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ASEAN-UK SAGE | Supporting the Advancement of Girls' Education

GUIDANCE NOTE

Leveraging Existing Technology in Low-Resource Settings to Support Learning

Conceiving and developing implementation plans for schools

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About EdTech Hub

EdTech Hub is a global research partnership. Our goal is to empower people by giving them the evidence they need to make decisions about technology in education. Our evidence library is a repository of our latest research, findings, and wider literature on EdTech. As a global partnership, we seek to make our evidence available and accessible to those who are looking for EdTech solutions worldwide.

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EdTech Hub Helpdesk

The Helpdesk is the Hub's rapid response service, available to FCDO advisers, World Bank and UNICEF staff in more than 70 low- and lower-middle-income countries (LMICs). It delivers just-in-time services to support education technology planning and decision-making. We respond to most requests in 1–15 business days. Given the rapid nature of requests, we aim to produce comprehensive and evidence-based quality outputs, while acknowledging that our work is by no means exhaustive. For more information, please visit edtechhub.org/helpdesk/.

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Abbreviations and acronyms

ACER	Australian Council for Educational Research
ASEAN	Association of Southeast Asian Nations
ASEAN-UK	Supporting the Advancement of Girls' Education
SAGE	
BRAC	Bangladesh Rehabilitation Assistance Committee
DLTV	Distance Learning Television
EdTech	Educational technology
GEM	Global Education Monitoring
GSMA	Global System for Mobile Communications Association
ICT	Information and communication technology
NGO	Non-governmental organisation
ODL	Open and Distance Learning
OER	Open Educational Resource
SEAMEO	Southeast Asian Ministers of Education Organization

1. Introduction

Interest in integrating educational technology (EdTech) into education systems has surged globally in recent years, particularly since the Covid-19 pandemic. Many governments and schools have invested in hardware and digital resources; however, there is a need to target these interventions to include measurable outcomes in teaching and learning. The Global Education Evidence Advisory Panel's Smart Buys report (↑Akeyampong et al., 2023, p. 7) emphasises that "investing in hardware like laptops, tablets and computers alone" is a 'bad buy' that has not been evidenced to lead to enhanced learning outcomes. Given this, it is pertinent to consider how existing resources can be used most effectively, including the possibility of designing new approaches that leverage what is already in place.

In April 2024, with partners, EdTech Hub began working through that particular challenge to respond to a request received through the ASEAN-UK SAGE programme's Helpdesk offering to the Southeast Asian Ministers of Education Organization (SEAMEO) centres in the Southeast Asian region. The request involved exploring how available hardware and digital resources could be repurposed to support teaching and learning in a low-resource school setting. Given the challenges of working with scarce resources, with a focus on feasibility and cost-effectiveness, this guidance note aims to bridge the gap between research and practice.

While the original request was made in response to the needs of a school context in Southeast Asia that caters to migrant learners and where teacher shortages are prevalent, this guidance note leverages global good practices to suggest strategies that ministries, implementers, donors, and school-level stakeholders alike can consider repurposing and test existing digital resources and available hardware, rather than make costly investments.

In order to serve as a practical guide for implementers and decision-makers on how available technologies can support teaching and learning in similar contexts across schools globally, this guidance note draws upon an existing body of evidence on what works in using EdTech in low-resource settings. The note aims to provide implementers and key decision-makers with a clear understanding of the steps required in the early phases of EdTech implementation in a low-resource school to aid teachers when delivering lessons or to address teacher shortages. Additionally, this guidance note also provides guidelines on transitioning

from the conception phase to the development of an implementation plan.

Section 2 explores key considerations for implementing EdTech in low-resource contexts, including constraints, evidence-based responses, and examples from Southeast Asia. Section 3 provides guidance on planning for context-specific EdTech implementation, detailing phases such as defining outcomes, conducting a needs assessment, curating existing resources, and developing an implementation framework. Section 4 provides a conclusion, while Section 5 presents key takeaways from the implementation planning process and highlights common gaps that hinder effective implementation in low-resource settings.

1.1 Limitations

This guidance note is limited in its focus on conception, intervention design, and implementation plan development. The Helpdesk request did not extend beyond the initial implementation phase, and, therefore, this note provides general guidance for developing an initial implementation plan that requires further testing in low-resource settings. Additionally, this guidance note does not recommend using a specific technology or digital resource to enhance teaching and learning; rather, it recognises that programmes are context-specific and require tailored approaches, even within a particular country. The note acknowledges that schools may not have sufficient financial resources or capacity to create context-specific content in the early phase of implementation. It therefore addresses how existing resources (e.g., Open Educational Resources [OERs] and local EdTech content) can be used with hardware already available in schools in order to serve as a teaching aid, or to be used in classrooms where teacher shortages are prevalent. Guidelines on developing new content are outside the scope of this guidance note.

2. Considerations for implementing EdTech in low-resource contexts

> *"Investing in education technology hardware alone is almost always a bad use of funds. What matters is how the technology is used by teachers, students, parents, and administrators. Purchasing new hardware like tablets or computers is expensive and does not improve learning outcomes on its own"*
> (↑Akeyampong et al., 2023, p. 24).

This section expands on the perspective outlined by ↑Akeyampong et al. (2023) above by presenting general constraints in low-resource settings, insights from evidence on the appropriate use and adoption of EdTech, and the particular challenges encountered in Southeast Asia, where the helpdesk request originated.

2.1 Constraints in low-resource contexts

For the purpose of this guidance note, we characterise low-resource settings as regions with significant barriers to the adoption and implementation of EdTech. These include constraints around existing infrastructure (e.g., learning and teaching resources, disruptions in electricity and internet connectivity), limited financial resources (e.g., limited school and district budgets), limited digital literacy in communities, capacity challenges including teacher shortages, cultural and linguistic diversity, and socioeconomic, gender-based, or disability-related barriers to education. While several of these limitations are prevalent in remote or hard-to-reach areas, urban locations can also be considered low-resource contexts if some or all of these issues exist.

2.2 Evidence-based responses

Knowledge about the practical use of EdTech is a growing field. Still, general evidence on cost-effective approaches offers valuable insights for improving learning, despite constraints around limited funds for acquiring and maintaining hardware and digital resources. The Global Education Evidence Advisory Panel provides guidance through its 'Smart Buys' framework, highlighting investments in education categorised as 'great' or 'good buys', which are supported by strong evidence and proven cost-effectiveness. Conversely, they caution against 'Bad Buys', which have consistently been shown to be ineffective or not cost-effective

(↑Akeyampong et al., 2023). Figure 1 lists examples of good practices and common pitfalls.

Figure 1. *Good practices and risks associated with EdTech implementation of education programmes* (↑Akeyampong et al., 2023)

✅ Do invest in structured pedagogy through skills-based teacher training and teacher support structures.

✅ Do invest in supporting teachers to facilitate targeted teaching at the learning level.

✅ Do invest in interventions that target learning at the level of the child.

❌ Do not assume investments in EdTech and infrastructure alone (i.e., in digital hardware, textbooks, and buildings) will improve learning.

Recent literature highlights significant gaps across many countries in Southeast Asia that have led to a lesser focus on the nuances of EdTech implementation and integration. For example, in the Philippines, the Global System for Mobile Communications Association (GSMA) observes that a "disconnect" between national policies and local implementation has led to gaps in the integration of EdTech (↑Deshpande & White, 2024). According to the report, there is a focus on hardware provision without "addressing the need for accompanying software, teacher training or technical support" (p. 57). ↑UNESCO & SEAMEO's (2023) Global Education Monitoring (GEM) report identifies similar challenges in Thailand's One-Tablet-Per-Child project launched in 2012, with teachers reportedly facing issues integrating the tablets into classroom practice (for more details, see Figure 2). These insights underscore the importance of situating technology within the broader EdTech ecosystem, rather than focusing solely on hardware.

Figure 2. *Key lessons from Thailand's One-Tablet-Per-Child Scheme*

Thailand's One-Tablet-Per-Child policy, implemented between 2011 and 2014 (↑Dipendra, 2023), distributed over 860,000 tablets to Grade 1 students, featuring 336 learning objects across subjects. Although massive, this initiative encountered numerous challenges, such as contractual and supply chain issues. ↑Viriyapong & Harfield (2013) identified four key takeaways:

- **Contextualised content**: Content must be accessible and adaptable to individual students' abilities and learning contexts.
- **Usability**: Issues such as battery life, screen brightness, and button defects can negatively affect a programme. Hardware must be user-friendly.
- **Teacher support**: Effective teacher training and interactive software are

essential, ensuring classroom support and engagement for both teachers and students.
- **Learning outcomes:** Tablet activities should be integrated with curricula, and robust data collection and analysis methods are necessary to evaluate individual, class, and school-level learning outcomes effectively.

What can we learn from the One-Tablet-Per-Child policy?

Successful EdTech initiatives must consider contextualisation, usability, teacher support, and learner outcomes to ensure the success and buy-in of their programmes.

2.3 EdTech implementation: The Southeast Asian context

Recent research, including that conducted through the ASEAN-UK SAGE programme, highlights that many children across Southeast Asia, particularly learners from marginalised groups and migrant communities, increasingly face barriers to educational attainment. While a scoping study by ↑Afzal et al. (2024) estimates that approximately 11.8 million children in Southeast Asia are out of school, a rapid evidence review by ↑Nietschke et al. (2024) highlights a "learning crisis" in the quality of education for children who are in school (↑Nietschke et al., 2024, p. 14). Investment in the region's EdTech sector remains limited, alongside poor connectivity, localisation challenges, limited government capacity, and systemic barriers to digital access, specifically for marginalised learners (↑Chrisani et al., forthcoming). Compounding these challenges is the gap in teacher supply, which is projected to be 4.5 million in Southeast Asia by 2030 (↑UNESCO & International Task Force on Teachers for Education 2030, 2024).

To address these challenges and ensure that learners have the necessary digital skills to succeed as future professionals, the use of technology has expanded across Southeast Asia, although there are great variances between and within countries. Nine out of eleven countries in the region focus on digital literacy in their policies and plans, and two ASEAN documents, the 2020 ASEAN declaration on Human Resource development for the Changing World of Work (↑ASEAN, 2020), and the 2022 declaration on the digital transformation of Educational Systems in ASEAN (↑ASEAN, 2022) reflect the region's commitment to integrating technology in education.

Of the interventions leveraging technology across the region, several have used low-tech methods to provide distance learning by aligning with devices that communities already have access to. One such programme,

with measurable outcomes, implemented by the Philippines' Department of Education and the non-governmental organisation (NGO) Youth Impact, uses phone and SMS tutoring to deliver lessons in emergency contexts (see Figure 3 below). The implementation's positive outcomes, such as a 65% increase in students mastering key numeracy skills, emphasise how available hardware can be used for scalable, low-cost, and accessible EdTech interventions when combined with appropriate pedagogical and assessment tools and how they contribute to a programme's success.

Figure 3. *Phone tutoring to improve learning in the Philippines and beyond*

Between 2020 and 2022, the NGO Youth Impact conducted large-scale, randomised control trials in the context of emergency Covid-19-related school closures in India, Kenya, Nepal, the Philippines, and Uganda (↑Angrist et al., 2023). The study tested the impact and effectiveness of mobile phone calls and SMS educational tutorials as a high-access, low-cost, scalable means to reach students and their caregivers while schools were not in session.

Teachers made use of mobile phones owned by families of primary school children to provide educational interventions via 1:1 phone call tutorials and SMS messages. Mobile phones were chosen for the intervention as they are an affordable means for reaching students in low-income countries, where over 70% of households have access to them. The intervention consisted of weekly 20-minute live phone call tutorials for eight weeks, along with SMS messaging with content and reminders to engage. These tutorials covered foundational numeracy and were tailored to students' learning levels through frequent assessments.

The study demonstrated strong results, with students in all five trials showing learning gains. On average, there was a 65% increase in the proportion of students who mastered division, effectively covering all core numeracy concepts taught in the programme. However, while phone calls were highly effective, SMS-only interventions showed limited impact and were only beneficial in settings with no other learning options.

The intervention also improved teaching practices and motivation. Teachers were more likely to tailor feedback to students' learning levels and involve parents. Notably, 97% of both control and treatment teachers said that they would like to deliver the programme in the future. These results suggest effective programmes can boost teacher engagement and quality.

The study team believes that the pedagogy used by the programme to assess students' learning levels and deliver tutorials tailored to their needs was as important as the modality of teaching and allowed for success. At approximately USD 11–12 per child, the intervention was not only effective but also highly cost-effective, allowing for greater scale. Given that the largest effect of this study was on students from the poorest and lowest parental educational backgrounds, it demonstrates the intervention's potential for bridging equity gaps.

Drawing on the Youth Impact example of creating new pedagogical content with available devices, various organisations across Southeast Asia have developed digital materials for radio, TV, computers, tablets, and smartphones. In particular, Open and Distance Learning (ODL) has gained significant momentum in the region in the aftermath of Covid-19 (↑SEAMEO SEAMOLEC, 2023). Resources such as the Southeast Asian Massive Open Online Courses Network, Wawasan Open University in Malaysia, Open Educational Resources portal in Cambodia, and Inibudi.org[1] in Indonesia have expanded in recent years (↑UNESCO, 2023). Meanwhile, Coursera, a massive open online course provider, saw the fastest global growth in enrolments in Indonesia, the Philippines, and Vietnam (↑UNESCO, 2023).

Low-tech solutions, including conventional and interactive broadcast media, have helped deliver education to learners in remote areas of Southeast Asia (↑SEAMEO SEAMOLEC, 2023). The Philippines' Alternative Learning System uses radio, as well as printed materials and online learning, to reach students in remote and marginalised communities (↑UNESCO, 2023). In Thailand, Distance Learning Television (DLTV), a key initiative led by the government since 1995, broadcasts educational content throughout the country, while in Lao PDR, My Village TV, led by the government and UNICEF, provides programmes to improve access to quality education for marginalised children under the age of six (↑Barnes et al., 2024). TV programmes like TV Okey in Malaysia and Think! Think! in Cambodia, are also designed to reach learners who lack internet access (↑Rui & Upadhyay, 2022).

Mid-tech solutions, such as Let's Read, a digital library of storybooks in Asia that can be accessed offline once downloaded, are also widely used throughout the region (see Figure 4). The availability of content underscores the potential to repurpose existing resources for use in low-resource settings. Inevitably, where funding is available, there are opportunities to contextualise existing content or, if needed, develop content that is more relevant. However, at the school level, funding constraints may make developing new content unaffordable.

[1] See http://Inibudi.org. Retrieved 23 July 2025.

Figure 4. *Evidence on the initiative 'Let's Read' to support literacy and inclusion*

Let's Read,[2] an initiative by the Asia Foundation, is a digital library of storybooks, offered in over 55 languages. Hosted on an auditory-impaired-friendly website, the books target pre-primary and primary school children and cover subjects including reading, science, health, and critical thinking. The free tool only requires an internet connection to download the books, which can then be accessed offline.

In Indonesia, findings from a preliminary study indicate that primary school students found the Let's Read app engaging due to its diverse language choices, story categories, and additional interactive features (↑Samsudin & Rahmawati, 2023). Research conducted on the translation quality of stories revealed that translating the storybook *Dive* from English to Indonesian demonstrated precision and effectiveness in conveying the original message (↑Setiajid et al., 2023). Moreover, two additional studies in Indonesia found positive outcomes: eleventh-grade students actively engaged with English reading materials (↑Prihartono et al., 2021), while seventh-grade students improved their English vocabulary after using the application (↑Mardiah et al., 2022).

The Let's Read platform also offers books in minority languages, supporting sociolinguistic development. Research indicates that teaching students in their native language is effective, making multilingual education a key to quality and inclusive learning (↑Ball, 2010; ↑Zhao et al., 2024; ↑Giannini, 2024). For example, in Thailand, where over 50 indigenous languages are spoken, providing content in students' native languages can enhance learning outcomes. Let's Read offers books in Kachin and Chin, as well as audiobooks in Burmese, which can be used in schools along the Thai-Myanmar border. Overall, the tool shows how adapting and translating content can boost engagement and foster a sense of inclusion among marginalised learners (↑Chrisani et al., forthcoming).

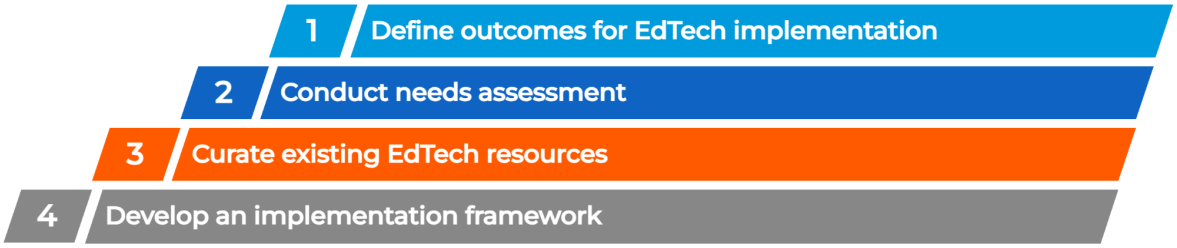
[2] See https://www.letsreadasia.org/. Retrieved 23 July 2025.

3. Planning for context-specific EdTech implementation

Effective and context-specific EdTech implementation in low-resource schools involves aligning the use of technology with the specific challenges and needs of communities, as well as understanding the priorities and policies of the local government. Moreover, exploring how past investments can inform or strengthen new initiatives can help demonstrate strategic continuity and efficient use of resources. This section focuses on how this can be achieved in practice. It outlines the planning process, from conception —i.e., defining outcomes —through to the development of an implementation plan, and includes recommendations for necessary steps.

It is essential to note that implementation is an iterative process, and insights gained throughout the course of an intervention should inform the design of a programme, enabling continuous improvement and generating evidence across all phases. The phases of this process, as illustrated in Figure 5, are described in further detail below.

Figure 5. *Phases of planning for an EdTech implementation*



Phase 1: Define outcomes

Even when EdTech integration is motivated by challenges such as teacher shortages or the need to support marginalised children, for sustained impact on education through the use of technology as an enabler, the following two questions are helpful when defining outcomes (Hollow & Jefferies, 2022).

1. **Will this use of technology lead to a sustained impact on learning outcomes?** This question enables decision-makers to focus on measurable outcomes (i.e., the impact of an input on learning) rather than on outputs (e.g., the number of devices provided).

2. **Will this use of technology align with government priorities and lead to the strengthening of national education systems?** This question relates to understanding whether the use of EdTech is aligned with existing curricula, national and regional assessments, and priorities.

Focusing on the learning outcomes and the policy environment within which implementation will occur can help decision-makers avoid a 'tech-first' approach and ensure that people are always at the centre. To help answer these two questions, implementers and decision-makers should conduct desk research and engage continually with key stakeholders to validate insights. As part of this early process, it is also important to define clear success metrics that will guide monitoring and evaluation efforts throughout implementation. These metrics should be developed in consultation with stakeholders to reflect both system-level priorities and local needs.

a. Desk research

Desk research can provide valuable insights into the broader education ecosystem and help ensure an intervention is contextually relevant and sustainable. Typically, such research entails examining the educational landscape, analysing national and regional policies that promote the integration of EdTech in schools, mapping key education stakeholders (including government agencies, private organisations, and NGOs), and categorising the different types of schools and learning centres operating in the region.

Mapping out existing educational initiatives as part of the broader educational landscape provides critical context for understanding where EdTech might add the most value. This comparison, including an assessment of the appropriateness, effectiveness, and cost-effectiveness of EdTech relative to other education interventions, when possible, helps identify opportunities to build on or align with existing efforts, avoid duplication, and determine the most suitable solution for the given context. Conducting this analysis during the initial desk research ensures that a proposed intervention is evidence-based and tailored to the specific needs and constraints of the education system.

In localities with diverse linguistic and cultural populations, it is also essential to explore how EdTech can support multilingual and multicultural learning contexts. By assessing how technology can address the unique needs of learners from different backgrounds, particularly in

marginalised communities, the framework can be designed to promote equitable access to quality education in a sustainable way.

b. Stakeholder engagement

Feasible and sustainable EdTech implementation relies heavily on building and maintaining relationships with key stakeholders in an education system (including teachers, administrators, communities, school and district officials, as well as NGOs and private sector partners) across all phases of an EdTech programme. Engaging and communicating with stakeholders early in the programme's lifecycle, particularly those who will be directly impacted by it, can help create avenues for feedback and ensure continual improvement (↑Principles for Digital Development Working Group, 2024).

When defining outcomes, stakeholder engagement involves understanding government priorities and contextual needs from key decision-makers involved in implementation (i.e., at the school or district level or with partner organisations), and validating data gathered through desk research to co-develop an intervention's outcomes. Communicating and coordinating regularly with stakeholders also provides an opportunity to encourage a culture of evidence uptake, as it is dependent on the "requirement for all parties to understand and agree on the usefulness, meaning, and credibility of the evidence" (↑Hollow & Jefferies, 2022, p. 19).

To further inform EdTech implementation, stakeholders at the school level, i.e., teachers, school administrators, students, and parents, should be involved by conducting a needs assessment. Co-creating the implementation plan with teachers and key stakeholders from the outset can foster ownership and investment in adopting EdTech, while also ensuring the plan's feasibility from their perspective, thereby enhancing its practicality and increasing the chances of success. In parallel, cultivating champions across all levels of the education system by identifying individuals committed to co-creation, building on trusted relationships, and connecting them to real-time impact can help generate visibility, mobilise support, and sustain momentum for scaling (↑Mukoyi & Qargha, 2023). This approach is detailed in the section on Phase 2 below.

Phase 2: Conduct a needs assessment

Investing in content and hardware at the onset of an EdTech programme is a costly undertaking and requires an in-depth understanding of the context, the experiences of the learners and teachers involved, and existing

gaps. To this end, conduct a needs assessment by developing tools based on broader research questions guided by the previous phase (see Phase 1).

We outline details and different aspects of a needs assessment below. Our recommendations highlight key components and include a note on addressing challenges associated with the process.

a. Consider learner needs

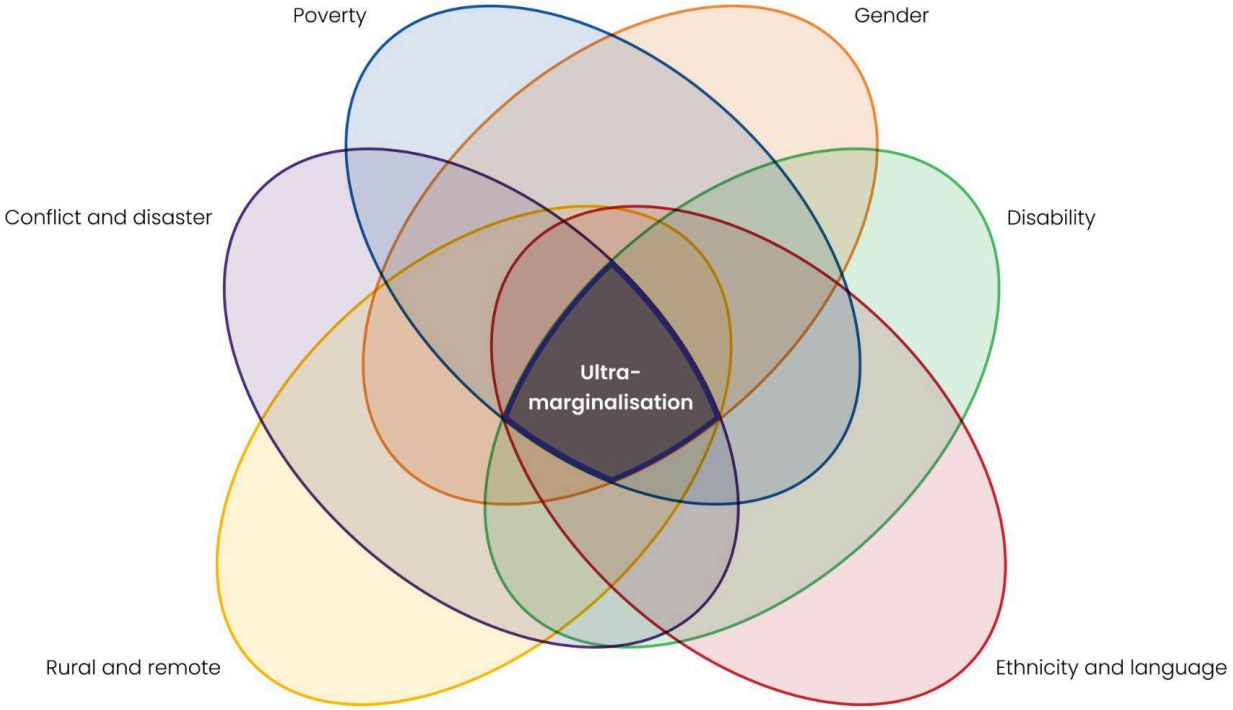
To ensure that students' needs are captured through a needs assessment, it is useful to consider marginalised groups within the context of low-resource schools. Specifically, we recommend using the following question to guide this part of the process (↑Hollow & Jefferies, 2022):

Will this use of technology work for the most marginalised children and enhance equity?

Use the needs assessment process to gather insights into the lived experiences of marginalised groups and understand how various factors, such as cultural and linguistic barriers, geographical location, and socio-economic background, among others, contribute to marginalisation. Consider how diverse learners interact with the education system and understand the barriers and enablers in access to education. Some examples of how this can be achieved are:

- Gathering information on the challenges faced by students.
- Learning about learners' access to devices, their familiarity with technology, and specifics about the supporting infrastructure at home and school.
- Determining how students from diverse backgrounds and/or with special educational needs are supported in school and at home.
- Noting whether students face additional barriers due to their gender or socio-economic background.
- Understanding any existing policies or programmes that support learners in accessing education, e.g., scholarships and meal programmes.

Figure 6. *Factors contributing to marginalisation in the ASEAN region. Source: ACER data visualisations, reproduced with permission* (↑Australian Council for Educational Research (ACER), no date).



b. Explore capacity

Use the needs assessment to understand the key challenges school officials and teachers face in the school (e.g., high teacher turnover, lack of school supplies, diverse student populations with various sociolinguistic needs), as well as teacher readiness for EdTech in the classrooms. This can involve the following:

- Understanding the challenges faced in teaching through traditional methods.
- Learning about teachers' familiarity with technology and access to personal devices.
- Understanding existing policies that support teachers, e.g., incentives for teacher training programmes.
- Determining how teachers support students from diverse backgrounds and/or with special educational needs in their pedagogy.

- Leveraging communities of teachers to ensure buy-in of the programme and provide peer support. This can include WhatsApp or Facebook support groups, as well as virtual communities of practice.
- Using existing training programmes for teachers and school officials, or building on them further.
- Assessing elements of a training programme that teachers find useful and whether they provide guidelines on integrating technology into their teaching practice.

c. Determine infrastructure

This aspect involves understanding the school environment, such as the number of classrooms available, electricity and internet connectivity, and the technology available. Gathering insights on which modalities are commonly available can help determine the most effective channels for delivering EdTech interventions and ensure that solutions are adaptable to the specific needs and resources of the community. To this end, create a school infrastructure survey to gather details on:

- The availability and condition of devices in school for students, teachers, and school officials. This also involves noting technical specifications and developing an inventory of hardware.
- Internet connectivity and signal strength in the region that should be tested during field visits.
- Access to electricity and the availability of a backup power supply, if any.
- Students' and teachers' access to devices in school, including computers, radio, TV, projectors, and tablets. The kind of devices available will help determine the appropriate digital resources (for more details, see the section on Phase 3 on curating digital resources)

d. Map digital resources

Closely related to identifying learner needs, capacity, and infrastructure is understanding how students and teachers use digital resources for teaching and learning, if at all. This includes making careful notes of commonly used digital resources such as YouTube videos, social media apps for teaching, and online platforms. It is also worth exploring what aspects of these resources teachers and students find useful, as well as any

challenges that arise. As part of this process, check how well each resource aligns with the intended learning outcomes defined in the section on Phase 1. This ensures the resources are fit for purpose (not merely available), which is key for effective implementation. Insights from this process can inform the development of a curated list of resources supported by available hardware in schools (see the section on Phase 3).

e. Address challenges in the needs assessment

Although conducting a needs assessment is essential, data collection can be challenging in low-resource contexts. Decision-makers and implementers are often constrained by limited funds, lack of trained personnel to conduct field visits and gather data, little time, access to relevant tools to gather insights, and the complexities of the location. To address these concerns and gather high-quality insights effectively, consider the following strategies.

- Pair qualitative methods with quantitative data collection approaches to ensure cost-effectiveness. In practice, this would mean using a combination of interviews, focus group discussions, and surveys with key school- and district-level stakeholders.
- Use hybrid approaches to data collection. For example, combine phone interviews and digital surveys (e.g., to understand stakeholder capacity and school-level infrastructure) with field visits to gain a deeper understanding of the local context (e.g., using classroom observations and interviews with school leaders).
- Partner with local organisations experienced in data collection to gather insights rapidly. This can also have long-term benefits in terms of building local capacity for monitoring and evaluating an implementation.
- Alternatively, involve district or school-level officials in gathering data if they can be supported with robust data collection tools. For an example of needs assessment tools, see a report by ↑Tanweer et al. (2022) on a needs assessment and hypothesis for a sandbox in Bandarban, Bangladesh.

Phase 3: Curate digital resources

This subsection provides guidelines for curating existing digital resources, such as OERs and locally developed EdTech content. As noted in the introductory sections of this document, creating tailored content often requires significant investments and/or technologically adept teachers

who can create their own digital resources. Compiling a comprehensive list of existing EdTech initiatives in the focus region or on the focus topics can help identify ongoing efforts and lessons learnt, and build on available resources, thereby saving on additional costs associated with content development and procurement. Additionally, it enables more informed decision-making and ensures that new interventions build on existing knowledge rather than duplicating efforts.

The EdTech Hub Helpdesk frequently provides partners with curated lists that offer in-depth insights into these initiatives. For an example of a detailed curated list, see ↑Flam et al.'s (2024) *EdTech to Support Blended Learning in Mozambique*. The development of a curated list involves building on insights from the needs assessment phase with a scan of available resources that align with the outcomes developed for the programme. Supplementing the list of digital resources used in the implementation context involves desk research to identify examples of EdTech tools and initiatives that can inform programmes while aligning with school and district priorities. At this stage, it is useful to consider whether this use of resources will be effective in the specific implementation context (↑Hollow & Jefferies, 2022). This can be achieved by developing inclusion criteria and considering appropriate modalities to shortlist EdTech tools.

a. Create inclusion criteria

Create inclusion criteria by collaborating with key stakeholders involved in implementation to ensure relevance and applicability. Examples of inclusion criteria include:

- Initiatives originating from the focus region, diverse sociolinguistic environments, and countries with comparable infrastructure and access to ICT devices.
- Tools and resources showcasing successful practices in EdTech, particularly emphasising blended learning strategies in classroom settings for specific grades or topics.
- Programmes addressing teacher capacity and development in education.
- Initiatives for low-resource settings that adopt a multimodal EdTech approach (i.e., no tech, low-tech, and high-tech), by utilising relevant and accessible technology for enhanced learning experiences.
- Tools and resources available in the region's dominant languages.

- Digital resources that teachers are already using frequently in the implementation context.

b. Consider appropriate modalities

When compiling a curated list, consider appropriate modalities and take stock of the different modalities available in the context. Assess their accessibility and usability by exploring how often teachers and students report using them. Curated lists should include a section on the modality of each EdTech resource. Consider highlighting digital resources that can be used across different modalities (e.g., YouTube can be accessed on smart TVs, computers, tablets, and phones) as multimodal approaches can support accessibility in low-resource contexts. For instance, findings from ↑Mazari et al. (2023) emphasised the need for multimodal approaches to support equitable responses in the context of the floods in Pakistan in 2022. An example of a multimodal approach to EdTech in low-resource contexts is further detailed in Figure 7 below. While the example includes the development of new content, it emphasises how prioritising technologies communities are already using can make for a flexible and accessible EdTech programme.

Figure 7. *Multimodal approaches for delivery supporting psychosocial well-being in Bangladesh, Tanzania, and Uganda* (↑Mazari et al., 2023)

The international development organisation **BRAC's *Remote Play Labs*** reach communities at home through interactive, playful sessions for literacy and numeracy, storytelling 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).

✅ Allow for sharing content with families **who cannot access** flexible learning environments

✅ Do not require intensive training

❌ May require **parental engagement**

Once inclusion criteria have been developed and appropriate modalities identified based on conversations with key stakeholders, identify and shortlist EdTech tools and initiatives (see Table 1 for an example of a simplified curated list). Factors such as strong impact data, cost-effectiveness, sustainability, and language considerations can help create a shortlist of appropriate digital resources.

Note that the curated list may undergo further iterations based on results from the first cycle of EdTech implementation. Once the list is complete, share it with relevant stakeholders and refine it further if needed.

Table 1. *Example of a simplified curated list*

Tool or initiative	Instructional design	Context	Modality	Grade level	Cost considerations	Available evidence
Kolibri	Student-centred	Global	Laptops and other devices	Primary and secondary	Free; open platform	(↑Open Development and Education, 2022) (↑Kabugo, 2020)
Let's Read	Student-centred	Asia	Mixed (website and mobile app)	Primary	Free; open platform	(↑Samsudin & Rahmawati, 2023) (↑Setiajid et al., 2023) (↑Prihartono et al., 2021) (↑Mardiah et al., 2022)
Curious Learning	Student-centred	Global	Mixed (mobile apps on various devices)	Primary and secondary	Free; open platform	(↑Koval-Saifi & Plass, 2018) (↑Orozco-Over & Rascon-Ramirez, 2023)
Rising on Air	Student-centred	Africa and Asia	Radio and SMS	Primary and secondary	Free scripts; can edit and translate to meet local needs (this may include additional costs)	(↑Henkel et al., 2024) (↑Romero & Sandefur, 2022) (↑Sebele et al., 2022)

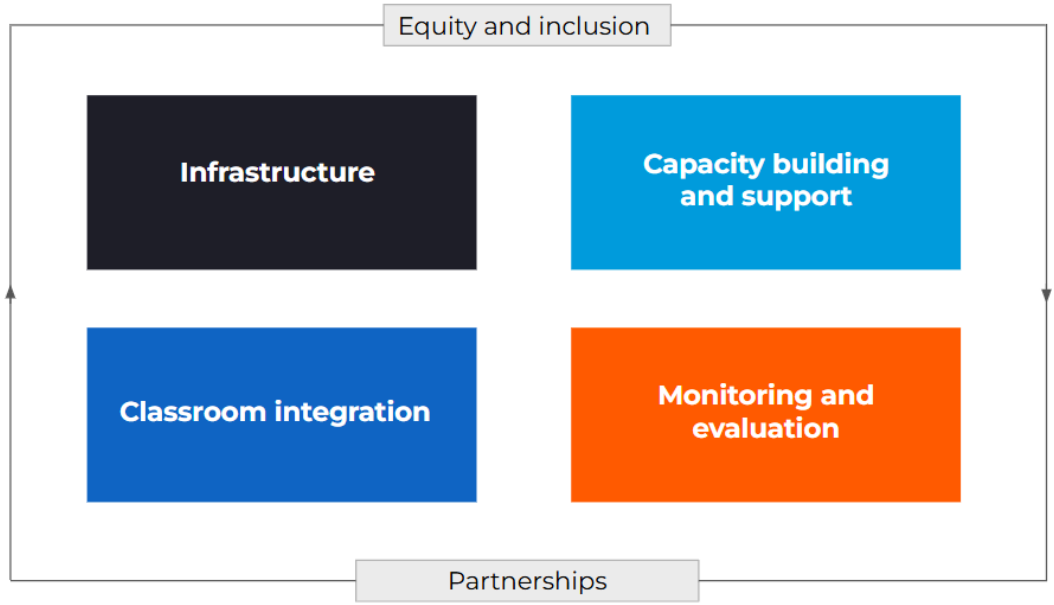
Phase 4: Develop an implementation plan

After you have analysed the data collected through the needs assessment and developed a curated list of resources, combine insights from these two phases to develop an implementation plan for each digital resource. To guide the development process, consider the following questions (↑Hollow & Jefferies, 2022).

- **How will this use of technology lead to a sustained impact on learning outcomes?** Focusing on capacity-building and supportive mechanisms (i.e., teacher training, peer support) for teachers can lead to improvement in learning outcomes (↑Akeyampong et al., 2023).
- **How will this use of technology work for the most marginalised children and enhance equity?** This involves centring equity and inclusion within the planning process, along with a focus on classroom integration strategies that address the diverse needs of marginalised children.
- **Will this use of technology be feasible to scale in a cost-effective manner that is affordable for the context?** Focusing on robust monitoring and evaluation mechanisms ensures that the impact on learning outcomes and data on cost-effective approaches is recorded, which can help determine the feasibility of scaling.
- **How will this use of technology be effective in the specific implementation context?** Finding ways to address infrastructural and capacity constraints identified during the needs assessment phase can support effective implementation. This may also include engaging with stakeholders or forming new partnerships to support access to additional resources in a particular context.

While there is no one right way to create an EdTech implementation plan for schools, based on the guiding questions listed above, the following components should be considered to support a culture of evidence-based decision-making (see Figure 8 below).

Figure 8. *Key components of a school implementation plan*



Infrastructure, capacity building and support, classroom integration, and monitoring and evaluation are key components, as explained further in Table 2 below. Additionally, **equity, inclusion,** and **partnerships** are cross-cutting themes to consider across all components.

Table 2. *Key components of an implementation plan*

Infrastructure	Capacity building and support	Classroom integration	Monitoring and evaluation
This includes addressing challenges with **internet connectivity, device availability and condition** and **power supply** to ensure that digital tools can be effectively integrated into the school environment. Given the constraints in low-resource settings, an implementation plan should **include cost-effective ways to supplement available electricity supply** (e.g., solar power, uninterruptible power supply), **improve internet connectivity or bandwidth**, and develop a plan to **maintain or upgrade hardware**.	Teachers and school staff need **ongoing training** and **technical support** to use EdTech tools effectively. Professional development should focus on integrating technology into pedagogy in meaningful ways, for example, by using: ■ **Teacher training** and **development**, which requires pedagogical expertise as well as specialised knowledge of how technology can be used to support teaching and learning. To support teachers in accessing training opportunities and resources on using EdTech. Consider partnering with organisations in the local ecosystem highlighted in the desk research. ■ **Peer networks** for continuous support.	This involves aligning technology use with curriculum goals, providing structured guidance on how and when to use digital resources disaggregated by grade and subject levels, and ensuring that tools enhance, rather than replace, effective teaching strategies. This category can include, but is not limited to: ■ **Developing a usage schedule** tailored to students' and teachers' needs and the available infrastructure. ■ **Curriculum alignment**, i.e., collaborating with teacher champions to integrate tools into lesson plans and address curriculum gaps. ■ **Lesson plans** for teachers to support the design of learning	In several parts of the world, understanding what is working around EdTech is prevented by significant data gaps in terms of measuring learning outcomes and monitoring the effectiveness of educational programmes. The ↑Australian Council for Educational Research's (ACER) (2024) data gap map of the Southeast Asian region highlights the limited availability of data and information on learning and digital access and skills and recommends exploring "ways to effectively monitor education, social and economic outcomes". **Establishing clear metrics and feedback loops** allows key decision-makers and administrators to track progress, identify challenges, and make data-driven decisions for ongoing improvement. Moreover, monitoring and evaluation processes should be designed to be flexible and iterative, allowing implementers to adapt tools and indicators as new insights

Infrastructure	Capacity building and support	Classroom integration	Monitoring and evaluation
	These should also be put in place by leveraging existing networks and support groups if their existence is evidenced through needs assessment. Regular meetings or virtual discussions enable teachers to share their experiences, challenges, and strategies for effectively using EdTech, fostering a community of practice. ■ **An IT helpdesk** — by designating an IT teacher or administrator as a person to whom teachers can turn for technical support can provide timely assistance to teachers struggling with technical issues.	activities. ■ **Parent support** — by hosting information sessions, encouraging resource-sharing, and establishing communication channels to keep parents and caregivers informed. ■ **Student support** — by developing personalised learning plans and multilingual support when needed. Leverage multilingual resources and provide bilingual vocabulary lists to assist students requiring additional support.	and challenges emerge during implementation. Regular feedback from learners, teachers, and caregivers, through surveys, interviews, or other methods, can reveal how EdTech is experienced on the ground and surface potential barriers. Organisations can combine quick data touchpoints with more in-depth case studies in schools to generate richer insights. Aspects of a monitoring and evaluation plan could include: ■ **Defining key indicators or metrics** to measure the effectiveness of the implementation against established outcomes (see Phase 1 on defining outcomes). ■ **Setting up a system to collect relevant data** along with an accompanying schedule. Depending on the context, different tools can be used, including paper-based materials and mobile-based data collection

Infrastructure	Capacity building and support	Classroom integration	Monitoring and evaluation
			methods. ■ **Assigning and training monitoring and evaluation personnel**—by either hiring additional personnel or training teachers and administrators to collect data if the former is costly. However, training teachers and administrators might be time-intensive and existing assessment mechanisms can be leveraged and integrated into a monitoring and evaluation plan to address this concern.

Partnerships

As highlighted in previous sections, partnership is a key theme in supporting the implementation of EdTech interventions within a particular ecosystem. Partnerships can involve organisations that support training teachers in integrating EdTech into their pedagogy, capacity-building of administrators and district officials in using data for decision-making, and providing support with data collection and monitoring, among other activities. To leverage available resources and ensure cost-effective approaches, local partnerships can also be considered for procuring EdTech resources and hardware in the long term, beyond the initial implementation cycle.

Infrastructure	Capacity building and support	Classroom integration	Monitoring and evaluation

Equity and inclusion

As with partnerships, equity and inclusion are not separate components but key themes to consider across all components of an implementation plan. Within the implementation plan, this can include ensuring that:

- Hardware and software are accessible to students and teachers
- Teachers are trained in inclusive pedagogy
- The programme supports diversity
- Content is aligned with local cultural norms and languages
- Parents and caretakers are actively involved in a given EdTech programme.

Additionally, care must be taken to ensure that EdTech implementation does not exacerbate existing inequities and access issues and that alternative arrangements are made to address accessibility challenges, as highlighted by the example of the Girls' Education Challenge initiative outlined in Figure 9 below.

Figure 9. *UKAid-supported Girls' Education Challenge in Nepal*

During the Covid-19 pandemic, various Girls' Education Challenge projects (a programme funded by UKAid) across Nepal took stock of whether girls and their families had access to technology such as phones, radio, or the internet and explained how effective the use of these modalities would be for educational delivery. It was found that girls tended to have limited and inconsistent access to technology. In response, the projects deployed a multi-modal delivery approach, which included radio, telephone calls, self-learning packs, and small-group learning. (↑Rui & Upadhyay, 2022).

An implementation plan should outline how gaps identified from the needs analysis will be addressed by suggesting cost-effective alternatives or supplementing the implementation with additional resources, where applicable, for each EdTech resource identified from the curated list. Additionally, to develop a clear and actionable plan, each component should be supplemented with:

- Defined action items
- Clarity on roles and responsibilities for different stakeholders
- Resource requirements
- Operational outcomes (note that while these should be aligned with broad measurable goals or outcomes defined in Phase 1, they are tied more directly to implementation tasks.

For an example of how this might look in practice, see Table 3 below. A sample template for an implementation plan is available here.

Table 3. *Example of a subsection of an implementation plan for a given EdTech resource*

Category	Sub-category	Action items	Roles and responsibilities	Resource requirements	Operational outcomes
Key component (e.g., capacity building)	Subcomponent (e.g., teacher training)	Concrete steps to support implementation (e.g., developing training materials)	Stakeholders responsible for completing action items (e.g., implementers to connect with partners to hire trainers and school administration to develop a training schedule)	Financial or technological resources or stakeholder capacity needed to action tasks (e.g., training personnel, training materials)	The effect that completing an action item is expected to have (e.g., teachers feel supported and confident in using EdTech in the classroom)

d. Beyond the development of an implementation plan

After sharing the initial draft of the implementation plan with key decision-makers and stakeholders, projected timelines can be discussed and added to ensure structured and sustainable implementation. Furthermore, a staggered implementation should be considered to ensure that the school system and key stakeholders are not overwhelmed; it is possible to make rapid adjustments to the plan, build teacher capacity, and generate evidence of effectiveness. For instance, this could include initially introducing the programme to specific grade levels or across a limited number of subjects.

Once an implementation plan has been developed, the focus will shift towards implementation and gathering new insights through continuous monitoring and evaluation as the programme moves forward. While the initial implementation plan may be constrained by limited resources, it is important to note that financial resources, infrastructural needs, teacher capacity, and partnerships will evolve over time; many of these are not one-off considerations. Key areas, such as hardware and digital resources, ongoing teacher support and professional development, regular maintenance and upgrade of technology, and monitoring and evaluation will require ongoing funds. The initial plan, therefore, should not only address immediate needs and priorities but also lay the groundwork to ensure sustainability and scalability and build on it with each iteration. The first implementation cycle will then enable implementers and decision-makers to test initial assumptions and adjust the plan in response to practical realities.

4. Conclusion

Implementing EdTech in schools in low-resource contexts requires careful consideration of how technology can be used to support teaching and learning by leveraging existing evidence on effectiveness or by generating new research through iterations where gaps exist. The process of creating an implementation plan starts with:

- Aligning learning outcomes with educational priorities;
- Conducting a needs assessment to understand the context, infrastructure, learner needs and teacher capacity;
- Curating a list leveraging available EdTech resources;
- Developing an implementation plan by focusing on infrastructure, capacity building and support, classroom integration, and ongoing monitoring and evaluation to support evidence generation and inform future improvements.

Throughout the process of developing an implementation plan, it is essential to focus on engagement with key stakeholders and building partnerships with other organisations to ensure the sustainability and scalability of an intervention. Additionally, given the barriers prevalent in low-resource contexts, it is vital to prioritise implementation strategies that facilitate equity and inclusion, such as multimodal approaches and multilingual support.

5. Key takeaways

This section highlights lessons learnt from the process of developing an implementation plan and common gaps that impede effective implementation in low-resource contexts.

Development of an implementation plan should be flexible and iterative

As the implementation progresses, the plan should be updated to reflect changes in budgets, roles and responsibilities, partnerships, timelines and insights from implementation data. Lessons from staggered implementation should inform the programme to ensure that contextual realities are reflected in the plan and to generate evidence in areas where there is a dearth of actionable insights. Monitoring and evaluation processes should also be flexible and iterative, adapting to emerging learnings and shifting circumstances to remain relevant and useful throughout implementation.

Developing curated lists requires tradeoffs between relevance and accessibility

Content that is readily available, particularly Open Educational Resources developed in high-income countries, can be implemented quickly and at minimal cost if appropriate hardware already exists. Further, such resources may also have accompanying data on effectiveness. However, these resources may only be aligned with the local curriculum to a limited extent, and the content may not be in the language used by learners and schools in many contexts. Where possible, consider partnering with local EdTech providers to curate their developed resources for a programme and supplement these with Open Educational Resources. Moreover, choose technology that fits the local context; simple, low-tech solutions are often the most appropriate and sustainable in low-resource contexts.

Technology can be used to enable teaching and learning, but it cannot replace them

EdTech should be considered as one of several tools within a broader system to improve learning outcomes. It can help address teacher shortages and also serve as a complementary aid when teachers are present. There is increasing evidence on what works in EdTech, and existing research suggests that investments in hardware alone do not lead

to direct improvements in education, particularly in low-resource contexts. Ensuring capacity-building for stakeholders, particularly teachers, building relationships with stakeholders involved in implementation, and establishing partnerships is crucial to successful implementation.

Implementing EdTech in schools is an ongoing investment

While it is common to invest in initial hardware and digital resources, sustainable implementation requires ongoing costs on maintaining and updating resources, capacity building, and monitoring and evaluation. Consider reserving a dedicated budget line for all EdTech-related expenses such as maintenance and upgrade of existing hardware and software, internet connectivity and electricity, ongoing teacher training, capacity-building of school officials, student support, and monitoring and evaluation.

Engage communities and teachers early on and invest in partnerships

Find ways to involve teachers, parents, community members, school administrators, and local organisations to ensure buy-in, support, and long-term sustainability of EdTech initiatives. There is evidence that involving communities in the design of programmes can lead to sustainability (↑Belgrave et al., 2022). Additionally, involving communities, teachers, and school stakeholders in a needs analysis helps understand and contextualise their challenges and ensure that EdTech can adequately address their needs. Equally important is identifying and supporting local champions, who can drive adoption, model effective use, and influence peers across the system. Partnering with local organisations for support with training personnel, acquiring hardware and digital content, electricity and internet connectivity, and monitoring and evaluation can ensure a programme's longevity and foster local ownership.

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Annex: Additional resources

Examples of curated lists

Flam, R., Ramesh Vasudevan, S., & Coutrim, E. (2024). ***EdTech to Support Blended Learning in Mozambique: A curated list of EdTech interventions*** (Helpdesk Response No. 179). EdTech Hub. https://doi.org/10.53832/edtechhub.1004. Available at: https://docs.edtechhub.org/lib/DJRV7KZW. Available under Creative Commons Attribution 4.0 International.

Koomar, S., & Blest, H. (2020). ***Using EdTech to Support Effective Data Monitoring: A Curated Resource List***. (Helpdesk Response No. 23). EdTech Hub. https://doi.org/10.5281/zenodo.4762325. Available at: https://docs.edtechhub.org/lib/FS4CMYUB. Available under Creative Commons Attribution 4.0 International.

Koomar, S., Moss Coflan, C., & Kaye, T. (2020). ***Using EdTech in Settings of Fragility, Conflict and Violence: A Curated Resource List*** (EdTech Hub Helpdesk Request No. 11). EdTech Hub. https://doi.org/10.53832/edtechhub.0042. Available at: https://docs.edtechhub.org/lib/CMS6HPI8. Available under Creative Commons Attribution 4.0 International.