

EdTech for Education in Emergencies

A Rapid Evidence Review

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Rapid Evidence Reviews

This publication is an example of the Rapid Evidence Reviews (RERs) that are produced by EdTech Hub. The purpose of RERs is to provide education decision-makers with accessible, evidence-based summaries of good practice in specific areas of EdTech. All previous RERs are available at <https://edtechhub.org/research/>.

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Abbreviations and acronyms

CWTL	Can't Wait to Learn
EiE	Education in Emergencies
ICT	Information and communications technology
INEE	Inter-agency Network for Education in Emergencies
IRI	Interactive Radio Instruction
LAYS	Learning-adjusted Years of Schooling
LMIC	Low- and middle-income country
OECD	Organisation for Economic Co-operation and Development
RCT	Randomised controlled trial
RER	Rapid Evidence Review
SIRIP	Somali Interactive Radio Instruction Program
TaRL	Teaching at the Right Level

Executive summary

This Rapid Evidence Review (RER) provides a synthesis of recent evidence relating to the implementation of EdTech programmes, platforms, and devices in emergency contexts. The main aim of the review is to provide education decision-makers, funders, and implementers (among others) with a clear picture of ‘what works’ regarding EdTech in emergencies. Crucially, it also aims to create an understanding of the conditions necessary to ensure the effectiveness of these interventions.

For this RER, we reviewed evidence generated between 2019 and 2024 on EdTech implementations in different crisis contexts, including conflicts, situations of violence and oppression, environmental disasters, and public health emergencies such as the Covid-19 pandemic. We focused on implementations aimed at primary- and secondary-age learners, as well as their teachers and caregivers.

Following a two-step screening process involving relevance and quality checks (see [Section 2](#)), 42 sources were identified for analysis. During the thematic analysis process, data was organised according to the following themes:

- The types of EdTech that are most effective in emergencies.
- The barriers and challenges that limit EdTech effectiveness in emergencies.
- The conditions for effective implementation of EdTech in emergencies.

Key findings

Regarding the effectiveness of different types of EdTech

- When implemented well, radio learning stands out as a feasible, equitable, and effective option for learning in emergencies.
- Basic mobile technologies can provide both educational content and interaction in emergency settings without internet connectivity.
- Game-based learning can improve academic and socio-emotional outcomes and increase learning motivation in emergencies.

- Internet-based options can keep learners and teachers connected and may result in high-quality learning, though opinions are divided.
- Videos can provide access to the world beyond a crisis and benefit children of differing abilities.

Regarding the barriers and challenges that limit the effectiveness of EdTech

- Significant equity and access issues remain despite the promise of learning through technology.
- Caregivers may not always be aware of digital learning options or able to support their children's distance learning, which can limit learner engagement with these options.
- Digital skills gaps prevent learners and teachers from making the most of EdTech interventions.
- Data protection issues may hamper EdTech effectiveness in crises.

Regarding the conditions for effective EdTech implementation

- Successful emergency responses involving EdTech use pre-existing knowledge, infrastructure, and resources.
- EdTech responses should respond to users' realities.
- Emergency EdTech responses should be multimodal.
- Training must be prioritised to enable users to use tech-based options effectively.

1. Introduction

EdTech Hub's goal is to ensure that EdTech contributes to improving learning outcomes for children worldwide, regardless of their location or circumstances. We partner with national governments and the global education sector to build systems that can sustainably integrate EdTech into education policy and practice. We do this by building the evidence base around EdTech: what works and under what conditions.

A Rapid Evidence Review (RER) of literature relating to the use of technology for education in emergencies (EiE) in low- and middle-income countries (LMICs) was published by the Hub in 2020 ([↑Mitchell et al., 2020](#)). Much has changed since then; the Covid-19 pandemic has dramatically reshaped the global education landscape and, at the time of writing, the world is experiencing record levels of displacement due to natural disasters and escalating conflicts ([↑UN News, 2024](#)). Two hundred and twenty-two million school-age, crisis-affected children urgently need educational support ([↑International Parliamentary Network for Education & Geneva Global Hub for Education in Emergencies, 2023](#)). It is, therefore, necessary to gain a renewed understanding of how EdTech is being used to address these new and evolving challenges, what the literature since 2020 tells us about how effective these EdTech-related efforts have been, and how to ensure that EdTech implementations within EiE can have maximum impact.

1.1 Aim of the RER

The overarching aim of this RER is to provide education decision-makers, funders, and implementers (among others) with a clear picture of the most up-to-date evidence relating to the use of EdTech in emergency contexts. Within this, the specific aims are to:

- Synthesise available data on the effectiveness of EdTech in emergencies, highlighting examples of programmes, platforms, and devices supported by robust evidence.
- Present evidence relating to the feasibility of EdTech implementation in emergency contexts, including data on contextual appropriateness or readiness and potential challenges.

1.2 Scope and key definitions

The RER adopts the following definitions:

Education in emergencies: We have adapted the definition provided by the [↑Inter-agency Network for Education in Emergencies \(INEE\) \(2024\)](#) and define education in emergencies as the quality of current and future learning opportunities for children of primary and secondary-level age in situations of crisis, including non-formal education. As stated in the INEE glossary,

“common situations of crisis in which education in emergencies is essential include conflicts, protracted crises, situations of violence, forced displacement, disasters, and public health emergencies”
([↑INEE, 2024](#)).

It is also important to note that, while we acknowledge that the majority of LMICs could be considered to be in a state of crisis in some form, it has been necessary to limit the scope of this review given time constraints. This is to ensure that we create a coherent, digestible end product. To achieve this, we decided to focus our searches on contexts included in the *Disasters Emergency Committee Lessons (DEC) Lessons Paper 2019–2024* ([↑DEC, 2024](#)) and the [↑International Rescue Committee’s \(2024\)](#) emergency watch list.

Finally, we have deliberately decided to exclude sources relating to refugee or internally displaced populations, given that another upcoming RER will be devoted to exploring this specific area in detail ([↑Barnes & Katrin, 2025](#)).

EdTech: We adopt the following definition of educational technology (EdTech): “Technologies—including hardware, software, and digital content—that are either designed or appropriated for educational purposes” ([↑Hennessy et al., 2021](#), p. 8). The term ‘Information and communications technology’ (ICT) is also used to refer to hardware and software for learning, and the ways in which these are deployed for educational purposes are highlighted in each instance.

1.3 Review structure

We present the methodological approach in [Section 2](#), including details of the literature search strategy, the inclusion criteria, and methodological limitations. [Section 3](#) includes detailed findings under the three themes

that emerged from a thematic analysis of the identified literature. Finally, [Section 4](#) draws together the evidence reviewed in a concluding synthesis.

2. Methodology

The methodological approach for this RER is informed by the Cochrane Collaboration Rapid Reviews Methods Group guidance on producing rapid reviews ([↑Garritty et al., 2021](#)). This permits a rigorous and systematic approach while defining the scope narrowly enough so that it can be completed within a rapid time frame. The details of this approach are presented below.

2.1 Search and screening process

The research process comprised a systematic sequence of searching and screening conducted in Google Sheets. The first step in locating relevant materials for review was to define the inclusion criteria. To be included, sources had to:

- relate to both EdTech and emergencies as defined above
- relate to primary- or secondary-school-age learners
- have been published between 2019 and 2024¹
- have been published or endorsed by a recognised government agency or non-governmental body operating within the EiE sector
- contain specific details of EdTech implementation
- contain evidence indicating the effectiveness of an EdTech intervention or the feasibility of EdTech use in a particular context
- relate to countries classified as low- or lower-middle-income by the [↑World Bank \(2025\)](#)—if the emergency referred to in the sources is the Covid-19 pandemic.

Keywords relating to EdTech in emergencies were then combined into comprehensive search strings (see [Annex](#)), which were then input into both Google Scholar and the main Google search engine in order to capture both academic and grey literature. Given that programme data is often published in the form of reports rather than journal articles and the fact that the most recent data may not be available in journals due to

¹ It was felt that beginning from 2019 would enable the research team to incorporate any sources that were missed by the previous RER ([↑Mitchell et al., 2020](#)) because they were still in the process of being published.

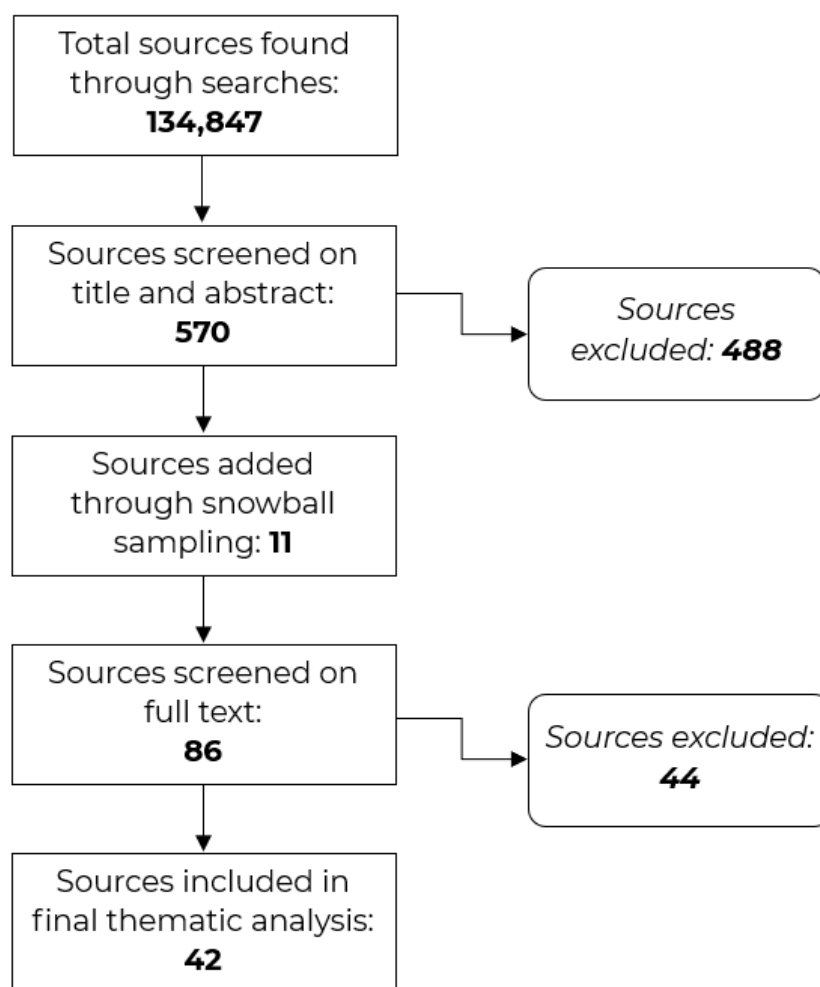
lengthy review processes, it was considered necessary to include grey literature within the search criteria.

The search results were then subjected to an initial screening round in which titles and abstracts (or introductions) were screened according to the inclusion criteria, with relevant results recorded in Google Sheets until no new relevant hits had been recorded for at least two pages. Additional sources were added to the search results through snowball sampling.

All sources meeting the inclusion criteria were then screened for a second time. In the second round of screening, the source content was assessed for quality: the research team evaluated the rigour of the methodology adopted, the accuracy of spelling and grammar used, and the reputability of the authoring and/or publishing organisation.

Sources scoring highly in all three areas were then analysed in full according to an analytical framework in Google Sheets. The framework was developed according to the research questions and also informed by patterns noted during the screening process.

The results of the two-stage screening process are summarised in [Figure 1](#) below.

Figure 1. Search and screening results

2.2 Limitations

This RER has five fundamental limitations. These include:

1. Searches were only conducted in English due to time constraints. Conducting searches in other languages may have enabled us to identify a greater number of relevant evidence.
2. Occasionally, resources were behind paywalls, some of which were still not available even after our institutional access credentials had been entered. Therefore, these sources had to be excluded.
3. Searches brought up numerous sources relating to higher education and a smaller number relating to early childhood development. However, these have not been included in this review, which is limited to sources relating to children of primary and secondary school age due primarily to time constraints. Future reviews should

explore the body of literature relating to both adult and early childhood education.

4. Several sources initially identified as relevant were of too low a quality to be included; either their methodology was not robust, the spelling and grammar used were inaccurate to the point of impeding communication, or they were not hosted by reputable institutions or published within recognised or peer-reviewed publications.
5. Lack of robust data. A significant number of the sources identified through the searches contained information about how EdTech has been used in crisis settings, especially during the Covid-19 pandemic. However, very few of these contained any indication of how effective these interventions had been. Many sources that looked promising at first glance ultimately had to be excluded for this reason. This gap underscores an urgent need for empirical data on EdTech in emergencies.

3. Thematic analysis

This section begins with an overview of the literature reviewed, which is classified by:

- Type of source
- Type of data and methodology
- Type of emergency
- Focus context.

We then present the review findings by the three themes identified:

- Types of EdTech found to be effective in emergencies
- Barriers to EdTech implementation in emergencies
- Conditions for successful EdTech implementation in emergencies.

3.1 Overview of the analysed sample

Details on the sources, data, methodology, types of emergency covered, and contexts for the 42 sources that made up the final sample are given below.

- **Type of source:** 21 sources are reports, 16 are journal articles, three are online articles/blogs, and two are conference papers.
- **Type of data/methodology:** 31 sources contain effectiveness data in some form, while 11 contain data on EdTech feasibility/suitability in a particular context. A significant proportion (19) are desk reviews that incorporate and analyse secondary data. Of the 23 sources that include primary data, only four are randomised controlled trials (RCTs) or quasi-experimental, with the remaining sources comprising a combination of qualitative and quantitative surveys, interviews/focus groups, and case study approaches.
- **Types of emergency:** 27 sources focus on the Covid-19 pandemic, seven are conflict-related, and two relate to situations of state oppression. Twelve sources refer to multiple crises. Only one source relates to climate or natural disasters (the 2022 Pakistan floods), and one relates to an economic crisis (in Lebanon).

- **Focus contexts:** Sources on the Covid-19 pandemic relate to a wide variety of contexts, most of which are in sub-Saharan Africa. Four sources focus on the current war in Ukraine, and three focus on ongoing conflicts within the Occupied Palestinian Territory² (prior to the Israel-Hamas war beginning in 2023, about which there were no relevant sources).

It is important to underline here the significant proportion of sources related to Covid-19 pandemic responses (27 out of 42 = 64%). It is clear that Covid-19 has fundamentally altered the evidence landscape for EiE. While a skewing towards evidence on EdTech used to address this particular crisis is somewhat inevitable, efforts have been made to ensure that EdTech use in other emergencies is not overshadowed or underrepresented.

3.2 What types of EdTech are most effective in emergencies?

This section explores the different EdTech programmes, platforms, and devices that were identified in the literature as effective. We have adopted a broad definition of effectiveness, meaning that interventions may be deemed effective if there is strong evidence either that they result in positive learning outcomes (both academic and socio-emotional) or positive psychosocial well-being outcomes. Equity is also an important factor to consider when exploring effectiveness that will be addressed within the analysis; an intervention that has produced modest outcomes may still be considered effective if these outcomes have been experienced by a wider variety of learners, including those identified as disadvantaged.

When implemented well, radio learning stands out as a feasible, equitable, and effective option for learning in emergencies

The literature suggests that learning via radio may be one of the most feasible and effective ways of sustaining learning in a range of crises. In Northern Nigeria and Ghana, [Wawire et al. \(2023\)](#) suggest that radio was an effective way of increasing child literacy during the Covid-19 pandemic:

² Though some of the reviewed sources use the term 'Palestine', we adopt the term 'Occupied Palestinian Territory' in line with UN usage. See <https://unctad.org/topic/palestinian-people/The-question-of-Palestine>. Retrieved 4 March 2025.

“Radio and home-based instruction have been more effective in developing reading skills in young children than children who did not receive intervention using either radio or home-based instruction” (↑FHI 360, 2021 in ↑Wawire et al., 2023, p. 38).

In parallel, ↑UNESCO et al.’s (2020) multi-country survey revealed that 81% of respondents from LMICs (all ministry officials) considered radio learning to be effective to some extent as a learning tool during the Covid-19 pandemic.

Some sources (↑OECD et al., 2022; ↑Tlili et al., 2024; ↑Wawire et al., 2023) suggest that this success is due to the comparatively wide reach of radio broadcasts, rendering them more equitable than other tech-based options (though this varies considerably by region). This is supported by data from the aforementioned 2020 survey conducted by UNESCO and partners: “Low-income countries were more likely than others to consider remote learning not effective across all modalities, except for radio” (↑UNESCO et al., 2020, p. 23).

Other sources indicate the promise of radio but also emphasise that effectiveness depends on several implementation conditions. An initial (and perhaps obvious) condition of ensuring the wide reach of radio learning is to broadcast programmes in the languages understood by the communities listening to them. An example is the MG-Cubed programme in Ghana during the Covid-19 pandemic, which involved broadcasting lessons and health messages in local languages. ↑AlSheikh Theeb (2022) suggests that this aspect of radio programming helped to ensure that 96% of the programme cohort returned to school following closures.

Another condition of success for radio learning is finding a way to compensate for its unidirectionality; this can be done in different ways. ↑Amenya et al. (2021) found that radio learning in remote areas of Kenya during the Covid-19 pandemic was only effective when learners listened in groups, which allowed them to discuss and interpret lessons together with the support of peers and facilitators. The finding is supported by evidence compiled by ↑Wawire et al. (2023), who identify radio learning initiatives in Northern Nigeria and Ethiopia that were reportedly effective during the pandemic as learners without radios were able to listen at community learning centres supported by trained facilitators.

A different way of increasing the dynamism (and arguably, therefore, success [see ↑Muñoz-Najar et al., 2021]) of radio learning outside of the Covid-19 context is through Interactive Radio Instruction (IRI). The Somali

Interactive Radio Instruction Program (SIRIP), which uses this methodology in the form of audio programmes curated by teachers or learning centre facilitators, has been found to increase learning outcomes despite the unstable context: “Grade one SIRIP learners scored 15 per cent higher than non-SIRIP learners on standardised literacy tests, and 20 per cent higher in maths” ([↑Koomar et al., 2020](#), p. 5).

Similarly, the Making Waves interactive radio initiative in the Democratic Republic of the Congo, in which radio lessons are embedded within teacher-facilitated instruction and group work, resulted in students scoring “higher on all reading and mathematics subtasks when assessed compared to those studying traditional alternative learning programmes” ([↑UNESCO, 2023](#), p. 40). The commonality between these interventions is their embeddedness within live instruction, indicating that teacher facilitation may be a crucial success factor for this medium. How this can be achieved in a clear and manageable way for teachers is a notable gap in the literature that requires further exploration, especially given accounts such as that of [↑Turner et al. \(2022\)](#), who note a lack of clarity around teachers’ specific roles alongside the implementation of EdTech as a commonly reported challenge.

It is worth noting here that, compared to radio learning, there was a surprising lack of data relating to learning via televised broadcasts. The only data that surfaced through our searches indicated that TV may not have the same potential as radio. According to UNESCO’s 2020 survey of national responses to the Covid-19 pandemic, only 16% of respondents in lower-middle-income countries and 27% in low-income countries felt that TV was an effective learning tool during the pandemic ([↑UNESCO et al., 2020](#)). This may be due to significant disparities in television ownership in low-income settings ([↑Dreesen et al., 2020](#); [↑UNESCO, 2023](#)).

Basic mobile technologies can provide both educational content and interaction in emergency settings without internet connectivity

The literature highlights several ways mobile technologies (i.e., mobile phones and tablets) can be used to sustain learning during emergencies. While smartphones can provide access to more high-tech learning options (such as video learning or live remote lessons—see [subsection](#) on this below), basic phones have an important role to play in contexts where high-tech options are not viable: where internet access is limited or where internet-enabled device access and affordability is low ([↑Tarricone et al.,](#)

2021). Basic mobile technologies can provide learning continuity in two key ways: by providing access to learning resources and by facilitating interaction with teachers and peers ([↑Aurino et al., 2022](#); [↑Baraka, 2021](#); [↑Karimy et al., 2024](#); [↑Mazari et al., 2023](#); [↑Muñoz-Najar et al., 2021](#); [↑Shraim & Crompton, 2020](#); [↑Tarricone et al., 2021](#); [↑UNESCO, 2023](#)). The majority of interventions that are identified in the literature as effective do both of the above in some form.

[↑Islam et al. \(2022\)](#) provide a powerful example of how basic mobile technology can provide both learning content and interaction in a crisis. Their RCT explores the use of mobile phones within the Global Development and Research Initiative's (GDRI) implementation to deliver audio lessons using the IRI approach (see [subsection on radio learning](#) above) during the Covid-19 pandemic in rural Bangladesh. It provides compelling evidence for the effectiveness of this approach, achieving learning outcome improvements “equivalent to 0.59 Learning-Adjusted Years of Schooling (LAYS) for the Standard group and 0.64 LAYS for the Extended group” ([↑Islam et al., 2022](#), p. 3). Crucially, the intervention was found to have significant equity benefits; the authors found that: “the intervention was especially beneficial for students who were female, academically weaker, from the poorest socio-economic strata and who had parents with low levels of education” ([↑Islam et al., 2022](#), p. 3).

In parallel, [↑Angrist et al. \(2020\)](#) conducted a rapid randomised trial of an adaptation to the TaRL (Teaching at the Right Level) approach during the Covid-19 pandemic, involving remote instruction by phone and simple SMS texts. The authors reported that “both low-tech interventions yield large, statistically significant learning gains and push students’ numeracy skills farther from the beginner level” [↑Angrist et al. \(2020, p. 19\)](#). Furthermore, both interventions were found to be cost-effective relative to others in similar contexts, with the SMS-only intervention costing USD 13.3 per standard deviation gain in learning and the combined SMS and phone call intervention costing USD 48.28 per standard deviation gain in learning ([↑Angrist et al., 2020, p. 25](#)). These findings indicate that mobile-based learning may be both a feasible and scalable option for education in emergencies.

Other cases where mobile technology has been used effectively to facilitate educational communication during the Covid-19 pandemic include the use of WhatsApp and SMS to facilitate remote teacher training ([↑Sims, 2021](#)) and using phone calls to monitor educational progress within the MG-Cubed programme in Ghana ([↑AlSheikh Theeb, 2022](#); [↑Pacitto et al.,](#)

2023). Finally, though effectiveness data is not yet available, [↑Karimy et al.'s \(2024\)](#) study on the use of EdTech in Taliban-controlled Afghanistan suggests that AI chatbots that can be run offline on basic mobile devices hold significant potential to keep girls and women learning through interaction in their context.

Game-based learning can improve academic and socio-emotional outcomes and increase motivation to learn in emergencies

Five of the studies reviewed consider the value of game-based learning in crisis contexts, three of which ([↑Brown et al., 2020](#); [↑De Hoop et al., 2019](#) [↑Turner et al., 2022](#)) relate to 'Can't Wait to Learn' (CWTL), a digital, game-based learning programme developed by War Child Holland, which does not require internet connectivity to be played and is delivered through solar-powered tablets. [↑Brown et al.'s \(2020\)](#) quasi-experimental study relates to implementing the programme with primary-age, out-of-school children in Sudan, while [↑Turner et al. \(2022\)](#) conducted their pre-post testing with lower-secondary-age, out-of-school learners in Lebanon. Both studies identified significant learning gains in numeracy, while [↑Brown et al. \(2020\)](#) also noted gains in Arabic literacy (which was not tested by Turner et al.). Interestingly, these gains are not reflected in [↑De Hoop et al.'s \(2019\)](#) study, which reports on a school-based implementation of CWTL in Jordan (both the aforementioned Sudan and Lebanon-based studies were carried out with out-of-school learners). [↑De Hoop et al. \(2019\)](#) found equal learning gains among learners receiving CWTL and children receiving the standard curriculum, which the authors attribute to a number of operational challenges.

Concerning psychosocial well-being, results are more mixed. Facilitators interviewed by [↑Turner et al. \(2022\)](#) “noted strengthened social bonds and collaboration among the children, the development of friendships, and healthy competition” (p. 98) and also perceived increases in self-esteem, which they attributed to the independence that the game afforded them. However, results from [↑Brown et al. \(2020\)](#) and [↑De Hoop et al. \(2019\)](#) relating to CWTL implementations in Sudan and Jordan showed no statistically significant increases in psychological well-being ([↑De Hoop et al. 2019](#)) or in children's sense of hope ([↑Brown et al., 2020](#)). [↑Brown et al. \(2020\)](#) and [↑Turner et al. \(2022\)](#) also both report issues with the psychometric validity of the self-esteem measurement instrument, meaning that neither was able to report quantitative results for this measure confidently.

Elsewhere, online game-based learning has been found to increase learner motivation. [↑Kaminsky \(2024\)](#) reports this effect in the context of online educational gaming during the current war in Ukraine. [↑Ali et al. \(2023\)](#) provide findings gathered through experiences of both conflicts and the Covid-19 pandemic in the Occupied Palestinian Territory and Iraq. During the qualitative interviews conducted by the latter, teachers reported that digital educational games:

“[...]stimulate focus, increase attention, help meditation and thinking, increase [...] the desire to obtain information [...] keep boredom away from the student, and [help] him to compete with his colleagues, which motivates him to improve his performance”
([↑Ali et al., 2023](#), p. 8).”

Increased motivation was also a theme emerging from Turner et al.’s qualitative data, which facilitators attributed to the game’s goal-oriented basis: “[the children] wanted to see the end of the game. They wanted to reach a goal” ([↑Turner et al., 2022](#), p. 98). However, Turner et al. also reported that some learners became frustrated and bored after repeatedly playing the same minigames, indicating that content variety is critical to sustaining motivation.

Internet-based options can keep learners and teachers connected and may result in high-quality learning, though opinions are divided

The literature mentions a range of internet-based learning tools. Evidence suggests that social media platforms may be useful learning tools during crises due to users’ familiarity with them and their capacity to keep teachers and learners connected ([↑Baytiyeh, 2021](#); [↑Sarmiento et al., 2022](#); [↑Shraim & Crompton, 2020](#); [↑Tarricone et al., 2021](#); [↑Tlili et al., 2024](#)).

According to teacher participants from some of the reviewed studies, synchronous learning via platforms such as Zoom and Google Classroom is also believed to be effective for learning in emergencies. [↑Tlili et al. \(2024\)](#) and [↑Kaminsky \(2024\)](#) both report positive outcomes of live lessons via these platforms to sustain learning during the current war in Ukraine. In the context of Covid-19 in Kenya, some teachers who were teaching remotely even reported preferring online instruction to in-person classes as they felt it reduced disruptions and distractions ([↑Ochieng & Waithanji Ngware, 2022](#)). In the Afghanistan context, teacher and learner participants

interviewed by ↑Ahmadi et al. (2024) were effusive in their support of live lessons, emphasising that they had confidence in the quality of education delivered through this medium:

“They reported that it improves their engagement with educational materials and resources, positively influences their learning and teaching abilities, and promotes communication and collaboration among students and teachers” (↑Ahmadi et al., 2024, p. 38).

This was not a universal finding, however. Two sources indicate potential quality and well-being issues with live lessons in the Covid-19 context. Teachers surveyed in the Philippines generally believed that emergency remote teaching (ERT) was not effective; most of the 28,859 survey respondents believed that students were learning less or much less than in non-Covid times (↑Sarmiento et al., 2022). Meanwhile, ↑Shraim & Crompton (2020, p. 12) note that teachers in the Occupied Palestinian Territory “felt the additional burden of pressure to deliver learning in a time of crisis as well as to support their students’ emotional needs”.

Videos can provide access to the world beyond a crisis and benefit children of differing abilities

Asynchronous learning through video tutorials (e.g., via YouTube) is also flagged as a medium with strong potential in emergencies (↑Ahmadi et al., 2024; ↑Bakhmat et al., 2023; ↑Guglielmi et al., 2021).³ Videos are identified as an important way of providing learners with access to information beyond their own context (↑Ahmadi et al., 2024; ↑Bakhmat et al., 2023). This access to the ‘world outside’ is an aspect that respondents to Ahmadi’s survey of women in Taliban-controlled Afghanistan suggest is as important for psychosocial well-being as it is for academic progress (↑Ahmadi et al., 2024).

Elsewhere, there is evidence that online videos provide opportunities for reaching specific groups of learners in emergencies. eKitabu, a Kenya-based organisation that provides digital educational content across Thirteen sub-Saharan African countries, developed YouTube videos with Kenyan sign language to support the foundational literacy of learners with hearing impairments during the Covid-19 pandemic. This adaptation was

³ A notable, evidence-based example of effective video-based learning in emergencies is Sesame Workshop’s Alhan Sim Sim initiative. This is an early childhood programme and is therefore out of scope, but further information can be found here: <https://sesameworkshop.org/our-work/what-we-do/ahlan-simsim/>.

found to increase learners' communication skills, confidence, and learning outcomes significantly ([↑Guglielmi et al., 2021](#)).

3.3 Barriers and challenges to EdTech in EiE

Despite the promise of learning through technology, significant equity and access issues remain

There is a pronounced trend in the literature regarding EdTech use in emergencies: a strong correlation between the perceived (or proven) success of EdTech interventions in emergencies and the socio-economic level of the impacted individuals. At the country level, evidence from the Covid-19 pandemic suggests that distance learning failed to reach 31% of learners worldwide “and 72% of the poorest” ([↑UNESCO, 2023](#), p. 3). The quotation below may explain why this is the case.

“Among low-income countries, only 20 per cent considered remote learning sufficient enough to account for official school, while 70 per cent of lower-middle-income, 82 per cent of upper-middle-income and 86 per cent of high-income countries perceived it to be a valid learning alternative to official school days” ([↑UNESCO et al., 2020](#), p. 23).

At the individual level, access to online learning is repeatedly proven to be dependent on the financial means of learners and their families. [↑Ochieng & Waithanji Ngware](#) underline the fact that the aforementioned teacher preference for online classrooms was the preference only in “high-end private schools” ([2022](#), p. 8). Several other examples of disparities in access that correlate with socio-economic status are presented in [↑Dreesen et al., \(2020\)](#), [↑Muñoz-Najar et al. \(2021\)](#), and [↑UNESCO \(2023\)](#), among others. However, this yawning digital divide is perhaps most strongly articulated by [↑West \(2023\)](#), who points out numerous cases of “unchecked exclusion” and “staggering inequality” that online learning created during the Covid-19 pandemic ([↑West 2023](#), p. 1).

Socio-economic disadvantage is directly correlated with a lack of the necessary infrastructure and devices with which to access EdTech ([↑Kiru et al., 2023](#); [↑Koomar et al., 2020](#); [↑Lennox et al., 2021](#); [↑Muñoz-Najar et al., 2021](#); [↑Ochieng & Waithanji Ngware, 2022](#); [↑Sarmiento et al., 2022](#); [↑Sims, 2021](#); [↑Wawire et al., 2023](#); [↑UNESCO, 2023](#)). [↑Dreesen et al. \(2020\)](#) highlight a range of infrastructure and device access divides across 127 countries during Covid-19, including stark contrasts in TV ownership between rural and urban households, and electricity supply between the poorest and

wealthiest quintiles. Several sources also emphasise that this is often as much a problem for teachers as it is for learners ([↑Carter et al., 2022](#); [↑Sarmiento et al., 2022](#); [↑Sims, 2021](#); [↑Vakaliuk et al., 2021](#)).

Beyond socio-economic disparities, specific groups are missing out on EdTech access in emergencies

The literature also suggests that access issues may be intersectional. Gender-based biases are a common barrier that prevent girls from continuing to access learning resources in emergencies ([↑AlSheikh Theeb, 2022](#); [↑Amenya et al., 2021](#); [↑Carter et al., 2022](#); [↑INEE, 2021](#); [↑Pacitto et al., 2023](#); [↑UNESCO, 2023](#)). [↑UNESCO's \(2023\)](#) Global Education Monitoring report highlighted that 9% fewer women than men own a mobile phone and 16% fewer use mobile internet in low- and middle-income countries. This issue does not only affect learners; a study assessing teacher preparedness to respond to the educational challenges posed by Covid-19 in Rwanda highlighted that, even before the pandemic, male teachers in Rwanda had more access than female teachers to both technological devices and the internet ([↑Carter et al., 2022](#)).

Other factors that negatively influence access to EdTech include the deprioritisation of children with disabilities during emergencies ([↑Kiru et al., 2023](#); [↑UNESCO, 2023](#)) and language barriers where tech-based learning options are primarily available only in dominant languages, which can alienate learners from minority communities ([↑Muñoz-Najar et al., 2021](#); [↑Wawire et al., 2023](#)). These challenges highlight the importance of governments and implementers developing clear frameworks that force them to consider how EdTech will reach the most marginalised learners during a conflict or crisis. Without such frameworks, EdTech may do more harm than good and exacerbate the existing learning divide ([↑INEE, 2021](#); [↑West, 2023](#); [↑UNESCO, 2023](#)).

Caregivers may not always be aware of digital learning options or able to support distance learning, which can limit learner engagement with these options.

The literature suggests that caregivers play a crucial role in mediating learners' use of EdTech during emergencies ([↑Islam et al., 2022](#)) but that they may also face barriers to providing the support required. [↑Mazari et al. \(2023\)](#) found that caregivers' lack of awareness of the digital options available was a key limiting factor in the roll-out of distance learning in the wake of the 2022 Pakistan floods, an issue echoed by [↑Muñoz-Najar et al. \(2021\)](#) based on the examples of Covid-19 responses in a range of countries.

There is also evidence that caregivers' education level may have an important impact on learners' access to and use of EdTech in emergencies. [↑Muñoz-Najar et al. \(2021\)](#) note that caregivers with little or no education may be less likely to operate a computer or a laptop. This suggestion is substantiated by [↑Aurino et al. \(2022\)](#), who found that nudge messaging designed to increase caregiver engagement with their children's remote learning was only effective when caregivers had a minimum level of schooling.

Digital skill and training gaps prevent learners and teachers from making the most of EdTech interventions

The literature frequently highlights gaps in the digital skills of both learners and teachers as a barrier to EdTech use. [↑Kaminsky \(2024\)](#) and [↑Bakhmat et al. \(2023\)](#) both identify learners' lack of digital literacy as a factor that limits EdTech effectiveness, while others highlight either gaps in teacher training frameworks or a complete lack of EdTech training within professional development ([↑Bakhmat et al., 2023](#); [↑Kiru et al., 2023](#); [↑Shraim & Crompton, 2020](#); [↑Sims, 2021](#); [↑Tarricone et al., 2021](#)).

When training on EdTech on both digital skills and EdTech integration in teaching is not embedded into teacher training frameworks, it becomes exceedingly difficult for teachers to switch to remote learning techniques in the middle of an emergency ([↑Tarricone et al., 2021](#)). This issue is evidenced by [↑Shraim & Crompton](#) who, in the Covid-19 context in the Occupied Palestinian Territory, reported that “almost all teachers found online teaching stressful and lacked confidence in their ability to deliver it [...] without training or technical support” ([2020](#), p. 12).

EdTech effectiveness in crises may be hampered by data protection issues

While storing learner data using solutions such as cloud storage may make particular sense in unstable conflicts in which physical infrastructure is at risk of being destroyed ([↑Baytiyeh, 2021](#)), there are also concerns about the security and protection of learner data during crises. In a recent review of 163 EdTech products endorsed by 49 governments during the Covid-19 pandemic, [↑Han \(2022, p. 12\)](#) found that 145 products (89%) “appeared to engage in data practices that put children's rights at risk, contributed to undermining them, or actively infringed on these rights.” If such unethical practices are allowed to continue through EdTech implementation, the risk of exploitation is added to the list of challenges already faced by crisis-affected learners.

This challenge is especially stark in the context of the Occupied Palestinian Territory, where [↑Shraim & Crompton \(2020, p. 12\)](#) report that cyber-extortion through social media platforms is particularly common among teenage girls. The authors suggest that the fear of this alone could lead to disengagement with online learning during crises, as caregivers may discourage or prevent learners from going online due to their “concerns about their [children’s] online safety when using social networks more heavily.” A lack of learner motivation impedes the use of EdTech in emergencies.

As noted earlier in relation to gamified learning, EdTech interventions may be considered effective on the basis of their ability to motivate learners. Turning this around, a broader lack of learning motivation may limit the extent to which EdTech can support learning in emergencies ([↑Ali et al., 2023](#); [↑Shraim & Crompton, 2020](#)). Learner motivation may be impacted in numerous ways during crises, resulting in low attention spans, behavioural issues and reduced learning and memory skills. Similarly, crises can negatively impact teacher motivation due to additional crisis-induced pressures on aspects of their lives beyond their teaching role ([↑Kiru et al., 2023](#)).

Challenges inherent to certain emergencies can prevent EdTech implementation

In conflict contexts such as Sudan and Ethiopia, there are perhaps obvious challenges to EdTech implementation, including violent attacks (affecting programme participants and staff alike), and disruptions to food, fuel and electricity supplies, among others ([↑Brown et al., 2020](#); [↑Cameron et al., 2024](#)). Conflicts can damage and destroy school buildings and resources, creating physical barriers and fear of attending school ([↑Baytiyeh, 2021](#)). In other crises, extreme weather events and epidemics can also derail EdTech implementation ([↑Brown et al., 2020](#)).

3.4 What are the conditions for successful EdTech implementation in crisis settings?

A consistent thread running through the identified literature is that EdTech in itself cannot guarantee a positive impact on learning outcomes; much depends on how EdTech interventions are implemented. This section therefore focuses on how to implement EdTech in emergency contexts, based on lessons learnt in the reviewed literature.

Successful emergency responses involving EdTech make use of pre-existing knowledge, infrastructure, and resources

There is a common assertion within the literature that some of the most successful EdTech interventions in emergency contexts are effectively extensions of what was happening in the country before the emergency occurred ([↑Lennox et al., 2021](#); [↑OECD et al., 2022](#); [↑Tarricone et al., 2021](#); [↑UNESCO, 2023](#)). This may take the form of leveraging existing content and interventions that were already available and operational before the crisis ([↑Muñoz-Najar et al., 2021](#); [↑UNESCO, 2023](#)). Examples from the Covid-19 context include incorporating the social media platforms already used regularly by learners into emergency education plans ([↑Baytiyeh, 2021](#); [↑Sarmiento et al., 2022](#); [↑Tarricone et al., 2021](#)), and harnessing a radio-based intervention already developed for use during the Ebola crisis in Sierra Leone. Conversely, some contexts such as Haiti, and Edo State in Nigeria, provided online remote learning even though they did not have the infrastructure to roll it out equitably, resulting in low uptake ([↑Muñoz-Najar et al., 2021](#)).

However, it is important to acknowledge instances in which the procurement of new hardware is a necessary component within a broader EdTech strategy, provided that this procurement is proportionate, targeted, and sustainable. Good examples of successful EiE implementation involving EdTech acquisitions include the introduction of solar radios during the Covid-19 pandemic in South Sudan ([↑UNESCO, 2023](#)) and solar-powered tablets to facilitate the implementation of CWTL in Lebanon and Sudan ([↑Brown et al., 2020](#); [↑Turner et al., 2022](#)). Additionally, results from [Diaz-Lema et al.'s \(2023\)](#) teacher survey suggest that access to quality devices was a top priority for respondents.

EdTech implementations should respond to users' realities

Beyond the previous points about using what is available and familiar to users, EdTech in emergencies must also be context-appropriate in other ways. This includes ensuring that content is available in the appropriate languages ([↑AlSheikh Theeb, 2022](#); [↑Aurino et al., 2022](#)) and that it aligns with learners' schedules ([↑INEE, 2021](#)). An example of where the latter point was not taken into account was in Sierra Leone during the Covid-19 pandemic, where “recorded lessons were aired daily at a fixed time, leaving

out students who had household or labor responsibilities” ([↑Muñoz-Najar et al., 2021](#), p. 40).

There is also evidence from the literature beyond EiE that co-designing EdTech content with users is vital for effectiveness (see [↑Durall Gazulla et al., 2023](#)). A good example of this principle being applied in the EiE context is CWTL’s implementations in Lebanon, Jordan, and Sudan ([↑Brown et al., 2020](#); [↑De Hoop et al., 2019](#); [↑Turner et al., 2022](#)). As [↑Turner et al. \(2022, p. 80\)](#) explain in the case of Lebanon, the co-design process with out-of-school children “resulted in an experiential learning interface that reflects children’s realities and dreams.” This process may be critical in EiE contexts to create a sense of stability and avoid using content that may reawaken conflict-related trauma ([↑Alain et al., 2018](#)).

Emergency EdTech responses should be multimodal

A common theme within the reviewed literature is the importance of offering multiple options for sustaining learning during crises ([↑Dreesen et al., 2020](#); [↑INEE, 2021](#); [↑Lennox et al., 2021](#); [↑OECD et al., 2022](#); [↑Sims, 2021](#); [↑Wawire et al., 2023](#)). As noted previously, many Covid-19-related interventions can be considered effective only for those with the financial means to access them. While eliminating the social inequalities that lead to this digital divide is a profoundly complex and long-term endeavour, in the shorter term, having low-tech options available for those without the devices required for internet-based solutions is critical to sustaining learning for a higher number of learners. For example, interviewees working for Promoting Equality in African Schools (PEAS) in Uganda during the Covid-19 pandemic reported that their ‘multi-pronged approach’, which included SMS-based learning, telephone trees, radio broadcasts, and paper-based learning, resulted in 95% of the student body being able to access at least one form of support ([↑Pacitto et al., 2023](#)). Conversely, the iMlango project in Kenya developed an app as their primary pandemic response tool, which 77% of the learner cohort did not use due primarily to a lack of internet-enabled devices ([↑Pacitto et al., 2023](#)).

There is strong evidence that using different modalities and approaches in tandem makes for a more successful intervention. A good example comes from the Nigerian context at the height of the Boko Haram crisis. The Technology Enhanced Learning for All programme used mobile devices in combination with radio to help 22,000 disadvantaged children continue to learn in Adamawa state:

“Within six months of listening to the programme, there was improvement in literacy and numeracy skills, with a sharper improvement observed among girls. The combination of mobile classroom visits with radio instruction was more effective: beneficiaries exposed to both learning modalities outperformed those exposed only to the radio programme by 25%” (†Jacob & Ensign, 2020 in †UNESCO, 2023, p. 40).

In parallel, †Angrist et al. (2020) conducted a rapid randomised trial of an adaptation to TaRL (Teaching at the Right Level) during the Covid-19 pandemic, involving remote instruction by phone and simple SMS texts. The research team observed a 24% increase in Annual Status of Education Report (ASER) test scores for learners who experienced a combined phone call and SMS intervention, and a 13% increase for those who experienced SMS only. A final example of the strength of multi-modality during the pandemic is that of eKitabu, which launched a daily 30-minute broadcast called Digital Story Time through multiple channels, including the organisation’s YouTube channel, its website, and also on DVDs and flash drives. In 2020, eKitabu reported that:

“The program currently reaches four million households”, and has reportedly become so popular that “Kenya’s Ministry of Education has added the broadcast to the primetime slot on EDU Channel TV, so it now airs twice a day” (†eKitabu, 2020).

Training must be prioritised to enable users to use tech-based options effectively

A frequently identified success factor in the literature is the need for EdTech interventions in emergencies to be appropriately supported by professional development that focuses on digital literacy (†Diaz-Lema et al., 2023; †Dreesen et al., 2020; †Muñoz-Najar et al., 2021; †Tarricone et al., 2021; †Vakaliuk et al., 2021). While the majority of sources focus on teachers, †Carter et al. (2022) suggest that this should extend to school leaders where possible. †Aurino et al. (2022), †Dreesen et al. (2020), and †Muñoz-Najar et al. (2021) all emphasise the importance of providing support to caregivers so that they may better support their children’s technology use, especially in situations in which schools are forced to close and home learning becomes a necessity.

Beyond digital literacy, other sources emphasise the importance of supporting teachers in integrating digital tools and content into their teaching. Qualitative evidence from †Turner et al. (2022) suggests that teachers or facilitators may require additional support with classroom

management when learners use EdTech, especially if the programme involves facilitators with limited formal teacher training. Using qualitative evidence from both EiE and non-EiE programmes, [↑Pacitto et al. \(2023\)](#) also suggest a range of strategies that can be used within teacher professional development relating to EdTech integration. These include providing continual training rather than one-off sessions, using modelling as a key strategy for training teachers on device and content use in the classroom, and supporting peer learning through communities of practice using platforms such as WhatsApp.

Other conditions for success

Though less commonly noted or discussed in less detail, other important prerequisites for effective EdTech implementation in emergencies include education actors having access to robust data sharing and monitoring systems to tailor and target their interventions effectively ([↑Dreesen et al., 2020](#); [↑OECD et al., 2022](#); [↑UNESCO, 2021](#)) and including multiple stakeholders within the implementation of EdTech interventions ([↑OECD et al., 2022](#); [↑Pacitto et al., 2023](#); [↑Sims, 2021](#); [↑Tlili et al., 2024](#)).

4. Synthesis and conclusions

It is clear that EdTech in different forms has the potential to sustain learning during a range of different crises. Options such as radio and mobile-based learning have the broadest reach, are cost-effective, and may have particular advantages where high-tech infrastructure is not available, while learning online through video or social media may provide familiarity and access to a wide range of learning resources. Game-based learning is associated with convincing learning gains and has clear motivational value, while live lessons provide the most potential for collaborative learning and quality when implemented well and supported by comprehensive training. The common denominator for interventions with the most robust effectiveness data is that they involve EdTech being embedded within some form of facilitation and inviting interaction between peers and teachers. This dependency indicates that a focus on supporting and developing teachers and facilitators to curate the EdTech experience is essential.

The diversity of crisis-affected contexts means that all answers to the question of ‘what works’ must be highly nuanced; different emergencies affect learners in myriad ways, and these impacts and the educational and psychosocial needs resulting from them are determined by the educational provision available before the crisis began, as well as learners’ and teachers’ individual situations, skill sets, and learning preferences. For this reason, it is critical that all interventions use the structures and systems already in place, and that they adopt contextualisation to users’ realities as a central principle.

EdTech usage outside emergency contexts continues to cause serious equity concerns; we hear repeatedly of scenarios in which some learners and teachers benefit easily from EdTech, while many others miss out for a range of reasons far beyond their own control. This issue is magnified in emergency contexts, in which the need to access quality education becomes even more urgent and those who have lost so much risk being even further disenfranchised and excluded. Therefore, emergency EdTech interventions must be aimed first and foremost at the most marginalised. At the very least, multiple options and access pathways should be made available to ensure that everyone stands a chance of experiencing the learning benefits of EdTech.

This review brings into focus the pronounced need for further, high-quality evidence to inform our understanding of EdTech in emergencies. While

many sources provide narrative reports of EdTech implementation, very few are accompanied by robust evidence of effectiveness. Of those that do, the vast majority focus on the educational access that EdTech provides, while saying very little on the quality of that tech-mediated education. Similarly, few sources provide insight into exactly how EdTech should be integrated within teaching and learning, or how to best prepare teachers to carry out this integration. Finally, detail is often lacking regarding the precise content or functionality of EdTech programmes. Much more testing of specific components within an EdTech intervention is needed to isolate which elements contribute the most to learning and well-being gains, in which combinations, and under which circumstances.

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Annex: Search strings

For Google Scholar:

- ("Educational technology" OR "Education technology" OR EdTech OR "distance learning") AND (emergenc* OR crisis OR crises OR disaster OR displace* OR refugee OR "natural disaster")
- ("Educational technology" OR "Education technology" OR EdTech OR "distance learning") AND (emergenc* OR crisis OR crises OR disaster OR displace* OR refugee OR "natural disaster") AND ("Cyclone Idai" OR Afghanistan OR Ukraine OR "Pakistan floods" OR "Türkiye-Syria Earthquake" OR "Turkey-Syria earthquake" OR Sudan OR "South Sudan" OR Myanmar OR Somalia OR Ethiopia OR Gaza OR "occupied Palestinian territory" OR Burkina Faso OR Mali OR Niger OR "Democratic Republic of the Congo" OR DRC)
- ("Educational technology" OR "Education technology" OR EdTech OR "distance learning") AND ("Cyclone Idai" OR Afghanistan OR Ukraine OR "Pakistan floods" OR "Türkiye-Syria Earthquake" OR "Turkey-Syria earthquake" OR Sudan OR "South Sudan" OR Myanmar OR Somalia OR Ethiopia OR Gaza OR "occupied Palestinian territory" OR Burkina Faso OR Mali OR Niger OR "Democratic Republic of the Congo" OR DRC OR Chad OR Haiti OR Nigeria OR Central African Republic OR Ecuador OR Lebanon OR Syrian OR Yemen)

For Google main:

- EdTech education technology ICT crisis emergency disaster refugee evidence
- EdTech education technology ICT crisis emergency disaster refugee hurricane flood earthquake evidence
- EdTech education technology ICT crisis emergency Afghanistan/Ukraine/Pakistan/Turkey/Syria/Sudan/South Sudan/Myanmar/Somalia/Ethiopia/Gaza/occupied Palestinian territory/Burkina Faso/Mali/Niger/DRC/Chad/Haiti/Nigeria/Central African Republic/Ecuador/Lebanon/Yemen (emergencies searched one by one)
- EdTech education technology ICT crisis emergency Covid-19