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Learning continuity in response to climate emergencies

Supporting learning continuity following the 2022 Pakistan floods

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Recommended citation

Mazari, H., Baloch, I., Thinley, S., Radford, K., Kaye, T., & Perry, F. (2023). *Learning continuity in response to climate emergencies: Pakistan's 2022 floods* [Technical Report]. EdTech Hub. https://doi.org/10.53832/edtechhub.0135. Available at https://docs.edtechhub.org/lib/42XI4RCK. Available under Creative Commons Attribution 4.0 International, https://creativecommons.org/licenses/by/4.0/.

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Reviewers Laila Friese and Sam Wilson

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Abbreviations and acronyms

EiE	Education in emergencies
IVR	Interactive voice response
INGO	International non-governmental organisation
NGO	Non-governmental organisation
PDNA	Post-Disaster Needs Assessment
PKR	Pakistani Rupees
TLC	Temporary learning centre
TPD	Teacher professional development

Executive summary

Executive summary

With recent research identifying challenges in how existing responses to Pakistan's 2022 floods are supporting learning continuity, we explored **the extent to which EdTech has the potential to improve access to and quality of education through the various phases of response to the floods — in a feasible way with attention to scalability.**

Through the insights of 88 flood-affected parents and teachers (interviewed in October 2022 and January 2023), Education Officers, development partners, and international experts in education in emergencies, we found that:

- **Despite substantial investment in distance learning modalities prior to the floods,** there were gaps in parental awareness about distance learning options, teachers' pedagogical skills and levels of comfort with technology, access challenges created by poverty, unequal infrastructure (across provinces and between urban and rural localities), which could have impacted the feasibility and scalability of distance learning modalities.

- During the different phases of response to the emergency, communities' needs and infrastructural realities keep changing. However, existing responses to support learning have not been able to address these needs at scale. We find that the most **significant barrier to learning continuity is lack of information and coordination**. Even where schools reopened, teachers felt insufficiently supported to address students' varying needs and were not offered the curricular flexibility to do so.

- **To support learning continuity in any future climate emergencies,** we recommend investing in communication and coordination mechanisms and the development of a central database, which can identify linguistically and contextually appropriate content on teaching, learning, and psychosocial support that is shareable via devices to which communities have access.

Context

Capacity context

Parents' literacy skills may impact how they can participate in their children's learning. Many parents are unaware of distance learning options.

There were gaps in teacher training provision before the floods. Teachers vary in their familiarity and level of comfort with integrating digital content into their teaching, highlighting the value of peer networks

Access to EdTech

The gender digital divide impacts access to mobile-based communication and education, and any additional expenses (for high-tech, low-tech, and even no-tech) must be factored into design.

Resource constraints vary between provinces (Balochistan is an outlier). Still, even within Punjab, rural teachers in south Punjab found it difficult to access app-based teaching and learning resources even before the floods.

Contextualising existing approaches

Procurement processes for EdTech (technology and content) can be time-consuming, but a large amount of multimodal content has already been developed.

Parents and teachers favour devices they are already familiar with, including mobile phones (e.g., for using WhatsApp). But if teachers are expected to use their personal mobile phones, content must not require a high volume of storage.

Relief

Challenges

Learners and families are forced to focus on their family's survival needs and do not have equal access to information.

Infrastructural context

Our findings indicated that during the relief phase of emergency response, communities across the country did not have access to technology due to infrastructural damage. Although solar panels can generate energy in the rain, communities reported that they did not do so effectively.

Approach

While prioritising relief efforts through cross-sectoral collaboration, investments in communication plans to provide relief information could indirectly enhance education participation. During this phase, stakeholders should create an inventory of multimodal teaching and learning resources available in local languages.

Recovery

Challenges

Long-term school closures are a reality for many students, but most parents are unable to send their children to temporary learning environments.

Teachers are expected to support learning in low-resource environments with multigrade classrooms, but do not have appropriate materials. There appear to be challenges in distributing appropriate teaching and learning support at scale.

Infrastructural context

In the recovery phase of emergency response, some communities have been able to use solar power for their mobiles. Schools with WhatsApp groups could continue to communicate across the school community.

Approach

Use tech-community know-how to support student retention and facilitate peer networks. During this phase, multimodal teacher training content should be delivered through school networks and made available to enhance TLCs. Consider the availability and scalability of different modalities, along with the availability of appropriate content,.

Remedy

Challenges

As some schools re-open, several challenges could lead to further learning loss and more dropouts.

Teachers are under pressure to support large classrooms of students while running back-to-school campaigns without clear guidance or curricular flexibility. Further, teachers are being given additional responsibilities (e.g., to collect data for the national census across all provinces and to train for the roll-out of a new curriculum in Balochistan).

Infrastructural context

It appears that high-tech devices are being procured during the remedy phase of the emergency response. Some schools are receiving funding to invest in devices, and some teachers have received tablets to support data collection for the national population census.

It is critical to consider that even where school infrastructure has been restored, the impact of the floods on digital infrastructure has resulted in inequitable access to it.

Approach

Use multimodal approaches to support community-based learning while schools are being rebuilt.

Through technology, teachers should receive guidance and support on how to manage classrooms once schools re-open. They also need curricular flexibility to prevent students from falling even further behind. Where devices have been procured, it is critical to consider how they can support teachers in addressing learning loss (e.g., through digital assessments or delivering learning content).

Prepare

Preparing an enabling environment

Pakistan has invested heavily in distance-learning modalities. However, to support learning continuity in future climate emergencies in a feasible and scalable way the country would also benefit from **investing in communication and coordination mechanisms. A central database could help to identify linguistically and contextually appropriate multimodal content on teaching, learning, and psychosocial support that is shareable via mobile phones and other multimodal devices**.

Introduction

Introduction

Pakistan's 2022 floods left one-third of the country submerged in floodwater and destroyed almost 26,000 schools, leaving the most vulnerable at risk of falling deeper into poverty and further behind in education (↑World Bank, 2022; ↑ESWG, 2022).

- While educational technology (EdTech) is not the "most pressing issue… in times of crises" (↑Selwyn, 2021), it can be one part of the response to support flood-affected communities from falling further behind in education — if it is used in a feasible and cost-effective way.

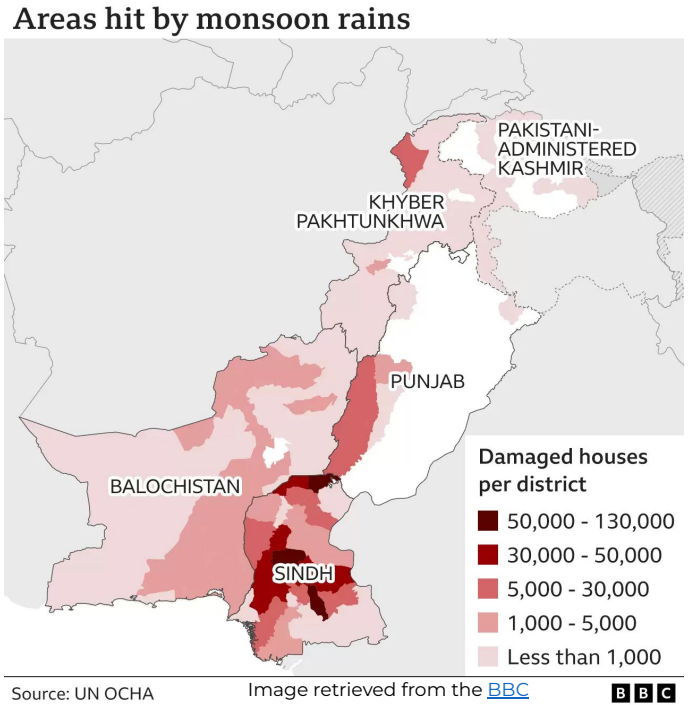
- The Government of Pakistan and its development partners are collaborating to respond to the crisis by addressing basic needs and assessing damage to infrastructure. However, rapid research on the educational response highlights several challenges regarding the reach (↑Barón et al., 2022) and quality of this response (↑Sarwar, 2023; ↑Mazari et al., 2022).

This study builds on national and global evidence on education in emergencies (EiE) with preliminary insights from flood-affected communities in Pakistan to reflect on **the extent to which, and when, it is feasible to use technology at scale to support learning continuity in response to climate emergencies in Pakistan.** It also explores the potential for using technology to improve preparedness for future learning responses.

Background

The impact of Pakistan's 2022 floods

The magnitude of Pakistan's recent floods have compounded marginalisation.



Due to extensive loss of life, livelihoods, assets, and human capital, the national poverty rate is estimated to increase by:

- 3.7 to 4.0 percentage points, affecting the most "vulnerable and marginalised households, with disproportionate impacts on women and girls" (↑Government of Pakistan et al., 2022, p. 46).

The floods have also impacted the ways communities can access education in areas where learning levels and enrolment were already very low (↑Sarwar, 2023) by:

- damaging over 26,000 schools, teaching and learning resources, and digital infrastructure (↑UNICEF, 2022a)

It is currently estimated that (at minimum) an additional one million children could drop out of school and that learning poverty could increase from 75% to 79% as a result of the floods (↑Barón et al., 2022).

Natural disasters pose a risk of compounding Pakistan's learning crisis

Earthquake	Floods	Floods
2005	2010	2022
Destruction	**Destruction**	**Destruction**
3,660 government schools destroyed in Khyber Pakhtunkhwa (↑Andrabi et al., 2020)	**10,348 schools** damaged across Balochistan, Gilgit-Baltistan, Khyber Pakhtunkhwa, Sindh, and south Punjab (↑Alexander, 2011)	**Over 26,000 schools are estimated to have been** damaged or destroyed in Balochistan, Khyber Pakhtunkhwa, Sindh, and south Punjab (↑Government of Pakistan et al., 2022)
Response challenges	**Response challenges**	**Response challenges**
"The Education Cluster focused on the traditional aspects of education (infrastructure, supplies, and teacher training) and gave far less attention to broader protection issues for children," (↑Kirk, 2008)	Despite the response focusing on infrastructure, some schools are still under construction over a decade after the floods. Not enough attention was given to the quality of teachers and best learning practices within the schools. (↑Alexander, 2011)	"The focus on emergency response (...) is largely focused on temporary infrastructure (...) with little attention to how these venues are used by teachers/volunteer teachers and children," (↑Sarwar, 2023)
Learning impact: student learning loss	**Learning impact: student dropouts**	**Estimated learning impact**
Children lost 1.5 to 2 grades worth of learning, which is estimated to reduce their lifetime earnings by 15%. (↑Andrabi et al., 2020)	'The most cited reason for children not returning to school was damage to school infrastructure. (↑Alexander, 2011)	It is estimated that an additional 1 million children could drop out of school, and that learning poverty could increase from 75% to 79% as a result of the floods. (↑Barón et al., 2022)

This timeline includes **large-scale natural disasters in Pakistan, however,** small-scale emergencies frequently impact lives, livelihood, and learning as well.

Lessons from previous responses

1. Child protection should be a part of the educational response.
2. The infrastructure restoral of schools can take years to complete.
3. More attention should be given to quality and best learning practices in Temporary Learning Centres (TLCs).

Responses to the 2022 floods

Cross-sectoral partnerships are being formed to identify and respond to community needs.

The Government of Pakistan partnered with international and non-governmental organisations to conduct the Pakistan Floods 2022: Post-Disaster Needs Assessment (PDNA) (↑Government of Pakistan et al., 2022) to help understand the scale of resources required for recovery and reconstruction by calculating the damage, loss, and needs. They have also prioritised communities' survival needs through forming partnerships across government agencies and with development partners to address health, nutrition, and provide social protection (i.e., cash transfers) (↑Asian Development Bank, 2022).

The education sector's response (↑Government of Pakistan et al., 2022) aims to encourage a holistic approach to relief, recovery, and rehabilitation through:

1. **Establishing temporary learning centres** (TLCs) to provide children with a safe space to access nutrition, health, and hygiene, as well as psychosocial and educational support (in collaboration with the Education Sector, Protection, Shelter and WASH)
2. **Distributing emergency education supplies** (school-in-a-box, student recreational kits, teaching and learning materials) to support learning continuity
3. **Training teachers on psychosocial support and multigrade teaching** in emergencies, and school management committees on psychosocial support and safe reopening of schools.

However, recent research raises concerns that there are several challenges preventing these responses from supporting learning continuity at the required scale.

Key gaps in educational response

As a result of the floods, an additional 1 million children could drop out of school and learning poverty could increase from 75% to 79%. (↑Barón et al., 2022)

What are existing challenges in educational responses to Pakistan's 2022 floods?

Restoring school infrastructure	Enhancing quality of learning	Remedying learning loss
The education response to Pakistan's 2022 floods focuses on infrastructure with little attention to what happens in a learning environment. (↑Sarwar, 2023)	According to parents and teachers, temporary learning centres are difficult to access and do not have age-appropriate learning material. ↑Mazari et al., (2022)	There is an absence of remedial curriculum to address learning loss and concerns whether Pakistan's' school system can absorb children at different levels of learning. (↑Sarwar, 2023)

Have we learned from previous natural disasters?

Restoring school infrastructure	Enhancing quality of learning	Remedying learning loss
Over a decade after Pakistan's 2010-2011 floods, some schools are still under construction. (Ashfaq, 2019, Khan, 2019, as cited in↑Sarwar, 2023)	During the 2010 floods, not enough attention was given to quality and best learning practices in temporary learning centres (TLCs) and schools. (↑Alexander, 2011)	After Pakistan's 2005 Earthquake, most of the learning loss accumulated after children returned to school. (↑Andrabi et al., 2020)

To what extent can EdTech be used to efficiently and effectively help address the student dropouts and learning loss attributed to the 2022 floods?

Despite the magnitude of Pakistan's 2022 floods, there appear to be challenges in responding at scale. *80% of respondents reported that no relief efforts had taken place in their area, only 9% reported that their children attending TLCs, and 4% are using distance learning modalities.* (↑Barón et al., 2022)

To what extent does EdTech have the potential to improve access to and quality of education through the various phases of response to Pakistan's floods — in a feasible way with attention to scalability?

Study design: preliminary insights, approach, and methodology

Preliminary insights

Preliminary insights: our initial approach

This study builds on an existing rapid evidence resource we generated based on initial data collected for the study two months after Pakistan's 2022 floods peaked. Finding that "EdTech in climate emergencies is an area of 'non-knowledge'" (↑Selwyn, 2021), we contextualised existing evidence on EIE, including ↑INEE Minimum Standards for Education (2010) and Save the Children's Ethical Use of EdTech in Emergencies, with qualitative insights from flood-affected parents and teachers to understand **when and to what extent it is feasible to use technology to support learning continuity in response to Pakistan's floods.** We uncovered four potential responses to support learning in such contexts:

Response 1 — **Enhance participation** through communication
Response 2 — **Share teaching and learning content** that can be used at home and to enhance flexible learning environments
Response 3 — **Support flexible learning environments** with multigrade classrooms (including TLCs and community-run centres)
Response 4 — Support teachers to **address learning loss** through multimodal approaches.

For more information on preliminary insights, see ↑Mazari et al., (2022) *Learning continuity in response to climate emergencies: Preliminary insights on supporting learning continuity following the 2022 Pakistan floods.*

Building on what we learnt

Through interviews with flood-affected communities, national stakeholders, and international EiE experts, we refined our approach.

Following interviews with informant, we realised there was a need for a more holistic approach to understanding feasibility and scale:

- **Given the magnitude of Pakistan's floods** and limited funding for response, national stakeholders suggested that a focus on the scalable use of technology (particularly around equity) could help inform more cost-effective decisions around programme design.
- **Save the Children had developed guiding questions for EiE before the Covid-19 pandemic** (↑Tauson & Stannard, 2018). International experts on EiE recommended updating the model to include capacity-building as a separate category.

Through interviewing parents and teachers from flood-affected communities, we realised that addressing the use of technology across the different phases of the floods is essential to fully addressing how:

- **Digital infrastructural contexts and the needs and priorities of communities change over time,** altering the way technology can or should be used for learning continuity.
- **Learning challenges persist over time rather than in particular phases of an emergency.** School infrastructure can take years to restore, and even when schools reopen, many students remain at risk of dropping out.

Our approach to feasibility and scale

Reflecting on the feasibility and scalability of responses

We draw on several resources to define feasibility and scalability.

As mentioned in the previous section, we needed to know more about the feasibility and scalability of EdTech and drew on additional literature on scaling and about the cost-effective use of EdTech:

- We consulted International Development Research Centre's *Scaling Impact* (↑McLean & Gargani, 2019) to define principles for the 'scalable' use of humanitarian interventions, while the Swedish International Development Cooperation Agency's (Sida) *How to define value for money in the humanitarian sector* has been used to consider cost-effectiveness (↑Dross et al., 2013). Since these resources are not specific to the use of technology, we referred to critical post-Covid-19 literature for guidelines on cost-effective investments in EdTech.

- This study's approach to the use of technology has been inspired by:
  a. ↑World Bank et al.'s (2020) 'smart buys', which outline cost-effective investments in EdTech. We used these to rationalise the way this study identifies the use of technology in response to Pakistan's floods.
  b. ↑World Bank et al.'s (2020) *Re-imagining human connections*', which outlines approaches to ensuring EdTech investments focus on scaling education (↑Hawkins et al., 2020).

What is our understanding of scalability?

We synthesised different approaches to create a framework to identify feasible and scalable responses for Pakistan's floods.

Justification

Does technical evidence justify scale ? Do impacted communities desire scale? (↑McLean & Gargani, 2019)

Will the required upfront investment in EdTech be justified by decision-makers? (↑Mitchell et al., 2020b)

Equity

Will implementation leave some children behind? (↑Tauson & Stannard, 2018)

Empowerment

Are there plans to train teachers? Does the response enhance engagement with students? (↑Hawkins et al., 2020)

Have learners and families contributed to response design?

Coordination

Is there adequate coordination in place to connect actors at scale? (↑McLean & Gargani, 2019)

Consideration

Are available resources being allocated across activities effectively? (↑DFID, 2019; ↑Dross et al., 2013).

Are there methods to evaluate effectiveness? (↑McLean & Gargani, 2019)

✅An innovation cannot be scaled unless it can engage successfully with the broader environment in which it will exist (↑McLean & Gargani, 2019)

✅ Considerations of the use of EdTech should focus on **education** and not just on the **technology** (↑Hawkins et al., 2020)

❌Do not assume investments in EdTech and infrastructure (i.e., in digital hardware, textbooks, and buildings) will improve learning. ↑ (World Bank et al., 2020)

Methodology

Assessing the role of EdTech in climate emergencies in Pakistan

We explore the extent to which EdTech can efficiently and effectively help reduce student dropout rates and learning loss attributed to the 2022 floods:

RQ1: To what extent and when is it feasible and scalable to use technology to support learning during climate emergencies in Pakistan?

The focus on feasibility recognises that several contextual factors impact the success or failure of EdTech interventions, particularly in times of crisis and emergencies. The focus on scalability is critical because of the magnitude of the floods and the extent of their impact across Pakistan.

RQ2: How can Pakistan learn from this emergency to prepare better for climate emergencies in the future?

The focus on preparedness allows us to recognise that even though technology was not used to support learning continuity in these floods, we can learn to improve the potential for learning continuity in future emergencies in Pakistan.

Methodology: parents and teachers

We collected data for this study in two stages. In the first stage, we explored tech feasibility during the initial phase of flood relief. Later we explored the extent of learning continuity once some schools reopened.

We collated qualitative data through the following methods:

Stage 1

Phone Interviews with **8** teachers and **8** parents in flood-affected areas

Open-ended WhatsApp voice notes received from **5** teachers and parents in flood-affected areas

Stage 2

Phone Interviews with **11** teachers and **8** parents in flood-affected areas

WhatsApp voice notes received from **49** teachers and parents in flood-affected areas

We conducted semi-structured interviews in phone calls. We delivered open-ended questions via WhatsApp voice notes.

Methodology: two distinct samples of parents and teachers

We used snowball sampling to target flood-affected parents and teachers. We did not re-interview any of the community members across the two stages.

	Stage 1 data collection (October 2022)		Stage 2 data collection (January 2023)		Total
	Parents	Teachers	Parents	Teachers	
Balochistan	3	4	4	5	16
Khyber Pakhtunkhwa	N/A	N/A	22	22	44
Punjab (South)	2	3	2	3	10
Sindh	4	5	4	6	19
Total	9	12	32	36	89

In the first data collection stage, we had no responses from Khyber Pakhtunkhwa. To overcome this challenge in the second stage, we worked with a community member in Khyber Pakhtunkhwa to collect data.

Methodology: key informant interviews and desk review

To supplement community insights, we interviewed stakeholders, including government education officers, development partners, and researchers working in Pakistan. To supplement our desk review of existing global evidence, we interviewed international experts on EiE.

We collated evidence from the following:

Phone Interviews with **6** government education officers, **6** development partners, and **2** researchers

Phone Interviews with **4** international experts on EiE

Desk review of (global and national) evidence on EiE

Desk review of evidence from emergencies in Pakistan

Our approach to defining feasibility and scale

We collected qualitative data in two stages (the first about two months after the floods peaked and the second three months later). This staged and time-based approach shaped our study and allowed us to reflect on multiple elements that could potentially impact the feasible and scalable use of technology to support learning continuity.

- **The implementation context prior to the floods:** We unpack this by comparing evidence on learning continuity in Pakistan during the Covid-19 pandemic with insights shared by flood-affected communities. Although the floods have made access to technology more difficult, there were several considerations (equity and inclusion, capacity, modalities) that could influence decisions to scale EdTech, even before Pakistan's floods.

- **The emergency phases of Pakistan's 2022 floods (relief, recovery, and remedy):** We consider these in terms of the phase-dependent infrastructural reality and the varying roles and needs of learners and families, teachers and school personnel, and systems.

- **The preparedness phase after the floods:** We suggest lessons learnt are used to prepare an enabling environment for learning continuity in future emergencies.

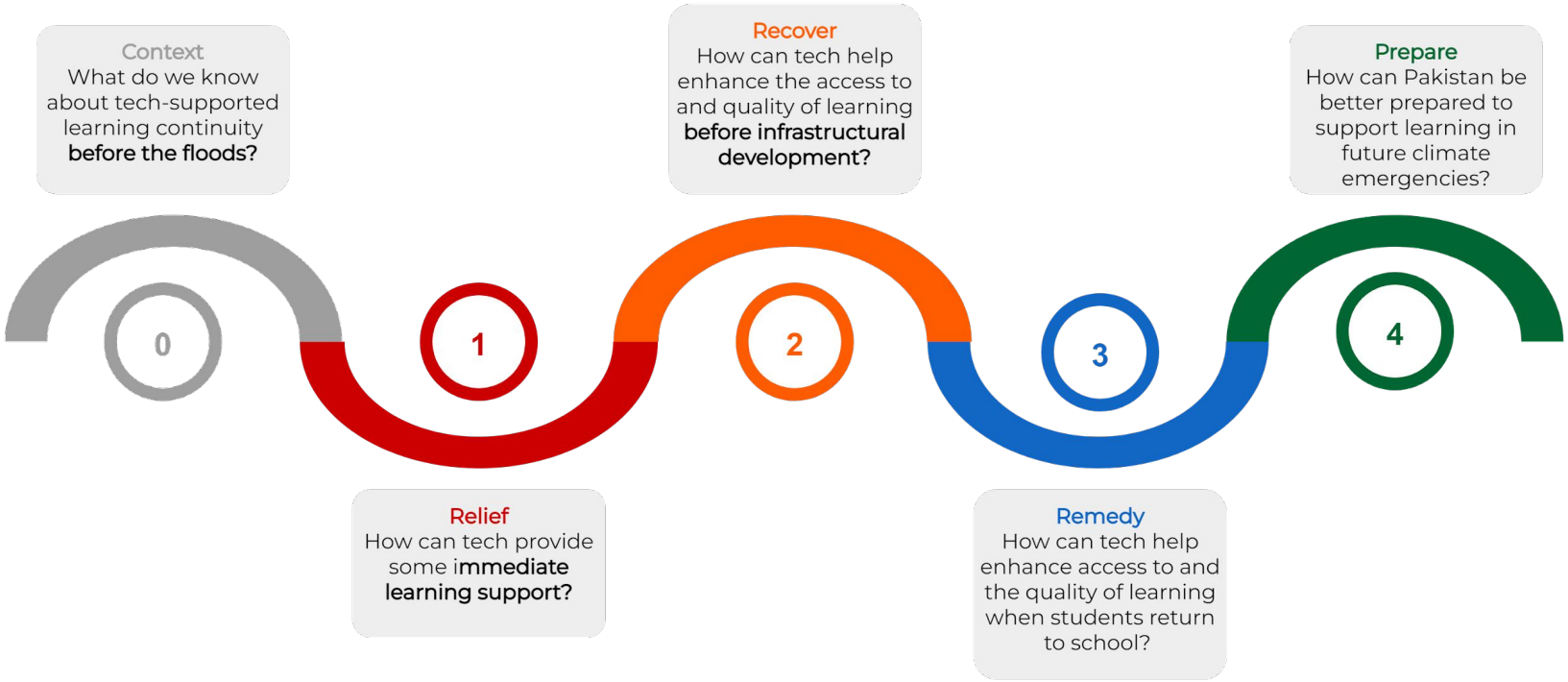
A phased response to supporting learning continuity

A phased response to learning continuity

The different phases of response needed to tackle the emergency of Pakistan's floods present multiple challenges for learners and families, teachers and school personnel, and systems.

- Although EiE literature frequently separates emergency phases into relief, recovery, and preparedness, our data uncovered the need to dedicate a separate phase, *remedy*, to the period when schools start reopening.
- In the subsequent slides, we begin by providing information about the implementation context prior to the floods. While it is critical to consider feasibility from an infrastructural perspective, it is even more important to think about how this infrastructure can effectively and equitably support teaching and learning.
- **To justify how technology can support learning continuity during the first three phases of an emergency** we unpack the varying roles and needs of learners and families, teachers and school personnel, and systems. Using this needs-based approach, we outline different ways technology could be used to empower stakeholders to **enhance participation, share content, enhance flexible learning environments, and remedy learning loss.**
  - It is essential to note that the suggested responses to support learning will not be addressed in explicit ways through each phase (for examples, teachers cannot be expected to address learning loss during the relief phase of an emergency). Instead, we identify ways for stakeholders to do the groundwork required to address the priorities of the next emergency phase.
- The phased approach we recommend then leads to a discussion that focuses on the fourth phase of response to Pakistan's floods: preparedness.

A phased approach



"Post-disaster phases have fuzzy boundaries and recovery phases are better defined by the objectives achieved (...) than by limiting each phase to a specific time period" (↑Contreras, 2016).

Implementation context

Equity and inclusion

What can we learn from the Covid-19 pandemic about the impact of school closures on equity and inclusion?

Evidence from the Covid-19 pandemic	Reflections on response to floods
Internet bundles for streaming digital content are expensive (↑Zubairi et al., 2022).	**Digital access varies depending on gender and poverty.**
Girls' exclusion from regular access to technology was particularly acute for those from the poorest households in rural areas (↑Zubairi et al., 2022).	
Rural parents were more likely to be unaware of digital learning interventions (↑Zubairi et al., 2022).	**Access to information varies depending on whether families are based in urban or rural areas.**
Learning losses are highest in the surveyed districts of Balochistan, followed by Punjab, Sindh, and Khyber Pakhtunkhwa (↑ASER Pakistan, 2021).	**Levels of learning loss vary, depending on province.**

Even with distance education materials in place, Covid-19 led to student dropouts and learning loss. The context of the floods makes it even more difficult to address learning continuity due to the devastating impact on communities' livelihoods and infrastructural access, and less emphasis on distance learning than during the Covid-19 response.

Findings on equity: gender and poverty

Gender considerations

"My phone is buttoned [basic], so it doesn't have WhatsApp. ***My husband uses it [a smartphone], but he is too busy in his shop.****"*
Parent Interview, Khyber Pakhtunkhwa

"Due to no compound or boundary wall, ***teachers and adolescent girls were reluctant to come to school*** *because they could be seen from outside."*
Teacher Interview, Sindh

Implications
The topic of gender only came up twice during our interviews, in reference to technology and physical infrastructure. In terms of physical infrastructure, where schools have reopened, the lack of boundary walls prevents some girls and teachers from attending school, suggesting that these girls could benefit from access to distance learning.

However, access to technology can be more of a challenge for girls. In one household, the male parent has access to a smartphone, while the female parent has a basic phone. In our desk review, we found that in Pakistan, women are 38% less likely to own a mobile phone and 48% less likely to use the internet (↑Zubairi et al., 2022). These realities highlight the importance of **multimodal approaches.**

Poverty considerations

"It is difficult for us to even make a phone call because there is ***huge inflation right now.****"*
Parent Interview, Khyber Pakhtunkhwa

"Parents ***can't afford technology,*** *and most of them only have a basic feature phone — So, it might not be as effective,"*
Teacher Interview, Punjab

Implications
Poverty impacts how households can equitably access no-tech, low-tech, and high-tech learning solutions in multiple ways. According to (↑Barón et al., 2022) the floods destroyed learning resources and tools, including textbooks and pencils, and children go to school unequipped. What is more, many mobile phone users only have basic feature phones.

Whether considering no-tech, low-tech, or high-tech solutions, it is essential to consider **the impact of additional expenses on low-income families.** Even where families have access to mobile phones, the additional expense of phone calls or internet packages can impede access to learning, and hence impact learning continuity.

Findings on equity: province and locality

Provincial considerations

*"Content cannot be delivered. The **infrastructure does not exist, and teachers need to be supported to use technology."***
Teacher Interview, Balochistan

*"**Balochistan is an outlier.** It's different from Punjab. It is a single-room school, the resource constraints... it's actually really troubling."*
Researcher Interview, Pakistan

*"Every school has been given **one tablet per school to measure enrolment.**"*
Teacher Interview, Punjab

Implications
While schools in Punjab have access to tablets for student enrolment data, some areas of Balochistan had limited infrastructure even before the floods. In terms of education, learning losses recorded after the Covid-19 pandemic were highest in the surveyed districts of Balochistan (↑ASER Pakistan, 2021).

This raises the importance of using **multimodal approaches** that align with the implementation context in a particular province and the need to approach learning continuity in an accessible way.

Urban / rural considerations

*"But children might come once the **harvesting season** is over."*
Teacher Interview, Punjab

*"There is **no trend to use technology for teaching**, particularly in rural schools."*
Teacher Interview, Sindh

*"QAED [Punjab's teacher training institute] has developed a very helpful application, but the challenge here is the **unavailability of internet / mobile phone signals**."*
Teacher Interview, Punjab

Implications
Even within provinces (i.e. Punjab) that offered a digital teacher professional development (TPD) portal to teachers before the floods, poor connectivity impacted usage of the portal. One teacher reported feeling "discriminated" by a perceived disconnect between the urban centres of Punjab and the realities of his rural community.

Aside from connectivity, rural communities also have different needs that impact their participation in education; for example, education is often disrupted during the harvesting season. This suggests that programme **design should be flexible to accommodate the participation of rural learners.**

Capacity

What can we learn from the Covid-19 pandemic about capacity?

Evidence from the Covid-19 pandemic	Reflections on flood response
Many parents don't know how to use tech or do not have enough time to support learning (↑Zubairi et al., 2022).	**Parents are likely to have even less time to support learning during the floods.**
[There are] parental concerns about digital content (particularly for girls) being harmful or incompatible with religious beliefs (↑Zubairi et al., 2022).	**Parents need more information about learning opportunities.**
Children who reported relying on family support during school closures had better learning outcomes than children who did not rely on family support (↑ASER Pakistan, 2021).	**Parental involvement in education can lead to higher learning outcomes.**
Approximately 75% of teachers used SMS or WhatsApp to send content or information to students (↑Zubairi et al., 2022).	**Many teachers have familiarity with mobile phones.**
Lack of familiarity with technology may make teachers resistant to using it (↑Zubairi et al., 2022).	

Given that communities are focused on survival, it is important that early responses use tools parents and teachers know how to use.

Findings on capacity

Parents

*"**Parents are not literate** and they do not have time to teach their children."*
Teacher Interview, Punjab

*"During Corona, we did not see any digital platforms or tools used for education purposes — **I had no knowledge of these**..."*
Parent interview, Balochistan

"During the flood, we did not use the phone or online resources to teach our children. The reason for this is that neither the school nor anyone else taught me how to use it for education."
Parent interview, Khyber Pakhtunkhwa

Implications
Families lack time and sometimes literacy skills to support their children's learning. This was a more critical issue in the earlier phases of Pakistan's flood emergency when families focused on their survival needs. Some families had not heard of the distance learning modalities available during the Covid-19 pandemic, indicating that lack of information also hinders capacity. Voice-based mobile communication (i.e. phone calls, voicenotes) with caregivers may be more equitable than SMS, in relation to parental literacy skills.

Teachers

*"They should train teachers. This is the necessity of the time. **We are already lagging behind.**"*
Teacher Interview, Balochistan

*"We know children accept technology quickly, but **teachers need capacity-building and access to devices and digital content.**"*
Teacher Interview, Sindh

"I use Google and I show / share the material that I find online with my students."
Teacher Interview, Balochistan

Implications
Interviews revealed the challenges in delivering teacher training before the floods. In Balochistan, teachers have different levels of comfort with using technology to enhance their instruction. Some teachers integrate digital content into their instruction more fluently, while others feel they need pedagogical capacity-building and improved access to devices and digital content.

Modalities

What can we learn from the Covid-19 pandemic about distance learning modalities?

Evidence from the Covid-19 pandemic	Considerations for flood response
Internet connectivity can be patchy and power outages are common (↑Zubairi et al., 2022).	**Infrastructural damage from the floods has impacted the way individuals can use devices, make phone calls, and stream content.**
About 30% of learners reported lack of access to technology as an obstacle to learning during school closures (↑UNICEF & Viamo, 2021).	
Learning continuity was accessed through: TV (32% rural, 25% urban) Mobile phones (16% rural, 24% urban) Printed packs (10% rural, 13% urban) (↑UNICEF & Viamo, 2021).	**Most parents and teachers interviewed preferred mobile phones for content delivery.**
	Many printed resources have been destroyed by the floods.
	TV is not accessible during the floods.

The flood's devastating impact on infrastructure and livelihood makes accessing learning (through no-tech, low-tech, and high-tech modalities) a greater challenge than it was during the Covid-19 pandemic.

Findings on modalities

Modality considerations

*"WhatsApp is being used when needed. When you need to use it, you open the data package. I **think mobile has replaced TV** — but Facebook is good."*
Parent Interview, Balochistan

*"People **do not listen to the radio** any longer."*
Teacher Interview, Sindh

*"I think the option between Facebook, WhatsApp or SMS; **the best option would be to use WhatsApp**."*
Teacher Interview, Sindh

*"Every school has been given **one tablet that is SIM-enabled.**"*
Teacher Interview, Punjab

Implications
Although mobile phones are recommended widely by flood-affected communities across provinces, many have noted that inflation has made internet access difficult to afford. For this reason, it is essential to consider how multimodal approaches can be utilised to support equitable responses. Access to technology at the school level also varies, for example, schools in Punjab have access to a tablet, while some schools in other provinces do not have access to any devices.

Procurement considerations

*"If the government or any organisation plans to use technology, they should **provide dedicated devices and connectivity if needed**."*
Teacher Interview, Punjab

*"**Procurement permission for technology and digital content is tricky.** There are different actors and institutions involved for reviewing and approving the devices and content. In emergency programmes we can't afford time and resources for lengthy and uncertain responses."*
Development Partner Interview, Pakistan

Implications
Lengthy procurement processes in Pakistan make investing time and resources into new devices difficult during the early phases of emergencies. However, teachers also feel that using their personal devices can pose challenges if much storage space is needed. While indicating the importance of using devices that communities can access, our findings also emphasise the need for content that does not place burdens on teachers' devices.

Devices communities can access

Availability and familiarity with technology should play a major part in selecting tools to deliver learning continuity (↑Crompton et al., 2021).

Mobile phones can be used at every phase of an emergency response in different ways.

- ✅ Low barriers for use; high levels of ownership
- ✅ Success in supporting emergency TPD
- ✅ Most resources available on basic phone

WhatsApp

- ✅ Preferred by communities
- ✅ Requires intermittent connectivity
- ✅ Does not require literacy
- ❌ Requires a smartphone
- ❌ Infrastructural context and internet data costs may impact scale
- ❌ Less access for women

Phone calls

- ✅ Community will not have to pay cost for interactive voice response (IVR)
- ✅ Does not require literacy
- ✅ Opportunities to collect evaluation data
- ❌ Phone calls require constant network coverage and availability

SMS

- ✅ Affordable
- ✅ Does not require a smartphone
- ❌ Requires basic literacy

Modalities and use cases

Modality	Mobile phone	Radio	TV	Tablet
Considerations	✅ Low barriers for use; high levels of ownership ✅ SMS service is affordable ✅ Success in supporting teacher professional development in emergencies ✅ Most resources available on basic phone ❌ Literacy must be considered for SMS	✅ Low-cost of content development ✅ Quick scale-up for community-based learning / TLCs ✅ Low recurrent costs ❌ Low household ownership in Pakistan. (↑NIPS/Pakistan & ICF, 2019) ❌ Lower engagement for individual learning	✅ Supports visual learning ✅ Large screen for learning ✅ Good medium for psychosocial support ❌ Difficult to access for displaced people	✅ Wireless connectivity; solar power ✅ Larger screens; portable ✅ Could be used to address learning loss ✅ More affordable than many smartphones ❌ Cost could make it difficult to scale
Use cases	Kakuma Refugee Camp (Kenya) uses mobile phones (SMS and WhatsApp messenger) to support teacher training.	BRAC's Remote Play Labs uses radio and mobile phones to deliver community activities focused on learning and well-being. ↑UNICEF, 2022b).	Sesame Workshop and the International Rescue Committee developed a social-emotional learning TV programme (↑Kohn et al., 2021).	EdTech Hub's Sandbox with onebillion found that the onetab effectively improves learning outcomes but the current model is too expensive to scale . (↑Schmitt, 2021)
	The Sustainable Development Policy Institute (SDPI) and EdTech Hub found that WhatsApp groups can be used effectively to conduct remedial learning in Pakistan. (↑Adil et al., 2021) Much of the content developed in Pakistan can be accessed over mobile phones.	UNESCO launched an interactive radio instruction (IRI) programme in 19 districts in Pakistan during Covid-19, but information is not publically available on what content was delivered. (↑Zubairi et al., 2022).	The Ministry of Federal Education and Professional Training has procured content from EdTech providers to continue its Teleschool initiative. (↑UNICEF, 2022b)	Much of the content developed by EdTech developers in Pakistan can be accessed over mobile phones or tablets. (↑Zubairi et al., 2022).

Approaches for learning continuity during Pakistan's floods

Phased approach

Findings on digital infrastructure across relief, recovery and, remedy phases

Relief

*"The **mobile network is poor.** There has been no electricity for the last three months."*
Teacher Interview, Balochistan

*"**Even solar systems weren't working as well** because it was cloudy and raining."*
Teacher Interview, Sindh

*There was an **electricity breakdown** here. Wires also were broken or destroyed in the flood water.*
Teacher Interview, Balochistan

Implications
In the relief phase, our findings indicated that communities across the country did not have access to technology due to infrastructural damage.

Although solar panels can generate energy in the rain, communities reported that they did not do so effectively.

Recovery

*"We currently **charge our mobiles using solar panels** or take our battery packs to town to charge them, and then bring [them] home to charge mobile phones and other electronic devices."*— **Teacher, Sindh**

*"We already had **WhatsApp groups, so we used to communicate** with each other through those groups."*
Teacher Interview, Punjab

*"Electricity has not been restored as yet. **We are using solar system.**"*
Teacher Interview, Balochistan

Implications
In the recovery phase, some communities have been able to use their mobiles through solar power. Schools with WhatsApp groups in place were able to continue communication across the school community.

Remedy

*"Our school has just **received a PKR 100,000 grant from a charity to buy PCs** for our IT lab"*
Teacher Interview, Khyber Pakhtunkhwa

*"Our school has **electricity and solar power.**"*
Teacher Interview, Balochistan

*"**Even during the normal situation,** there was no reliable service."*
Teacher Interview, Balochistan

Implications
It appears that high-tech devices are being procured during the remedy phase of the emergency. Some schools are receiving funding to invest in devices, while some teachers have received tablets to support data collection for the national population census.

Phases for learning continuity in emergencies

Relief

At the onset of any emergency, it is important to ensure that learners, families, and teachers are aware of relief and plans for learning continuity. Quickly adaptable technology could play a role in supporting current relief efforts and communicating and coordinating with caregivers and children.

Recovery

During this phase, it is important to take an inventory of what approaches can support returns to school and address learning loss while infrastructural restoration plans are being made (with the consideration that restoration can take an extended period of time). Are any tools available that can be quickly distributed (e.g. distance learning content — tech and non-tech)?

Remedy

During this phase, there is a need to ensure children are returning to school, learning, and being supported to remedy learning loss. It is important to take into account that even while some schools are reopening, many students will still not have access to education.

Prepare

The information and lessons learnt from all the earlier phases can and should inform the planning and preparation for executing learning plans during any future climate emergencies. How can Pakistan build a resilient system that minimises learning loss during climate emergency-induced school closures?

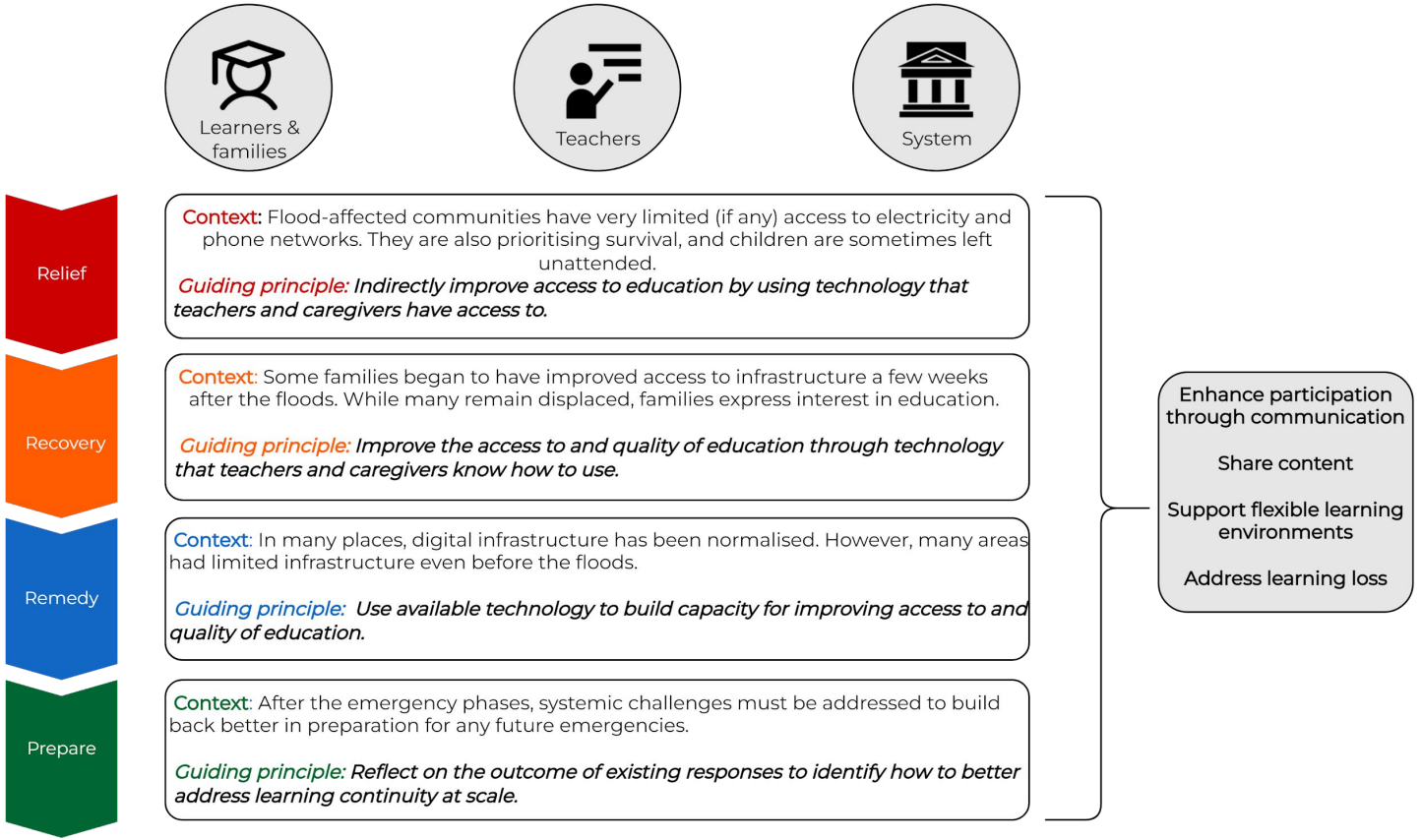
Enhance participation through communication

Share content

Support flexible learning environments

Address learning loss

Infrastructural availability and capacity changes across phases



Guiding principles for using technology to enhance learning responses in the context of each phase of the floods.

Relief

Implications of findings from the relief phase

During the relief stage of Pakistan's floods, it would not have been realistic nor feasible to use methods for learning continuity employed during the Covid-19 pandemic.

Learners and families are under immense pressure to meet their survival needs in the relief period of an emergency. Children are often left unattended while parents try to access relief for the family. There is minimal access to phone networks, and it can be risky to use electricity.

Teachers and school personnel cannot communicate with each other regularly in the relief phase of an emergency. One parent reported: "*Even the teachers were in the same situation. We were all trying to survive.*"

The Government of Pakistan, non-governmental and international non-governmental organisations (NGOs and INGOs) drove efforts to address physiological needs and conduct needs assessments for damage to infrastructure. Funds from other programmes were ringfenced to respond to the floods. During this phase, Government Education Officers were busy tracking damaged school infrastructure.

Without the requisite infrastructure and distance learning materials in place, pre-developed, available, and ready to distribute, **it could be difficult to justify using EdTech for learning continuity during the relief phase of an emergency. However, technology can indirectly support learning by helping communities address their survival needs.**

Findings on the relief phase

Learners and families

*"It might be **difficult to use tech for learning in the rescue phase.** This phase is not just a change of location but a change of mentality."*
Parent Interview, Sindh

*"Parents are struggling to find food and work, so their **children are left unattended** at home."*
Parent Interview

*"**There was an electricity breakdown here. Wires also were broken or destroyed in the flood water**."*
Parent Interview, Balochistan

Implications
Families are under immense pressure to meet their physiological and psychosocial needs. Children are left unattended, with little support for their learning. While this situation highlights the need for child-friendly spaces, our findings reveal that few families were able to access such spaces.

Teachers and school personnel

*"Our **teachers are equally disturbed,** like parents — everyone is disturbed."*
Teacher Interview, Sindh

*"For many days we were **not able to communicate** with them,"*
Teacher Voice Note, Balochistan

*"During the flood, no one from school contacted us. Even the **teachers were in the same situation**. We were all surviving"*
Parent Voice Note, Khyber Pakhtunkhwa

Implications
Only intermittent communication is possible during the relief phase due to damaged infrastructure and because families and teachers alike were in survival mode.

Systems

*"Education was not the first response... the immediate response was to **rescue people and provide them with food and shelter**."*
Development Partner Interview, Pakistan

*"We put our lives in danger by taking pictures of schools that were underwater... **they [the government] had all the data, but we have not received support yet**."*
Education Officer Interview, Sindh

Implications
The government and development partners recognise that addressing food and shelter needs is critical.

Government Education Officers are occupied with tracking infrastructural damage, but some express confusion in how their efforts could lead to provision of relief and support.

Stakeholder needs and roles in the relief phase

During the early stages of a crisis, parents and caregivers are presented with competing priorities and obligations, and as a result, the responsibility of learning is often left with the child (Kizilcec et. al, 2021).

Flood-affected communities

✅Parents should be supported to address family's survival needs

✅Teachers may need access to the contact information for all their students to enable communication once connectivity is restored

❌Parents might not have the time or resources to support distance learning

❌Teachers are part of flood-affected communities and should not overburdened

System

✅ Prioritise relief efforts through cross-sectoral collaboration

✅ Develop communication plans to provide consistent and equal access to information

✅ Coordinate with all stakeholders to update plans for education in emergencies

✅ Take an inventory of existing teaching and learning resources available in local languages

Recovery

Implications of findings from the recovery phase

Learners and families: Schools can take “years to be reconstructed”, making long-term school closures a reality for many students. Parents we interviewed expressed concerns about their young children being unable to access child-friendly spaces, although development partners mentioned that the available spaces predominantly serve primary school children. This raises further concerns since the proportion of children who dropped out of school during the Covid-19 pandemic increased with level of education (↑ASER Pakistan, 2021).

Teachers: Many of the teachers we interviewed felt that even children who attended TLCs did not benefit in terms of their learning due lack of appropriate teaching and learning materials. Teachers felt such challenges made managing large numbers of students with different learning levels more difficult. While some of the teachers we interviewed received some form of psychosocial support training, there appears to be uneven access to psychosocial resources.

Systems: A development partner reported that challenges in ownership have impacted coordination. In his opinion, while development partners are distributing tents and equipment for TLCs, it is the government’s role to allocate teachers and distribute appropriate teaching and learning materials. A researcher found that some psychosocial material being distributed was in English rather than in local languages.

With some infrastructural improvements and appropriate multimodal teaching and learning material pre-developed, available, and ready to be distributed, **it could be feasible to consider using technology that communities can access at the recovery stage of an emergency to support learning continuity.**

Findings on the recovery phase

Learners and families

"How could we send her out [to a TLC]? ***She's too young.****"*
Parent Interview, Khyber Pakhtunkhwa

"It's possible to use tech or focus on learning ***after two or three weeks of displacement.****"*
Parent Interview, Sindh

*"****In our area, there are no TLCs.*** *If any homes are still intact, then we teach our children on our own."*
Parent WhatsApp Interview, Balochistan

Implications
None of the parents we interviewed could access TLCs. Although some development partners mentioned TLCs are "for primary students", parents of young children were concerned about their children's safety. In the recovery phase of the emergency, some of the parents we interviewed believed that it **was** possible to focus on learning continuity.

Teachers and school personnel

"Since ***children didn't have the same curriculum and syllabus****, TLCs probably weren't a useful academic experience."*
Teacher Interview, Sindh

"My ***school had 500 enrolments, but the TLC accommodated 100 children****."*
Teacher Interview, Sindh

*"****Even children who went to TCLs are badly affected.*** *They also had no choice or option available to continue their education."*
Govt. Education Officer Interview, Sindh

Implications
Teachers face multiple issues resulting from lack of age-appropriate learning materials, to teaching in crowded TLC spaces. These challenges make it particularly difficult to manage multigrade classrooms. As a result, teachers and parents alike felt that attending a TLC is not "useful academic experience."

Systems

"Psychosocial material has been sent in [...] ***in English.*** *It's not very clear if they've been used."*
Researcher Interview, Pakistan

*"****TLCs are for primary school students.****"*
Development Partner Interview, Pakistan

"They [the government] ***should allocate teachers in TLCs,*** *if we are not providing teachers then who is?"*
Development Partner Interview, Pakistan

"More or less, it's just ***tents have been provided****, just to make sure that kids get to one place."*
Researcher Interview, Pakistan

Implications
While responses focus on creating spaces for children to gather, there appear to be challenges in distributing appropriate teaching and learning content and allocating teachers.

Stakeholder needs and roles in the recovery phase

In emergencies, coordination between teacher training providers, governmental and non-governmental organisations, and international organisations can be complex (↑UNESCO, 2022).

Teachers

✅ Expected to support learning in low-resource environments with multigrade classrooms

✅Expected to address psychosocial well-being needs of self and learners

✅Expected to communicate with learners and families

System

✅ Continue relief efforts

✅ Allocate teachers and distribute teaching and learning resources

✅ Develop and communicate concrete plans for return to schools

Remedy

Implications of findings from the remedy phase

Long-term school closures could impact learners. Some education officers we interviewed believe it will take several years to rebuild / repair all schools. So there is a need to continue considering approaches to enhance flexible learning environments. However, our data highlights the many reasons beyond infrastructure that could lead to more children dropping out of school.

Where schools have reopened, teachers and school personnel are apparently running 'back-to-school' campaigns, with teachers trying to communicate with families. However, these efforts appear to be on an ad-hoc basis rather than as part of an overall plan. Some of the teachers we interviewed are expecting learners to return to school after they finish supporting their parents in the harvest season.

Even when learners return to school, learning loss, exam pressure, and school expenses may lead to more children dropping out. Some of the learners who have returned to school have illnesses that impact their learning. Teachers are aware of learning loss but report not receiving instructions for catch-up plans. Following their intuition, some teachers reviewed pre-flood lessons before diving into the syllabus. However, this can be challenging in classrooms with a large number of students.

There appear to be no plans to adjust the syllabus at the systems level. One Government Education Officer explained that children would not be officially disenrolled and that technology could, perhaps, be used to send them exams. This anecdotal comment sheds light on how the system continues to focus heavily on exams rather than learning.

With infrastructural availability, teaching guidance materials, and curricular flexibility in place, **it could be feasible to consider using technology communities have access to at the remedy stage to support teachers enhanced participation in education and to address learning loss.**

Findings on the remedy stage

Learners and families

*"**Children were also infected by malaria,** and due to that, many remained absent for many days."*
Teacher Interview, Punjab

*"A few **(students) have completed three lessons, a few have four or five lessons ... . Now there is just one month left to annual examinations!** You [can] imagine what their performance would be like."*
Teacher Interview, Balochistan

*"The exams they conducted had strict marking schemes... **There was a huge learning loss, but instead of showing empathy, they exhibited unkindness to our people."***
Parent interview, Punjab

Implications
Even where schools have reopened, many learners return to school with illnesses and are expected to take their annual exams despite this. Parents and teachers feel the focus on exams "exhibits unkindness".

Teachers and school personnel

*"When you have **200 students**, you just imagine how learning and teaching would happen."*
Teacher Interview, Punjab

*"We had to run a **campaign to bring the children back to school** [...] It took huge effort and time."*
Teacher Interview, Balochistan

*"We **informally evaluated their level of comprehension of what we taught them before.**"*
Teacher Interview, Sindh

*"**Today's training was on the population census**. We're supposed to collect census data on tablets."*
Teacher Interview, Punjab

Implications
In addition to the multiple challenges teachers are facing, they are also expected to support data collection for the national census.

Systems

"This academic year they're implementing the Single National Curriculum. Teachers AND students are struggling to study the textbooks."
Government Education Officer, Balochistan

*"No, **there was no government plan;** it [reviewing previous lessons] was all our own initiative."*
Teacher Interview, Sindh

*"The department is focusing on rehabilitation and reconstruction but **there is little focus on learning recovery or capacity-building.**"*
Teacher Interview, Balochistan

Implications
There is widespread concern that the education response has not supported teachers to remedy learning loss. Further, in Balochistan, the Single National Curriculum is being implemented, increasing the burden on teachers and students.

Stakeholder needs and roles in the remedy stage

To remedy learning, efforts need to be made to provide targeted training for teachers in the content and pedagogy most needed for learning recovery after schools reopen (↑World Bank, 2020).

Teachers

✅ Build capacity to develop technical skills to leverage technology for learning

✅Build virtual communities to enhance motivation and continued participation

✅Remedy learning

System

✅ Provide teacher training for pedagogical and technical skills

✅ Coordinate plans for learning awaiting full infrastructural recovery

✅ Provide guidance on curricular adjustments and tools for managing multigrade learning environments

Prepare

What do our findings tell us about preparedness?

Having triangulated data and insights — from community engagements, expert interviews, and a review of existing literature — the importance of building resilience and capacity before and after emergencies emerges as a key phase for enhancing learning continuity.

Communities fear that the learning disruptions caused by floods are likely to be an ongoing challenge for many. There are concerns that the floods will compound learning loss from earlier emergencies (such as the Covid-19 pandemic and other natural disasters).

Our research highlights a need for **strategic communication and coordination to build resilience and ensure the effective use of technology-enabled solutions in case of future emergencies.** This strategic planning could help overcome the challenge of emergency responses needing to move from no-tech to high-tech very suddenly.

As local conditions change, so do the most effective modes of education delivery and the relevance of educational content. It is, therefore, important to consider how content can be delivered using various devices and how delivery should be flexible to meet the rapidly changing realities of the impacted communities (↑Dahya, 2016).

Guiding Principle: *Reflect on the outcome of earlier responses to identify how to better address learning continuity at scale.*

Findings on preparedness

Learners and families

*"**Every other year there is heavy rain** and then there is a flood."*
Parent Interview, Balochistan

*"**We are losing our next generation.**"*
Teacher Interview, Sindh

*"But I think **we would not be able to rehabilitate or reconstruct all schools;** it would take time and require resources."*
Government Education Officer, Balochistan

Implications
Learning disruptions caused by floods are likely to be an ongoing challenge for many communities. This reinforces the need for investment in multimodal approaches that can be leveraged in future emergencies.

Teachers and school personnel

*"Our school has just received a PKR 100,000 grant from a charity to **buy PCs for our IT lab.**"*
Teacher Interview, Khyber Pakhtunkhwa

*"**The government needs to work on remote solutions.** Until they are part of the system, teachers won't use them."*
Teacher Interview, Sindh

*"There used to be schools run in the afternoon, where **children who were not able to go in the morning or were not performing well also attended these schools to improve their learning.**"*
Teacher Interview, Balochistan

Implications
Some schools are investing in tech after the floods without a clear plan for its use. This highlights the need to share information systematically on how different modalities can be used to enhance learning. Teachers believe that embedding distance learning into the system will improve the likelihood of its usage in future emergencies.

Systems

*"The progression of tech opportunities to support learning throughout the different phases is so valuable. **People jump from no-tech to high-tech very quickly.** How can frameworks be used to select criteria for EdTech providers and content?"*
EiE Expert Interview, United Kingdom

*"In emergency programmes **we can't afford time and resources for uncertain responses.**"*
Development Partner Interview, Pakistan

*"**Procurement permission for technology and digital content is tricky.**"*
Development Partner Interview, Pakistan

Implications
Decision-making around learning continuity in emergencies could benefit from frameworks with effective selection criteria, and equity-focused procurement plans. Pakistan has already invested a lot in distance learning modalities, but we need to know more about what works.

Stakeholder needs and roles in the preparedness phase

It is essential to provide support to parents and teachers, so they can help children sustain their engagement with education and learning during emergency contexts (↑World Bank, 2020).

Community

✅ Caregivers would benefit from providing up-to-date contact information to schools to support communication in emergencies.

✅Communities would benefit from knowing how they can support their children's learning and well-being during school closures and emergencies.

✅ If supported to use distance learning modalities in regular instruction, teachers might be more likely to use them during emergencies, and families may be more likely to support learning.

System

✅Coordination plans and guidelines should be developed to strengthen communication between communities and education officers in emergency situations.

✅There needs to be investment in building the technical capacities of learners and the pedagogical capacities of teachers.

✅ Efforts should be made to develop frameworks to support decisions regarding device and content procurement, and evaluations should be conducted for existing pilot programmes and distance learning content that can be shared via accessible devices.

Using technology through the emergency phases

Stakeholders needs and roles across emergency phases

	Learners & families	Teachers & school personnel	Systems
Relief	Learners and families are forced to focus on their family's survival needs, but do not have equal access to information.	Learners and families are forced to focus on their family's survival need, but do not have equal access to information.	While prioritising relief efforts through cross-sectoral collaboration, the system should develop communication plans to provide information about relief. At this stage, stakeholders should make an inventory of what resources are available in local languages.
Recovery	Long-term school closures are a reality for many students, but most parents are unable to send their children to temporary learning centres.	Teachers and school personnel are expected to support learning in low-resource environments with multigrade classrooms but do not have appropriate teaching and learning materials.	There are challenges in delivering quality education in temporary learning centres — appropriate material (e.g. psychosocial material only appears to be available in English, and there is not enough teaching and learning material) and allocating teachers in TLCs.
Remedy	The children who have returned to school face several challenges that could impact their participation in school and lead to further learning loss. Parents and teachers fear that the pressure of exams will have a significant impact on the future of learners.	Teachers and school personnel report they are running 'back-to-school' campaigns, where teachers communicate with families on an ad-hoc basis. Teachers are trying to review previous lessons, but this is based on their own initiative rather than clear guidance.	Teachers report receiving no guidance on returns to school, training, or adjusting the syllabus. Instead, some Government Education Officers appear to be concerned about conducting exams rather than being encouraged to think about the future of learning.
Prepare	Having triangulated data and insights – from community engagements, expert interviews, and a review of existing literature – the importance of building resilience and capacity before and after emergencies emerges as a key phase of enhancing learning continuity.		

Tech-enhanced response across emergency phases

	Enhance participation	Share content	Support flexible learning environments	Remedy learning loss
Relief	Use **digital tools that communities have access to** to ensure that all stakeholders are informed about **options for relief and learning** (e.g. stipends for school enrolment and options for temporary learning) (↑Mazari et al., 2022)	Psychosocial support content must be delivered through **tools communities already know how to use and have access to** (i.e., WhatsApp, Facebook, phone calls, or SMS). (↑Crompton et al., 2021).	TLCs may focus on relief efforts, but are not accessible to all students or may lack proper learning infrastructure. Make an inventory of available multimodal teaching and learning content that could potentially enhance sessions in TLCs or support community-based learning.	Make a**n inventory** of what material is available to support teachers to address learning loss, and for government officials to make plans for curricular adjustment.
Recovery	**Behavioural nudges** can help retain many students, including girls but is often not enough for families facing greater structural barriers (i.e., financial pressures). (↑Baron & Twinomugisha, 2021) Peer networks should be used to share information on the benefits of education. (↑Ajzenman et al., 2022)	Formalise **digital peer networks** through **devices that teachers and caregivers have access to.** During this phase, it is appropriate to disseminate local language teacher training content through **school networks.** (↑Mendenhall et al., 2018).	Consider how technology can be used to **scale and enhance** support for teachers and community leaders to engage learners. To be most effective, remote learning must allow for **meaningful two-way interaction.** (↑World Bank, 2020)	Make plans for curricular adjustment and deprioritise exams. Identify what tools are available to support with formative assessment or delivery. B**ehavioural nudges to families can lead t**o higher learning outcomes. (↑Orozco-Olvera & Rascon-Ramirez, 2022)
Remedy	Peer networks over Facebook, SMS and WhatsApp can help provide psychosocial support, while helping communities exchange information on the benefits of education. (↑Morris et al., 2021)	Concise resources on pedagogical approaches can be shared via devices teachers already have access to and know how to use and can be **discussed across peer networks.** (↑Crompton et al., 2021).	Infrastructural recovery is a time- and resource-intensive process. The use of **multiple modalities** (phones, TV, tablets, and radio) could be used to **support community-based learning** while schools are being rebuilt. (↑Dahya, 2016) .	Tech can support teachers deliver remedial learning through formative assessments to id**entify learning loss** and also **deliver content** to address learning loss. **WhatsApp or SMS** can be used effectively, but require teacher buy-in and motivation. (↑El-Sefary et al., 2021;↑Adil et al., 2021).
Prepare	Findings from the emergency phases suggest that quality learning continuity has been difficult to deliver due to a lack of coordination and communication during the emergency phases of Pakistan's flood. This study reveals a need to invest in improved communication and coordination to prepare for future emergencies. Developing a central database that identifies linguistically and contextually appropriate multimodal content on teaching, learning, and psychosocial support that can be shared via mobile phones and other multimodal devices could support learning continuity in future climate emergencies in a feasible and scalable way.			

Preparing an enabling environment for learning continuity

What do our findings tell us about scalability?

Justification

After the relief phase, communities are invested in learning **if they can meet their survival needs.**

Communities require access to information across all phases of an emergency and can quickly use peer networks to exchange information, content, and enhance psychosocial well-being.

Equity

Families feel options for learning are inaccessible or lack quality, indicating that **existing responses already exhibit challenges for equity.**

Multimodal options for distance learning already exist across Pakistan and could potentially be used in an equitable way if stakeholders are empowered prior to any future emergency.

Empowerment

Critically, flood-affected teachers appear to face **the greatest burden when schools reopened.** Teachers are expected to re-enrol students and address learning loss without guidance and curricular flexibility. Furthermore, teachers are given additional responsibilities (e.g. to deliver a new curriculum in Balochistan and to collect data for the national census across the country).

Coordination

Many of the challenges of empowering teachers appears to be due to **limited coordination until the restoral of school infrastructure**.

Teachers require guidelines on what to do once schools reopen, and learners deserve options to remedy their learning loss. Without coordination it does not matter whether options are high-tech, low-tech, or no-tech.

Consideration

Stakeholders agree that it is **inappropriate to invest resources into novel responses during an emergency.**

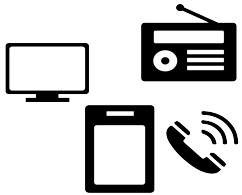
However, Pakistan has invested heavily in multimodal teaching and learning materials. Appropriate existing teaching and learning content should be identified on a database in preparation for future emergencies.

To use EdTech in a scalable and feasible way, we must **consider long-term resource considerations and support parents, caregivers, and teachers with the guidance they need and provide greater access to psychosocial support.**

Long-term resource considerations

Consider leveraging technology solutions to enhance learning continuity across various phases on interventions focussing on learners' varying needs across contexts.

Multiple modalities



✅Optimise the impact of technology interventions through strategic investment in multimodal approaches

✅ Design plans to integrate context-appropriate multimodal approaches for each emergency phase

Addressing issues of access

✅ Allocate government and humanitarian sector resources to address unequal access to technology infrastructure and materials

✅ Prioritise provision of consistent and equal access to information

Leveraging technology to support parents and caregivers

Access to devices and building awareness: Community insights reveal that not all parents and caregivers have access to smartphones and other high-tech devices. Additionally, they are not aware of how devices can be used for teaching and learning. As such, it is important to allocate resources to improve access and build awareness.

Trusted devices: Given the lack of familiarity with technology-enabled solutions for teaching and learning, it is important to leverage technology and platforms that parents and caregivers trust and are familiar with so as to ensure buy-in. Mobile phones can be an effective medium of delivery, but parents and caregivers can be gatekeepers to access (↑Jordan & Mitchell, 2020).

Competing priorities: As illustrated through community insights, during emergency situations, parents and caregivers are confronted with myriad challenges pertaining to survival and livelihood. As they negotiate these challenges, it is important to ensure they are not further burdened by the complexities of supporting learning continuity.

Implementation considerations

✅ Important to use **devices and platforms that are trusted by parents and caregivers**

✅ Prioritise approaches that **do not burden** parents and caregivers, especially during emergencies

✅ Taking literacy levels into account, **voice notes** could be an alternative to SMS communication

✅ **Online safety of children** should be considered and communicated to parents

Leveraging technology to support teachers and school personnel

Training and development: Recognising the multidimensional roles and responsibilities teachers and school personnel play, both within and beyond the classroom, it is important to ensure training and development programmes are targeted and designed with their schedules and availability in mind.

Use of technology: To ensure that the adoption of technology-enabled teaching solutions is seamless and does not burden teachers and school personnel, familiar and easily accessible forms of technology should be prioritised.

Communities of practice and mentoring: Given the rapidly changing nature of technology, there is a need to troubleshoot and develop timely skills. Additionally, it is crucial for teachers, school personnel and other users of technology solutions to be motivated and technically supported. Communities of practice and targeted mentoring present an effective way of providing motivation and support.

Implementation considerations:

✅**Communities of practice** are necessary for effective TPD and can be strengthened by social media platforms

✅ Technology can offer **low-cost and quick ways of providing coaching and mentoring** via-video recorded classroom observations, but **human relationships** underpin the success of technology solutions

✅ **Handheld devices** are cost-effective and also align with teacher preferences

✅ Training and materials should be accessible **asynchronously** to overcome connectivity issues

✅ **WhatsApp groups** can be used to formalise peer learning

Leveraging technology for psychosocial support

Communities: Peer networks can provide structure and improve psychosocial well-being. Given the distress and emotional trauma revealed through community insights, there is a demonstrable need to prioritise the establishment of such networks.

Devices: Simple, easy-to-use technology builds self-esteem and will also enhance adoption. The NGOs MMKN, Save the Children (in India), and Jusoor (with UNHCR and EdTech Hub) used WhatsApp groups to support well-being (↑Tutunji et al., 2020) — these are examples of the use of simple and familiar platforms to provide psychosocial support.

Context: The use of educational software and content can reinforce student identity, which can be empowering during emergency conditions. As it is difficult to develop such software during an emergency, its development should be considered during the prepare phase.

Implementation considerations:

✅ **Telementoring** provides a low-cost solution to support psychosocial wellbeing.

✅ Supporting the psychosocial well-being of parents can also have a positive impact on **parental involvement in children's education**

✅ Partnerships with international experts and government agencies and accelerating support

✅ Evaluation of support can be conducted through phone-based surveys

Conclusion

Education in climate emergencies

During the **relief phase** of Pakistan's floods, technology that communities have access to can be used to share information about available options for relief and learning. Linguistically appropriate content must be delivered through tools communities already have access to and know how to use. An inventory of available multimodal teaching and learning content for the recovery phase should be made.

During the **recovery phase** of Pakistan's floods, tech communities' know-how should be used to support student retention and facilitate peer networks. At this stage, teacher training content should be delivered through school networks. Available modalities which can be scaled in the remedy phase should be considered alongside appropriate content.

During the **remedy phase** of Pakistan's floods, available technology can be used to build community capacity. Consistent efforts must be made to enhance student retention, while teachers require guidance and support on what to do when schools reopen. With curricular flexibility, tech can support teachers with remedying learning loss.

During the **prepare phase**, there is much to learn from responses to the current flood emergency. Communities are invested in learning **if** they can meet survival needs, but don't have access through existing responses. Pakistan has invested heavily in distance modalities, but would benefit from investing in a central database to identify appropriate multimodal teaching and learning content.

For policy guidance see ↑Mazari et al. (Forthcoming). **For examples of how supporting learning continuity is being supported in other contexts,** see this document's Annex.

References

References

These references are available digitally in our evidence library at https://docs.edtechhub.org/lib/42XI4RCK

ASER Pakistan. (2021). *Annual Status of Education Report. ASER-Pakistan 2021*. ASER Pakistan Secretariat & Idara-e-Taleem-o-Agahi. http://aserpakistan.org/document/aser/2021/reports/national/ASER_report_National_2021.pdf. (details)

Adil, F., Nazir, R., & Akhtar, M. (2021). *Investigating the Impact on Learning Outcomes Through the Use of EdTech During Covid-19: Evidence from an RCT in the Punjab province of Pakistan* (Working Paper No. 41). EdTech Hub. https://doi.org/10.53832/edtechhub.0067. Available from https://docs.edtechhub.org/lib/FSVST5BF. Available under Creative Commons Attribution 4.0 International. (details)

Alexander, J. (2011). *Education Cluster in Pakistan – Lessons Learned: Flood Response*. UNICEF Global Development Commons. https://gdc.unicef.org/resource/education-cluster-pakistan-lessons-learned-flood-response. (details)

Amenya, D., Fitzpatrick, R., Page, E., Naylor, R., Jones, C., & McAleavy, T. (2020). *Maintaining learning continuity during school closure: Community Health Volunteer support for marginalised girls in Kenya.* Education Development Trust. https://www.educationdevelopmenttrust.com/our-research-and-insights/research/maintaining-learning-continuity-during-school-clos. (details)

References

Andrabi, T., Daniels, B., & Jishnu, D. (2020). *Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005*. UKAID, Australian Aid, Gates Foundation, and Oxford Policy Management. https://riseprogramme.org/sites/default/files/2020-11/RISE_WP-039_Adrabi_Daniels_Das.pdf. (details)

Asian Development Bank. (2022, August 31). *$3 Million ADB Grant to Support Pakistan's Flood Response* [Text]. Asian Development Bank. https://www.adb.org/news/3-million-adb-grant-support-pakistan-flood-response. (details)

Bailey, R., Raisch, N., Temko, S., Titus, B., Bautista, J., Eniola, T. O., & Jones, S. M. (2021). Innovations in Social and Emotional Learning Research and Practice: Building from Evidence and Applying Behavioral Insights to the Design of a Social and Emotional Learning Intervention in Northeast Nigeria. *International Journal of Environmental Research and Public Health*, *18*(14), 7397. https://doi.org/10.3390/ijerph18147397. Available from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8304789/. (details)

Barón, J. D., Bend, M., Roseo, E., & Farrakh, I. (2022). *Floods in Pakistan: Human Development at Risk* [Special Note]. World Bank. http://hdl.handle.net/10986/38403. (details)

Beam, E., Mukherjee, P., & Navarro-Sola, L. (2022). Lowering Barriers to Remote Education: Experimental Impacts on Parental Responses and Learning. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4234910

Contreras, D. (2016). Fuzzy Boundaries Between Post-Disaster Phases: The Case of L'Aquila, Italy. *International Journal of Disaster Risk Science*, *7*(3), 277–292. https://doi.org/10.1007/s13753-016-0095-4. (details)

References

Crompton, H., Burke, D., Jordan, K., Wilson, S., Nicolai, S., & Myers, C. (2021). *EdTech and Emergency Remote Learning: A Systematic Review* [Systematic review]. EdTech Hub. https://doi.org/10.5281/zenodo.5651932. Available under Creative Commons Attribution 4.0 International. (details)

DFID. (2019). *VfM Guidance: The 4th E Equity External Version*. Department for International Development. https://www.ukaiddirect.org/wp-content/uploads/2021/02/Equity-and-VfM-Guidance-2019_FCDO_EXTERNAL.pdf. (details)

Dahya, N. (2016). *Education in Conflict and Crisis: How Can Technology Make a Difference? A Landscape Review*. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. https://www.eccnetwork.net/sites/default/files/media/file/GIZ%20InDesign-Vorlage%20fu%CC%88r%20Publikationen%20%E2%80%93%20DIN%20A4%20hoch.pdf. (details)

Dross, E., Baker, J., Polastro, R., & Shah. (2013). *How to Define and Measure Value for Money in the Humanitarian Sector ?* https://www.sida.se/en/publications/study-how-to-define-and-measure-value-for-money-in-the-humanitarian-sector-final-report. (details)

ESWG. (2022). *Pakistan Floods: Education Snapshot – 30 September 2022 – Pakistan | ReliefWeb*. https://reliefweb.int/report/pakistan/pakistan-floods-education-snapshot-30-september-2022. (details)

Government of Pakistan, Asian Development Bank, European Union, United Nations Development Programme, & World Bank. (2022). *Pakistan Floods 2022: Post-Disaster Needs Assessment*. https://reliefweb.int/report/pakistan/pakistan-floods-2022-post-disaster-needs-assessment. (details)

References

Hassan, H., Islam, A., Siddique, A., & Wang, L. C. (2022). *Telementoring and homeschooling during school closures: A randomized experiment in rural Bangladesh* [Preprint]. SocArXiv. https://doi.org/10.31235/osf.io/mhyq5

Hawkins, R., Trucano, M., Cobo, C., Twinomugisha, A., & Ciarrusta, I. S. (2020). *Reimagining Human Connections : Technology and Innovation in Education at the World Bank*. World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/829491606860379513/reimagining-human-connections-technology-and-innovation-in-education-at-the-world-bank. (details)

INEE. (2010). *INEE Minimum Standards for Education: Preparedness, Response, Recovery*. Inter-agency Network for Education in Emergencies (INEE). https://inee.org/resources/inee-minimum-standards. (details)

Jordan, K., & Mitchell, J. (2020). *Messaging Apps, SMS, and Social Media: A Rapid Evidence Review* (Rapid Evidence Review No. 8). EdTech Hub. https://doi.org/10.5281/zenodo.4556938. Available from https://docs.edtechhub.org/lib/XHBPFYVC. Available under Creative Commons Attribution 4.0 International, Open Access. (details)

Kimathi, D., El-Serafy, Y., Plaut, D., & Kaye, T. (2021, July 16). The Importance of Caregiver Engagement in Supporting Learning. *EdTech Hub*. https://edtechhub.org/2021/07/16/keeping-kenya-learning-the-importance-of-caregiver-engagement-in-supporting-learning-beyond-the-classroom/. (details)

Kirk, J. (2008). *Building back better: post-earthquake responses and educational challenges in Pakistan*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000163575/PDF/163575eng.pdf.multi. (details)

References

Kohn, S., Foulds, K., Cole, C., Matthews, M., & Hussein, L. (2021). Using a Participatory Approach to Create SEL Programming: The Case of Ahlan Simsim. *Journal on Education in Emergencies*, *7*(2), 288. https://doi.org/10.33682/hxrv-2g8g. Available from https://archive.nyu.edu/handle/2451/63543. (details)

Mazari, H., Baloch, I., Thinley, S., Kaye, T., & Perry, F. (2022). *Learning continuity in response to climate emergencies: Preliminary insights on supporting learning continuity following the 2022 Pakistan floods* [Evidence review]. EdTech Hub. https://doi.org/10.53832/edtechhub.0134. Available from https://docs.edtechhub.org/lib/IHTU7JRT. Available under Creative Commons Attribution 4.0 International. (details)

Mazari, H., Baloch, I., Thinley, S., Radford, K., Perry, F., & Kaye, T. (Forthcoming). *Learning continuity in response to Pakistan's 2022 floods: Policy brief* [EdTech Hub Policy briefing]. EdTech Hub. https://doi.org/10.53832/edtechhub.0160. Available from https://docs.edtechhub.org/lib/333BJPIR. Available under Creative Commons Attribution 4.0 International. (details)

McLean, R., & Gargani, J. (2019). *Scaling Impact; Innovation for the Public Good*. (details)

Mitchell, J., Ashlee, A., Clericetti, G., Gladwell, J., & Torrance, R. (2020). *Education in Emergencies: A Rapid Evidence Review* (Rapid Evidence Review No. 7). EdTech Hub. https://doi.org/10.5281/zenodo.4556940. Available from https://docs.edtechhub.org/lib/ZPTMAP5C. (details)

NIPS/Pakistan, N. I. of P. S.-, & ICF. (2019). *Pakistan Demographic and Health Survey 2017–18*. https://dhsprogram.com/publications/publication-fr354-dhs-final-reports.cfm. (details)

References

Orozco-Olvera, V., & Rascon-Ramirez, E. G. (2022). *Improving Enrollment and Learning Through Videos and Mobiles: Experimental Evidence from Northern Nigeria by Victor Orozco-Olvera, Ericka G. Rascon-Ramirez :: SSRN*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4221220. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4221220. (details)

Sarwar, M. B. (2023). *Towards a Resilient Education Recovery from Pakistan's Floods: Rapid Response Research*. Malala Fund & Pakistan Coalition for Education. (details)

Schmitt, L. (2021, August 17). Scaling Personalised Learning Technology in Malawi. *EdTech Hub*. https://edtechhub.org/2021/08/17/scaling-personalized-learning-technology-in-malawi-lessons-from-our-sandbox-with-onebillion/. (details)

Selwyn, N. (2021). Ed-Tech Within Limits: Anticipating educational technology in times of environmental crisis. *E-Learning and Digital Media*, *18*(5), 496–510. https://doi.org/10.1177/20427530211022951. (details)

Tauson, M., & Stannard, L. (2018). *EdTech for Learning in Emergencies and Displaced Settings: A rigorous review and narrative synthesis*. Resource Centre. https://resourcecentre.savethechildren.net/node/13238/pdf/edtech-learning.pdf. (details)

Tutunji, S., Boujikian, M., Carter, A., & Atkinson, G. (2020). *Jusoor's WhatsApp-Assisted Learning Programme: Sprint Review 1*. (EdTech Hub Sprint Review). https://docs.edtechhub.org/lib/NBWSSFLK. (details)

UNESCO. (2022). *Crisis-sensitive teacher policy and planning*. UNESCO, Norad, GPE, UNHCR, UNICEF, the World Bank, International Labor Organisation, International Task Force on Teachers for Education. (details)

References

UNICEF. (2022a). *Schools for more than 2 million children in Pakistan remain inaccessible due to devastating floods – UNICEF*. https://www.unicef.org/press-releases/schools-more-2-million-children-pakistan-remain-inaccessible-due-devastating-floods. (details)

UNICEF. (2022b). *The role of remote modalities in implementing mental health and psychosocial support programs and services in the education sector*. (details)

UNICEF, & Viamo. (2021). *Brief on learning continuity amidst COVID-19 school closures in Pakistan*. UNICEF Regional Office for South Asia (ROSA). https://www.unicef.org/pakistan/media/3761/file/Pakistan%20Brief%20on%20learning%20continuity%20amidst%20COVID19.pdf. (details)

World Bank. (2020). *The COVID-19 Pandemic: Shocks to Education and Policy Responses*. World Bank. https://doi.org/10.1596/33696. Available from http://elibrary.worldbank.org/doi/book/10.1596/33696. (details)

World Bank. (2022). *Pakistan's Floods are Deepening its Learning Crisis*. https://blogs.worldbank.org/endpovertyinsouthasia/pakistans-floods-are-deepening-its-learning-crisis. (details)

References

World Bank, FCDO, & BE2. (2020). *Cost-effective approaches to improve global learning: What does recent evidence tell us are "Smart Buys" for improving learning in low- and middle-income countries? Recommendations of the Global Education Evidence Advisory Panel*. World Bank, FCDO, BE2. https://documents1.worldbank.org/curated/en/719211603835247448/pdf/Cost-Effective-Approaches-to-Improve-Global-Learning-What-Does-Recent-Evidence-Tell-Us-Are-Smart-Buys-for-Improving-Learning-in-Low-and-Middle-Income-Countries.pdf. (details)

Zubairi, A., Khalayleh, A., Baloch, I., Mazari, H., Kaye, T., & Groeneveld, C. (2022). *Pakistan Digital Learning Landscape Analysis* [Technical Report]. EdTech Hub. https://doi.org/10.53832/edtechhub.0093. Available from https://docs.edtechhub.org/lib/HEXCEXFK. Available under Creative Commons Attribution 4.0 International. (details)

Annex: Use cases

Supporting parents and caregivers

✅ Important to use **devices and platforms that are trusted by parents and caregivers**
✅ Prioritise approaches that do not burden parents and caregivers, especially during emergencies
✅ Take literacy levels into account — **voice notes** could be an alternative to SMS communication
✅ **Online safety of children** should be accounted for and communicated to parents

Example

Keep Kenya Learning (KKL) developed a programme for caregivers through curating resources **delivered over TV and SMS**. Ninety-two per cent of caregivers were able to access all or most educational resources on their phone, and 70% correctly recalled phone safety tips and good practices (↑Kimathi et al., 2021). The project had three main objectives: **1) to build awareness about learning at home**, **2) provide guidance on the caregiver role in supporting students at home,** and **3) increase access to resources to promote learning at home.**

Supporting teachers by leveraging familiarity and convenience

✅Communities of practice are necessary for effective TPD and can be strengthened by social media platforms

✅ Technology provides cheap and quick ways for coaching and mentoring via video-recorded classroom observations

✅ Handheld devices are cost-effective and also align with teacher preferences

✅ Human relationships underpin the success of technology solutions such as the use of hand-held devices

Teacher professional development in low- and middle-income countries

↑Hennessy et al., (2022) examine diverse forms of technology-mediated teacher monitoring and training that have been found to be effective for teacher learning and identify five key areas where technology support can be most effective: 1) Supporting virtual coaching and coaches; 2) Fostering remote communities of practice; 3) Developing teachers' reflective skills; 4) Improving teachers' pedagogical subject content knowledge; 5) Providing flexible learning environments. The research notes the value addition of portable devices. In addition to having lower per-unit costs, these portable devices are recognised for their versatility compared to personal desktop computers, as they can be shared among colleagues to enable more flexible access. Hand-held devices can bridge accessibility gaps and reduce inequalities by providing greater access to teacher learning in remote / rural areas, enabling marginalised voices and enhancing agency. ↑Hennessy et al., (2022) also found that technology provides cheap and quick ways for coaching and mentoring via video-recorded classroom observations. This use of technology can be further optimised by leveraging technology-enabled social media platforms, such as Facebook and WhatsApp, to support teachers within and across countries to form remote communities of practice, share resources, and build knowledge.

Delivering teacher professional development (TPD)

✅ Training and materials should be accessible **asynchronously** to overcome connectivity issues

✅ **WhatsApp groups** can be used to formalise peer learning

Example

M-mentoring (mobile mentoring), prototyped in Kakuma Refugee Camp in Kenya, uses **mobile phones (SMS and WhatsApp messenger) to support teacher training.** Teachers received instructional support tips and motivational quotes about classroom management. **Text messaging proved successful in leveraging human resources,** increasing the effectiveness of teacher training, connecting teachers to people and resources outside of their local settings, and providing real-time data about what is and isn't working in the classroom (↑Dahya, 2016).

Remedying learning loss

✅ Important to use **devices and platforms that are trusted by parents and caregivers**

✅ Prioritise approaches that do not burden parents and caregivers, especially during emergencies

✅ Take literacy levels into account — **voice notes** could be an alternative to SMS communication

✅ **Online safety of children** should be accounted for and communicated to parents

Example

Remote Learning (Botswana) rolled out a 30-day low-tech remedial intervention for one hour a day to improve numeracy skills for primary-aged children across 10,000 households in Botswana. All learners received a weekly SMS message with a mathematics problem and, where possible, a weekly 15–20 minute phone call and regular follow-up calls to check progress and understanding with learners and their parents / caregivers (↑UNICEF & World Bank, 2022). Facilitators were trained over WhatsApp.

Messaging to increase learning outcomes

✅SMS acts as a nudge to direct instruction via phone

❌ Although accessible through simple phones, SMS interventions require literacy

❌ Increasing participation through messaging does not necessarily lead to learning outcomes

✅ Learning outcomes can be enhanced by pairing complementary interventions

✅ Messaging interventions need to account for socio-economic inequalities

Botswana

↕Angrist et al., (2020) present evidence to suggest that leveraging SMS messages and phone calls for direct instruction and communication provides a cost-effective and scalable solution for education delivery and also garners significant parental engagement. SMS messages alone were found to be less effective at producing learning gains than the combination of phone calls and SMS messages.

Bangladesh

↕Beam et al., (2022) studied an informational text message campaign during Covid-19 school closures in Bangladesh and found that providing information about a free online learning platform increased student numeracy scores. However, this impact was only concentrated among wealthier households, Pairing messages with additional teacher support through phone calls was found to be a more effective solution to deliver more equitable improvements in learning outcomes.

Remedying learning loss: example from Pakistan

✅ Fear of additional burden can reduce school personnel buy-in

❌ Lack of teacher buy-in will lead to lack of learner compliance

✅ Use technology communities already know how to use

❌ The cost of mobile data packages can limit access for learners from low-income households

Example

EdTech Hub and SDPI explored the effectiveness of delivering TaRL over WhatsApp to reach marginalised learners in south Punjab (↑Adil et al., 2021). Over WhatsApp, students received a learning problem, a recorded video to solve the problem, and a short quiz.

Example

Harvard University and CERP are researching a pilot of a "Targeted Instruction Programme" (TIP) in Islamabad (study funded by EdTech Hub). Teachers use the mobile-based tool to record student assessment scores and are supported to separate children by their learning levels.

Remedying learning loss: example from Pakistan

✅ Make use of existing pilot programmes

✅Utilise multimodal approaches and prioritise accessibility features such as offline functionality

✅ Leverage strategies and partnerships with cross-sectoral players

❌ Will require parents / teachers to understand how to use solution

Example: Knowledge Platform

Through Knowledge Platform, one laptop in a school is pre-loaded with digital lessons including those that align with federal / provincial curricula. An accompanying assessment dashboard allows teachers to identify learning gaps in classrooms with high student-teacher ratios. The platform also makes personalised learning easily available at home over mobile phones with offline functionality through Learn Smart Pakistan. The platform partnered with Jazz and the Federal Directorate of Education to pilot an intervention targeting girls' schools in Islamabad.

See https://www.knowledgeplatform.com/ and https://jazz.com.pk/ Retrieved 21 March 2023

Example: SABAQ / MUSE

SABAQ produces digital videos and content and uses a multimodal deployment approach. For instance, the MUSE app, developed in collaboration with the School Education and Literacy Department in Sindh, can be used offline, online, or with partial connectivity. Online content is available over an Android app or a browser, while offline content is available over the Muse Smart Kit through LCD / LED TVs. User feedback is incorporated regularly.

See https://sabaq.pk/ Retrieved 21 March 2023

Psychosocial support: telementoring

✅ Telementoring provides a low-cost solution to support psychosocial well-being

✅ Particularly impactful during times of school closures

✅ Can also have a positive impact on parental involvement in children's education

Bangladesh

↑Hassan et al. (2022) studied the impact of telementoring and homeschooling during school closures in a randomised control trial in 200 Bangladeshi villages.

- Over-the-phone mentoring delivered by volunteer mentors to primary graders and their mothers in a low-resource setting significantly improved the learning outcomes of children by as much as 0.75 SD.
- Phone mentoring also increased mothers' involvement in their education.
- The total monetary cost of this intervention was USD 8,094 which was spread across 419 children who received the treatment, resulting in a cost per child of less than USD 20.

Psychosocial support: example from Pakistan

Pakistan

Rozan, an Islamabad-based NGO, provides psychosocial support and counselling to communities. Its hotline was developed in 2001, in partnership with John Hopkins University. Rozan first began working in emergency contexts during Pakistan's 2005 earthquake and continued to support communities during other national emergencies, including the 2010 floods. During the Covid-19 pandemic, Rozan expanded its reach by offering psychosocial support to communities over the phone, with a focus on women and girls at risk of gender-based violence. Its internal evaluation found that:

✅ More women than men were reached through the intervention; this was perhaps due to the use of multimodal approaches to share content

✅Partnerships helped implementation. Psychosocial content was developed in partnership with international experts, partnerships between the Government of Punjab and development partners helped with implementation

✅ Conducting an evaluation through phone-based surveys during tele-counselling sessions was promising

❌ TV was the most effective way to raise awareness about mobile mentorship, but would be difficult to access during floods

❌ More urban than rural were reached, with very fewer reached in Balochistan than Punjab.

❌Rozan telementors require training prior to telementoring, which may impact scalability.

Psychosocial well-being to address learning loss

Participation:
The NGOs MMKN, Save the Children (in India) and Jusoor (with UNHCR and EdTech Hub) used **WhatsApp groups to support well-being.** (↟Tutunji et al., 2020)

Share content:
Harvard University and the International Rescue Committee used SMS to support teachers' delivery of Social and Emotional Learning (supplemented with **videos, learning circles, and certificates)** (↟Bailey et al., 2021)

Flexible learning:
The NGO BRAC's *Remote Play Labs* uses radio and mobile phones to deliver community activities focused on learning and well-being (↟UNICEF, 2022b)

Flexible learning:
Sesame Workshop and the International Rescue Committee engaged parents and caregivers to develop a **social-emotional learning TV programme.**(↟Kohn et al., 2021)**.**

- ✅ **Simple, easy-to-use technology** builds self-esteem.
- ✅ **Contextualised educational software** reinforces student identity.
- ✅ Technology that includes **two-way connectivity** enables relationship building.
- ✅ **Peer networks** can provide structure and improve psychosocial well-being.

Multimodal approaches for delivery

BRAC's *Play Labs* engage communities in physical play, songs and rhymes, stories, dance, art, and more as tools for learning. Play Labs run across Bangladesh, Uganda, and Tanzania, and serve refugee children in Bangladesh.

✅ In-person sessions can provide **routine and motivation** (↑Amenya et al., 2020).
❌ **Requires training** for facilitators and teachers

BRAC's *Remote Play Labs* reach communities at home through interactive, playful sessions for literacy and numeracy, story-telling sessions, and physical-play activities over weekly 20-minute phone calls or radio sessions.

Radio lessons in flexible learning environments

Although BRAC's radio programme is for at-home delivery, listening to radio lessons as a group is more effective than listening individually at home (↑Amenya et al., 2020).

✅ Radio could potentially be used to enhance delivery in **flexible learning environments**
✅ **Does not require intensive training**

Mobile phone lessons (distance learning)

Mobile phones can be an effective medium of delivery, but parents and caregivers can be the gatekeepers to access (↑Jordan & Mitchell, 2020).

✅ Share content with families **who cannot access** flexible learning environments
✅ Does not require intensive training
❌ May require **parental engagement**