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## RAPID EVIDENCE REVIEW

# EdTech for Out-of-School Children and Youth: A Rapid Evidence Review for the Southeast Asian Region

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## About this document

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This publication has been produced by [EdTech Hub](#) as part of the ASEAN-UK Supporting the Advancement of Girls’ Education (SAGE) Programme. The ASEAN-UK SAGE programme aims to enhance foundational learning opportunities for all by breaking down barriers that hinder the educational achievements of girls and marginalised learners. The programme is in partnership with the Southeast Asian Ministers of Education Office, the British Council, the Australian Council for Educational Research, and EdTech Hub.

### Rapid Evidence Reviews

This publication is one part of a series of Rapid Evidence Reviews (RERs) that has been produced by EdTech Hub. The purpose of the RERs is to provide education decision-makers with accessible, evidence-based summaries of good practice in specific areas of EdTech. The reviews originally focused on topics which are particularly relevant in the context of widespread global challenges to formal schooling as a result of the Covid-19 pandemic, and now extend to cover further areas. All the RERs are available at <https://edtechhub.org/research/>.

*EdTech for Out-of-School Children and Youth: A Rapid Evidence Review for the Southeast Asian Region*

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## Abbreviations and acronyms

<b>ASEAN</b>	Association of Southeast Asian Nations
<b>BEEP</b>	Basic Education Equivalency Program
<b>CLC</b>	Community-based learning centre
<b>DepEd</b>	Department of Education (Philippines)
<b>DLF</b>	Distance Learning Education via Satellite Foundation of Thailand
<b>ICT</b>	Information and communications technology
<b>ICT4ALS</b>	Philippine Department of Education's Alternative Learning System
<b>MoES</b>	Ministry of Education and Sport (Laos)
<b>MoEYS</b>	Ministry of Education, Youth and Sport (Cambodia)
<b>OOSCY</b>	Out-of-school children and youth
<b>RER</b>	Rapid Evidence Review
<b>SEAMEO</b>	Southeast Asia Ministers of Education Office
<b>UNHCR</b>	United Nations High Commissioner for Refugees

## Executive summary

This Rapid Evidence Review (RER) provides an overview of existing literature on the use of educational technology (EdTech) by and for out-of-school children and youth (OOSCY) in Southeast Asia. The review's scope includes the following countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, and Vietnam.

After a two-stage screening process, we analysed 21 sources. Details on the inclusion criteria and associated limitations are given in [Section 1.6](#). The rapid nature of the review required a focused approach to literature discovery and a thematically guided analysis process. As such, the search strategy was not designed to be exhaustive.

The findings of the thematic analysis of the relevant literature on technology for OOSCY are structured according to four themes:

1. **'Nature of EdTech for OOSCY'** highlights the type of available OOSCY-focused EdTech interventions documented in the region.
2. **'Effectiveness of different EdTech for OOSCY'** explores the effectiveness of different EdTech interventions for OOSCY based on the available literature.
3. **'Barriers to EdTech use'** examines the barriers that can prevent OOSCY in the region from fully benefiting from EdTech.
4. **'Lessons in EdTech for OOSCY from the Covid-19 pandemic'** highlights what we can learn about how EdTech can be used to support OOSCY from how EdTech was implemented in the region during Covid-19-related school closures.

Key findings from this review include the following:

1. There is a general paucity of high-quality research on using EdTech with OOSCY in the Southeast Asian region.
2. Before the Covid-19 pandemic, OOSCY primarily accessed education through broadcast media or learning centres. The literature suggests that broadcast media may be particularly effective due to its lack of reliance on high-tech devices and infrastructure. However, we found no empirical evidence to support this.

3. Several barriers continue to prevent OOSCY from accessing education via EdTech. These include:
  - infrastructure and device access issues in rural and remote areas
  - a lack of stakeholder readiness for EdTech innovations
  - challenges in contextualising EdTech with OOSCY needs
  - a lack of OOSCY-targeted government support.
4. Connectivity in the region has increased significantly in recent years, but there is little evidence to indicate whether this has positively impacted OOSCY learning.
5. There are valuable lessons to be learnt from the Covid-19 pandemic in terms of how EdTech can be used to make education accessible to OOSCY. However, direct mentions of OOSCY in the literature on Covid-19 education responses in the region are conspicuously absent.

# 1. Introduction

This RER provides a summary of how EdTech is being harnessed to address the needs of children and youth unable to attend school in the Southeast Asian region. It explores the potential benefits of using EdTech to improve access to and quality of educational opportunities for this group of learners, as well as the limitations and challenges of EdTech. The RER aims to offer insight and evidence that can assist in developing and implementing effective EdTech interventions for OOSCY across Southeast Asia and beyond.

## 1.1. Background

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Despite recent progress, significant numbers of children and youth in Southeast Asia continue to miss out on education. In 2017, UNESCO estimated that around seven million primary and lower secondary school children were out of school in Southeast Asia ([↑UNESCO, 2017](#)). The Covid-19 pandemic compounded the issue, and around 140 million children in Southeast Asia were reportedly out of school due to pandemic-related school closures ([↑UNICEF, 2021](#)), with a considerable risk that many would not return to education due to increased financial pressure on families ([↑Jeon et al., 2021](#)). Non-attendance also appears to increase with each education level; the higher the level of education, the greater the percentage of out-of-school children and youth ([↑UNESCO, 2024](#)).

Children and youth living in Southeast Asia may be unable to attend school for several reasons. Those based in rural areas and from the poorest households tend to be overrepresented among OOSCY ([↑UNESCO & UNESCO Bangkok Office, 2017](#)). In Vietnam, for example, a pre-pandemic housing survey found that the rate of out-of-school children in rural areas was nearly twice that in urban areas (9.5% versus 5.7%, according to the General Statistics Office of Vietnam ([↑UN Vietnam, 2019](#))). Other vulnerable groups are also disproportionately represented among OOSCY, including child labourers, children with disabilities, child brides, stateless or undocumented children, and children affected by conflict, such as the recent insurgency in southern Thailand ([↑Binsaleh & Binsaleh, 2013](#); [↑Mishra, 2023](#); [↑UNESCO & UNESCO Bangkok Office, 2017](#)).

These groups are likely to become even more educationally marginalised due to the impacts of climate change, to which Southeast Asia is particularly vulnerable ([↑Weng et al., 2020](#)). Indeed, the Philippines and Myanmar are at extremely high risk, scoring above 7.1 in the Children's

Climate Risk Index ([↑Jeon et al., 2021](#)). As highlighted by [↑UNESCO et al. \(2023: pp. 63-64\)](#):

*“Climate change and climate displacement exacerbate existing educational inequalities and barriers to education, and more adversely affect the financially disadvantaged, girls and women, rural communities, those with pre-existing health risks, and persons with disabilities.”*

Refugees and asylum seekers continue to be among Southeast Asia’s most educationally excluded groups. While there is some variation across the region, the percentages of primary school-aged refugee and asylum-seeker children enrolled in formal primary education are generally low in all countries for which data is available: 40% in the Philippines, 13% in Malaysia, 6% in Indonesia, and only 2% in Thailand ([↑UNHCR, 2020](#)).

In light of this significant need and the renewed commitments crystallised by the ASEAN Declaration on ‘Strengthening Education for Out-of-school Children and Youth’ ([↑ASEAN, 2016](#)), it is important to understand the role that EdTech can play and has already played in efforts to tackle access to and quality of education for OOSCY in Southeast Asia.

## 1.2. Research questions

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Two research questions guide the review:

- What are the key emergent themes in the available literature on the use of technology for education of OOSCY in the Southeast Asian region?
- What are the key learnings and recommendations that can be drawn from the available literature to inform efforts to bring quality education to OOSCY?

## 1.3. Definitions and scope of the review

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For this review, we adopt the following key definitions:

**Southeast Asia:** Countries that are member states of The Association of Southeast Asian Nations (ASEAN). These are Brunei Darussalam (‘Brunei’), the Kingdom of Cambodia (‘Cambodia’), the Republic of Indonesia (‘Indonesia’), the Lao People’s Democratic Republic (‘Laos’), Malaysia, the Republic of the Philippines (‘the Philippines’), the Republic of Singapore (‘Singapore’), the Kingdom of Thailand (‘Thailand’), the Democratic



Republic of Timor-Leste ('Timor-Leste'), the Union of Myanmar ('Myanmar'), and the Socialist Republic of Viet Nam ('Vietnam') ([↑SEAMEO, no date](#)). Timor-Leste has also been included in this category based on its pending membership of ASEAN. All the countries identified above are member countries of the Southeast Asia Ministers of Education Organization (SEAMEO).

**EdTech:** Educational technology. “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 is highlighted in each instance.

**OOSCY:** Out-of-school children and youth. “Children and young people in the official age range for the given level of education who are not enrolled in pre-primary, primary, secondary, or higher levels of education” ([↑Unesco Institute for Statistics, 2020](#)). Given that school-going age varies in different countries, this review deliberately avoids restricting this to a particular age range.

## 1.4. Theme identification

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We conducted a systematic online search and screening process to identify evidence on the use of EdTech with OOSCY in the Southeast Asian region. More details on that process, including the inclusion and exclusion criteria, are provided in [Section 1.6](#) below. After screening, we selected 21 papers for analysis. Following a thematic analysis of these papers, we classified them into four themes. These themes are discussed in depth in [Section 2](#) of this review and are:

- Nature of EdTech for OOSCY
- Effectiveness of different types of EdTech for OOSCY
- Barriers to EdTech use for and with OOSCY
- Lessons in EdTech for OOSCY from the Covid-19 pandemic.

## 1.5. Structure of the RER

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We present the methodological approach below in [Section 1.6](#), including details of the literature search in [Section 1.6.1](#), the eligibility criteria in [Section 1.6.2](#), and possible limitations of the methodology in [Section 1.7](#).

[Section 2](#) includes detailed findings under the four themes that emerged from a thematic analysis of the identified literature. Finally, [Section 3](#) draws together key learnings from the evidence reviewed.

## 1.6. Methodology

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The methodological approach 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 time frame.

While conducting a systematic, thematic review of primary studies, it quickly became apparent that there are significant evidence gaps with few rigorous, quality evaluations or impact studies available. Consequently, we decided to include reviews of other literature or systematic reviews.<sup>1</sup>

Therefore, the research process comprised a systematic sequence of searching and screening. After the research questions and inclusion criteria had been defined, keywords were combined into comprehensive search strings (see [Annex](#)), which were then input into Google Scholar. The search results were then screened according to the inclusion criteria, first based on paper titles and abstracts and then on full content.

### 1.6.1. Literature search

Google Scholar constituted the primary source of literature. [Figure 1](#) below details the process used to arrive at the articles that were ultimately thematically analysed for this review. It is essential to highlight that, unlike a more traditional systematic review process, which may screen all search results, the rapid review methodology used here relied on a system of quotas. As such, for the first round of screening, we selected only the most relevant results (up to a maximum of 500), as ranked by Google Scholar. Seventy-nine articles were initially captured for further screening.

It is also important to highlight that we did not screen or rank the results for quality or limit them to peer-reviewed/academic publications. Relying solely on peer-reviewed academic articles would have resulted in the team having very few papers to review. It would have excluded a larger number of voices from the Southeast Asian region due to the systemic factors that

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<sup>1</sup> [Higgins et al. \(2023\)](#) distinguish a systematic review thus: “Systematic reviews seek to collate evidence that fits pre-specified eligibility criteria in order to answer a specific research question. They aim to minimize bias by using explicit, systematic methods documented in advance with a protocol.”

exclude many academic researchers in low- and middle-income countries from mainstream peer-reviewed journals.

### 1.6.2. Screening and eligibility criteria

The title and abstract screening, as well as all subsequent screenings, were conducted according to the eligibility criteria in Table 1.

**Table 1.** *Eligibility criteria for literature searches and screening*

Criterion type	Inclusion criteria
Focus demographic	Out-of-school youth and children
Education level	Primary and/or secondary
Geography	Southeast Asian countries
Literature type	All
Date range	2009–2024

During the full-text screening stage, we also screened papers for quality issues. Several papers were excluded at this stage due to being based on unrigorous methodologies or written errors impeding the successful communication of key messages. These issues highlight a limitation of relying on Google Scholar as the primary source of literature. While the titles and abstracts may have initially demonstrated the necessary relevance, the substantive content often proved to be of too low a quality to be useful.

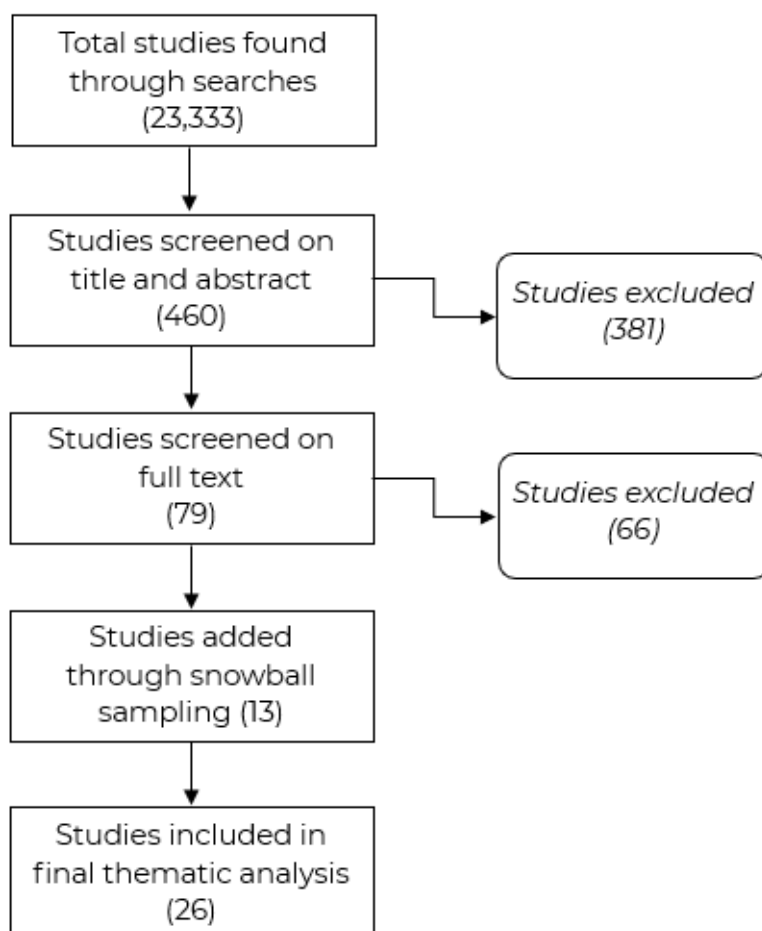
Attention is also drawn to the other methods we used to find literature: snowball sampling and additional internet searches. While the main thrust of the literature review involved a highly systematic approach, we recognised that some highly relevant sources might not be captured through those searches alone. We therefore decided to search the reference lists of the most relevant papers surfaced through the systematic literature review for additional sources. As a result, this RER has been supplemented with sources that have emerged through searches outside of Google Scholar.

It is important to note that the process for finding literature concerning Timor-Leste differed from that of the other countries included in the study.

The search strings included the term “ASEAN”, as the other countries in this review are ASEAN member states. However, Timor-Leste is not currently part of ASEAN (although it has applied for membership). We therefore conducted separate searches for literature on Timor-Leste.

The original intention was to limit the search to more recent sources published over the past ten years. However, after some test searches, it became clear that the range would need to be extended to 15 years as very little relevant data was available. Further, while most selected sources conformed entirely with the inclusion criteria, a small, complementary collection of other informative sources was also referenced. Examples include [↑Unwin et al. \(2007\)](#) and [↑Waring & Sacchanan \(2008\)](#), which provide in-depth analyses of EdTech use with OOSCY in Southeast Asia but were published outside the publication date range. In addition, given the scarcity of empirical studies that met the inclusion criteria, we decided to include non-academic sources that provide relevant information on the nature of EdTech interventions for OOSCY in the region; information relating to Cambodia’s Basic Education Equivalency Program (BEEP) is a good example ([↑BEEP, 2024](#)).

[Figure 1](#) below illustrates the full literature search and screening process.

**Figure 1.** Literature search and screening process

## 1.7. Limitations

This review has four fundamental limitations stemming from the rapid time frame and the nature of available evidence. These include:

### 1. Limited availability of high-quality data

There is a considerable gap in the evidence base on EdTech for OOSCY in Southeast Asia, particularly in rigorous evaluations and impact studies. Of the papers that met the inclusion criteria, only a few were of the quality that would usually be considered for inclusion in evidence reviews; many needed more analytical depth and were often narrative in nature. Many also contained written errors that suggest a less-than-rigorous pre-publication process (though we have made allowances to accommodate the fact that many authors were not writing in their first language). We extended the original date range for inclusion (2014–2024) to enable the inclusion of more high-quality papers. However, we acknowledge that this carries the

risk of including sources that may be less relevant to current conversations.

### **2. Overlaps in the literature**

Because of the limited availability of data, it was not always possible to draw on studies that focus on the use of technology in exclusively pre-tertiary OOSCY education in the Southeast Asian region. Some of the literature also incorporated examples from education settings that provide opportunities for tertiary-level learners or non-formal education options aimed at adults (e.g., [Waring & Sacchanan, 2008](#)).

### **3. Dominance of literature focusing on the Covid-19 pandemic**

A large portion of the literature around EdTech for OOSCY emerging from the searches related to learners who were out of school due to Covid-19-pandemic-related school closures, but would otherwise have been in education. This literature can be helpful and informative concerning EdTech use with OOSCY outside of this context, and has been included in the final analysis for this reason. However, the relatively large amount of Covid-19-pandemic-related literature may have diverted searches and attention away from those who have recently been out of school for non-Covid-19-related reasons in the region.

### **4. The search and inclusion strategy**

An inherent limitation of the RER is that the search and inclusion strategy is not exhaustive by design. Therefore, not all relevant literature may have been located and included.

## 2. Systematic review and thematic analysis

This section covers the primary analysis and synthesis of the literature that surfaced through the search, discovery, and screening process. The findings are presented along four themes, with analytical categories discussing recurring topics in each theme.

### 2.1. Nature of EdTech for OOSCY

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The literature suggests that some OOSCY in the Southeast Asian region can access education using EdTech in two main ways: through broadcast media and learning centres.

#### 2.1.1. Broadcast media

Literature searches identified examples of EdTech for OOSCY in radio and television broadcasting. In the Philippines, Malaybalay City's Department of Education has delivered a radio instruction programme based on real-time and on-demand broadcasts since 2008. The programme aims to reach learners in rural and underserved areas likely to lack access to other educational options ([UNESCO, 2023](#)). In this intervention, broadcasts are complemented by mobile text messages and social media posts, which facilitate a two-way interaction between radio hosts and learners.

In Thailand, the Distance Learning Education via Satellite Foundation of Thailand (DLF) has been broadcasting live teaching and learning programmes since 1995. By 2021, the DLF was operating 15 channels aimed at all educational levels, from kindergarten to higher education and teacher development. Users can now watch broadcasts on demand through the distance learning television (DLTV) homepage and YouTube channel ([Dipendra, 2023](#)). Similar educational television channels in the region include TV Okey in Malaysia, and Think! Think! In Cambodia, both of these aim specifically to reach learners without access to the internet ([Rui & Upadhyay, 2022](#)). [Figure 2](#) provides a detailed example of multi-modal broadcast media being used to support marginalised learners in Laos, some of whom may have been OOSCY. The intervention was developed before the Covid-19 pandemic and leveraged broadcast media and karaoke machines for early childhood development centres. [Section 2.4](#) below discusses additional examples of broadcast media available in the region (but which are not linked explicitly to non-Covid-19-related OOSCY).

**Figure 2.** *My Village TV—broadcast television in Laos*

In 2012, UNICEF, in partnership with the Laos Ministry of Information, Culture and Tourism and the Ministry of Education and Sports (MoES) developed *My Village TV*—a television programme to improve access to quality education for marginalised children under the age of six.

The purpose of the programme was to

*“contribute to preparing children for school through a range of holistic skills that address the physical, language, cognitive, social and emotional development of girls and boys from different ethnic backgrounds and abilities”* (UNICEF, 2017, p. 7).

Although the programme was available primarily on public television, it could also be accessed on YouTube, Facebook, and through DVDs. UNICEF also provided karaoke machines to some early childhood development centres. A 2017 evaluation report found the broadcast content to be relevant and inclusive to an ethnically diverse audience, and there was evidence to suggest that it was effective in improving children’s school readiness and caregiver practices. However, more robust mechanisms for monitoring the programme were needed and multiple platforms and distribution methods were helpful in reaching the most marginalised children. In fact, the poorest households used mostly television or DVDs to watch *My Village TV* (UNESCO, 2023).

The programme was also available during school closures due to the Covid-19 pandemic in 2020.

### 2.1.2. Informal and vocational learning centres

Several examples of learning centres that provide OOSCY with the space and resources to learn, and EdTech initiatives conducted via these centres, were identified in the literature. Two aimed to provide education access to refugees and asylum seekers in particular. In Indonesia, Wahyuni & Fatdha (2019) report on non-formal IT literacy classes being held at local institutions or within temporary refugee accommodation and delivered by the International Organization of Migration or other refugees in the community. In Thailand, Dipendra (2023) highlights the Mobile Literacy for Out-of-School Children initiative, implemented by UNESCO Bangkok in collaboration with government and private sector partners. The initiative provided tablets with preloaded materials, satellite television, and internet-enabled devices in 60 schools and migrant learning centres in five Thai provinces. Tablets were preloaded with over 1,000 books and learning materials in Thai, Burmese, and Karen languages through the LearnBig app. Since 2015, the initiative has provided support to 6,200 migrant and marginalised Thai children and teachers across 89 migrant learning centres. Its user base has also increased substantially, with over 83,000 individuals accessing its resources in 2021 (Dipendra, 2023).



Another initiative focusing on equivalency programming is the eSkwela project in the Philippines, which established community-based e-learning centres in major centres in the Philippines to conduct ICT-enhanced alternative education programmes ([↑Kamei, 2010](#); [↑Unwin et al., 2007](#)). These centres were strategically set up in village halls and public markets to facilitate maximum community access. They were designed to enable out-of-school learners and other marginalised community members to learn new skills and competencies, prepare for accreditation and equivalency exams, or prepare to rejoin the formal school system. ICT provision included the eSkwela Portal, an online Personalized Learning Environment (PLE), and a site monitoring system.

Finally, and more generally, [↑Waring & Sacchanan \(2008\)](#) report on community-based learning centres (CLCs) in Thailand, which use technology to provide and promote lifelong learning activities and learning for local people in rural and urban areas, including those who are out of school. Managed by local committees, these education centres provide learners with computer access for self-study and computer literacy classes. In 2007, there were reportedly 8,691 CLCs throughout Thailand. While they vary in location and structure, these centres are typically community-owned but receive resource support from non-governmental organisations and the Thai government's Department of Non-Formal Education. Similar examples can be noted in Cambodia and Timor-Leste (see [Figure 3](#) below).

**Figure 3.** *Non-formal education in learning centres in Cambodia and Timor-Leste*

Other examples of learning centres for use by OOSCY were found in Cambodia and Timor-Leste. In Cambodia, the Basic Education Equivalency Program ([↑BEEP, 2024](#)) provides flexible online education and learning centre access to OOSCY to complete basic education equivalent to Grade 9. The programme is targeted at children aged 14 and above who can pursue skills education at technical and vocational education and training (TVET) institutes or technical high schools upon completion of the programme.

In Timor-Leste, a self-funded social enterprise (AHHA Education) offers full-time English, computer literacy, and personal development courses in 54 community centres across Timor-Leste ([↑UNESCO and SEAMEO, 2020](#)). Similarly, InfoTimor, implemented by the xpandFoundation, focuses on upskilling youth with ICT skills and employment coaching within five Technology Learning Centres nationwide ([↑InfoTimor, no date](#)).

### 2.1.3. Other EdTech modalities

The literature revealed two initiatives in Timor-Leste which use EdTech to provide marginalised learners, including OOSCY, with independent education access. The first is the SPARK Digital Library, which provides access to multiple quality books for children to read independently at home via a mobile app ([↑Kent, 2022](#)). In the second, learners without internet access in Baucau, Timor-Leste, may have been able to benefit from a recent implementation of RACHEL (Remote Area Community Hotspots for Education and Learning), which establishes wireless connections with laptops, tablets, or smartphones, offering internet-independent access to educational content ([↑World Possible, 2018](#)).

The Alternative Learning System currently offered to OOSCY in the Philippines combines several modalities with non-tech approaches already mentioned in this section. One of the largest alternative education systems in the world, it provides non-formal education through a combination of face-to-face instruction, printed materials, broadcast media, and online and blended learning sessions ([↑UNESCO, 2023](#)).

## 2.2. Effectiveness of different EdTech interventions for OOSCY

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While evidence indicating the impact and effectiveness of different EdTech interventions was sparse across the literature, this section identifies trends from the available data.

### 2.2.1. Effectiveness due to low-tech focus

Regarding reach, the literature suggests that low-tech approaches, such as TV and radio broadcasts, may be effective in helping OOSCY in the region access education. While it is unclear if this figure can be generalised to the wider region, 95% of people in Indonesia reportedly have access to a television ([↑Rui & Upadhyay, 2022](#)), suggesting that learning delivered through this medium stands a good chance of reaching marginalised groups such as OOSCY. This seems to have been the case in Thailand, where the DLF reports that its educational broadcasts have reached more than a million learners and teachers, especially from rural areas ([↑Dipendra, 2023](#)). The Malaybalay City radio broadcasts in the Philippines have been considered a success due to their cost-effectiveness and the fact that they have reportedly reached some 3,000 learners ([↑UNESCO, 2023](#)). Their success may also be attributable to the fact that, according to findings

from a Department for Education (DepED) survey taken by 700,000 respondents (including learners, teachers, and caregivers), radio is

*“the largest and most widely preferred learning option especially in places where effective learning instructions are hampered by slow internet connectivity, no cellphone signal and television is not readily available.”* (↑[DepED, Division of Malaybalay City, 2020](#))

From an education in emergencies perspective, ↑[Rui & Upadhyay \(2022\)](#) and ↑[Weng et al. \(2020\)](#) both suggest that interactive audio instruction methods, such as the one adopted by Malaybalay City, may be the most effective way of continuing education after disruptions such as climate emergencies thanks to their lack of reliance on high-tech infrastructure. Combining radio broadcasts with opportunities for learners to interact with the show hosts in real time via mobile phones (another low-tech option) may also increase learning quality through increasing active engagement (↑[Ting et al., 2023](#)). This is supported by evidence that mobile phones are the most accessible technology across the region, in both rural and urban areas (↑[Jeon et al., 2021](#)), with “132 mobile phone subscriptions, including active pre-paid accounts, per 100 people across 10 Southeast Asian countries in 2022” (↑[UNESCO, 2023](#), p. 5).

Conversely, learning impact may be limited by the lack of personalised learning opportunities in broadcast media (↑[UNESCO, 2023](#)). ↑[Tarricone et al. \(2021, p. 10\)](#) also note that “Television broadcasts are unidirectional, costly, and time-consuming to develop, and cannot assist with monitoring and assessment.” Data from the Philippines supports this, with only 1% of learners who engaged with the country’s Alternative Learning System expressing a preference for radio or television-based instruction (↑[UNESCO, 2023](#)). It is important to note the contradiction between this finding and that of the ↑[DepED, Division of Malaybalay City, 2020](#). Radio may have been the only option for many who responded to the 2020 study, while more of those surveyed in 2021 may also have had access to other modalities, such as online learning.

### **2.2.2. Effectiveness due to community ownership**

The eSkwela project in the Philippines was hailed as a success in the early years of its implementation; it received a certificate of commendation in the non-formal education category of the UNESCO ICT in Education Innovation Awards 2007–2008 (↑[Kamei, 2010](#)). There is some data to support this recognition. In the 2008 round of the Department of Education’s Accreditation and Equivalency test (which provides learners with a certification of learning achievements comparable to the formal

school system), eSkwela learners achieved a passing rate of 57%—double the national average of 29%. [↑Kamei \(2010\)](#) attributes this success primarily to the project’s multi-stakeholder approach, including its strong focus on community ownership. Similarly, [↑Waring & Sacchanan \(2008\)](#) note that learning centres that are small and well-embedded within the community tend to be more successful, although the authors do not qualify this statement.

### 2.2.3. Other success factors

Although not all community learning centres in Thailand were deemed effective by [↑Waring & Sacchanan \(2008, p. 20\)](#), the authors note that, in successful cases, adopting a needs-based, practical approach is a crucial success factor: “the rural communities grasped the benefits of ICTs and through concrete situations, realised that ICTs could meet their needs.” Concerning learner motivation specifically, the authors note that to persevere with using technology for learning, the learners they observed needed to see the benefits of using ICTs for their livelihoods and how to integrate ICT into their daily lives. They were also more motivated when family members introduced them to ICTs.

Other success factors identified in the literature include the involvement of experienced ICT and education experts ([↑Dipendra, 2023](#); [↑Kamei, 2010](#)), rigorous monitoring and evaluation processes ([↑Kamei, 2010](#)), provision of devices for learners to access content independently ([↑Kent, 2022](#)), and the availability of high-quality resources ([↑Dipendra, 2023](#); [↑Kent, 2022](#)).

## 2.3. Barriers to EdTech use for OOSCY

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It is worth highlighting the limited number of examples of high-tech EdTech implementation for OOSCY in the region that emerged through our literature searches. It is striking that the only example of an app-based innovation was facilitated by a learning centre, with no apps for independent use identified through the searches. Equally, UNHCR’s countrywide provision of learning centres for refugees in Malaysia and Thailand does not appear to feature any use of technology ([↑UNHCR, 2020](#)). The conspicuous absence of tech-enabled interventions in a world increasingly turning to technology for solutions indicates that several barriers to EdTech use with different OOSCY continue to exist in this region.

### 2.3.1. Infrastructure issues and device access

The reviewed literature suggests that EdTech access by OOSCY may be severely hampered by a lack of the necessary infrastructure. In Thailand,

↑Binsaleh & Binsaleh, (2013) reported that wireless and mobile networks were not fully implemented in the southern Thai provinces, which are the most deprived in the country and home to many conflict-affected OOSCY. Similarly, ↑Waring & Sacchanan, (2008) note that local government efforts to provide internet connectivity to community learning centres in Thailand were hampered by incomplete infrastructure, including insufficient telephone lines and internet facilities.

More recent evidence from the Thai context suggests that significant progress has been made in this area, with 88% of the Thai population now using the internet and 90.4% of households having internet access as of 2023 (↑Dipendra, 2023). Internet access also appears to be increasing rapidly in the region more broadly, with internet use jumping from 16% of the regional population in 2004, to 70% in 2021 (↑International Communication Union, 2022 as cited in ↑UNESCO, 2023). However, societal inequities mean access is unequal across the region (↑UN Economic and Social Commission for Asia and the Pacific (ESCAP), 2020). In Laos and Myanmar, for example,

*“students from the richest households are almost eight times more likely to be connected to the internet than their peers from the poorest quintile. Viet Nam reported the widest divide: 94.5% of the richest children benefit from internet at home compared with 17.5% of the poorest.”* (↑UNESCO, 2023, p. 7).

This finding is also reflected in the Philippines, where 14% of learners using the country’s Alternative Learning System do so via blended learning, and 83% engage via paper-based materials (↑UNESCO, 2023). ↑UNESCO (2023) authors attribute this reliance on paper-based materials to a lack of connectivity and device access to engage in online learning. Just 1.5% of children from the poorest quintile live in a house with a computer, and less than 1% have an internet connection at home.

Infrastructural differences between urban and rural areas in the region are also stark. In Myanmar, for example, just 57.5% of the population in rural areas (where there are typically higher numbers of OOSCY) have electricity access, compared with 92% in urban areas (↑Jeon et al., 2021). In terms of internet access, in Indonesia, there are vast disparities in connectivity between low-income, rural and often more isolated locations across the fragmented archipelago compared to high-income urban areas such as Java (↑Rui & Upadhyay, 2022; ↑UNICEF, 2021). This data suggests that, while progress has undoubtedly been made, infrastructural issues, particularly in rural and deprived areas, may continue to prevent the most disadvantaged,

including OOSCY, from using EdTech to access education, thereby widening the learning gap even further.

It is also important to remember that existing infrastructure in this region may be particularly susceptible to disruption owing to volcanic activity and extreme weather events, which can easily hamper or destroy infrastructure development efforts ([↑Weng et al., 2020](#)). A sobering example of this is the triple disasters of earthquake, tsunami, and soil liquefaction in central Sulawesi in Indonesia in 2018, which reportedly led to losses in the region of USD 1.3 billion ([↑Gong, 2022](#)).

A lack of basic building infrastructure also prevents certain OOSCY groups from successfully using EdTech to access learning. In Indonesia, learning spaces used to run IT literacy classes for refugees were reportedly unfit for purpose. According to [↑Wahyuni & Fatdha, \(2019\)](#), learning spaces identified for refugee IT lessons could not accommodate all learners, were never cleaned, could often not be booked at times that were suitable for learners, and were located in places that were inaccessible to refugee learners by public transport. In addition, the location of some classrooms in community housing for single males meant caregivers worried about their daughters' safety, potentially leading to increased non-attendance by girls. This account serves as a reminder that, in the absence of individual device access for distance learning, communal learning spaces must be selected carefully, prioritising user context and needs.

### **2.3.2. User readiness**

Some sources from the literature suggest that teachers' lack of digital literacy or negative attitudes towards using EdTech may prevent OOSCY from taking full advantage of available EdTech options. According to [↑Binsaleh & Binsaleh \(2013\)](#) OOSCY in southern Thailand are most likely to be able to access learning through mobile devices. However, programmes that offer facilitated mobile learning may be limited because teachers reportedly do not know how to teach children using mobile devices due to a lack of guidelines and training.

Elsewhere, data from the eSkwela project in the Philippines suggests that many teachers experimented with the project's learning management system only for the first few months of site operations ([↑Kamei, 2010](#)). [↑Kamei \(2010\)](#) attributes this to excessive workload (many eSkwela teachers were also working in formal schools) and low levels of teacher confidence with using technology; observations suggest that teachers often reverted to the non-digital, lecture-style instruction with which they were more comfortable. In Indonesia, this barrier is reportedly still an issue even more



recently; in 2020, 67% of teachers reported difficulties operating devices using online learning platforms ([↑Rui & Upadhyay, 2022](#)).

Teachers are just one group struggling to use EdTech. The mindsets and experience levels of OOSCY themselves may also mean that EdTech is less accessible to them. For example, OOSCY involved in the eSkwela project in the Philippines reportedly had a limited understanding of how ICTs could support education and often preferred learning with more traditional methods such as books and direct teacher instruction ([↑Unwin et al., 2007](#)).

In southern Thailand, [↑Binsaleh & Binsaleh \(2013\)](#) report that families of OOSCY are also unequipped to support their children's learning through EdTech due to a lack of awareness of how the technology works. Conversely, in the case of refugees in Indonesia, [↑Wahyuni & Fatdha \(2019, p. 12\)](#) suggest that the majority of refugees in their focus context of Pekanbaru are familiar with ICTs: "Families with children have laptops, and more than one smartphone(s) and or tablet(s)." The authors suggest that this familiarity with and access to different devices increases refugees' ability to engage with learning through EdTech, although these assumptions are not substantiated further.

### **2.3.3. Lack of EdTech contextualisation**

While low levels of user knowledge may reduce the extent to which OOSCY can access EdTech, it is crucial to highlight that designers and developers of EdTech options for OOSCY must take responsibility and ensure that tools are accessible and contextualised to the needs of the target users ([↑Principles for Digital Development, no date](#)). The language in which content is available is a crucial determiner of accessibility and is identified in the literature as an area where implementers should place more focus. In Thailand's southern provinces, for example, available learning content for OOSCY is often in English, which is inaccessible to most learners, and any Thai content is also not understood by learners in the focus area, as they mostly use Malay ([↑Binsaleh & Binsaleh, 2013](#)). Similarly, in Vietnam, [↑Dotong et al. \(2016\)](#) note the lack of Vietnamese language software for use in educational applications for informal learning settings. Both these examples highlight a lack of contextualisation of EdTech tools as a barrier for OOSCY using technology for learning.

Lack of curriculum and grade alignment also prevents learning through EdTech from being fully accessible to OOSCY. Taking the example of IT literacy classes for refugees in Indonesia, [↑Wahyuni & Fatdha \(2019, p. 12\)](#) report that "classes are unaligned with the lesson grade in host country formal education institutions, which [are] categorised based on learners'

ages.” Similarly, in relation to mobile-learning-based programmes for OOSCY in southern Thailand, [Binsaleh & Binsaleh \(2013\)](#) report that available domain content was not age-appropriate (it was very text-heavy for the young ages of the learners) and was not interactive or differentiated. The authors add that the text was too small for learners to read on mobile devices.

### **2.3.4. Lack of government support**

The literature highlights various ways governments could better support EdTech interventions for OOSCY. For example, even though over 8,000 CLCs had been established across Thailand by 2008, many centres were reportedly operating “at a low level” resulting in a “high failure rate”. While the precise meanings of ‘low level’ and ‘high failure rate’ are not explored or substantiated, [Waring & Sacchanan \(2008, p. 82\)](#) attribute these results to a lack of government budgetary support for “educational technology materials, work plans and public relations”. [Binsaleh & Binsaleh \(2013\)](#) also note that the Thai government could do more to provide OOSCY in the war-torn southern states of Thailand with the devices required to access mobile learning interventions. This is especially relevant given the high number of children in these provinces who cannot attend school regularly due to conflict-induced instability and the fact that the provinces are reportedly the most undeveloped in the country ([Mishra, 2023](#)).

## **2.4. Lessons in EdTech for OOSCY from the Covid-19 pandemic**

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This RER does not focus on children and youth in Southeast Asia who were out of school during the Covid-19 pandemic purely due to pandemic-related school closures; instead, the intention has been to focus on those who would have been out of school regardless of the pandemic.

However, [Jeon et al. \(2021, p. 10\)](#) note that the pandemic “has highlighted the need for a more thorough understanding of the needs of families, teachers, and learners when learning must move from the classroom to the home”. Given the paucity of high-quality evidence on EdTech use with non-Covid-related OOSCY in the region, Southeast Asian experiences of the pandemic and the strategies employed to counter its impact on learning can provide valuable learnings. These can be applied to how EdTech can support OOSCY more broadly.



### 2.4.1. Overview of Southeast Asian education responses to Covid-19

The literature presented several EdTech-based Covid-19 responses that could inform the design and delivery of EdTech for OOSCY beyond the pandemic context.

↑Tarricone et al. (2021, p. 10) describe the use of TV and radio broadcasts as “crucial flexible learning strategies”. These modalities were used widely across the region; both governments and private entities in Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Singapore, Thailand, Timor-Leste, and Vietnam invested in educational TV broadcasts (↑Dipendra, 2023; ↑Dreesen et al., 2020; ↑Jeon et al., 2021; ↑Tarricone et al., 2021). Particular focus was given to TV broadcasting in Thailand, with continued broadcasting post-pandemic offering a potential service to non-Covid-related OOSCY:

*“The National Broadcasting and Telecommunications Commission (NBTC) approved the use of 17 channels for DLTV during the pandemic. In addition, Thai Public broadcasting service was authorised to use the spectrum to test the use of active learning television [...]. Even after the reopening of schools in July, MoE emphasised online and on-air classes.”*  
(↑Dipendra, 2023, pp. 10–11)

Educational radio broadcasts were also used in Cambodia, Indonesia, Laos, Myanmar, the Philippines, Timor-Leste, and Vietnam (↑Dreesen et al., 2020; ↑Tarricone et al., 2021).

Government-supported digital websites or apps were also available to learners with internet access in Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Timor-Leste, and Vietnam (↑Dreesen et al., 2020; ↑Jeon et al., 2021; ↑Nietschke & Dabrowski, 2023; ↑Tarricone et al., 2021). Specific examples mentioned in more detail in the literature include Cambodia’s learning platform used by the Ministry of Education, Youth and Sport (MoEYS) to distribute thousands of digital assets (e.g., videos) via social media (↑Tarricone et al., 2021). The Philippine Department of Education’s Alternative Learning System (ICT4ALS) digital platform allowed learners and teachers to access learning materials, and teachers could partake in webinars, courses, and tutorials. As of August 2020, the ICT4ALS platform reportedly had more than 26,000 active users (↑Jeon et al., 2021). Another example of a government-backed learning platform designed for multi-country use but tailored to a Southeast Asian context is UNICEF and Microsoft’s Learning Passport. Timor-Leste was the first country to use the Learning Passport, known as *Eskola Ba Uma* (‘School

Goes Home'), as its official digital learning platform, offering both online and offline content (↑[Dewan et al., 2021](#) in ↑[Jeon et al., 2021](#)).

Other distance learning modalities implemented in Brunei Darussalam, Indonesia, Malaysia, and Singapore included “learning management tools to conduct and deliver lessons, and online services such as Google Suite Education, Smart Class, Microsoft Teams, Quipper School, Sekolahmu and Kelas Pintar” (↑[Tarricone et al., 2021](#), p. 9).

It is worth noting ↑[Tarricone et al.'s \(2021, p. 13\)](#) observation that “Nearly all country documents reviewed did not explicitly address refugees, asylum seekers or internally displaced persons.” This suggests that pandemic education responses targeted learners who are usually in school, with those unable to attend for various reasons effectively falling even further off the radar than they perhaps already were during the Covid-19 pandemic.

### 2.4.2. Improve infrastructure and device access

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***“The right to education is increasingly synonymous with the right to meaningful connectivity.”***

**– ↑[UNESCO \(2023\)](#)**

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The literature indicates that some responses to the Covid-19 pandemic mentioned in [Section 2.4.1](#) above included device provision. Laos’s Ministry of Education and Sports (MoES) reportedly provided tablets to some learners with disabilities, although it is unclear how widespread this was (↑[Nietschke & Dabrowski, 2023](#)). Brunei Darussalam, Indonesia, Laos, Malaysia, and Vietnam all reportedly provided free mobile devices to learners through public donations and subsidies, and in some cases, provided free internet subscriptions for children without access (↑[Duong, 2020](#) as cited in ↑[Tarricone et al., 2021](#)). These actions constitute an interesting possibility for connecting non-Covid-related OOSCY to technology in the region.

Beyond individual device access, ↑[Tarricone et al. \(2021\)](#) and (↑[UNICEF East Asia and Pacific, 2021](#)) note that the pandemic may have served to illuminate the pre-pandemic infrastructural issues highlighted in [Section 2.3.1](#) above. This further supports the argument that it will be challenging to realise the potential of using EdTech to give OOSCY access to education unless Southeast Asian governments prioritise infrastructure development to support electricity and internet access in deprived and rural areas.

*“In Malaysia and Indonesia, for example, the shift towards distance learning, especially for children in rural areas and from socio-economically disadvantaged backgrounds, made it apparent that greater infrastructure investment was needed to support their access to the internet.”* (↑[Tarricone et al., 2021](#), p. 7)

The lack of necessary digital infrastructure was apparent in Laos, where 87.5% of rural children reportedly could not access distance learning (↑[UNESCO, 2023](#)).

### **2.4.3. Provide structured guidance for distance learning**

The literature highlights the importance of providing structured guidance for distance learning. This could include guidelines for caregivers and learners and guidance on the modalities available, as was reportedly done in Brunei Darussalam, Malaysia, and Vietnam through Covid-19 education response plans (↑[Tarricone et al., 2021](#)).

The literature also underscores the importance of training teachers in distance learning approaches. According to ↑[Putra et al.'s \(2020\)](#) study, learners in Indonesia reported receiving insufficient support during remote learning as teachers' support consisted of “just sending homework assessments through WhatsApp without providing follow-up support or interaction” (as cited in ↑[Jeon et al., 2021](#), p. 8). This suggests that teachers could have benefitted from training to show them more effective ways of using technology to facilitate learning at a distance. Some good examples of this kind of teacher training include the Vietnamese Ministry of Education and Training's provision of virtual training for using virtual classrooms, and the Malaysian Ministry of Education's creation of a digital peer learning community for teachers. The latter included content such as “notes, video tutorials and quizzes on how to plan, build and launch digital learning content” (↑[UNICEF, 2020](#) as cited in ↑[Jeon et al., 2021](#), p. 10).

### **2.4.4. Invest in multi-stakeholder collaboration**

Two sources underscore the importance of ensuring that different stakeholders collaborate to support the education of OOSCY in terms of policy, infrastructure, and implementation. In Indonesia, ↑[Tarricone et al. \(2021\)](#) and ↑[UNICEF East Asia and Pacific \(2021\)](#) report that such collaboration between the government, non-governmental, and international non-governmental organisations resulted in vital policy reform and communication with rural and disadvantaged communities during the pandemic. In both Indonesia and Vietnam, robust decentralised

decision-making processes helped ensure that national Covid-19 responses were interpreted effectively by local authorities ([UNICEF East Asia and Pacific, 2021](#)). Therefore, such collaborations are crucial for ensuring OOSCY's education access beyond the Covid-19 pandemic context.

[Tarricone et al. \(2021, p. 7\)](#) also note that “private sector collaboration in Singapore and Brunei Darussalam included the provision of high-speed internet access and devices for schooling”, indicating that there may be a role for private sector partners in ensuring access to education for OOSCY in remote areas.

### **2.4.5. Conduct rigorous monitoring and evaluation**

The lack of empirical data indicating the effectiveness of EdTech for OOSCY suggests that efforts to engage OOSCY in learning through EdTech need to be much more thoroughly documented. Examples of different Southeast Asian governments who provided guidance on how to do this well during the Covid-19 pandemic include the Philippines and Laos ([Tarricone et al. \(2021\)](#)).

More specifically, a good example of a government planning its Covid-19 education response in an evidence-informed way comes from Cambodia, where,

*“[...] the Ministry of Education, Youth and Sport (MoEYS) conducted a needs assessment survey with more than 15,000 respondents consisting of students, caregivers, teachers, school directors, teacher trainees and educators, administrators and local authorities.”* ([Jeon et al., 2021, p. 10](#))

Based on the needs assessment results, the comprehensive plan outlined the budget allocation and technical resources to support all learners at a distance, “including those most vulnerable” ([Jeon et al., 2021](#)). It is not clear how effective the plan ultimately was and whether it did indeed reach the most vulnerable. However, this example underlines how rigorous, evidence-based approaches to EdTech implementation for OOSCY are vital for ensuring that the needs and access requirements of OOSCY are well understood and reflected in the planning of interventions designed to support them.

### 3. Synthesis and conclusions

This section synthesises the findings from the four thematic areas identified in the literature. The findings are accompanied by examples from around the world that support these conclusions, and recommendations for future research and implementation.

The key findings from this review are detailed below.

#### **1. There is a general paucity of high-quality research on using EdTech with OOSCY in Southeast Asia.**

Of the papers that met the inclusion criteria for this research, many lacked analytical depth and were narrative in nature, with a substantial number containing written errors suggesting less-than-rigorous pre-publication processes. This could be because the use of EdTech as it pertains to OOSCY is fairly nascent in Southeast Asia, implying that initiatives focusing on OOSCY will require rigorous testing and iteration cycles. While the existing literature sporadically references interventions for OOSCY, either evaluations have not been conducted or are not publicly available. Regarding impact and effectiveness, there appears to be more evidence for using low-tech methods, including broadcast television.

For this reason, we recommend that:

- Future research explores the challenges and opportunities of leveraging technology to implement programmes for OOSCY through interviewing programme implementers.
- EdTech interventions for OOSCY should build in timelines that accommodate cycles for testing and iteration.

#### **2. Before the Covid-19 pandemic, OOSCY primarily accessed education through broadcast media or learning centres.**

OOSCY used learning centres to access general educational content or develop their digital skills, or a combination thereof. Some evidence may help guide intervention design, but there is limited evidence about the impact or effectiveness of existing interventions.

The literature suggests that broadcast media may be particularly effective in reaching learners due to its lack of reliance on high-tech devices and infrastructure. However, there is little empirical evidence

from the region on its impact on learning outcomes or effectiveness in engaging learners. Adding to the challenge, data from the Philippines shows that only 1% of learners expressed a preference for broadcast media (including radio and TV-based instruction).

Future research should therefore explore:

- The impact of different TV and radio broadcasts on the learning outcomes of OOSCY.
- How broadcasts could be designed to effectively engage OOSCY in particular.

In line with global evidence, we recognise that infrastructural relevance is, of course, just one part of the effective implementation of EdTech. Intervention effectiveness can be increased by prioritising community involvement through, for example, embedding small learning centres within communities or investing in communication campaigns to help communities see the benefits of ICTs. Evidence from beyond the Southeast Asia context (see [Figure 4](#)) also suggests that interventions must be planned with community schedules and priorities in mind, especially in the case of rural communities where OOSCY numbers are likely to be higher.

**Figure 4.** *Working with OOSCY and their communities in Pakistan*

In a study undertaken in Pakistan, EdTech Hub interviewed parents and teachers affected by Pakistan's 2022 floods. It transpired that rural OOSCY were less likely to be able to benefit from available digital learning solutions if the interventions in which these solutions are embedded are scheduled in conflict with community priorities. In particular, children who had to help their parents during the harvest season could not participate in programmes offered during this time ([Mazari et al., 2023](#)).

We recommend that:

- Programme implementers for OOSCY foreground communities during planning and implementation of EdTech programmes aimed at supporting the learning of OOSCY, and ideally co-design interventions with them.

**3. Several barriers prevent OOSCY from accessing education via EdTech, including infrastructure and device access issues in rural and remote areas, a lack of stakeholder readiness for EdTech innovations, a lack of technology contextualisation, and a lack of OOSCY-targeted government support.**

Connectivity in the region has increased significantly recently, but there is little evidence to suggest this has positively impacted learning for OOSCY. Like many parts of the world, the digital divide persists across many countries in Southeast Asia. While progress has undoubtedly been made, infrastructural issues, particularly in rural and deprived areas, may continue to prevent the most disadvantaged, including OOSCY, from accessing education via EdTech, thereby widening the learning gap even further. In parts of Southeast Asia (Brunei Darussalam and Singapore), private-sector collaboration has provided high-speed internet access and devices for schooling. Such collaborations indicate a potential role for private-sector partners in ensuring access to education for OOSCY in remote areas.

However, the literature suggests that more than the availability of infrastructure and devices is needed to ensure the effectiveness of digital learning solutions. Even where technology is available, programmes for OOSCY in Thailand and the Philippines revealed that teachers face several challenges, including their capacity to use technology and their understanding of learning solutions. These challenges prevent teachers from leveraging digital solutions (mobile phones in Thailand and a learning management system in the Philippines).

Based on these findings, we recommend that:

- Southeast Asian governments prioritise further infrastructure investments, especially in rural and disadvantaged areas where connectivity issues persist.
- Programme implementers for OOSCY include a robust teacher capacity development component as a standard feature.

**4. Valuable lessons can be learnt from the Covid-19 pandemic and government responses to the disruption to education.** These responses include examples of how EdTech can be leveraged to help OOSCY access education. However, direct mentions of OOSCY in the literature on Covid-19 education responses in the region are conspicuously absent.

Like many parts of the world, the Covid-19 pandemic in Southeast Asia catalysed a reliance on distance learning modalities to support learning continuity. As a result, a large portion of the literature around EdTech for OOSCY emerging from the searches relates to



learners who were out of school due to pandemic-related school closures but otherwise would have been in education. Nonetheless, lessons from national responses to the pandemic are applicable to EdTech design for OOSCY across Southeast Asian countries. For example, TV and radio broadcasts emerged as “crucial flexible learning strategies” during the pandemic ([↑Tarricone et al. \(2021\)](#)), and government-supported digital websites or apps were also made available to learners with internet access. The importance of consulting existing evidence as a basis for EdTech interventions is highlighted in [Figure 5](#) below:

**Figure 5.** *Contextualising evidence from responses to education disruption during the Covid-19 pandemic*

The effectiveness of EdTech interventions leveraged during the Covid-19 pandemic was “largely dependent” on whether their implementation was informed by pre-existing evidence on EdTech ([↑Hollow & Jefferies, 2022](#), p. 24). Similarly, the effectiveness of future EdTech implementations will be contingent on whether evidence is used to inform EdTech design and implementation. A good example of using evidence to inform EdTech implementation is the case of Promoting Equality in African Schools (PEAS). This Uganda-based organisation consulted all available literature relating to both EdTech implementation and previous epidemics (such as the Ebola outbreak) to inform their Covid-19 response planning, enabling them to provide an EdTech-supported response that reached 95% of their students during school closures ([↑EdTech Hub Preprint, 2023](#)).

Literature on educational responses to Covid-19-related school closures indicates that out-of-school learning must be supported by:

- robust infrastructure
- device provision where necessary
- structured distance learning guidance for teachers, learners, and families
- multi-stakeholder collaboration
- rigorous government monitoring processes.

These measures become even more important when transferring lessons from the Covid-19 pandemic to using EdTech for OOSCY and are likely to maximise equity of EdTech access and prevent an exacerbation of the digital divide.

Based on these findings, we recommend that:

- Programme implementers use existing evidence to inform programmes for OOSCY, recognising the unique barriers OOSCY face compared to their peers already in school.



## Bibliography

These references are available digitally in our evidence library at

<https://docs.edtechhub.org/lib/IIAMD77T>

*\*Denotes literature that provides context but was examined as part of the rapid evidence review.*

\*Association of Southeast Asian Nations. (2016). *ASEAN Declaration on Strengthening Education for out-of-school Children and Youth (OOSCY)*. ASEAN Main Portal.

<https://asean.org/asean-declaration-on-strengthening-education-for-out-of-school-children-and-youthooscy/>. (details)

BEEP. (2024). *Basic Education Equivalency Program (BEEP)*. EdTech Center @ World Education. <https://edtech.worlded.org/project/beep/>. (details)

Binsaleh, S., & Binsaleh, M. (2013). Mobile Learning: What Guidelines Should We Produce in the Context of Mobile Learning Implementation in the Conflict Area of the Four Southernmost Provinces of Thailand. *Asian Social Science*, 9(13), 270. <https://doi.org/10.5539/ass.v9n13p270>.

Available from

<http://www.ccsenet.org/journal/index.php/ass/article/view/30824>. (details)

Department of Education, Division of Malaybalay City. (2020, December 11). *DepEd Malaybalay Expands Radio-Based Instruction (RBI) to Formal Education*. DepED, Division of Malaybalay City.

<https://www.depedmalaybalay.net/articles/deped-malaybalay-expands-radio-based-instruction-rbi-to-formal-education.html>. (details)

Dewan, P., Carnelli, M., Pontuscha, R., Tubio, M. L., & Tsuruyama, E. (2021). Reimagining Digital Learning: Lessons from the learning passport in Timor-Leste. *UNICEF Connect: Evidence for Action*.

<https://blogs.unicef.org/evidence-for-action/reimagining-digital-learning-lessons-from-the-learningpassport-in-timor-leste>. (details)

Dipendra. (2023). *Technology in education: a case study on Thailand* — UNESCO Digital Library.

<https://unesdoc.unesco.org/ark:/48223/pf0000387746>. (details)

Dotong, C. I., de Castro, E. L., Dolot, J. A., & Prenda, M. T. B. (2016). Barriers for Educational Technology Integration in Contemporary Classroom Environment. *Asia Pacific Journal of Education, Arts and Sciences*, 3(2).

[https://www.academia.edu/32971361/Barriers\\_for\\_Educational\\_Technology\\_Integration\\_in\\_Contemporary\\_Classroom\\_Environment](https://www.academia.edu/32971361/Barriers_for_Educational_Technology_Integration_in_Contemporary_Classroom_Environment). (details)

Dreesen, T., Akseer, S., Brossard, M., Dewan, P., Giraldo, J.-P., Kamei, A., Mizunoya, S., & Ortiz, J. S. (2020). *Promising Practices for Equitable Remote Learning: Emerging lessons from COVID-19 education responses in 127 countries*. UNICEF Innocenti – Global Office of Research and Foresight.

<https://www.unicef.org/innocenti/documents/promising-practices-equitable-remote-learning>. (details)

Duong, K. A. (2020). *Vietnam: Covid-19 and the Challenges for the Education Sector*. Friedrich Ebert Stiftung.

<https://vietnam.fes.de/post/vietnam-covid-19-and-the-challenges-for-the-education-sector.html>. (details)

EdTech Hub Preprint. (2023). *Using Technology to Improve Education for Marginalised Girls: Lessons in implementation from the Girls' Education Challenge* [Preprint]. EdTech Hub.

<https://doi.org/10.53832/edtechhub.0172>. Available from <https://docs.edtechhub.org/lib/V8CZHW5B>. Available under Creative Commons Attribution 4.0 International. (details)

UN Economic and Social Commission for Asia and the Pacific (ESCAP). (2020). *Inequality in access to information and communication technologies (ICTs) in East and North-East Asia and South-East Asia* [Policy Brief]. United Nations.

<https://repository.unescap.org/handle/20.500.12870/3511>. (details)

\*Garritty, C., Gartlehner, G., Nussbaumer-Streit, B., King, V. J., Hamel, C., Kamel, C., Affengruber, L., & Stevens, A. (2021). Cochrane Rapid Reviews Methods Group offers evidence-informed guidance to conduct rapid reviews. *Journal of Clinical Epidemiology*, 130, 13–22.

<https://doi.org/10.1016/j.jclinepi.2020.10.007>. Available from [https://www.jclinepi.com/article/S0895-4356\(20\)31146-X/abstract](https://www.jclinepi.com/article/S0895-4356(20)31146-X/abstract). (details)

\*General Statistics Office of Vietnam. (2019). *Completed results of the 2019 Viet Nam population and housing census*.

<https://www.gso.gov.vn/en/data-and-statistics/2020/11/completed-results-of-the-2019-viet-nam-population-and-housing-census/>. (details)

\*Gong, L. (2022, November 22). *Climate-induced Disasters as an Evolving Threat to Southeast Asia's Maritime Security*. Asia Maritime Transparency Initiative.

<https://amti.csis.org/climate-induced-disasters-as-an-evolving-threat-to-southeast-asias-maritime-security/>. (details)

\*Hennessy, S., Jordan, K., Wagner, D. A., & EdTech Hub Team. (2021). *Problem Analysis and Focus of EdTech Hub's Work: Technology in Education in Low- and Middle-Income Countries* (Working Paper No. 7). EdTech Hub. <https://doi.org/10.5281/zenodo.4332693>. Available from <https://docs.edtechhub.org/lib/PBXBB7LF>. (details)

\*Higgins, J. P. T., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (Eds.). (2023). *Cochrane Handbook for Systematic Reviews of Interventions Version 6.4* (updated August 2023). Cochrane. [www.training.cochrane.org/handbook](http://www.training.cochrane.org/handbook). (details)

\*Hollow, D., & Jefferies, K. (2022). *How EdTech Can Be Used to Help Address the Global Learning Crisis: A Challenge to the Sector for an Evidence-Driven Future*. EdTech Hub.

<https://doi.org/10.53832/edtechhub.0115>. Available from <https://docs.edtechhub.org/lib/UUDK52LQ>. (details)

InfoTimor. (n.d.). *InfoTimor*. Retrieved July 30, 2024, from <https://technology.tl/>. (details)

International Communication Union. (2022). *E-learning in Thailand: Mapping the digital divide*.

<https://www.itu.int/hub/publication/d-pref-them-28-2022/>. (details)

Jeon, Y., Dreesen, T., Fushimi, A., & Koepl, D. (2021). *Reopening with Resilience: Lessons from Remote Learning during COVID-19 in East Asia and the Pacific*. UNICEF. <https://eric.ed.gov/?id=ED618934>. Available from <https://eric.ed.gov/?id=ED618934>. (details)

Kamei, M. (2010). *eSkwela project — eSchool for out-of-school youths and adults, Philippines*. 2010 International Conference on Technology for Education, India. <https://doi.org/10.1109/T4E.2010.5550039>. Available from <https://ieeexplore.ieee.org/document/5550039>. (details)

Kent, M. (2022, July 4). Digital library improving literacy in Timor-Leste. *ChildFund Australia*.

<https://www.childfund.org.au/stories/digital-library-improving-literacy-in-timor-leste/>. (details)

\*Mazari, H., Baloch, I., Thinley, S., Radford, K., Kaye, T., & Perry, F. (2023). *Learning continuity in response to climate emergencies: Pakistan's 2022 floods*. EdTech Hub. <https://doi.org/10.53832/edtechhub.0135>. Available from <https://docs.edtechhub.org/lib/42XI4RCK>. (details)

\*Mishra, R. (2023). *What's Behind the Growing Number of Attacks in Southern Thailand?* <https://thediplomat.com/2023/05/whats-behind-the-growing-number-of-attacks-in-southern-thailand/>. (details)

Nietschke, Y., & Dabrowski, A. (2023). Technology in education: A case study on Lao People's Democratic Republic. *International Education Research*. <https://doi.org/10.54676/IKWQ7828>. (details)

\*Principles for Digital Development. (no date). *Principles for Digital Development*. Principles for Digital Development. Retrieved 20 March 2024, from <https://digitalprinciples.org/>.(details)

Putra, P., Liriwati, F. Y., Tahrim, T., Syafrudin, S., & Aslan, A. (2020). The students learning from home experiences during Covid-19 school closures policy in Indonesia. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 5(2), 30–42. <https://doi.org/10.25217/ji.v5i2.1019>. Available from <https://journal.iainnumetrolampung.ac.id/index.php/ji/article/view/1019>. (details)

Rui, Y. (Tingting), & Upadhyay, A. (2022). *EdTech That Reaches Marginalised Learners: Relevant Examples for the Indonesian Context* (Helpdesk Response No. 37). EdTech Hub. <https://doi.org/10.53832/edtechhub.0102>. Available from <https://docs.edtechhub.org/lib/MNMTIMGA>. Available under Creative Commons Attribution 4.0 International. (details)

Rui, Y., & Upadhyay, A. (2022). *EdTech That Reaches Marginalised Learners: Relevant Examples for the Indonesian Context*. EdTech Hub. <https://docs.edtechhub.org/lib/MNMTIMGA>. (details)

\*Southeast Asian Ministers of Education Organization. (2022, January 19). *History of SEAMEO Members*. [https://www.seameo.org/img/SEAMEO\\_General/About\\_SEAMEO/History\\_HTML/seameomc/mcindex.htm](https://www.seameo.org/img/SEAMEO_General/About_SEAMEO/History_HTML/seameomc/mcindex.htm). (details)

- Tarricone, P., Teo, I., Mestan, K., Sundarsagar, K., Killimangalam, A., & Abd Razak, N. (2021). Flexible strategies for ensuring quality learning outcomes in education in emergencies (NEQMAP 2021 thematic review). *International Education Research*.  
[https://research.acer.edu.au/int\\_research/6/](https://research.acer.edu.au/int_research/6/). (details)
- \*Ting, F. S. T., Shroff, R. H., Lam, W. H., Garcia, R. C. C., Chan, C. L., Tsang, W. K., & Ezeamuzie, N. O. (2023). A meta-analysis of studies on the effects of active learning on Asian students' performance in science, technology, engineering and mathematics (STEM) subjects. *The Asia-Pacific Education Researcher*, 32(3), 379–400.  
<https://doi.org/10.1007/s40299-022-00661-6>. Available from <https://link.springer.com/10.1007/s40299-022-00661-6>. (details)
- \*UNESCO Institute for Statistics. (2020). *Out-of-school children, adolescents and youth*.  
<https://uis.unesco.org/en/glossary-term/out-school-children-adolescents-and-youth-number>. (details)
- UNESCO and SEAMEO. (2020). *TVET Country Profile — Timor Leste*.  
<https://files.eric.ed.gov/fulltext/ED608984.pdf>. (details)
- UNESCO & UNESCO Bangkok Office. (2017). *Situation analysis of out-of-school children in nine southeast Asian countries — UNESCO Digital Library*. <https://unesdoc.unesco.org/ark:/48223/pf0000252749>. (details)
- UNESCO, UNESCO Multisectoral Regional Office in Bangkok, & United Nations University Institute for the Advanced Study of Sustainability (2023). *Asia-Pacific regional synthesis: climate change, displacement and the right to education - UNESCO Digital Library*.  
<https://unesdoc.unesco.org/ark:/48223/pf0000385187>. (details)
- UNESCO. (2023). *Global Education Monitoring Report 2023, Southeast Asia: Technology in education: A tool on whose Terms?*  
<https://unesdoc.unesco.org/ark:/48223/pf0000387214>. (details)
- UNESCO. (2024). *UNESCO to implement new phase of Actions of ASEAN Declaration for Out-of-School Children and Youth*.  
<https://www.unesco.org/en/articles/unesco-implement-new-phase-actions-asean-declaration-out-school-children-and-youth>. (details)
- UNHCR Regional Bureau for Asia and the Pacific. (2020). *Closing the Gap: Asia Education Update*.

[https://www.unhcr.org/asia/sites/asia/files/legacy-pdf/5f97afcb4\\_0.pdf](https://www.unhcr.org/asia/sites/asia/files/legacy-pdf/5f97afcb4_0.pdf).  
(details)

UNICEF East Asia and Pacific. (2021, August 1). *COVID-19 Education Situation Analysis in Southeast Asia*.

<https://www.unicef.org/eap/reports/covid-19-education-situation-analysis-southeast-asia>. (details)

UNICEF. (2017). *My Village (ECD TV) Programme Evaluation Report*.

<https://www.unicef.org/laos/media/296/file/UNICEF%20Lao%20PDR.pdf>.  
(details)

UNICEF. (2020). *UNICEF Education COVID-19 case study: Malaysia – Empowering teachers to deliver blended learning after school reopening | UNICEF Evaluation*.

<https://www.unicef.org/evaluation/documents/unicef-education-covid-19-case-study-malaysia-empowering-teachers-deliver-blended>.  
(details)

UNICEF. (2021a). *Situational Analysis on Digital Learning in Indonesia*.

<https://www.unicef.org/indonesia/media/9956/file/Situation%20Analysis%20on%20Digital%20Learning%20in%20Indonesia.pdf>. (details)

UNICEF. (2021b). *The future of 800 million children across Asia at risk as their education has been severely affected by the COVID-19 pandemic*.

<https://www.unicef.org/rosa/press-releases/future-800-million-children-across-asia-risk-their-education-has-been-severely>. (details)

Unwin, T., Tan, M., & Pauso, kat. (2007). The potential of e-Learning to address the needs of out-of-school youth in the Philippines. *Children's Geographies*. <https://doi.org/10.1080/14733280701631940>. Available from <https://www.tandfonline.com/doi/abs/10.1080/14733280701631940>.  
(details)

Wahyuni, D. S., & Fatdha, T. S. E. (2019). ICT and education for refugees in transit. *SALTeL Journal (Southeast Asia Language Teaching and Learning)*, 2(2), 8–14. <https://doi.org/10.35307/saltel.v2i2.27>. Available from <https://journal.altsacentre.org/index.php/SALTeL/article/view/27>.  
(details)

Waring, M., & Sacchanan, C. (2008). *ICT in community-based lifelong learning center: model for northeast Thailand* [PhD Thesis, Auckland University of Technology].

<http://openrepository.aut.ac.nz/handle/10292/424>. (details)

Weng, B. C., Morooka, R., Mujtaba, R. S., & Shitong, Y. (2020). *Climate Change Impact on Education*. Aide et Action.  
<https://action-education.org/sea/wp-content/uploads/sites/40/2022/12/Climate-change-impact-on-education-in-Southeast-Asia-1.pdf>.  
(details)

World Possible. (2018, September 1). *RACHEL Deployment Journal in Baucau Area, Timor Leste — Countries / South Pacific*. World Possible Community.  
<https://community.worldpossible.org/t/rachel-deployment-journal-in-baucau-area-timor-leste/917>. (details)



## Annex: Search strings

- (“*Educational technology*” OR “*Education technology*” OR EdTech OR “*distance learning*” OR ICT) AND (“*out of school*” OR OOSC OR drop-out OR absen\* OR displace\* OR refugee) AND (Brunei\* OR Vietnam\* OR Cambodia\* OR Indonesia\* OR Lao\* OR Malaysia\* OR Myanmar\* OR Burma OR Philippines OR Singapore\* OR Thailand\* OR Timor-Leste OR “*ASEAN*” OR “*South-east Asia*”)
- (“*Education technology*” OR EdTech OR “*distance learning*”) AND (“*out of school*” OR OOSC OR absen\* OR displace\* OR refugee) AND (Brunei\* OR Vietnam\* OR Cambodia\* OR Indonesia\* OR Lao\* OR Malaysia\* OR Burma OR Philippines OR Singapore\* OR Thailand OR “*ASEAN*”)
- “*ASEAN*” AND “*digital learning*” AND (disab\* OR “*OOSCY*” OR “*Girls Education*” OR IDP OR asylum)
- (“*Education technology*” OR EdTech OR “*distance learning*” OR “*Mobile learning*” OR “*digital learning*”) AND (conflict OR displac\*) AND (Brunei OR Vietnam OR Cambodia OR Indonesia OR Lao OR Malaysia OR Burma OR Philippines OR Singapore OR Thailand OR “*ASEAN*”)