons, parents and caregivers will receive instructions on how to support children with learning unfamiliar content.

Education system leaders need to invest time and money to design curriculum-aligned materials that reflect the context in which students learn. Before launching an interactive radio instruction programme, governments need to identify aspects of the curriculum that have the biggest impact on a student's academic progress (Mundy & Hares, 2020). Education providers could, for instance, focus on primary-level numeracy.

Previously, interactive radio instruction programmes have improved learning outcomes in mathematics, literacy and social studies (Ho & Thukral, 2009).

Education providers can effectively adapt and re-record scripts from other countries to align with national curricular standards and local cultural traits (World Bank, 2005; Richmond, 2020). In doing so, educators can reduce the time and cost of developing and testing content for a radio-based education response to COVID-19.

The impact of interactive radio instruction remains unclear outside of a classroom context. Although radio-based education may not compensate for a loss of schooling, interactive radio instruction can help children maintain a link to learning (Hallgarten, 2020; McAleavy & Gorgen, 2020). Education providers need to, however, recognise that many households may not have access to radio broadcasts. In Pakistan, for instance, only five% of urban households and seven% of rural households own a radio (National Institute of Population Studies, 2019). Meanwhile, evidence from the Ebola pandemic suggests that most students require the support of a caregiver or study group to benefit from broadcasts (Plan International, 2015).

While these limitations do not necessarily preclude the possibility of a successful interactive radio instruction programme in Pakistan, education providers need to carefully consider these issues. Programmes leveraging interactive radio instruction may need to consider procurement of radios or other devices (e.g., MP3 players) that can be used to provide audio instruction.

### **3.2.2. The use of interactive radio instruction to teach hard-to-reach and out-of-school-children in India**

The Technology Tools for Teaching and Training (T4) programme in India aimed to improve learning outcomes among marginalised students between 2002 and 2011. The programme focused on girls, children in rural areas and students of a low caste. A key component of this initiative included interactive radio instruction for learners both in and out of schools.

The T4 programme initially used interactive radio instruction to help students develop their English language skills. In subsequent years, the initiative expanded to a multimodal approach where interactive radio instruction, educational television and computer-based audio content were used to teach English, mathematics and science. The programme reached more than 40 million students across eight states.

The T4 initiative adopted an iterative approach to programme design. User researchers consulted parents, students and teachers to monitor the extent to which audio lessons met the needs of learners. This information underpinned a five-step process that involved design, revision, testing, refinement and delivery.

*Box 3. The impact of the Technology tools for Teaching and Training interactive radio instruction programme*

A study of 34,000 participants in Chhattisgarh found that the intervention resulted in statistically significant improvements in learning outcomes across all three subject areas. In 2008, for example, Grade 4-students increased their mathematics scores by

an average of 29 percentage points. The study also found that boys and girls benefited equally from the initiative. In other words, the T4 programme did not exacerbate existing gender divisions.

USAID worked with eight Indian states and a range of local and international partners to co-finance this project. An impact evaluation report noted that the programme's five-year second phase cost \$14.4 million. In this period, the initiative reached a total of 85 million students. Based on these estimates, the programme had an annual per-student cost of \$0.03.

Carlson (2013) provides a detailed overview of the T4 programme.

### **3.2.3. The use of interactive radio instruction to ensure continued learning in West Africa during the COVID-19 pandemic**

Prior to the COVID-19 pandemic, Rising Academies ran a network of 160 schools that served 50,000 students in Liberia and Sierra Leone. In March 2020, Rising Academies partnered with the governments in these two countries to create an interactive radio instruction programme for out-of-school learners. This programme specifically targets students in remote rural areas who cannot access the internet. The current initiative is estimated to reach 1.4 million children in Liberia and Sierra Leone.

Within two weeks of school closures, Rising Academies started to air radio lessons that covered foundational numeracy and literacy skills. In Sierra Leone, radio stations charge Rising Academies \$30–60 for a one-hour slot. Meanwhile, Rising Academies pays a private studio \$30 to record a single interactive radio instruction lesson.

Rising Academies is currently developing the capacity to use text messages and WhatsApp to share audio recordings with learners who cannot access national radio. In doing so, Rising Academies aims to ensure that 'off the grid' communities can access educational content.

Rising Academies has also developed a web portal where international partners can download freely available, standardised scripts for interactive radio instruction lessons. Partners can adapt, record and deliver this content to students in their own countries. These scripts cover literacy and numeracy at five levels from early childhood education to senior secondary school. Rising Academies has incorporated important safeguarding messages into their content. In the past three months, 25 education providers from 16 countries have used these resources. In Pakistan, for example, Innovate Educate Inspire has translated content from the web portal into Urdu for delivery on MP3 players.<sup>6</sup>

Similarly to the T4 project, Rising Academies has adopted an iterative approach to programme design. At the end of each radio lesson, Rising Academies encourages parents and students to give feedback via SMS and a telephone hotline. Meanwhile, teachers from the Rising Academy school network regularly call their students to see what they think of radio lessons.

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<sup>6</sup> Information on Innovate Educate Inspire Pakistan's response to COVID-19 is available at <https://ieipakistan.org/openings/>.



While the impact of this programme is not known, the Centre for Global Development is running a randomised control trial to evaluate the initiative. In the meantime, radio scripts and sample audio content can be found on the 'Rising on Air' web portal.<sup>7</sup>

### 3.2.4. The potential use of interactive radio instruction as part of Pakistan's COVID-19 education response

The above examples indicate that governments and schools can use interactive radio instruction to support marginalised learners at a national scale. Marginalised learners could include children in urban slums, students in rural areas and those out of school.

*Box 4. The potential cost-effectiveness of interactive radio instruction in Pakistan*

The T4 programme in India suggests that interactive radio instruction can represent a cost-effective medium to improve student-learning outcomes. Initial price estimates indicate that interactive radio instruction broadcasts could represent a low-cost intervention in Pakistan. In Gilgit-Baltistan, for example, the state radio station charges \$24.5 (4,000 PKR) for a 20-minute slot.<sup>8</sup> However, education providers should investigate the start-up costs of radio-based programming as these can be prohibitive in some areas. Moreover, it remains unclear if an interactive radio instruction programme for children who are confined to the home can achieve the same results as the T4 initiative.

Meanwhile, the 'Rising on Air' programme shows how interactive radio instruction can ensure out-of-school children have an opportunity to continue learning during and after the current crisis. The initiative also exemplifies how educators can re-record and adapt radio scripts. In Pakistan, national education providers could explore the possibility of broadcasting a tailored version of the 'Rising on Air' programme. Alternatively, education providers could look to work with small-scale organisations such as IEI who have already adapted content to the national context.

The case studies also demonstrate that interactive radio instruction programmes can deliver educational content over a number of years or the relatively short period that schools are closed. Accordingly, an investment in interactive radio instruction could support continuity of learning during the current pandemic as well as remedial education and for out-of-school children in the future. The experience of Rising Academies suggests that education providers can develop their first radio content in a couple of weeks. In Pakistan, Innovate Educate Inspire edited and translated a standardised script from the 'Rising on Air' programme in 2 days (Lamba & Reimers, 2020).

Negotiations with radio stations can, however, prove a more significant challenge. In Gilgit-Baltistan, for instance, Innovate Educate Inspire decided to distribute audio content on MP3 players after a series of slow negotiations with the state radio station. This obstacle may be greater when education providers need to partner with multiple

<sup>7</sup> The 'Rising on Air' web portal is available at <http://www.risingacademies.com/on-air>.

<sup>8</sup> These estimates reflect quotes that the state radio station in Gilgit-Baltistan provided to Innovate Educate Inspire in March 2020.

radio stations at a national level. In this situation, educators should adopt an incremental strategy which prioritises radio stations that reach the widest number of marginalised learners.

The impact of interactive radio instruction programmes depends in part on the number of learners who can access a radio. In Pakistan, only 5% of rural households and 7% of urban households own a radio (see Figure 1). Based on these estimates, radio-based interventions may have a limited capacity to reach a large number of students.

At the same time, radio broadcasts are being increasingly accessed on basic feature phones and smartphones (USAID, 2020). The relatively high level of mobile-phone ownership in Pakistan (see Figure 1) suggests that students may be able to listen to interactive radio instruction broadcasts without a conventional radio. This option may work best for learners in urban areas where the rate of mobile-phone ownership is highest. If education providers pursue this option, they should provide families with clear guidance on how to access interactive radio instruction content on their phones.

The widespread availability of mobile phones presents an opportunity to deliver content from interactive radio instruction lessons to children who live in remote areas that do not receive radio coverage. Similarly to Rising Academies, education providers could share audio recordings with learners via SMS or WhatsApp. In practice, education providers would require a current list of registered students to contact. Accordingly, this approach may have a negligible impact on the education of children who are unregistered and out of school.

### **3.3. Mobile phones**

This section examines how mobile phones can be used to provide education services to hard-to-reach children in Pakistan. The section first provides an overview of how mobile phones are used to support distance education generally. Whereas other sections of this brief have provided two in-depth examples, to better showcase multiple examples in a relevant manner the two sub-sections highlight how these tools have been used in a number of different ways both prior to and during the COVID-19 crisis. The section then outlines how mobile phones can be used as part of Pakistan's COVID-19 education response.

#### **3.3.1. Using mobile phones to support learning**

As of 2020, more than two-thirds of the world's citizens own a mobile phone (Turner, 2020). This number is expected to continue growing, with an anticipated increase of nearly 50% to 7.33 billion devices in 2021. With the proliferation of mobile phones, educators and entrepreneurs are increasingly exploring how these devices can support education provision.

There are three main types of mobile phone, each of which can be used to support distance education:

- **Basic phones:** The original mobile phone, basic phones are not internet enabled. While some basic phones may come with some simple apps installed, these phones are primarily used to make and receive calls and to send SMS messages.
- **Feature phones:** Feature phones generally retain the same form of a basic phone, but are also able to connect to the internet. While the internet is accessible, it is mainly used for web browsing and emailing. Additional applications may be available, but these are fixed during manufacturing.
- **Smartphones:** Like feature phones, smartphones allow users to make and receive calls and SMS messages, and use the internet. However, unlike feature phones, smartphones allow users to install non-native applications above and beyond the original user interface. Smartphones are more powerful, meaning they can support more sophisticated applications than feature phones, process functions at a faster rate, and have additional functionality (e.g., cameras, etc.)

Each phone type can be used to support education service delivery in a number of ways. These are outlined in Table 3.

Table 3. Distance learning modalities and technologies<sup>9</sup>

Modality	Technology	Educational use
SMS and phone calls	<ul style="list-style-type: none"> <li>● Basic phones</li> <li>● Feature phones</li> <li>● Smartphones</li> </ul>	<ul style="list-style-type: none"> <li>● Broadcast messaging on important updates</li> <li>● SMS-based education services</li> <li>● Small group classes convened over phones</li> <li>● Call centres staffed by teachers</li> </ul>
Pre-recorded Audio	<ul style="list-style-type: none"> <li>● Feature phones</li> <li>● Smartphones / Tablets</li> </ul>	<ul style="list-style-type: none"> <li>● Interactive audio / radio instruction programmes</li> <li>● Audiobooks, podcasts, radio dramas, two-way programmes</li> </ul>
Pre-recorded Video	<ul style="list-style-type: none"> <li>● Feature phones</li> <li>● Smartphones / Tablets</li> </ul>	<ul style="list-style-type: none"> <li>● Video instruction programming</li> <li>● Educational television broadcasting</li> </ul>
Web-enabled mobile learning	<ul style="list-style-type: none"> <li>● Feature phones (internet-enabled)</li> <li>● Smartphones</li> </ul>	<ul style="list-style-type: none"> <li>● Electronic teaching and learning materials (e.g., learning packs, M-novels, mobile storybooks)</li> <li>● Use of Open Educational Resources</li> <li>● Virtual web-based teaching and learning groups</li> <li>● Web-based mobile-compatible Learning Management Systems (LMS) and Massive Open Online Courses (MOOCs)</li> <li>● Web-based communication platforms / instant messaging (e.g.,</li> </ul>

<sup>9</sup> This table was adapted from [Adam et al. \(2020\)](#)

		email or Facebook Messenger)
Application-based mobile learning	<ul style="list-style-type: none"> <li>• Feature phones</li> <li>• Smart phones</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Educational apps and games</li> <li>• Virtual app-based teaching and learning groups</li> <li>• App-based Learning Management Systems and MOOCs</li> <li>• App-based communication platforms / instant messaging (e.g., WhatsApp)</li> </ul>

Mobile phones provide an excellent option to support education service delivery in a range of contexts around the world. Widespread access to mobile phones means they provide a good option to support education service delivery during the COVID-19 pandemic and beyond. This has already begun to occur. In March 2020 there was a 90% increase in global educational application downloads compared to the fourth quarter of 2019 (Sydow, 2020).

Alternatively, in areas where access is not as high, phones could be a good investment that can be used not only for education, but also for cross-sectoral development programming. The cost of phones is lower than other devices (e.g., tablets, laptops, etc.). Phones are extremely transferrable and can be leveraged for other development initiatives including the use of mobile money for cash transfer programmes, e-health programmes, or digital citizenship initiatives.

### 3.3.2. The use of phones to support learning during the COVID-19 pandemic

During the COVID-19 pandemic, mobile phones have already been leveraged to support education programming in many different ways. Although these examples are current, they have not yet been evaluated. Despite this, they provide valuable insights into how phones can be used to support education service delivery.

In Bangladesh, the Bangladesh Rural Advancement Committee (BRAC) has been providing remote learning by mobile phone for children in BRAC schools (Chowdhury, Islam and Saltmarsh, 2020). These schools are generally targeted at hard-to-reach children in rural areas and urban slums. Teachers facilitate phone-based classes for groups of approximately 5 children lasting for circa 20 minutes at a time. Approximately 83,000 children in 2,762 schools are currently receiving classes through this initiative. Content delivered by teachers includes psycho-social support, previous lesson revision and ongoing curriculum implementation. Also in Bangladesh, a national call centre is being established to provide support to both teachers and students (Government of Bangladesh, 2020). The call centre will connect over 450,000 teachers with students. Students can call 3336 to ask questions to a teacher from a specific grade and subject. Teachers become eligible to provide support through this platform by completing an online training course.

A recent survey performed by Uwezo (2020) in Kenya identified Whatsapp as the platform that is most favoured by teachers to reach learners during the COVID-19 pandemic. Approximately 70% of schools are using Whatsapp to provide learners with materials and content to support alternative education. Approximately 33% of teachers also used SMS messaging to send content and/or information to students. However, while the survey highlighted that use of Whatsapp by teachers it also indicated that only 27% of students actually accessed content via Whatsapp. This is attributed to challenges including data and connectivity and access to their parents' phones. This indicates that while Whatsapp can provide teachers with an alternative way to distribute content, this alternative approach does not work for all learners and should be deployed in conjunction with other methods.

In India, the use of mobile applications to support learning has grown dramatically. Use of the BYJU'S learning application expanded by more than 6 million users, to approximately 50 million users, in March alone (Sangwan, 2020).<sup>10</sup> The app, which is targeted at students in grades 1–12, mainly focuses on mathematics and science. However, it also provides support for examination preparation across various subjects. Students accessing the application are spending an average of 71 minutes per day on the application. BYJU'S significant growth came after it offered free access to its application, which has traditionally required payment after the first 15 days of usage. Previously, access for K–12 students cost 10,000 Indian Rupees (US\$ 130) per year. While this is well beyond the means of most hard-to-reach children, BYJU'S has shown willingness to provide free or discounted access in times of crisis and may be open to discussions of discounted rates if working with development partners.

### 3.3.3. The use of phones to support learning prior to the COVID-19 pandemic

Evidence of the impact of phone-based education programming — whether in class or at a distance — has been proliferating for some time. Phones can provide students who do not have access to traditional school settings with opportunities to participate in education. While the examples below are focused on phone-based education, some examples are accessible across multiple devices including tablets and computers. This demonstrates the flexibility of designing applications for these devices.

In Kenya, eLimu supports the provision of literacy education to refugees in Dadaab — the third largest refugee camp in the world.<sup>11</sup> eLimu works with local communities to develop digital storybooks that contain locally relevant stories. In Dadaab, eLimu worked with the local communities to identify 20 high-priority local stories. They then recorded refugees telling these stories in their own language (often Somali, but with some resources available in Swahili and English) before having illustrators develop digital storybooks (Rich, 2018). These digital story books were uploaded into the eLimu app, along with literacy-building functionality such as letter tracing and spelling

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<sup>10</sup> For more information on this application see BYJU (n.d.). This information is available at <https://byjus.com/>.

<sup>11</sup> For more information on this programme see eLimu (n.d.). This information is available at <https://e-limu.org/>.

activities. While eLimu is accessible from phones, in this intervention, the app was pre-installed onto tablets as part of BRCK's Kio Kit. The Kio Kit includes solar charging to enable it to be deployed in the most hard-to-reach areas.<sup>12</sup> Outside of this initiative, eLimu also provides learning materials for all students in Kenya. This includes reading support materials and access to previous exams for revision. Access to exam papers is available at the cost of 1 Kenyan Shilling (US\$ .01) per day.

Mobile phones have also previously been used to provide literacy education for children in Pakistan. UNESCO's Literacy Promotion through Mobile Phones project used an SMS-based approach to develop skills amongst 250 urban children. Over a four-month period, participants in the pilot both sent and received text messages that helped to build confidence and competence in basic literacy. The project, which cost less than US\$57 per learner — including the cost of purchasing a mobile phone — demonstrated a significant increase in literacy levels over the four months (Miyazawa, 2009).

### **3.3.4. The potential use of mobile phones as part of Pakistan's COVID-19 education response**

As seen above, mobile phones are a readily available, flexible, low-cost tool that can easily be leveraged to provide distance education experiences. There are also a number of examples of its ability to provide services to those in the most hard-to-reach areas. This includes students who have never previously attended school (like many in Dadaab) and those who have never previously been enrolled (like those in Bangladesh and India).

The interventions mentioned above have been designed to support learning in a specific context. Each application will need to be adjusted to ensure alignment with the local context, including language of instruction, cultural context and digital literacy.

Mobile phones are not a one-size-fits-all solution. To be most effective, a detailed analysis of the target population must be undertaken prior to the commencement of any phone-based initiative. Only by understanding the contextual challenges and opportunities faced by students can mobile phone-based education solutions be deployed in an efficient and effective way. For example, many children in remote areas may not have phones or a connection to the internet. Even in cases where families own phones, a child's access may be limited if adults are using the device for other purposes. Projects targeting these children may have to include the purchase of a device and preloading with relevant content. Alternatively, children who have access to smartphones or other more elaborate devices may not be motivated to engage in learning on a feature phone or via SMS. Phone-based education will be at its most successful when high-quality data is used to inform interventions which specifically target population segments with appropriate technology.

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<sup>12</sup> For more information on the KioKit see BRCK (2020). This information is available at <https://www.brck.com/education/>.

### 3.4. Online learning

This section examines how online learning can be used to provide education services to hard-to-reach children in Pakistan. The section first provides an overview of how online learning can be used to support distance education generally. It then provides two case studies: one in Nepal and one that is applicable on a global scale. After these examples the section provides suggestions on how online learning can be used to support Pakistan's COVID-19 education response.

#### 3.4.1. Using online platforms to support learning

The Global Partnership for Education (GPE) identifies online learning as one of four options that can facilitate learning during school closures due to the COVID-19 crisis (Burns, 2020). UNESCO (2020) identifies the following types of online learning platforms:

- digital learning management systems
- systems built for use on basic mobile phones
- systems with strong offline functionality
- Massive Open Online Courses (MOOCs)
- self-directed learning content
- mobile reading applications
- collaboration platforms that support live-video communication
- tools for teachers to create digital learning content
- external repositories of distance learning solutions

Online learning is also grouped into two broad categories — asynchronous learning and synchronous learning.

- Synchronous learning happens in real time. Online live classroom teaching and video conferencing are some manifestations of synchronous learning.
- Asynchronous learning allows learners to access the same material at different places and different points of times. Learners can decide how fast to progress through materials. An example of asynchronous programmes is using the same e-learning website at different points and times.

Both types of online learning provide distinct opportunities and pose unique challenges for learners. In asynchronous learning, for example, learners may feel isolated or may not receive real-time support which can result in reduced motivation. Meanwhile, synchronous learning requires advanced self-management skills, internet connectivity and access to a suitable device.

#### 3.4.2. The use of online learning to support learners in Nepal

The Open Learning Exchanges's (OLE) E-Pustakalaya programme offers a free and open digital library. The library contains a collection of over 6,000 books, audio books, course content and reference materials. The programme provides children with free and open access to age-appropriate reading materials while also encouraging them to learn

through independent research and inquiry. Students and teachers can freely use these materials both in class and after class.

In addition to the E-Pustakalaya programme OLE designs and develops educational content, which is distributed for free. OLE has also worked with teachers to bring about change in the classroom. OLE's teacher-training approach ensures that teachers with little or no prior experience of technology can gain the skills and confidence necessary for using technology to improve the teaching-learning process. OLE also provides customised technological hardware to under-resourced schools especially in rural Nepal.

The World Bank, the Center for Education Innovations and GPE identified OLE as one of the most innovative EdTech programmes in South Asia (Wodon, 2015; Trucano, 2017). OLE was also a recipient of an MIT J-WEL grant in K-12 Education Innovation. Wodon (2015) reports that OLE has also successfully delivered technology supported education programmes in Nepal during the earthquake 2015.

### **3.4.3. Khan Academy**

Khan Academy is a non-profit education organisation based in California, US. It produces thousands of educational video tutorials, lessons, and learning tools to help students learn across the world. Khan Academy's educational content is available for free on its website, but also on its e-learning app. The material is produced in a number of languages, including Urdu, and is constantly reviewed and updated. Khan Academy has also launched a number of interventions to increase access to its resources in order to benefit students from LMICs.

ICTworks (2016) recommends adapting offline tools to benefit students where there are infrastructure challenges. In line with these suggestions, Khan Academy facilitates and distributes its content for offline use. Khan Academy also allows and supports various organisations around the world to make its content available offline. Kolibri, an educational product of the Learning Equity Organization, has made the content of Khan Academy available offline in a number of LMICs. Kolibri offers tools for self-paced, collaborative learning to provide instant feedback for students and teachers. These tools provide personalised recommendations to enable students to work at their own pace with support from mentors and peers. While Khan Academy will not solve all education challenges in LMICs, studies have shown that the customisation and adaptation of both online and offline learning proved useful and worth trying.

### **3.4.4. The potential use of online learning as part of Pakistan's COVID-19 education response**

There is widespread hope and enthusiasm for online learning. For example, the World Education Forum (Li & Lalani, 2020) advises that online learning can be extremely effective. Banerjee et al. (2016) contend that to benefit students where there are infrastructure challenges, the combination of online and offline versions is greatly



beneficial. In short, policymakers should note the effectiveness of blending both online and offline learning to help maximise the reach of education programmes.

However, it is important to note that, like other modalities, online learning should be considered as part of a broad strategy to reach the hardest to reach learners. Although some countries have impressive general statistics about device ownership when child-level assessments are undertaken the results look different. For example, a recent report by Usawa indicated that only 16 percent of Kenyan children in government schools have access to any kind of digital resources (Uwezo, 2020). Additionally, the ability to learn from digital resources — and the ability to learn independently — appears to be related to socio-economic status. As such, online learning tools should be deployed in strategic ways that ensure the most marginalised learners are not further disadvantaged by their inability to access online resources ([Haßler, 2020](#)).

## 4. Recommendations

Pakistan should adopt a multimodal COVID-19 education response plan that uses various types of technology to reach the greatest number of learners. This response should use existing resources and consider what technology marginalised populations are able to access. Based on this overarching proposal to deliver a multimodal approach, we present the following recommendations.

1. While many different technological modalities are available to support distance learning, the most disadvantaged children will only have limited access to tech, if any access at all. Therefore, low-tech interventions need to be considered. The first priority should be to ensure that children have access to existing printed learning materials that they can use from home.
2. Educational television, mobile phone-learning and online learning should be used in combination to help ensure continuity of learning for children in remote areas and urban slums. As highlighted in the descriptions above, these modalities are also easily accessible for children who are out of school. In Pakistan, significant proportions of the population in both rural and urban areas can access these modalities.
3. Television should be used to support learning outside of the classroom both during and after the current pandemic. The high rate of TV ownership across Pakistan suggests that this mode of education can support students in remote areas and urban slums. Moreover, out-of-school children can continue to access educational television in their homes after schools reopen. Education providers should draw on existing, localised resources such as content from *Teleschool*, *Taleem Ghar* and (where possible) *Sim Sim Hamara*.
4. Mobile phones should be used to support learning both in and outside of the classroom. In Pakistan, mobile phones represent a low-cost tool which children in urban slums, students in remote areas and out-of-school children can access. Teachers can use phone calls, SMS messaging and WhatsApp to help students build foundational skills, revise content and offer psycho-social support. A telephone hotline could also be set up to address the concerns of teachers, students and parents. If students have access to smartphones, education providers should offer a curated list of applications with curriculum-aligned content.
5. Mobile-based interventions should be designed in line with the capacity of marginalised students to access data-intensive online content. Many children in remote areas, for example, may not have access to suitable hardware or connectivity. While interactive applications can be engaging, education providers should prioritise interventions that students can access on basic and feature phones. In some cases, supplying users with phones preloaded with education applications may be necessary. These phones can also be leveraged in other non-education interventions.

6. Education providers should upload resources to an online repository where students can download content for offline use. These repositories should be accessible by anyone with an internet connection. Learners with high technological affordances could download videos to watch offline and to share with their peers who lack connectivity. Education providers can draw on readily available online repositories to support children in the immediate crisis. A comparison of different online repositories can be found in [McBurnie \(2020\)](#).
7. interactive radio instruction, and other forms of radio-based instruction, should not be a priority in the immediate response. While educators have used interactive radio instruction to improve learning outcomes at scale, interactive radio instruction broadcasts will have limited reach in Pakistan due to low rates of radio ownership in rural and urban areas. Even if children could access radio broadcasts, evidence from previous crises suggests learning outcomes remain heavily dependent on ongoing adult supervision.
8. In the medium- to long-term, interactive radio instruction could be used to reach out-of-school children. Education providers could, for example, distribute MP3 players with preloaded audio content. Alternatively, educators could air interactive radio instruction lessons on the radio if data shows that a significant proportion of out-of-school children can access broadcasts on their phone. If education providers pursue an interactive radio instruction programme, they should explore the possibility of adapting existing content from organisations such as Rising Academies.
9. Educational resources need to be adapted to the local context and the needs of marginalised students regardless of the mode of delivery. Content should reflect the language, culture and competencies of target groups. In practice, educators may need to add subtitles in local dialects to television episodes. Alternatively, education providers may need to provide additional scaffolding to help out-of-school children navigate unfamiliar subjects.
10. Regardless of the modality adopted, programme designers should attempt to reuse and re-deploy content wherever possible. This may include replaying the same content on various occasions (e.g. multiple screenings of the same TV shows) or using content designed for one modality on another (e.g. uploading content designed for TV to Youtube). This creates economies of scale and will help ensure that multiple students with access to different modalities will be able to engage with content.
11. Adequate training and support materials should be made available to teachers and caregivers to ensure they can effectively play their role in delivering remote education services. The exact nature of the training / support should be aligned with the modality being leveraged or programme being deployed.
12. The federal ministry and provincial departments of education should ensure that their COVID-19 education plans are aligned, and well coordinated to effectively reach the students most in need. DFID should work with the government to establish a dedicated trans-governmental working group to facilitate the design and roll-out of the COVID-19 response.

13. A robust communication plan should be developed to ensure students, teachers and parents are aware of the tools at their disposal to support learning continuity. DFID may wish to work with the government to support them to ensure that any investments in distance learning modalities receive as high a level of uptake as possible.
14. As with more general education programming, any interventions developed to support COVID-19 should include a robust and agile monitoring, evaluation and research system. The collection, reflection, analysis and evaluation of disaggregated and stratified data will assist in quickly learning and adjusting any distance-learning approach to ensure it meets the needs of students.

## 5. References

- Adam, T., Kaye, T., & Haßler, B. (2020). *The Maldives and Sri Lanka: Question & Answer Session*.
- ASER Pakistan. (2019). *Annual Status of Education Report*.
- Basic Education Coalition. (2020). *Pivot Stories: BEC Members Continue to Meet New Learner Needs during COVID-19*. Basic Education Coalition.
- Batada, A., Banerjee, S., & Subramanian, M. (2016). Opening New Doors: Community Engagement in India. In *The Sesame Effect: The Global Impact of the Longest Street in the World* (pp. 207–229). Routledge. <https://doi.org/10.4324/9781315751399-22>
- BBC. (2012, June 5). *US pulls Pakistan Sesame Street aid*. <https://www.bbc.com/news/world-asia-18329054>
- Boone, J. (2012, June 5). US pulls funding from Pakistan's Sesame Street. *The Guardian*. <https://www.theguardian.com/world/2012/jun/05/pakistan-sesame-street-funding-withdrawn>
- Borzekowski, D. (2015). Sesame street in the tea estates: A multi-media intervention to improve sanitation and hygiene among Bangladesh's most vulnerable youth. *Annals of Global Health*, 81, 107–108. <https://doi.org/10.1016/j.aogh.2015.02.748>
- Borzekowski, D. L. G., Singpurwalla, D., Mehrotra, D., & Howard, D. (2019). The impact of Galli Galli Sim Sim on Indian preschoolers. *Journal of Applied Developmental Psychology*, 64. <https://doi.org/10.1016/j.appdev.2019.101054>
- Borzekowski, D., Lando, A. L., Olsen, S., & Giffen, L. (2019). The Impact of an Educational Media Intervention to Support Children's Early Learning in Rwanda. *International Journal of Early Childhood*. <https://doi.org/10.1007/s13158-019-00237-4>
- BRCK. (2020). *BRCK | KioKit*. <https://www.brck.com/education/>
- Bricklin, J. (2012, June 6). Killing 'Sesame Street' In Pakistan. *Forbes*. <https://www.forbes.com/sites/juliabricklin/2012/06/06/killing-sesame-street-in-pakistan/>
- Burns, M. (2020). *School, interrupted: 4 options for distance education to continue teaching during COVID-19*. <https://www.globalpartnership.org/blog/school-interrupted-4-options-distance-education-continue-teaching-during-covid-19>

- Carlson, S. (2013). *Using Technology to Deliver Educational Services to Children and Youth in Environments Affected by Crisis and/or Conflict*. USAID.
- CGTN. (2020, February 12). *Chinese education authorities to broadcast lessons on television*. <https://www.youtube.com/watch?v=5E2RQIZCLjs>
- Chowdhury, Z., Islam, R., & Saltmarsh, S.-J. (2020). *How BRAC is supporting Bangladesh to continue education in a pandemic*. <http://blog.brac.net/how-bangladesh-is-continuing-education-in-a-pandemic/>
- eLimu. (n.d.). *eLimu | Home*. Retrieved 11 June 2020, from <https://e-limu.org/>
- Fernald, L., Alderman, H., Behrman, J., O’Gara, C., Yousafzai, A., Cabral de Mello, M., Hidrobo, M., Ulkuer, N., Ertem, I., & Iltus, S. (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet*, 378, 1339–1353. [https://doi.org/10.1016/S0140-6736\(11\)60889-1](https://doi.org/10.1016/S0140-6736(11)60889-1)
- Government of Bangladesh. (2020a). *COVID-19 Response and Recovery Plan*. [https://mopme.gov.bd/sites/default/files/files/mopme.portal.gov.bd/notices/c56bd6a7\\_75e3\\_4435\\_bad9\\_fff2f714192/COVID%2019%20Response%20and%20Recovery%20Plan\\_Govt.pdf](https://mopme.gov.bd/sites/default/files/files/mopme.portal.gov.bd/notices/c56bd6a7_75e3_4435_bad9_fff2f714192/COVID%2019%20Response%20and%20Recovery%20Plan_Govt.pdf)
- Government of Bangladesh. (2020b). *Compendium of Social Protection Research in Bangladesh*. The General Economics Division (GED), Bangladesh Planning Commission. <http://socialprotection.gov.bd/wp-content/uploads/2020/03/Compendium-of-Social-Protection-Research-in-Bangladesh.pdf>
- Government of Pakistan. (2018). *Pakistan Education Statistics (2016-17)*. <http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202016-17.pdf>
- Government of Sindh. (2019). *School Educator Sector Plan and Roadmap for Sindh (2019-2024)*. <https://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/pakistan-sindh-esp.pdf>
- Government of the Punjab. (2019). *Punjab Education Sector Plan (2019-2024)*. <https://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/pakistan-punjab-esp.pdf>
- Government of the Punjab. (2020). *Taleem Ghar*. <https://taleemghar.punjab.gov.pk/>
- Hallgarten, J. (2020). *Evidence on efforts to mitigate the negative educational impact of past disease outbreaks*.

- Haßler, B. (2020). Continue or reboot? Overarching options for education responses to COVID-19 in low- and middle-income countries. Zenodo.  
<https://doi.org/10.5281/ZENODO.3753513>
- Haßler, B., Khalayleh, A., & McBurnie, C. (2020). *A five-part education response to the COVID-19 pandemic* (EdTech Hub Helpdesk Response No. 5).  
<https://doi.org/10.5281/zenodo.3756012>
- Ho, J., & Thukral, H. (2009). *Tuned in to student success: Assessing the impact of interactive radio instruction for the hardest-to-reach*. Education Development Center.  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.507.3541&rep=rep1&type=pdf>
- Human Rights Watch. (2018). *'Shall I feed my daughter, or educate her?': Barriers to girls' education in Pakistan*.
- ICTworks. (2016). *What is the Matthew Effect on Khan Academy in India?*  
<https://www.ictworks.org/what-is-the-matthew-effect-on-khan-academy-in-india/>
- Kaliyadan, R. (2012, April 14). Mediamarx: Voice to the Voiceless. *Kheda Communication Project*.  
<http://mediamarx.blogspot.com/2012/04/kheda-communication-project.html>
- Kaye, T., Groeneveld, C., Moss, C., & Haßler, B. (2020). *Nepal "Ask me anything" Session: Responses to audience questions* (EdTech Hub Helpdesk Response No. 13).  
*Kheda Communication Project*. (n.d.).  
<http://ecoursesonline.iasri.res.in/mod/page/view.php?id=116100>
- Kolucki, B., & Lemish, D. (2011). *Communicating with children: Principles and practices to nurture, inspire, excite, educate and heal*. UNICEF.
- Lamba, K., & Reimers, F. (2020). *Sierra Leone and Liberia: Rising Academy Network on air*.  
<https://oecdeditoday.com/wp-content/uploads/2020/05/Sierra-Leone-Liberia-Rising-Academy-Network.pdf>
- Lee, H. J. (2009). *Sisimpur's reach and educational impact: Evidence from a national longitudinal survey of a Sesame Street project in Bangladesh*. Sesame Workshop.
- Li, C., & Lalani, F. (2020). The COVID-19 pandemic has changed education forever. This is how. *World Economic Forum*.  
<https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/>
- Malik, Rabea. (2020). Challenges and opportunities for Pakistan education systems in the COVID-19 response. *The Education and Development Forum*.  
<https://www.ukfiet.org/2020/challenges-and-opportunities-for-pakistan-education-systems-in-the-covid-19-response/>

- Mares, M., & Pan, Z. (2013). Effects of Sesame Street: A meta-analysis of children's learning in 15 countries. *Journal of Applied Developmental Psychology, 34*, 140–151. <https://doi.org/10.1016/j.appdev.2013.01.001>
- McAleavy, T., & Gorgen, K. (2020). *What does the research suggest is best practice in pedagogy for remote teaching?*
- McBurnie, C. (2020). *Technical note on the use of virtual learning environments during the COVID-19 pandemic* (EdTech Hub Helpdesk Request No. 7). <https://doi.org/10.5281/zenodo.3805843>
- McGeown, J., Boisseau, S., & Bohan-Jacquot, S. (2020). *Guidance Note 2: Teacher Resources*. Humanity and Inclusion. <https://inee.org/system/files/resources/IE%20Series%20of%20BRIEFS%20to%20support%20COVID%2019%20%20%23%20%20Teachers%20External%20ENGLISH.pdf>
- McIntyre, N., & Watson, J. (2020). *Rapid Evidence Review: TV*. EdTech Hub.
- Miller, T., Jervis, V., Burns, J., Wongsaroj, S., & Hogg, T. (2015). *Potential benefits from sub-700 MHz spectrum in Pakistan*. GSMA.
- Ministry of Education and Federal Training (Pakistan). (2009). *National Education Policy*. [http://itacec.org/document/2015/7/National\\_Education\\_Policy\\_2009.pdf](http://itacec.org/document/2015/7/National_Education_Policy_2009.pdf)
- Ministry of Education and Federal Training (Pakistan). (2020). *National Education Response and Resilience Plan for COVID-19*. [http://mofept.gov.pk/Sitelimage/Misc/files/0\\_%20NERRP%20COVID-19%20MoFEPT%204%20May%202020%20Ver%2001.pdf](http://mofept.gov.pk/Sitelimage/Misc/files/0_%20NERRP%20COVID-19%20MoFEPT%204%20May%202020%20Ver%2001.pdf)
- Ministry of Federal Education and Professional Training (Pakistan). (2018). *National Education Policy Framework*. <http://mofept.gov.pk/Sitelimage/Policy/National%20Eductaion%20Policy%20Framework%202018%20Final.pdf>
- Ministry of IT & Telecom (Pakistan). (2018). *Digital Pakistan Policy*. <https://www.moitt.gov.pk/Sitelimage/Misc/files/DIGITAL%20PAKISTAN%20POLICY.pdf>
- Miyazawa, I. (2009). *Literacy Promotion through Mobile Phones*. UNESCO. [http://www.unesco.org.pk/education/documents/Project%20Brief%20Paper\\_ICT.pdf](http://www.unesco.org.pk/education/documents/Project%20Brief%20Paper_ICT.pdf)
- Moss, C. (2020). 18 large-scale EdTech initiatives on our radar in 2020. *EdTech Hub*. <https://edtechhub.org/2020/01/22/18-large-scale-edtech-initiatives-on-our-radar-in-2020/>



- Mundy, K., & Hares, S. (2020). Equity-Focused Approaches to Learning Loss during COVID-19. *Center For Global Development*.  
<https://www.cgdev.org/blog/equity-focused-approaches-learning-loss-during-covid-19>
- Munkhzul, A. (2020, March 12). Mongolia leads in organizing TV classes for children. *Montsame (Mongolia)*. <https://montsame.mn/en/read/218635>
- National Institute of Population Studies. (2019). *Pakistan Demographic and Health Survey 2017-18*. <https://dhsprogram.com/pubs/pdf/FR354/FR354.pdf>
- Naz, S., Memon, A., ul Haque, M., Nadeem, U., Jamal, G., & Khan, A. (2016). *Pakistan District Education Rankings*.  
[https://d3n8a8pro7vhmx.cloudfront.net/alifailaan/pages/537/attachments/original/1474368820/Pakistan\\_District\\_Education\\_Rankings\\_2016\\_Full\\_Report.pdf?1474368820](https://d3n8a8pro7vhmx.cloudfront.net/alifailaan/pages/537/attachments/original/1474368820/Pakistan_District_Education_Rankings_2016_Full_Report.pdf?1474368820)
- Okeleke, K. (2019). *The Power of Mobile to Accelerate Digital Transformation in Pakistan*. GSMA.  
<https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/06/The-Power-of-Mobile-to-Accelerate-Digital-Transformation-in-Pakistan-2019.pdf>
- OLE Nepal. (2020). *E-Pustakalaya | Home*. <https://www.pustakalaya.org/en/?lang=en>
- Pakistan Telecommunications Authority. (2019). *PTA Annual Report*.  
[https://www.pta.gov.pk/assets/media/pta\\_ann\\_rep\\_2019\\_27032020.pdf](https://www.pta.gov.pk/assets/media/pta_ann_rep_2019_27032020.pdf)
- Pakistan Telecommunications Authority. (2019). *Telecom Indicators*.  
<https://www.pta.gov.pk/en/telecom-indicators>
- Pasha, H. (2018). *Growth and inequality in Pakistan: Agenda for reforms*.
- Plan International. (2015). *Ebola: Beyond the health emergency* (p. 211). Plan International.  
<https://www.plan.ie/wp-content/uploads/2015/03/GLO-Ebola-Final-IO-Eng-Feb15.pdf>
- Qadir, M. J., & Hameed, A. (2018). A Study of the Usefulness of Punjab IT Labs Project in Schools of Punjab, Pakistan as Perceived by Students. *Journal of Education Research, 21*(2).
- Rich, S. (2018). Teaching literacy to youth in Dadaab. *ELimu*.  
<https://e-limu.org/teaching-literacy-youth-dadaab/>
- Richmond, S. (2020). *Repurposing Established Radio and Audio Series to Address the COVID-19 Educational Crises* (p. 9). Education Development Center.  
<https://www.edc.org/sites/default/files/Repurposing-Established-Radio-Audio-Series.pdf>

- Sangwan, S. (2020). Coronavirus: Edtech unicorn BYJU'S free offer sees 150% jump in new students.  
<https://yourstory.com/2020/04/edtech-unicorn-byjus-students-free-access-coronavirus>
- Schwab, K. (2019). *The Global Competitiveness Report*. World Economic Forum.
- Sesame Workshop. (2020). *Sisimpur | Sesame Workshop*.  
<https://www.sesameworkshop.org/what-we-do/shows/sisimpur>
- Sydow, L. (2020). Mobile Minute: Global Classrooms Rely on Education Apps As Remote Learning Accelerates. *App Annie*.  
<https://www.appannie.com/en/insights/mobile-minute/education-apps-grow-remote-learning-coronavirus/>
- Trucano, M. (2017). 20 innovative edtech projects from around the world. *World Bank Blogs*.  
<https://blogs.worldbank.org/edutech/20-innovative-edtech-projects-around-world>
- Turner, A. (2020). *1 Billion More Phones Than People In The World!*  
<https://www.bankmycell.com/blog/how-many-phones-are-in-the-world>
- Ubongo. (2020). *Results—Ubongo Learning*. <https://www.ubongo.org/results/>
- UNESCO. (2020). *Distance learning solutions*.  
<https://en.unesco.org/covid19/educationresponse/solutions>
- UNESCO, UNICEF, World Bank, World Food Programme. (2020). *Framework for reopening schools*.  
<https://unesdoc.unesco.org/ark:/48223/pf0000373348/PDF/373348eng.pdf.multi>
- UNICEF. (2020). *Education: Giving Every Child the Right to Education*.  
<https://www.unicef.org/pakistan/education>
- USAID. (2020). *Delivering Distance Education in Emergencies: A Review of Evidence and Best Practice*.
- Uwezo. (2020) Are Our Children Learning? The Status of Remote-learning among School-going Children in Kenya during the Covid-19 Crisis. *Usawa Agenda*.  
<https://palnetwork.org/wp-content/uploads/2020/05/Usawa-Agenda-2020-Report.pdf>
- Watson, J. (2020). Learning through television in low-income contexts: Mitigating the impact of coronavirus (COVID-19). *The EdTech Hub*.  
<https://edtechhub.org/2020/03/31/learning-through-television-in-low-income-contexts-mitigating-the-impact-of-covid-19/>

Wodon, Q. (2015). Supporting education in Nepal: Technology that improves teaching and student learning. *Rotary International*.

<https://blog.rotary.org/2015/08/25/supporting-education-in-nepal/>

Wodon, Q. (2015). Technology in the classroom: Learning from OLE Nepal. *Global Partnership for Education*.

<https://www.globalpartnership.org/blog/technology-classroom-learning-ole-nepal>

World Bank. (2005). *Improving Educational Quality through Interactive Radio Instruction*.

<http://documents.worldbank.org/curated/en/288791468035958279/pdf/357420AFRHD05211kit1nov10501PUBLIC1.pdf>