



Clear evidence, better decisions, more learning.

Learning continuity in response to climate emergencies

Preliminary insights on supporting learning continuity following the 2022 Pakistan floods

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About this document

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Notes

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Executive Summary

Preliminary insights

This resource is based on preliminary insights from EdTech Hub's emerging study of *Learning continuity in response to climate emergencies* following the 2022 Pakistan floods.

- The intention is to support stakeholders to identify feasible ways of using EdTech in response to Pakistan's 2022 floods.
- The design adopted for this resource balances generating primary insights from flood-affected parents and teachers quickly and complementing these with insights from the existing evidence base on education in emergencies globally and nationally.
- EdTech Hub's study of learning continuity in response to climate emergencies is ongoing. While the approaches shared through this resource do consider cost-effectiveness, scalability, and equity, our forthcoming ([Mazari et al., forthcoming](#)) comprehensive resource will explore these areas in greater depth by:
 - a. Increasing the sample of teachers and parents and including interviews with government stakeholders and development partners.
 - b. Drawing from a more varied evidence base on education in emergencies to identify specific ways of using EdTech to facilitate cost-effective, scalable, and equitable learning responses.

Context	To what extent and when is it feasible to use technology to support learning during climate emergencies in Pakistan?			
	Methodology The approach adopted for this resource balances generating primary insights from flood-affected parents and teachers quickly and complementing these with insights from the existing evidence base on education in emergencies.  Desk review  16 Phone interviews  5 Voicenotes			
Challenges	Barriers to education highlighted by Pakistan's Post-Disaster Needs Assessment (2022) and community insights:			
	Barriers to participation "A child is working at my medical store because his parents have withdrawn him from school."	Barriers to learning continuity "Children couldn't self-study the way they did during Corona because everyone at home was disturbed."	Barriers to flexible learning environments "Students don't have grade-appropriate (...) material in temporary learning centres."	Barriers to addressing learning loss "Even the exams they conducted had strict marking schemes — very able students were made to fail."
Response	 Ongoing psychosocial support is required for learning continuity			
	Immediate responses		Intermediate responses	
	Enhance participation by communicating through technologies communities can access	Share content through technologies communities can access	Support flexible learning environments through multimodal approaches	Address learning loss through multimodal approaches
Solution	 SMS, Facebook, and WhatsApp can help enhance communication around education and encourage student retention.	 SMS, WhatsApp and other social media platforms can host supportive peer networks to share resources on pedagogy, psychosocial support, and improve access to learning.	 Mobile phones, TV, and radio can support in-person delivery in temporary learning centres or community-led learning environments.	 WhatsApp, SMS, paper-based materials, or tablets can help teachers detect and remedy learning loss — through assessments and tailored content.

Introduction

“While hardly the most pressing issue to be tackled in times of crises, the educational technology community still needs to consider its place, its actions, and general relevance to contemporary conditions.”

—Neil Selwyn (2021)

Introduction

The education of 3.5 million school-aged Pakistani children has been disrupted ([↑ESWC, 2022](#))

- Pakistan's 2022 floods have left one-third of the country submerged in flood water and almost 26,000 schools have been destroyed, leaving the most vulnerable at risk of falling deeper into poverty and further behind in education ([↑World Bank, 2022](#); [↑ESWC, 2022](#)).
- While educational technology (EdTech) is not the “most pressing issue... in times of crises” ([↑Selwyn, 2021](#)), it nonetheless has the potential 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 development partners are collaborating to respond to the crisis. In doing so, they have leveraged global evidence from education in emergencies and national lessons from the Covid-19 pandemic to support learning.

This resource builds on global and national evidence on education in emergencies with preliminary insights from flood-affected communities in Pakistan to explore **the extent to which, and when, it is feasible to use technology to support learning continuity in response to climate emergencies in Pakistan.**

Background

Despite its very low carbon footprint, Pakistan is the country with the eighth highest climate risk

(↑Eckstein et al., 2021)

Learning impact: student learning loss	Learning impact: student dropouts	Learning impact to be determined
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 due to damages to school infrastructure (↑Alexander, 2011)	The extensive loss of lives, livelihoods, assets, and human capital have compounded marginalisation in Pakistan. (↑Government of Pakistan et al., 2022)
Destruction	Destruction	Destruction
3,660 government schools destroyed in Khyber Pakhtunkhwa	10,348 schools damaged across Balochistan, Gilgit-Baltistan, Khyber Pakhtunkhwa, Sindh, and south Punjab	Over 26,000 schools are estimated to have been damaged or destroyed in Balochistan, Khyber Pakhtunkhwa, Sindh, and south Punjab
Earthquake	Floods	Floods
2005	2010	2022
This timeline includes large-scale natural disasters in Pakistan, however, small-scale emergencies frequently impact lives, livelihood, and learning as well.		

Impact of the 2022 floods

Climate emergencies have the potential to impede Pakistan's quest for national progression and equity

- The extensive loss of lives, livelihoods, assets, and human capital have compounded marginalisation in Pakistan ([†Government of Pakistan et al., 2022](#))
 - a. “The national poverty rate is estimated to increase by 3.7 to 4.0 percentage points,” ([†Government of Pakistan et al., 2022](#), p.11).
 - b. Existing disparities will deepen, 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:
 - a. Almost 26,000 schools are reported to have been damaged or destroyed by the floods and over 7,000 schools are being used as shelters for displaced people ([†ESWG, 2022](#)).
 - b. Excessive damage to infrastructure, internet connectivity, and textbooks has left many modes of distance learning inaccessible and students at risk of dropping out ([†UNICEF, 2022a](#)).

Responses to the 2022 floods in Pakistan

Cross-sectoral partnerships have emerged quickly to address Pakistan's climate emergency to:

- **Assess the impact of the flood**

- a. The Government of Pakistan partnered with international and non-governmental organisations to conduct the Pakistan Floods 2022: Post-Disaster Needs Assessment ([↑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.

- **Rehabilitate and respond to community needs**

- a. Partnerships across government agencies and with development partners to promote food security and provide social protection (i.e., cash transfers) ([↑Asian Development Bank, 2022](#)). However, in [↑Barón et al.,'s \(forthcoming\)](#) study, 80% of respondents reported that no relief efforts had taken place in their area.
- b. Social protection programmes appear to have increased communities' aspirations during the 2010 Pakistan floods ([↑Kosec & Mo, 2017](#)).

Educational response to date

The Pakistan Flood Response Plan identifies children's basic needs as critical to learning continuity

It was found that responses to the 2010 floods focused heavily on infrastructure, while not enough attention was given to quality and best learning practices in Temporary Learning Centres (TLCs) and schools ([†Alexander, 2011](#)). The Pakistan 2022 Floods Response Plan ([†Government of Pakistan et al., 2022](#)) recognises this by **encouraging a more holistic approach:**

- TLCs will provide children with a safe space to improve their nutrition, health, and hygiene.
- Learning continuity will be supported with emergency education supplies (school-in-a-box, student recreational kits, teaching and learning materials).
- Teacher training on psychosocial support and multigrade teaching.

EdTech has the potential to extend the reach of existing responses by enhancing student participation, while supplementing lost resources, supporting flexible learning environments, and helping teachers address learning loss — if it is used in an equitable, feasible and cost-effective way.

Study design and approaches

Assessing the role of EdTech in climate emergencies in Pakistan

This resource is based on a preliminary assessment of whether and how EdTech can efficiently and effectively help address student dropouts and learning loss attributed to the 2022 floods.

As part of our study, we asked the question:

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

The focus on feasibility recognises that there are several contextual factors that impact the success or failure of EdTech interventions, particularly in times of crisis and emergencies:

“The use of particular technologies in itself does not ensure feasibility. Rather, several additional factors must be considered” ([↑Save the Children, 2018](#)).

Methodology

The study adopted for this resource balances generating primary insights from flood-affected stakeholders quickly and complementing these with insights from the existing evidence base on education in emergencies globally and nationally.

We collated evidence from the following:



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

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



Desk review of (global
and national) evidence
on education in
emergencies

Desk review of
evidence from
emergencies in
Pakistan

*This resource contains **preliminary insights** that will be further explored through a more expansive study.

Evidence-based considerations

What do we know about EdTech in climate emergencies?

EdTech in climate emergencies is an area of 'non-knowledge' ([↑Selwyn, 2021](#))

- Approaches for education in emergencies
 - a. Organisations including the Inter-agency Network for Education in Emergencies (INEE) have developed guidelines for education in emergencies that are useful to consider.
 - b. [↑Save the Children \(2018\)](#) have developed guiding questions on the 'ethical implementation' of EdTech in emergencies.
- Evidence on education in emergencies
 - a. Over the past decade, 90% of studies on education in emergencies globally have been undertaken in relation to Covid-19 ([↑Crompton et al., 2021](#)).
 - b. In Pakistan, Covid-19 highlighted how access to technology, digital skills, and attitudes can impact learning continuity — particularly for marginalised learners.

Considerations for EdTech in emergencies

↑Save the Children's (2018) guiding questions unpack how EdTech can be implemented 'ethically' in emergency contexts

Equity and access

Will the integration of EdTech leave some children behind?

Access

What are the barriers that may affect access to EdTech?

Is the required infrastructure in place?

Emergency

How long is the disruption to learning?

Do children have access to any education (face-to-face or remote)?

Learning needs

Needs and values of families that shape learning and device usage.

Families

Family expectations of learning and willingness / access to use tech for learning.

Cost and feasibility

Are enough time, money, and skills available?

Has time been allocated to training teachers and families?

The resource draws on these six components to **identify the 'feasibility' of using technology** to support learning continuity in response to Pakistan's floods.

Considerations from the Post-Disaster Needs Assessment

Findings from Pakistan Floods 2022: Post-Disaster Needs Assessment ([↑Government of Pakistan et al., 2022](#)) have been used to contextualise [↑Save the Children's \(2018\)](#) guiding questions:

Equity and access

Girls education "will be disproportionately deprioritised."

([↑Government of Pakistan et al., 2022](#), p.46)

Access

Communities "lack any options to access alternate sources of electricity in cases of disruption."

([↑Government of Pakistan et al., 2022](#) p. 56)

Emergency

"Prolonged school closures and lack of education access,"

([↑Government of Pakistan et al., 2022](#) p. 33)

Learning needs

Learning losses "will have a long-lasting impact unless addressed during the rehabilitation phase."

([↑Government of Pakistan et al., 2022](#) p. 45)

Families

The "national poverty rate is estimated to increase by 3.7 to 4.0 percentage points."

([↑Government of Pakistan et al., 2022](#), p. 11)

Cost and feasibility

Teachers will require support "to adapt to new conditions."

([↑Government of Pakistan et al., 2022](#), p. 51)

EdTech interventions should address

Participation for marginalised students (girls)

Limited infrastructure

Prolonged disruptions in education

Learning loss

Families' financial burdens

Teacher support

Considerations for education in emergencies

The [INEE Minimum Standards for Education \(2010\)](#) are designed to support a crisis response approach to educational continuity during various types of emergencies.

However, the standards must be further contextualised in light of the climate-specific challenges impacting communities. In the context of the 2022 Pakistan floods, it is important to consider the following guidelines:

1. Learning response:
 - a. *“...ensure access to and continuity of quality education” and consider the “evolving learning needs of the affected population.”*
 - b. *“include a clear description of the context, barriers to the right to education and strategies to overcome those barriers.”*
2. Enabling environment:
 - a. *“Learning environments are secure and safe... and [support] the psychosocial well-being of learners, teachers and other education personnel.”*
 - b. *“Teachers and other education personnel receive periodic, relevant and structured training according to needs and circumstances.”*

Weaving these considerations into the process of determining how EdTech can support learning continuity in Pakistan during the current floods requires contextualisation and insights from educational communities.

Considerations for the cost-effective use of EdTech

Although knowledge about EdTech use during climate emergencies is limited, general evidence on cost-effective uses of EdTech can provide some guidance on how to improve learning in this context.

- The [World Bank et al.'s \(2020\)](#) 'smart buys' provide the following guidance to consider when investing in EdTech. 'Smart buys' are supported by strong evidence and are cost-effective, while there is repeated evidence of 'bad buys' not working or not being cost-effective.
 - ✓ Do invest in sharing information on the benefits, costs, and quality of education.
 - ✓ Do invest in changing the way teachers teach to support targeted teaching.
 - ✓ Do invest in interventions that target learning to the level of the child
 - ✗ Do not assume investments in EdTech and infrastructure (i.e., in digital hardware, textbooks, and buildings) will improve learning.

While these considerations are not specific to EdTech in emergencies, they do shape the way this study understands *feasible* EdTech responses.

This study's approach

Given the magnitude of human catastrophe caused by climate emergencies — loss of lives and livelihood, displacement, and infrastructural damage — **existing evidence cannot be directly applied and must be contextualised to realities** on the ground in order to be rapid, responsive, and effective.

Our approach

As suggested by Maslow's Hierarchy of Needs, it is difficult to cultivate motivation to learn unless students' basic needs are met ([↑Shohel et al., 2021](#))

1. This study's approach to feasibility is framed by [↑Save the Children's \(2018\)](#) guiding questions on 'the ethical implementation of EdTech'.
2. We contextualised these guiding questions with challenges identified in Pakistan's Post-Disaster Needs Assessment ([↑Government of Pakistan et al., 2022](#)): risk of student dropouts, prolonged school closures, learning loss, families' financial burdens, and need to support teachers.
3. These insights were used to identify areas from INEE's guidelines most relevant to the floods.
4. Analysing our preliminary data using this composite framework (see [Slide 25](#)), we identified six elements (building an enabling environment and four learning responses) to support learning continuity in response to the floods.



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

Save the Children (2018)'s guiding questions on the 'ethical implementation of EdTech in emergencies'

Equity	Access	Emergency	Learning needs	Families	Cost and feasibility
Will the integration of EdTech leave some children behind?	What are the barriers that may affect access to EdTech? Is the required infrastructure in place?	How long is the disruption to learning? Do children have access to any education (face-to-face or remote)?	Needs and values of families that shape learning and device usage	Family expectations of learning Willingness and access to use tech for learning	Is there enough time, money, and skills? Is there time allocated to training teachers and families?

Contextual insights from the Pakistan 2022 Floods Post-Disaster Needs Assessment

Student dropouts (girls in particular)	Infrastructural challenges	Prolonged school closures	Learning loss	Families' financial burden	Teacher support
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Using INEE Minimum Standards to frame considerations for effective responses

How can tech be used to encourage participation?	How can tech be used to share content in line with infrastructural realities of flood-affected areas?	How can tech be used to enhance teachers' or communities' delivery in flexible learning environments?	How can tech support teachers in addressing learning loss?	How can tech help families support (without being burdened) their child's learning?	How and when can teachers and families be trained to support learning continuity?
Learning response: participation	Learning response: sharing content	Learning response: flexible learning	Learning response: learning loss	Learning enablers: parents and caregivers	Learning enablers: teachers

In order to address learning loss, psychosocial well-being must be addressed across every learning response.

Approaches for learning continuity during Pakistan's floods

Contextualising existing evidence with current insights

To identify approaches to support learning continuity during Pakistan's floods we:

1. **Contextualised Covid-19 evidence** with community insights during the floods to develop considerations for relevant responses.
2. **We uncovered barriers to learning during the floods** by analysing **preliminary community insights**:
 - a. We found four main themes: 1) barriers to participation, 2) barriers to accessing learning, 3) barriers to flexible learning environments, and 4) barriers to addressing learning loss.
 - b. By contextualising [↑Save the Children's \(2018\)](#) guiding questions with community insights, we determined the modalities feasible for immediate and intermediate responses.
3. **We categorised phases of response** based on the themes and modalities highlighted through community insights. Based on these themes and modalities, we drew relevant examples of EdTech usage from **evidence from EdTech in emergencies**, while taking into consideration [↑INEE Minimum Standards for Education \(2010\)](#) and [↑World Bank et al.'s \(2020\)](#) 'smart buys'.

Considerations based on evidence from Covid-19 in Pakistan

What can we learn from Covid-19 about the impact of school closures?

	Evidence from Covid-19	Reflections on flood response
Learning loss	55% of children do not feel confident to study on their own if school closures reoccur (ASER Pakistan, 2021)	Given that families must prioritise survival, distance learning during closures would be self-directed, and thus students should not be placed under pressure to learn. <i>"Parents are struggling to find food and work, so their children are left unattended at home."</i>
	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)	
	Learning losses are highest in the surveyed districts of Balochistan, followed by Punjab, Sindh, and Khyber Pakhtunkhwa (ASER Pakistan, 2021)	Leaving learning loss unaddressed could demotivate students and their parents. <i>"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."</i>
	The proportion of children who dropped out during the pandemic increases with level of education (ASER Pakistan, 2021)	Financial pressures can lead to school dropouts. <i>"A Grade-9 student refused to fill out the examination board's registration form because he could not pay the registration fees."</i> Children are dropping out of school to support their family's livelihood. <i>"A child is working at my medical store because his parents have withdrawn him from school."</i>

Given that families are focused on survival, children may have less support in their learning than they had during Covid-19. Financial pressures are causing some students to drop out of school.

What can we learn from Covid-19 about accessing distance learning?

	Evidence from Covid-19	Considerations for flood response
Access	Internet bundles for streaming digital content are expensive (†Zubairi et al., 2022)	The internet has become even more expensive for many community members. <i>"Mobile phones and the internet have become expensive due to inflation."</i>
	Internet connectivity can be patchy and power outages are common (†Zubairi et al., 2022)	Infrastructural damage has impacted the way individuals can use their devices, make phone calls, and stream content. <i>"The network has a huge issue. All telecom networks are slow. They are almost non existent."</i>
	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)	All parents and teachers interviewed preferred mobile phones for content delivery. <i>"I think mobile has replaced TV."</i>
		Printed resources are not accessible during the floods. <i>"The textbooks have been soaked in flood water — the same as furniture."</i>

The flood's devastating impact on infrastructure and livelihood makes accessing technology more of a challenge than it was during Covid-19.

What can we learn from Covid-19 about learning enablers?

	Evidence from Covid-19	Reflections on flood response
Enabling learning	Many parents don't know how to use tech or do not have enough time to support learning (†Zubairi et al., 2022)	Parents should not be immediately burdened with training. <i>"Parents are struggling to find food and work, so their children are left unattended at home."</i>
	Parental concerns about digital content (particularly for girls) being harmful or incompatible with religious beliefs (†Zubairi et al., 2022)	Parents need to be aware of learning opportunities. <i>"During Corona, we did not see any digital platforms or tools used for education purposes — I had no knowledge of these..."</i>
	Rural parents were more likely to be unaware of digital learning interventions (†Zubairi et al., 2022)	
	Approximately 75% of teachers used SMS or WhatsApp to send content or information to students (†Zubairi et al., 2022)	All content should be delivered through tools communities are already fluent in using. <i>"I think the option between Facebook, WhatsApp or SMS; the best option would be to use WhatsApp."</i>
	Lack of familiarity with technology may make teachers resistant to using it (†Zubairi et al., 2022)	

Given that learning enablers are prioritising their survival, it is important immediate responses use the tools the enablers already know how to use.

Barriers to learning during the floods

Community insights on intermediate challenges

Barriers to participation

"Children are dropping out of school. I know at least five who have not returned. A Grade-9 student refused to fill out the examination board's registration form because he could not pay the registration fees."

Teacher Interview

"Children have dropped out because they couldn't pay their fees. A child is working at my medical store because his parents have withdrawn him from school."

Parent Interview

"We are making every sacrifice for our children. We haven't paid their school fees for the last four months. They are our future. We have even reduced our food expenses."

Parent Interview

Implications:

Families are under immense pressure to meet their physiological needs. Anticipated school dropout rates are high (due to financial pressures).

Barriers to learning continuity

"Textbooks are completely destroyed."

Teacher Interview

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

Parent Interview

"I have 70 children in my class. When I ask them — can I borrow your pencil? They look at each other to see who has it — I found no one has pencils or sharpeners. Parents do not have money to buy them."

Teacher Interview

"Children couldn't self-study the way they did during Corona because everyone at home was disturbed."

Parent Interview

Implications:

Psychosocial issues impact engagement with distance learning. If distance learning takes place, it will be self-directed. Children do not have access to no-tech learning modalities (textbooks or pencils).

Community insights on intermediate challenges

Barriers to flexible learning environments

"Students do not have their grade-appropriate books and material in TLCs."

Teacher Interview

"The TLC is far, like 7–8 km from where we are living now. Some are in Dadu city, which is also far. There is water in between, so we cannot send our kids there because it's a life risk."

Parent Interview

"I suggest that the government provide a few tents to make the school functional. Furniture and tents may be provided."

Parent Interview

"Children are not learning properly in the TLC — because children are chasing the vehicles for searching food and other items."

Parent Interview

Implications:

TLCs appear to be either under-equipped or inaccessible. Community-run temporary learning shelters are suggested as an alternative.

Barriers to addressing learning loss

"We have to start our academic activities from the very beginning, like starting the academic year again."

Teacher Interview

"Even the examinations they (the government) conducted had strict marking schemes — very able students were made to fail. They discriminated against us. There was a huge learning loss, but instead of showing empathy, they exhibited unkindness to our people."

Parent WhatsApp Voice note

"We have a number of children infected by malaria or typhoid. It impacts their learning."

Parent Interview

Implications:

Even where schools have reopened, illnesses are preventing students from learning.
Exams put additional pressure on students.
Many schools do not have plans for remedial learning.

Resource considerations: immediate

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

Mobile phones



- ✓ 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

Radio



- ✓ 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

Resource considerations: intermediate

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

Tablets



- ✓ 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

Television



- ✓ Supports visual learning
- ✓ Large screen for learning
- ✓ Good medium for psychosocial support
- ✗ Difficult to access for displaced people

Strategies for learning continuity in emergencies

During times of conflict and crisis, due to the other obligations that parents and caregivers are confronted with, learning becomes the responsibility of the child ([↑Madaio et al., 2019](#)).

1. **Immediate responses** should use technologies communities already have access to and familiarity with in order to ([↑Crompton et al., 2021](#))
 - Response 1 — Enhance participation through communication
 - Response 2 — Share content to address the barriers to learning continuity that can be used at home and to enhance flexible learning environments
2. **Intermediate responses** should use multimodal approaches (i.e., approaches that combine no-, low-, or high-tech like radio, television, SMS, and smartphones where available) to:
 - Response 3 — Support flexible learning environments with multigrade classrooms (including TLCs and community-run centres)
 - Response 4 — Support teachers to address learning loss in varying degrees

All responses require careful consideration of the **physiological and psychosocial barriers** to learning and must be designed to enhance scalability. To do this, learning enablers (**teachers and caregivers**) must be supported at every stage.

How and when to use technology to support education in Pakistan's climate emergency

EdTech can be used alongside face-to-face modalities to:

Immediate:

Enhance participation

Community insights revealed an anticipated dropout rate of 20–30% and current absentee rates of more than 50%.

SMS, Facebook, and WhatsApp can help enhance communication around education and encourage student retention.

Immediate:

Share content

WhatsApp and other social media platforms can host supportive peer networks to share resources on pedagogy, psychosocial support, and improve access to learning content that has been lost during the floods.

Intermediate:

Support flexible learning environments

TLCs may not be accessible to all students or may lack proper learning infrastructure.

Mobile phones, TV, and radio can support in-person delivery, particularly in multigrade sessions in TLCs or community-led learning.

Intermediate:

Address learning loss

Multimodal formative assessments

(WhatsApp, SMS, paper-based, or tablets). can help teachers detect learning loss.

Multimodal content

(WhatsApp, TV, tablets) can be used to support **targeted instruction** for remedial learning.

Phases of response

Addressing education during climate emergencies

1

Enhance participation by communicating through technologies communities can access

2

Share content through technologies communities can access

3

Support flexible learning environments through multimodal approaches

4

Address learning loss through multimodal approaches

Psychosocial well-being is required to address learning loss

Immediate response

Technologies communities can access

Intermediate response

Multimodal learning support



Psychosocial well-being is required 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**)

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**

Enhance participation by communicating through technologies communities can access

Phones can be used to enhance participation in education through / by:

Communication networks

Formalising avenues to connect with peers over Facebook, SMS, and WhatsApp can help provide psychosocial support, while helping communities exchange information on the benefits of education ([↑Morris et al., 2021](#)).

Supporting Retention

Behavioural nudges can help retain many students, including girls ([↑Baron & Twinomugisha, 2021](#)) but is often not enough for families facing greater structural barriers (i.e., financial pressures) ([↑Ajzenman et al., 2022](#)).

Raising Awareness

Use digital tools that communities have access to to ensure that all stakeholders are informed about options for relief and learning (stipends for school enrolment, options for distance and temporary learning) ([↑Chuang et al., 2020](#) [↑Jordan & Mitchell, 2020](#); [↑Mitchell et al., 2020b](#)).

Share content through technologies communities can access

Teachers and students need to be able to manage their lives during an emergency, while also teaching and learning ([†Crompton et al., 2021](#)).

Supporting training

Concise resources on pedagogical approaches should be shared on devices teachers already have access to and know how to use ([†Crompton et al., 2021](#)).

Encouraging motivation

Formalised digital peer networks should be used to encourage motivation, share resources, and provide psychosocial support ([†Mendenhall et al., 2018](#)).

Enhancing access

All 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](#)).

Supporting flexible learning environments

When leveraging tech to support flexible learning environments, it is crucial that interventions supplement rather than replace in-person learning where possible.

Leverage traditional technologies

Based on existing research from non-crisis, low-income countries, it is recommended that blended learning in emergency contexts should look to leverage 'traditional' tools and technologies like print, TV, and radio. This is because use of the internet presents the risk of expanding the digital divide.

Multiple modalities

The use of multiple modalities (phones, TV, tablets, and radio) has demonstrated success in better supporting distance learning, particularly in rural settings. These modalities could be used to support community-based learning in areas lacking access to TLCs.

Flexible design

As local conditions change, so do the most effective modes of education delivery and the relevance of the content. Therefore, it is important to consider how content can be delivered using various devices. Content also needs to be designed flexibly to meet the rapidly changing realities of the impacted communities.

Source: ([↑Dahya, 2016](#)).

Addressing learning loss

Learning loss can be addressed in varying degrees, depending on children's access to learning. High-tech devices are only recommended to support teachers deliver remedial learning in schools.

Distance learning

WhatsApp or SMS can effectively be used to conduct remedial learning ([†Adil et al., 2021](#)) but:

- requires motivation / psychosocial support
- requires awareness
- should not burden teachers ([†Adil et al., 2021](#))

Flexible learning environments

TV or radio can support targeted instruction or 'reading camps' through blended delivery, however:

- must be run by trusted community members ([†Amenya et al., 2020](#))
- must consider access barriers for girls, in particular

In-school learning

Tech can support teachers deliver remedial learning (digital assessments to identify and content to address learning loss) ([†El-Sefary et al., 2021](#)). Schools:

- must adjust curricular objectives
- offer low-stakes assessments
- could split multi-grade classrooms by learning level

Learning enablers

*“Our teachers are disturbed,
parents are disturbed —
everyone is disturbed.”*

—Teacher Interview

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
- ✓ **SMS has been demonstrated** to provide effective strategies to enhance practices and motivation (↑[Jordan & Mitchell, 2020](#))

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 is not working in the classroom (↑[Dahya, 2016](#)).

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
- ✓ Taking 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.**

Conclusion

Education in climate emergencies

Community insights highlight the structural, psychosocial, attitudinal, and infrastructural challenges impacting learning continuity

Enhance participation by communicating through technologies that communities

have access to in order to open avenues for psychosocial support and raise awareness of the benefits of education and options to access learning.

Share content through technologies that communities have access to (WhatsApp and SMS) to support those communities without access to flexible learning environments.

Support flexible learning environments

through multimodal approaches to enhance delivery of psychosocial support and learning.

Address learning loss through multimodal approaches that help teachers identify learning loss and provide targeted instruction for remedial learning.

Next steps

Given that EdTech in climate emergencies is an area of 'non-knowledge' ([↑Selwyn, 2021](#)), stakeholders should convene and align their responses to learning continuity.

1. EdTech Hub is building on these preliminary insights through a deeper analysis of the feasible use of technology in response to Pakistan's floods in order to:
 - a. **Expand the breadth** of the study by increasing the sample of teachers and parents, and including interviews with government stakeholders and development partners.
 - b. **Expand the depth** of the study by exploring specific ways of using EdTech to support cost-effective, scalable, and equitable learning responses and foster an enabling environment by supporting learning enablers (families and teachers).
2. Researchers exploring the challenges and solutions for education in climate emergencies in Pakistan can convene to limit duplication of effort and more efficiently support evidence-based decision-making
3. Governments and development partners can convene to consider the extent to which existing plans to use EdTech to support learning continuity in emergencies are accessible, cost-effective, and feasible in response to the floods.

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