EdTech Hub

Clear evidence, better decisions, more learning.

unicef ✿
for every child

UKaid
from the British people

THE WORLD BANK

About this document

Recommended citation	EdTech Hub. (2022). *Desk Review of Technology-Facilitated Learning in Pakistan: A review to guide future development of the technology-facilitated learning space in Pakistan.* EdTech Hub, UNICEF. https://doi.org/10.53832/edtechhub.0071. Available at https://docs.edtechhub.org/lib/6FN5VTP7. Available under Creative Commons Attribution 4.0 International, https://creativecommons.org/licenses/by/4.0
Licence	Creative Commons Attribution 4.0 International https://creativecommons.org/licenses/by/4.0/ You — dear readers — are free to share (copy and redistribute the material in any medium or format) and adapt (remix, transform, and build upon the material) for any purpose, even commercially. You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
Notes	EdTech Hub is supported by UK aid (Foreign, Commonwealth and Development Office), Bill & Melinda Gates Foundation, World Bank, and UNICEF. The views expressed in this document do not necessarily reflect the views of UK aid (Foreign, Commonwealth and Development Office), Bill & Melinda Gates Foundation, World Bank, and UNICEF.
Reviewers	Asma Zubairi and Joel Mitchell
Acknowledgment	This report was commissioned by UNICEF Pakistan and produced under a collaboration between EdTech Hub and UNICEF Pakistan. Many thanks to UNICEF Pakistan colleagues for their support and input to develop this report.

Contents

Abbreviations and acronyms

AJK   Azad Jammu and Kashmir

CSO   Civil society organisation

DFID   Department for International Development

EMIS   Education Management Information System

FCDO   Foreign, Commonwealth and Development Office

ICT   Information and communications technology

IRC   International Rescue Committee

IRI   Interactive radio instruction

LMIC   Low- and middle-income country

MoFEPT   Ministry of Federal Education and Professional Training

NICT   National Information & Communication Technology

NGO   Non-governmental organisation

OER   Open Educational Resource

PITB   Punjab Information and Technology Board

SELD   School Education and Literacy Department

SEND   Special educational needs and disabilities

STEAM   Science, technology, engineering, arts, and mathematics

Executive summary

The Covid-19 pandemic has positioned educational technology (EdTech) as a key part of education service delivery. As schools have closed around the world, EdTech has played a critical role in keeping children learning. This desk review considers the past, current and future role of EdTech in Pakistan. It forms part of EdTech Hub's landscape analysis to guide the engagement of Pakistan's Ministry of Federal Education and Professional Training (MoFEPT), UNICEF and other stakeholders in the technology-facilitated learning landscape in Pakistan.

During the Covid-19 pandemic, EdTech has been used in many different ways to keep children learning in Pakistan. This has ranged from educational radio broadcasting to children in remote mountains, to TV channels being used to deliver classes nationwide. Yet, as the pandemic has developed, this picture has become more complex. Optimism in EdTech's promise has given way to fears that the most marginalised children — particularly those who cannot access technological solutions — are falling further behind. Even those children who *are* able to use EdTech may not be learning. In short, a pre-existing digital divide has become more pronounced now that education delivery has had to increasingly rely on technology. This divide must be addressed if EdTech is to support effective learning for all children in all contexts in Pakistan.

This desk review argues that the only way to realise EdTech's potential is to recognise its shortcomings. Technology alone will not help children learn. EdTech's role is as one part of a wider education system. Technology facilitates learning with support from key actors such as parents, teachers, and school leaders and with sustained political support and supporting infrastructure.

This review provides an overview of Pakistan's technology-facilitated learning landscape that caters to the learning needs of children aged 6–16. It sets out key EdTech-related features, challenges and trends, in addition to highlighting prominent EdTech organisations and tools in Pakistan.

The review contains four sections.

Section 1 provides the background context for the desk review and outlines the aims, scope, and methodology used.

Section 2 examines Pakistan's EdTech 'enabling environment' of policies, infrastructure, and prominent EdTech organisations.

Section 3 examines EdTech in action, looking at how it has worked in practice during the Covid-19 pandemic and its impact on equity and learning outcomes.

Section 4 explores preliminary considerations for engaging and supporting the technology-facilitated learning landscape.

The desk review concludes that engagement in the technology-facilitated learning landscape comes at a critical time, as Pakistan emerges from Covid-19 looking to use EdTech to help to tackle its profound educational challenges. The review suggests that key considerations for the future include:

Change the story

1. **Digital skills to digital learning:** The Covid-19 pandemic provides an opportunity to change the narrative relating to EdTech use in Pakistan. Now is the time to change the vision of EdTech from a pathway to digital skills towards foundational skills for the most marginalised.

Infrastructure is weak
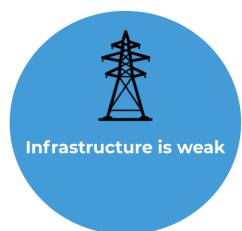
2. **Infrastructure for equity.** Significant infrastructural barriers limit widespread EdTech use and exacerbate compounded disadvantages that prevent some groups from accessing EdTech to learn.

Think: implementation

3. **Implementation challenges.** There are challenges and opportunities to implement EdTech at scale to reach all learners. Identifying these challenges and opportunities, and then developing plans accordingly, is a key part of developing an effective technology-facilitated learning strategy.

Focus on equity

4. **EdTech beyond Covid-19: EdTech for equity?** The biggest challenge, and opportunity, for the Pakistan government and other stakeholders will be to find ways to use EdTech to improve the learning of the most marginalised.

5. **Evidence of impact**. More evidence is needed on the impact of EdTech on marginalised groups and on what works to improve learning outcomes.

6. **Responsive institutional capacity coherent to learning.** At-scale EdTech rollout requires high levels of adaptability and coordination among governmental and non-governmental organisations. This level of coherence and capacity needs to be at the forefront of any national EdTech strategy.

Definitions

EdTech **or** *educational technology*

Technologies — including hardware (e.g., TV, radio, mobile, computers), software (e.g., apps), and digital content (e.g., e-books) — that are either designed or appropriated for educational purposes. This also includes information and communications technologies (ICTs) which are used at any point within the education system — in ministries, schools, communities, and homes, including between individuals and for self-study.

Technology facilitated learning

In this report, we use the term 'technology-facilitated learning' as an overarching phrase to encompass all types of technological tools that are used directly to enhance student learning (vs. supporting administrative tasks). This can include digital and high-tech tools such as personalised learning software on individual tablets, or low-tech tools such as radio. We use the terms predominantly in reference to tools aimed at enhancing student learning directly. In certain cases, it may refer to tools that are more teacher-focused, but we make this clear in the context.

Remote **or** *distance learning*

Distance Learning - education for learners who are not physically 'on site' (↑UNESCO, n.d). The suite of initiatives and programmes launched at the onset of the Covid-19 pandemic to deliver learning and education during school closures. These include a range of approaches including sharing learning resources digitally online or broadcasting via TV or radio. While typically tech-supported, remote or distance learning does not necessarily rule out non-tech efforts, such as delivering printed learning materials to students without access to technology.

1. Introduction

This section provides an introduction to the desk review. It sets out the background and details the aims, scope, and methodology used.
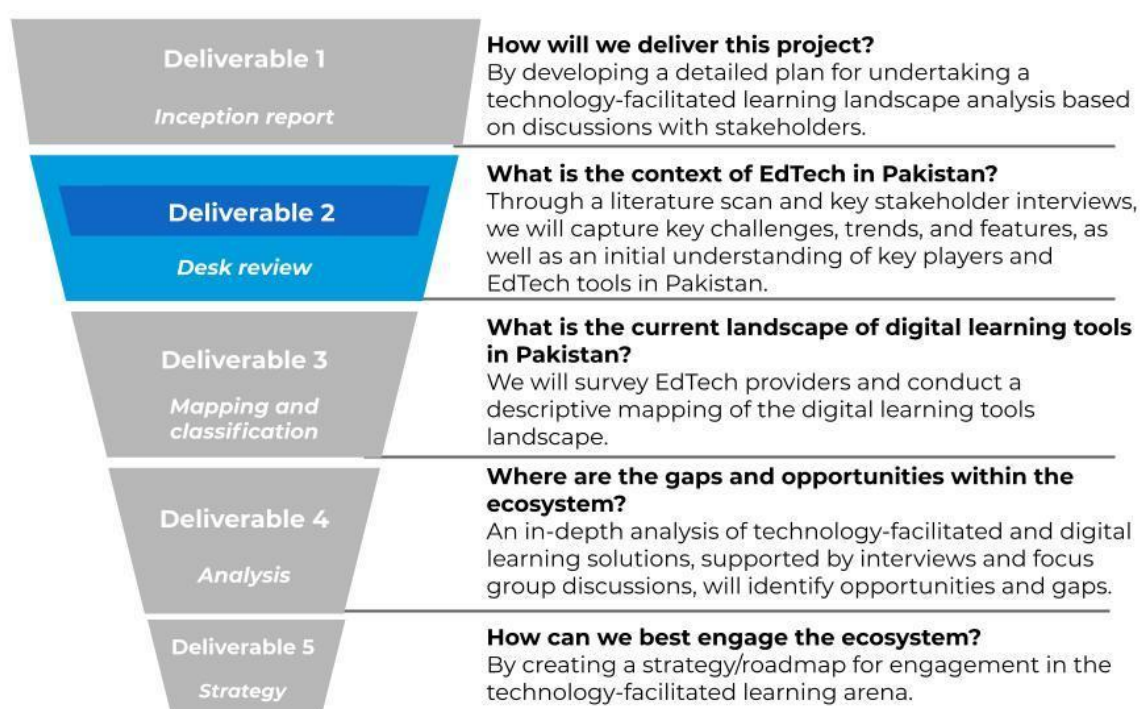
1.1. Background

In Pakistan, the Covid-19 pandemic has worsened an existing learning crisis. Since March 2020, waves of school closures have led to 51 weeks of lost schooling for over 46 million children and added to the challenge of reaching the 22.8 million children already out of school (⇡UNESCO, 2021).[1] Pakistan's national, provincial, and regional governments reacted quickly to this challenge. In May 2020, the Ministry of Federal Education and Professional Training (MoFEPT) released the Pakistan National Education Response and Resilience Plan (K-12) for Covid-19 to provide a framework for remote learning (⇡Ministry of Federal Education and Professional Training, 2020). The federal and provincial governments and other stakeholders are now deploying various options to support students' remote learning in Pakistan.

Along with other education sector stakeholders such as UNICEF Pakistan, the MoFEPT is looking to develop a national approach to leveraging EdTech in Pakistan. This strategy will identify how both low- and high-tech learning modalities can be leveraged to improve learning for all Pakistan's children, including the most marginalised.

To inform a sector engagement strategy, EdTech Hub is undertaking an in-depth landscape review exploring how EdTech is, and potentially can be used to support student learning in Pakistan. This review will inform the MoFEPT's engagement in the technology-facilitated learning space in Pakistan. The landscape review will undertake five stages as set out in Figure 1 (below).

---

[1] The 22.8 million figure, however, is likely to be a significant underestimate and is likely to have risen due to drop-out rates occurring as a consequence of the Covid-19-related school closures. ⇡ASER Pakistan (2021) reports the number of out-of-school children to have increased by 2% from 2019 to 2021.

Figure 1. Desk review within EdTech Hub's approach to the landscape review

Deliverable	Question	Description
Deliverable 1 *Inception report*	**How will we deliver this project?**	By developing a detailed plan for undertaking a technology-facilitated learning landscape analysis based on discussions with stakeholders.
Deliverable 2 *Desk review*	**What is the context of EdTech in Pakistan?**	Through a literature scan and key stakeholder interviews, we will capture key challenges, trends, and features, as well as an initial understanding of key players and EdTech tools in Pakistan.
Deliverable 3 *Mapping and classification*	**What is the current landscape of digital learning tools in Pakistan?**	We will survey EdTech providers and conduct a descriptive mapping of the digital learning tools landscape.
Deliverable 4 *Analysis*	**Where are the gaps and opportunities within the ecosystem?**	An in-depth analysis of technology-facilitated and digital learning solutions, supported by interviews and focus group discussions, will identify opportunities and gaps.
Deliverable 5 *Strategy*	**How can we best engage the ecosystem?**	By creating a strategy/roadmap for engagement in the technology-facilitated learning arena.

1.2. Aims and scope

In this desk review, we set out the key features, challenges, and trends of the technology-facilitated learning context, in addition to highlighting prominent EdTech organisations and tools in Pakistan. Notably, our focus is on EdTech tools used for student learning (whether targeting the student directly or indirectly via teachers or parents) rather than EdTech used in other parts of the education system (for example tools used exclusively for teacher professional development or classroom monitoring). As well as detailing fundamental features of Pakistan's infrastructure, policies and Covid-19 response, we have sought to add unique value in several ways, including:

- Examining the EdTech context and use in each of Pakistan's provinces and regions as well as at the national level

- A focus on how EdTech can be used to promote equity for marginalised groups

- Interviews with six key EdTech stakeholders including government representatives, international development partners, and EdTech entrepreneurs to supplement gaps in the literature and policy documents.

1.3. Methodology

The desk review draws on grey and academic literature alongside a selection of interviews with key stakeholders. The methodology comprised four overlapping stages, as outlined in Figure 2.

Figure 2. *Desk review methodology stages.*

1

Policy documents: national & provincial

2

EdTech evidence: journals, syntheses, reports

3

Survey data: PSLM, MICS etc.

4

Interviews with key EdTech stakeholders

In **Stage 1** we reviewed policy documents. These included education sector plans for Azad Jammu and Kashmir, Balochistan, Gilgit-Baltistan, Khyber Pakhtunkhwa, Punjab, and Sindh as well as national and provincial digital policies and national strategy documents.

In **Stage 2** we scanned EdTech evidence drawn from EdTech Hub, UNICEF, and World Bank sources. This evidence included journal articles and research syntheses as well as academic EdTech evidence from Pakistan.

For **Stage 3** we drew on infrastructure data from national government statistics, UNICEF's regional MICS surveys (2016/17 and 2015/16), ASER 2019[2] and Alif Ailan 2016 data.

In **Stage 4** interviews were conducted with six stakeholders spanning senior positions in government, donors and EdTech organisations to supplement the document review and explore the complex reality of Pakistan's EdTech landscape. The interviews set out to make sense of the digital learning initiatives introduced or implemented during the last 18 months and explore whether these initiatives related to any policy efforts. The interviews also helped to capture some key challenges and discuss the emerging trends.

Interviews were conducted with:

- Hassan Bin Rizwan (SABAQ/Ilm Association)

- Kamran Iftikhar Lone & Babar Khan (Alight, Pakistan)

---

[2] Data from ASER 2019 was used in this report, as ASER (2021) was published after this report was written.

- Abdal Mufti, Shahid Rehman, Dr Farah Nadeem (Project Monitoring and Implementation Unit, School Education Department, Government of Punjab (PMIU))

- Dr Fouzia Khan, Chief Advisor/ Additional Secretary, School Education and Literacy Department, Government of Sindh

- Waqar Naeem (Punjab Information and Technology Board (PITB))

- Talha Zakaria (UNICEF Pakistan)

2. Pakistan's EdTech enabling environment

> **"Just dropping PCs and tablets in a school will not work. For student learning outcomes to improve you need to have an ecosystem."**
>
> **— Waqar Naeem, Punjab Information and Technology Board, 2021**[3]

EdTech interventions require an 'enabling environment' of political support, infrastructure, finance and stakeholders to enable them to work at scale (↑Unwin et al., 2020)[4]. This section examines the EdTech enabling environment in Pakistan. In particular, it examines the political vision for EdTech as expressed through national and provincial education policy documents and the reach of technology infrastructure, while also providing an overview of prominent EdTech organisations.

2.1. EdTech policies

Historically, government EdTech policies in Pakistan have focused on building digital skills for the knowledge economy, rather than on basic education. However, the focus of policymaking is slowly beginning to shift towards using EdTech to support foundational learning, particularly in light of the Covid-19 pandemic.[5] This subsection, which examines both national- and provincial-level policies, finds that while this shift has begun, significant further evolution is still required.

2.1.1. National EdTech policies

Pakistan has a history of featuring EdTech in national ICT and education policies. The key features of these policies are set out below.

The National Information & Communication Technology (NICT, 2004)

This strategy for education urged ministries and education departments to upgrade ICT infrastructure, promote teacher professional development and collect Open Educational Resources (OERs) (↑Ministry of Education, 2010). The NICT strategy recognises the potential for EdTech to improve education in

---

[3] Interview for this report.
[4] A range of EdTech frameworks exists to model the EdTech ecosystem. Of particular relevance may be the Asian Development Bank's framework for South Asia (↑Asian Development Bank, 2017). For a full list of EdTech frameworks see Annex 2 in *A Case for a Systems Approach To EdTech* (↑Bapna et al., 2021).
[5] The implications of whether this has led to a shift in the EdTech private sector, or broader landscape will be explored further in the Landscape Analysis (deliverable 4, forthcoming).

Pakistan, strengthen teacher education and improve learning outcomes. It sets out the following priorities:

- Establish an online educational portal with appropriate content for students.

- Collect and adapt international OERs to local languages, curriculums and cultural norms (such as appropriate dress).

- Maximise opportunities for professional development through different ICT platforms such as interactive radio instruction (IRI), television, open distance learning, and online resources that are context-specific and geographically appropriate.

- Adapt international ICT standards for education.

- Provide distance learning to a large number of individuals by establishing virtual classroom education programmes using online, internet, and / or video facilities.

- Establish a national educational intranet (linked to the internet) to enable sharing of electronic libraries of teaching and research materials among educational institutions and faculty.

- Enhance ICT infrastructure of schools with a focus on schools above Grade 8.[6]

National Education Policy (2009)

This presents a broad vision and strategy for Pakistan's education. Key features related to technology in education include:

- Awareness of the implications of globalisation and the need for technology skills in a changing labour market

- Explicit alignment of the National Education Policy (2009) with the NICT policy (2004)

- Interest (though little detail) in private sector involvement in ICT provision

- Creation of a national University of Technology 'to produce technologists required by industry'

- Establishment of Vocational Colleges of Technology

---

[6] For more information on these policies see *EdTech Country Scan: Pakistan* (↑Baloch & Taddese, 2020)

- Commitment to using ICT to reach children and teachers with "a wide range of abilities […] from varied socio-economic backgrounds" (⇡Ministry of Education, 2009).

National Education Policy Framework (2018)

This policy framework sought to build teacher knowledge, increase content options online, and strengthen education management information systems (EMIS). The framework also stated that the Ministry of Federal Education and Professional Training (MoFEPT) should play a "leading role in harnessing the potential of ICT" (⇡Ministry of Federal Education and Professional Training, 2018). Priorities identified in relation to using technology in education are:

- enhance teacher and student content knowledge;

- improve access to free educational content;

- provide offline content solutions and options in remote areas;

- strengthen education management systems.

Digital Pakistan (2018)

Digital Pakistan sets out the strategy for the Government of Pakistan to become a "strategic enabler for an accelerated digitization ecosystem to expand the knowledge based economy and spur socioeconomic growth." (⇡Ministry of IT & Telecom, 2018) It strongly confirms the view that ICTs are primarily seen for their potential for economic growth in the 21st Century knowledge economy. The value of ICTs is seen as "increased productivity, improved access to health and education, equitable participation in social, political and economic spheres, thus breaking barriers of isolation." (⇡Ministry of IT & Telecom, 2018) Key features regarding education and technology promote:

- Equitable and quality ICT education, and links to the IT industry and digital skills, highlighted in a section on 'ICT Education'

- Use of ICTs in public schools and ensuring they are online

- Use of ICTs in primary and secondary education to build digital skills

- 'Early childhood coding programs'

- An explicit commitment to bridging digital divides that exclude girls, children with disabilities, and those in rural areas from accessing technology

■ A commitment to establish the necessary infrastructure and legislation for EdTech use in education. (⬆Ministry of IT & Telecom, 2018).

Pakistan 2025: One Nation, One Vision

This is a key document setting out the overall vision for Pakistan. The economic imperative is clear: "Our Vision today is to make Pakistan the next Asian Tiger [...] Our ultimate destination is to see Pakistan among the ten largest economies of the world by 2047 — the centennial year of our independence" (⬆Ministry of Planning, Development and Reform. Planning Commission, 2014). Pakistan 2025 also emphasises the value of EdTech within the knowledge economy, in the context of seven key pillars:

1. **'People First**: Developing social and human capital and empowering women

2. **Growth**: Sustained, indigenous, and inclusive growth

3. **Governance**: Democratic governance: institutional reform and modernisation of the public sector

4. **Security**: Energy, water, and food security

5. **Entrepreneurship:** Private Sector and entrepreneurship-led growth

6. **Knowledge Economy**: Developing a competitive knowledge economy through value addition

7. **Connectivity**: Modernising transport infrastructure and regional connectivity (⬆Ministry of Planning, Development and Reform. Planning Commission, 2014).

2.1.2. Analysis

Pakistani policies position technology in education as a tool to create digital skills for the knowledge economy. Even equity is seen through this lens, for example, the role of ICTs to empower women is firstly for their "increased productivity" as well as their education. As a result, the emphasis is on the use of technology to build digital, rather than foundational, skills — the most striking example of which is perhaps "early childhood coding programs" (⬆Ministry of IT & Telecom, 2018). This makes sense when seen in the context of the vision for Pakistan as the next "Asian Tiger" — a reference to the rapid economic success of South Korea, Taiwan, Singapore, and Hong Kong since the 1950s, attributed to their rapid industrialisation and export-oriented economies. However, as Nobel laureate Amartya Sen has argued powerfully, the success of the four "Asian Tigers" was dependent on human capital drawn from their expansion of basic education (⬆Sen, 2001). In other words, the route

to Pakistan's economic success may not just lie in acquiring digital skills, but in using technology and education to build the foundational skills needed to capitalise on digital growth.

2.1.3. Provincial and regional EdTech policies

At the provincial and regional level, there are EdTech components to the education policies and plans of Azad Jammu and Kashmir, Balochistan, Gilgit-Baltistan, Khyber Pakhtunkhwa, Punjab, and Sindh. At the time of writing, there is no education sector plan available for Islamabad Capital Territory.

Table 1 below, sets out the EdTech, hardware and equity priorities set out in the policies. The purpose of the table is to highlight the scope of the content included in the various policies. This is complemented by a narrative overview of each regional / provincial policy, which follows Table 1. Together, this is intended to provide an overview of how EdTech is conceived of across the various jurisdictions in Pakistan. This is followed by a brief analysis of the main trends seen across these various plans.

Table 1. EdTech policy priorities in provincial and regional plans.

	Policy	Responsible department(s)	EdTech Policy Priority Areas	Technology / Hardware components	Equity elements
Azad Jammu and Kashmir	AJK Education Policy (2021–2030)[7] Annual Development Plan (2019/20)[8]	Elementary and Secondary Education Department Information and Technology Board of Azad Jammu and Kashmir	Digital Skills Technology for Literacy Biometric attendance monitoring Multimedia classrooms Computer literacy	Computer labs	SDG4 Gender equality
Balochistan	Education Sector Plan (2020–2025)[9]	Education Department Science and Information Technology Department	Highlights challenges related to EdTech reach Address limited infrastructure Increase access Media / EdTech awareness campaign	Electricity Computers	Out-of-school children Girls
Gilgit-Baltistan	Education Sector Plan (2015–2030)[10]	Education Department Gilgit Baltistan Planning and Development Department	Digital Skills	Internet Computers e-Libraries	Special educational needs and disabilities (SEND) Girls
Khyber Pakhtunkhwa	Education Sector Plan (2018–2023)[11]	Elementary and Secondary Education Department	School accountability telephone hotline for parents	Computer labs	Out-of-school children (OOSC) (primary)

---

[7] ⬆Department of Elementary and Secondary Education, Government of Azad government of the state of Jammu and Kashmir, 2020
[8] ⬆Azad Government of the State of Jammu & Kashmir, 2018
[9] ⬆Government of Balochistan, 2020
[10] ⬆Education Department Gilgit-Baltistan, 2014
[11] ⬆Khyber Pakhtunkhwa Elementary and Secondary Education Department, 2017

		Department of Science and Technology and Information Technology	IT Innovation Scheme (and fund)		
Punjab	Education Sector Plan (2019/20–2023/24)[12] Digital Punjab (2018)[13]	Punjab School Education Department Punjab Information Technology Board	Digital Skills, with STEAM subjects EdTech for teacher professional development	Laptops Tablets Online textbooks	SEND OOSCs Girls
Sindh	School Education Sector Plan and Roadmap (2019–2024)[14]	School Education and Literacy Department Information Science and Technology Department	Digitise resources Enable learners and teachers to use technologies E-assessment Child-friendly content	N/A	OOSCs Girls Rural children

---

[12] ↑Government of the Punjab, 2019
[13] ↑Government of the Punjab, 2018
[14] ↑Government of Sindh. School Education & Literacy Department, 2019

2.1.4. Azad Jammu and Kashmir

Azad Jammu and Kashmir's recent education policy (2021–2030) commits to a range of key areas including "technology education and use of ICT in education". Priority is placed on using technology to build digital skills, rather than for foundational skills. A notable exception is the use of technology to promote literacy (↑Department of Elementary and Secondary Education, Government of the State of Azad Jammu and Kashmir, 2020). In the Annual Development Plan (2019/20) several specific targets are set for elementary and secondary education such as the deployment of biometric attendance monitoring, multimedia classrooms and computer literacy programmes (↑Government of the State of Azad Jammu & Kashmir, 2018).

2.1.5. Balochistan

Balochistan's Education Sector Plan (2020–2025), developed during the Covid-19 pandemic, recognises the limitations of EdTech for the province. Distance learning is noted as being unavailable beyond urban centres, internet access is limited, and a "shift in attitude" is needed for families to encourage the use of TV and radio for education. Based on this, the policy sets out the need for media and engagement with families to spread the message of the value of distance learning (↑Government of Balochistan, 2019).

2.1.6. Gilgit-Baltistan

Gilgit-Baltistan's Education Sector Plan (2015–2030) was written in 2008 and revised in 2014. It commits to computers and internet for all secondary schools by 2030 as well as encouraging the development of digital skills and the provision of e-Libraries (↑Education Department Gilgit-Baltistan, 2014).

2.1.7. Khyber Pakhtunkhwa

Technologies for education do not feature prominently in Khyber Pakhtunkhwa's Education Sector Plan (2018–2023). A specific goal — Objective 13 — seeks to establish a hotline for parents to hold schools to account. The Education Adviser's 'Special Initiatives' include the provision of computer labs

Desk Review of Technology-Facilitated Learning for Children in Pakistan

and IT tools in Khyber Pakhtunkhwa's high schools as well as an IT innovation scheme and accompanying fund (⬆Khyber Pakhtunkhwa Elementary and Secondary Education Department, 2017).

2.1.8. Punjab

The Punjab Education Sector Plan (2019/20–2023/24) emphasises that technology should form part of the curriculum alongside science, technology, engineering, arts, and mathematics (STEAM) as well as to complement teacher professional development (⬆Government of the Punjab, 2019). There is little mention of EdTech for basic education. Punjab's digital strategy — Digital Punjab (2018) — looks to address the digital divide through the wider-ranging distribution of laptops, tablets, and online textbooks (⬆Government of the Punjab, 2018).

2.1.9. Sindh

Sindh's School Education Sector Plan and Roadmap (2019–2024) sets out four EdTech priorities:

1. Digitise teaching and learning resources in public schools

2. Enable students and teachers to use technologies and improve learning outcomes

3. Establish an e-assessment system

4. Make EdTech content child-friendly and target rural children. (⬆Government of Sindh. School Education & Literacy Department, 2019)

2.1.10. Analysis of provincial / regional policies

A comparison of the provincial and regional approaches to technology-facilitated learning in their policies reveals a range of challenges and opportunities for future engagement:

- In all policies, there is an emphasis on the provision of EdTech hardware (e.g., computer labs), rather than measures to improve the quality of

Desk Review of Technology-Facilitated Learning for Children in Pakistan

learning outcomes through EdTech, for instance through teacher professional development.

- The focus on hardware is in contrast to the extensive evidence that technology provision alone does not improve learning outcomes. In Balochistan, for example, a significant barrier to EdTech success is attitude, capacity and people's comfort with technology.

- Apart from Balochistan and Gilgit-Baltistan, there is little consideration of how the limitations of basic infrastructure (in particular connectivity and electricity) will impact how EdTech is deployed.

- As with national policies, policies in Punjab, Azad Jammu and Kashmir and Gilgit-Baltistan emphasise the use of technology for digital skills. There is a conspicuous lack of emphasis on EdTech for foundational learning.

- Across provincial / regional policies there is a recognition of the needs of marginalised groups. However, these measures vary in their scope and depth — for instance, Punjab focuses on widening access to devices, whereas Sindh aims to make content applicable.

Desk Review of Technology-Facilitated Learning for Children in Pakistan

2.2. EdTech infrastructure and hardware

The availability of infrastructure — whether core facilities such as electricity and internet connectivity, or devices such as mobile phones, computers or TVs — is fundamental to EdTech implementation. The Covid-19 pandemic has exposed the wide variety of access to EdTech infrastructure across Pakistan and revealed considerable digital divides. Significant infrastructural barriers prevent children learning through EdTech, with prominent disparities within and between provinces and regions exacerbating existing disadvantages. This subsection highlights these disparities by exploring the availability, or lack thereof, of EdTech-related infrastructure.

2.2.1. What is EdTech infrastructure?

A range of EdTech frameworks[15] broadly agree that core infrastructure required to support EdTech deployment should include:

- Electricity

- Internet connectivity

- Hardware devices

- Maintenance parts and storage units

- Supply chain infrastructure (ie spare parts, replacements)

For instance, the World Bank's SABER-ICT framework suggests that two key infrastructure priorities underpin EdTech systems:

1. "**Ensuring adequate power:** In many developing countries, issues around reliable and affordable access to power loom increasingly large in the minds of policymakers, and ICT / education policies may become more closely aligned with policies around e.g., rural electrification.

2. **Providing sufficient equipment and networking infrastructure**: When it comes to educational technologies, what's 'sufficient' is typically a moving target. As ICT use increases, there is typically more demand for access to ICT devices and for faster and more reliable connectivity. It is often only over time that the importance of technical support and maintenance becomes truly apparent, and that related funding and human resource measures are put into place"(↑Trucano, 2016).

---

[15] For more information see Annex 2 in *A Case for a Systems Approach To EdTech* (↑Bapna et al., 2021).

In addition to infrastructure, the use of EdTech is contingent on access to hardware.[16] Examples of hardware include, but are not limited to:

- Computers

- Tablets

- Smartphones

- Feature phones

- TV

- Radio

2.2.2. National EdTech infrastructure and hardware

Pakistan is slowly ensuring that the infrastructure and hardware required to deploy EdTech solutions are in place, although significant advances are still required. Pakistan's electricity coverage is high (91% of households) but power outages are common(↑Government of Pakistan, 2020). Despite only 33% of households having internet access, up to 48% of households in urban areas can access the internet (↑Government of Pakistan, 2020). In relation to hardware, over 95% of households own mobile phones (according to ↑LIRNE Asia (2018), in 2018 approximately 53% of households had basic phones, 23% feature phones, and 22% smartphones) and TV ownership is relatively high (63%) (↑Government of Pakistan, 2020). By contrast, household ownership of computers is low (12%), radio ownership is low (6%) (↑NIPS/Pakistan & ICF (2019).

These figures hide significant disparities. For example, two-thirds of Pakistanis live in rural areas where access to health, education, and infrastructure drops from 74% in urban areas to 18% in rural areas (↑Pasha, 2018).

Table 2 and Figure 3 below shows national EdTech infrastructure and urban and rural disparities.

---

[16] In line with the scope of this work, EdTech hardware used solely for teachers (e.g., biometric attendance monitoring) or educational management (e.g., EMIS) is not listed.

Table 2. *National EdTech infrastructure, percentage of access by population. Source: Adapted from* ⇡Government of Pakistan, (2020)⇡Government of Pakistan (2021); ⇡NIPS/Pakistan & ICF, (2019); ⇡Tabassum et al. (2020).

	National (average)	**National (urban)**	**National (rural)**
Electricity	91%	98%	87%
Internet	33%	51%	24%
TV ownership	63%	86%	48%
Radio ownership	6%	5%	7%
Mobile phone ownership	45%	55%	39%
Computer ownership	12%	19%	7%

Figure 3. National EdTech infrastructure and hardware ownership. Source: Adapted from ⇡Government of Pakistan, (2020)⇡Government of Pakistan (2021); ⇡NIPS/Pakistan & ICF (2019); ⇡Tabassum et al. (2020)

National EdTech infrastructure (household)
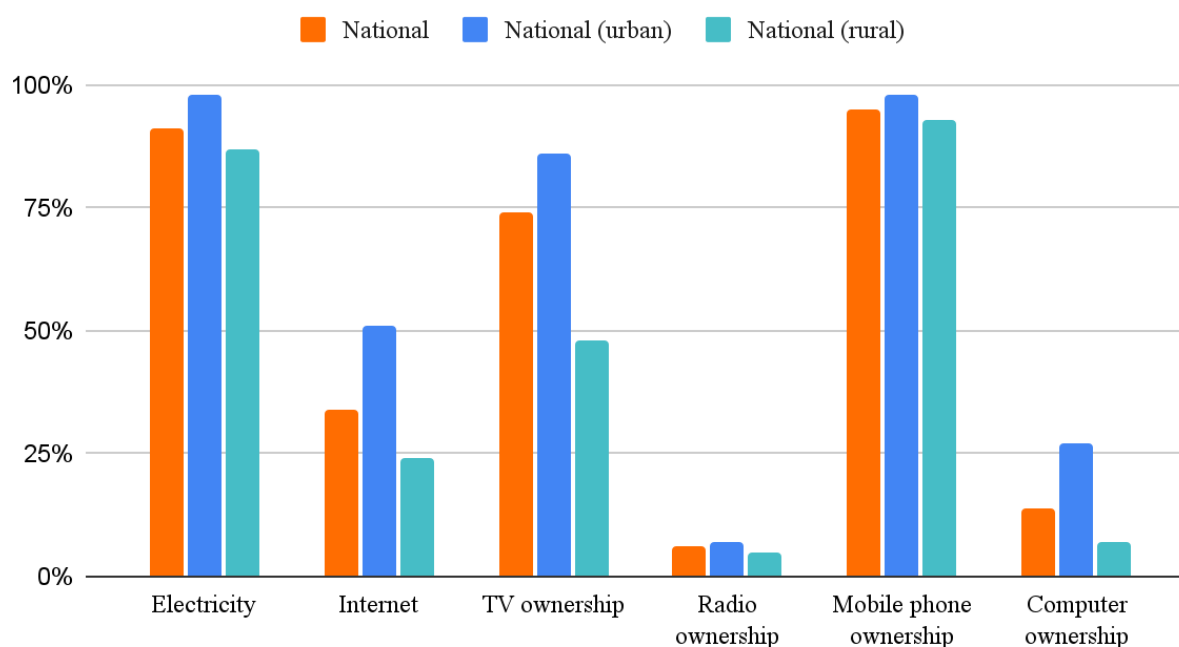
Key takeaways from this snapshot of national EdTech infrastructure include:

- The very low level of radio ownership.

- Generally low levels of internet access, especially in rural areas.

- High levels of mobile phone ownership.

- Wide disparity in TV ownership between urban and rural areas.

- Low levels of computer ownership, especially in rural areas.

2.2.3. Provincial EdTech infrastructure

"You're essentially not catering to the 30% who don't have a television, so that is a lost population."

– Abdal Mufti, Head of Research, PMIU Punjab, 2021

There are significant disparities in infrastructure and hardware reach both between and within provinces and regions. This is particularly apparent in terms of internet access. For instance in Punjab, 34% of the population have internet access, rising to 57% in urban centres and falling to 8% in some rural areas (⇡Government of Pakistan, 2021). Even those with internet access often struggle to have a connection strong enough for effective use of EdTech.[17]

Table 3 and Figure 4 show the extent of access to EdTech infrastructure in six out of seven provinces / regions (no data currently available for Azad Jammu and Kashmir). They provide breakdowns of the extent of access in rural and urban areas and also show the provincial / regional averages.

---

[17] Interview with Shahid Rehman, Programme Monitoring & Implementation Unit (PMIU), Government of Punjab

Table 3. Provincial EdTech infrastructure (urban and rural). Source: Adapted from ↑UNICEF & Government of Khyber Pakhtunkhwa (2018); ↑UNICEF & Government of Sindh (2021); ↑UNICEF & Government of Punjab (2018); ↑Government of Pakistan (2021); (NIPS/Pakistan & ICF (2019); ↑Tabassum et al. (2020).[18]

	Balochistan	Balochistan (urban)	Balochistan (rural)	Gilgit-Baltistan	Gilgit-Baltistan (urban)	Gilgit-Baltistan (rural)	KPK	KPK (urban)	KPK (rural)	Punjab	Punjab (urban)	Punjab (rural)	Sindh	Sindh (urban)	Sindh (rural)
Electricity	75%	95%	67%	98%	99%	97%	94%	99%	93%	95%	99%	92%	83%	96%	69%
Internet	19%	32%	15%	N/A	N/A	N/A	37%	55%	34%	26%	39%	19%	18%	28%	5%
TV ownership	N/A	N/A	N/A	50%	69%	45%	42%	71%	36%	71%	61%	87%	60%	80%	36%
Radio ownership	N/A	N/A	N/A	14%	15%	14%	13%	12%	14%	3%	2%	3%	5%	4%	7%
Mobile phone ownership	92%	95%	90%	92%	98%	90%	96%	99%	96%	96%	98%	94%	90%	95%	83%
Computer ownership	6%	15%	2%	21%	40%	17%	13%	31%	9%	16%	27%	10%	11%	17%	3%

Note: KPK = Khyber Pakhtunkhwa; GB = Gilgit-Baltistan

---

[18] No data currently available for Azad Jammu and Kashmir (DHS Survey data excludes AJK and GB, MICS6 survey for AJK forthcoming)

Figure 4. *Provincial EdTech infrastructure (urban and rural). Source: Adapted from* ⬆UNICEF & Government of Khyber Pakhtunkhwa (2018); ⬆UNICEF & Government of Sindh (2021); ⬆UNICEF & Government of Punjab (2018); ⬆Government of Pakistan, (2021); ⬆NIPS/Pakistan & ICF (2019); ⬆Tabassum et al. (2020).

Provincial / Regional EdTech Infrastructure (household)
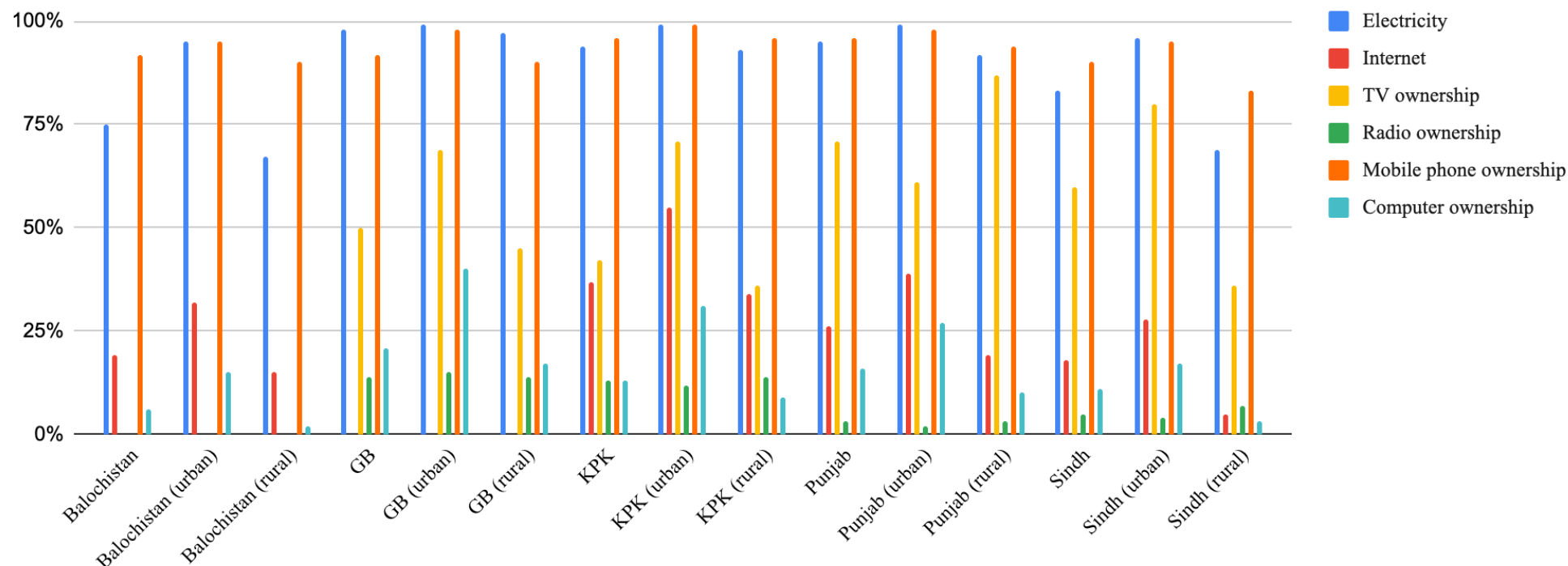
Key takeaways from this snapshot of provincial EdTech infrastructure include:

- Wide disparities in relation to infrastructure (particularly internet) and hardware (TV and computer ownership) both within and between provinces.

- Low levels of electricity coverage in rural Sindh and Balochistan, relative to high coverage in other areas

- Generally low internet access in rural areas, especially Balochistan and Sindh

- High variance in TV access between urban and rural areas within provinces

- High mobile phone access across provinces / regions and urban / rural areas

- Low levels of computer ownership, especially in rural areas.

The remainder of this subsection explores some of these findings in more detail, particularly as they relate to access to EdTech by the most disadvantaged.

2.2.4. EdTech infrastructure by gender and income

The Covid-19 pandemic has exposed perhaps the greatest challenge for EdTech implementation: the widening of digital divides between those that can and cannot use technology to learn (↑Save Our Future, 2020). Using technology to support learning can push already marginalised children further behind. This is primarily due to *access* issues (they or their families may not have the infrastructure, devices, skills, or finances to afford the technology that other children can) or *quality* issues (the content, design, or skills of those helping them to use technology may be unsuitable for their needs)(↑UNCTAD, 2021).

In Pakistan, particularly prominent disparities that may limit access to the EdTech infrastructure include inequalities in locality (for example, rural / urban settings, as already discussed above), gender, and income. Figures 5 and 6, below, highlight how gender and income affect access to EdTech infrastructure in Pakistan.
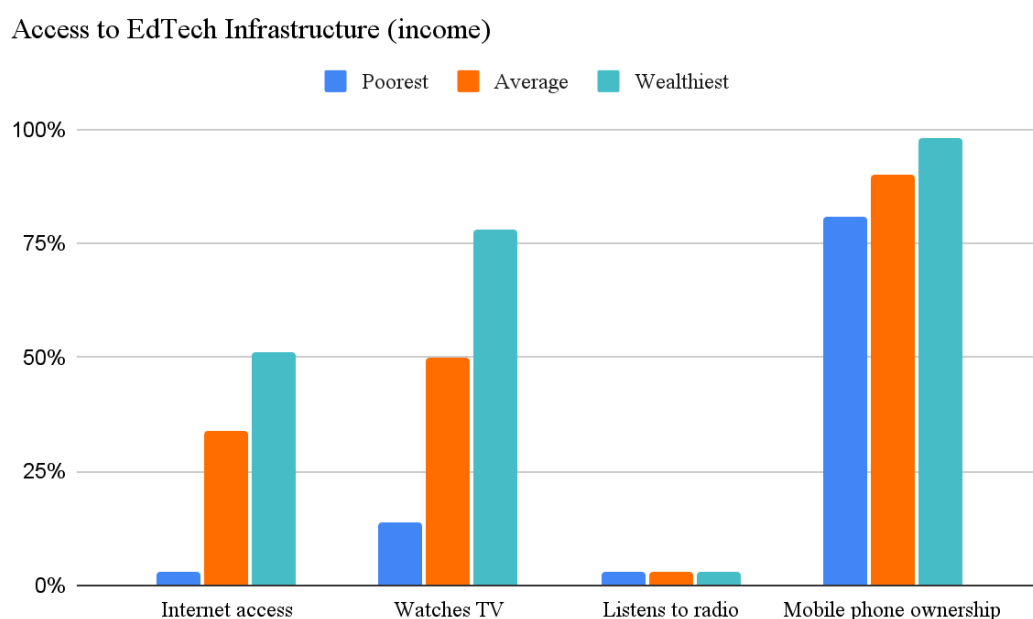
Figure 5. *Access to EdTech infrastructure (gender). Source: Adapted from* ⬆Government of Pakistan (2021); ⬆NIPS/Pakistan & ICF (2019); ⬆Tabassum et al. (2020).

Access to EdTech infrastructure (gender)
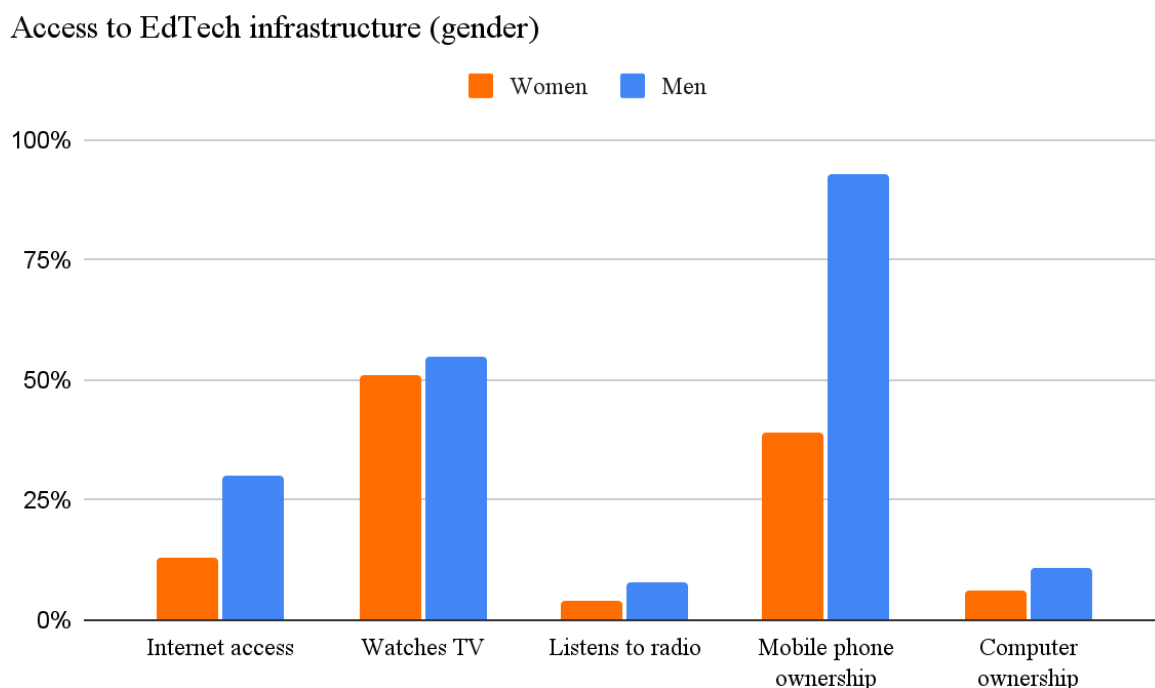
■ Women ■ Men

Key takeaways from this snapshot of gendered access to EdTech infrastructure and hardware include:

- A substantial difference in mobile phone ownership, with men more than twice as likely to own mobile phones than women (for a detailed exploration of the 'Mobile Gender Gap' in Pakistan see ⬆GSMA, 2021).

- A significant difference in internet access between men and women.

- Relatively similar exposure to broadcast media (TV and radio).

- A smaller but significant difference in computer ownership.

Figure 6. *Access to EdTech infrastructure (income). Source: Adapted from* ↑Government of Pakistan, 2021, ↑NIPS/Pakistan & ICF, 2019, ↑Tabassum et al., 2020.[19]

Access to EdTech Infrastructure (income)

Key takeaways from this snapshot of income-related access to EdTech infrastructure include:

■ Relatively high access to mobile phones across incomes (this average does not reflect wide variance by gender.)

■ A significant difference in internet access and exposure to television by income.

■ Low radio usage across all income groups.

2.2.5. Compounded disadvantage

Compounded disadvantage refers to the way inequalities combine, such as income and gender (↑Lyons & Pettit, 2011). For instance, many women in rural areas also have lower incomes - gender and poverty combine to reinforce their exclusion. This 'compounded disadvantage' means that although on average mobile phone access may seem high across income groups when gender is added to income, significant inequalities are exposed. Across Pakistan, gender and income combine to prevent poorer women from owning EdTech devices, especially mobile phones (for a detailed exploration of the 'Mobile Gender Gap' in Pakistan see ↑GSMA, 2021).

---

[19] 'Poorest' = lowest income quintile, 'Wealthiest' = highest income quintile.

As an example, Figure 7 shows the damage of the combined impact of gender and income disadvantage in Sindh. While male mobile phone ownership is consistently high across income and locality, poor women in rural areas are highly unlikely to own their own mobile phones.

Figure 7. *Compounded disadvantage: Mobile phone ownership in Sindh. Source: adapted from Sindh MICS Survey Data 2019/20* (⇡UNICEF & Government of Sindh, 2021)

Sindh: Mobile Phone Ownership (%)
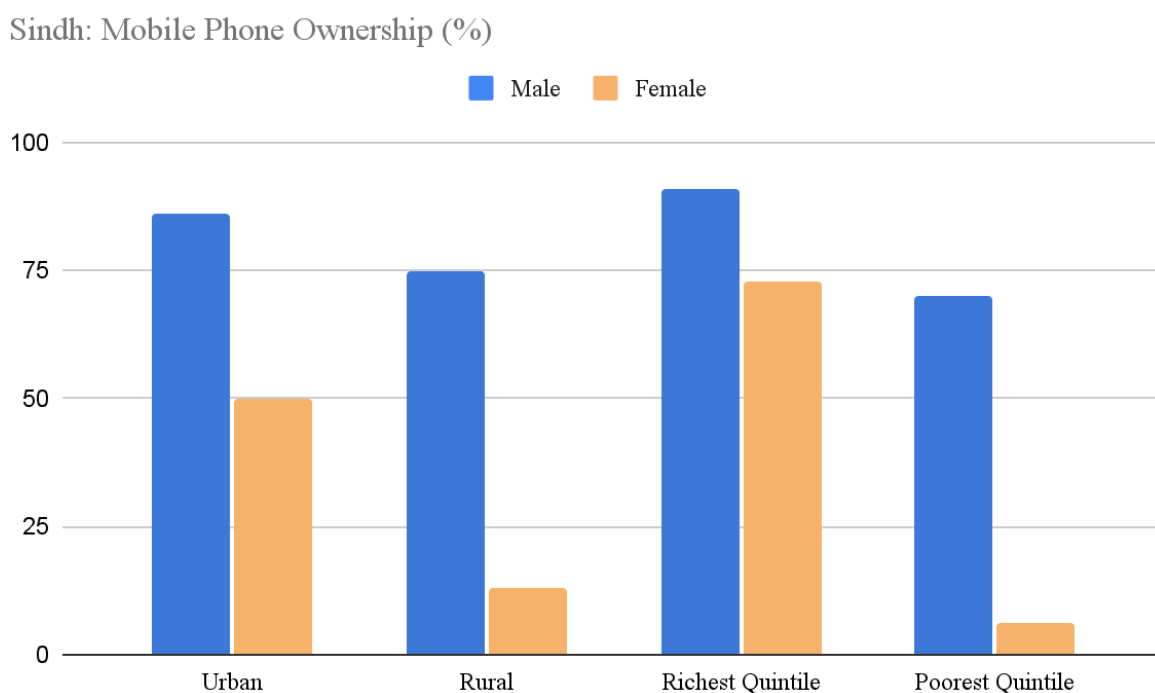
Despite this emphasis on EdTech access, however, it is crucial to note that inequality also extends to marginalised groups' capacity to use EdTech, and whether they are trained, comfortable or competent once they have access to technologies. As ⇡Zubairi et al. (2021b) make clear these aspects mean that inequalities are not solved simply by enabling access to EdTech.

2.2.6. School infrastructure and hardware

These disparities in access are mirrored in school EdTech infrastructure and hardware, which replicate the general infrastructure and hardware needs outlined above, although provision of EdTech also depends on government spending and differs between government and private schools. Overall, 62% of primary schools, 79% of middle schools, 91% of high schools, and 97% of higher secondary schools have electricity (⇡Baloch & Taddese, 2020).[20] Computer labs

---

[20] Recent data on electricity across schools is limited. These figures have been gathered from the ⇡Government of Pakistan et al. (2018).

are common (59% in urban areas, 41% in rural schools) reflecting national and provincial government priorities[21] (↑ASER, 2019). However, these rates vary substantially across provinces. Taking the example of the proportion of computer labs in rural government schools, Figure 8 demonstrates that school technology provision varies widely by province / region.

Figure 8. *Regional variety: provision of computer labs in rural government schools.*

Average proportion of computer labs in rural government schools (%)
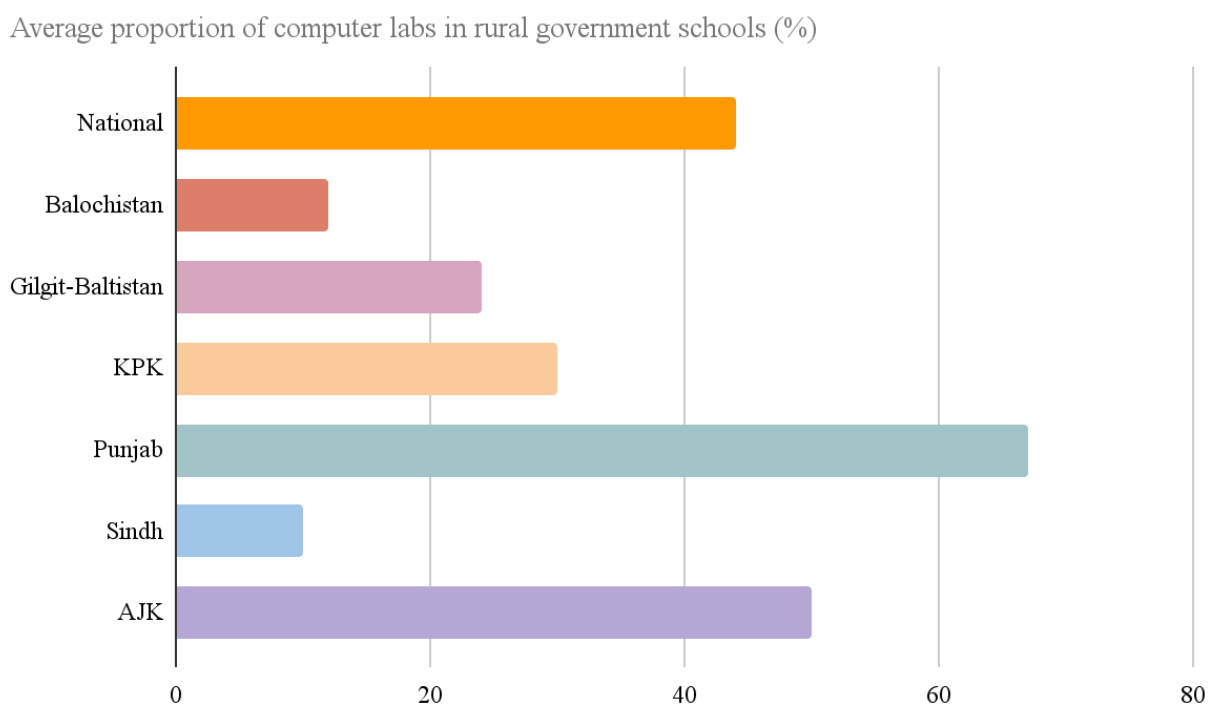
Much remains to be done to improve not only the EdTech infrastructure, but also the basic infrastructure of many schools; electricity, running water, and boundary walls remain urgent unfulfilled needs in many schools.[22] As Adnan Junaid, International Rescue Committee (IRC) Director for Pakistan, remarked, "most of Balochistan does not even have electricity — forget about internet, mobile phone usage and tablets" (↑International Development Committee, House of Commons, 2021). For the most part, the impact of even the most basic EdTech initiative is likely to be constrained if schools and / or families do not have access to electricity and at least a basic device. Likewise, more sophisticated programmes (e.g., digital personalised learning or the use of learning management systems) usually require high-tech hardware, as well as internet access.

---

[21] See Annex 1 for more detailed data on national urban and rural school infrastructure, as well as a breakdown of school infrastructure by province, presenting ASER 2019 data.
[22] For a breakdown of school infrastructure scores for district-level primary schools and middle schools based on the quality of school building, electricity, boundary wall, and toilet facilities see pp. 30–37 of ↑Alif Ailaan & SDPI, 2015.

These disparities in infrastructure, and the deeper inequalities they represent, were exposed by the Covid-19 pandemic.

2.3. Key non-governmental EdTech actors

The EdTech context has evolved significantly over the last 10 years, with many new organisations entering the EdTech space. This was compounded by the Covid-19 pandemic, as both private sector providers and non-governmental and civil society organisations (NGOs and CSOs) and development partners moved quickly to become active in this space. This section provides an overview of the key EdTech organisations operating within Pakistan's technology-facilitated learning landscape.

From 2010, increasing access to both ICT infrastructure and hardware, as well as donor emphasis on the learning crisis, led to a rise in the number of EdTech organisations operating within Pakistan (⇧Osama et al., 2015). Organisations such as the Sabaq Foundation (based on the Khan Academy model), ToffeeTV, TeleTaleem, Taleemabad and Knowledge Platform have focused on a model of local content creation (featuring prominently in the national Teleschool initiative in response to Covid-19). Several EdTech organisations focus on meeting the needs of particular marginalised groups such as Aahung (girls, slum children), Wondertree (children with SEND), Sabaq Lite (rural children) and the Deaf Reach Programme run by Family Education Services Foundation (⇧Baloch & Taddese, 2020). Several EdTech initiatives are donor-led such as USAID's Pakistan Reading Project and UNICEF and the Government of Balochistan's 'Mera Ghar Mera School' initiative.

A rapid analysis of 12 key Edtech organisations (see Table 6, below) identified by EdTech Hub was undertaken to identify high-level themes that indicate some of the existing coverage of EdTech organisations.[23]

- 10 organisations target primary-grade children, seven target middle-grade children and six target senior-grade children. Two initiatives specifically target learners with SEND while four include teacher and parent components.

- Seven of the organisations provide internet-based services only, two provide mobile-specific services while six offer blended 'multimodal' options combining low- and high-tech solutions.

---

[23] Note that a full analysis of these is beyond the scope of this paper. Further analysis will be undertaken in a subsequent paper aimed at gaining further insight into EdTech organisations.

Table 6. *Private EdTech organisations: target groups, technology used, and learning aims.*[24]

Organisation	Target Group	Technology	Learning aim
Aahung Pakistan	Adolescent girls	AR (augmented reality) Video	Life-skills / sexual health
KarMuqabla	Grades 1–10	Digitised textbooks, gamified content	All curriculum subjects
Knowledge Platform	K–12	Blended learning	All curriculum subjects
Sabaq Foundation	Grades 6–12	Raspberry Pi + SD Card, a Wi-Fi Router	All curriculum subjects
SABAQ & MUSE	Grades 1–5	Sabaq Tab, Muse App	Urdu, maths, science & Sindhi
Taleemabad	Grades 1–8, parents, school owners, teachers	Digital content / App	English, maths, Urdu, science
TeleTaleem	Grades K–12	Multimodal	Literacy, maths, assessment
TeleSchool	Grades 1–12	TV	Maths, science, English, Urdu
TEXT Private Ltd	Teachers, parents, school management	Mobile Phone	Content delivery by SMS. Accountability / Management
Toffeetv	Grades 1-8	Youtube / Animated Videos	Urdu
Wondertree	Children with SEND, parents, teachers	Interactive VR Games	Cognitive and motor skills; therapy

---

[24] For more information on these organisations see *EdTech Country Scan: Pakistan* (↑Baloch & Taddese, 2020)

2.3.1. International and national development partners

International NGOs have a long history of supporting education in Pakistan (⇡Osama et al., 2015). In EdTech, prominent donors have included USAID, the UK Government's Department for International Development (DFID - now the Foreign, Commonwealth and Development Office (FCDO)), the World Bank and the German development agency GIZ. National NGOs involved in the EdTech space include the Aga Khan Foundation - Pakistan, the Citizens Foundation, the READ Foundation, Idara-e-Taleem-o-Aagahi (ITA), and Development in Literacy (⇡Baloch & Taddese, 2020). Table 7 below sets out the key EdTech priorities of these organisations, which have been selected as they cater to a sizeable primary grades enrolment and have countrywide outreach.

Table 7. Overview of International and national development partners engaging in the EdTech space.

Development Partner	EdTech priority area
Development in Literacy, Pakistan	E-libraries Teaching training in technology (Mobile Taleem) Student Assessment
ITA	Monitoring of data, achievement and learning outcome of students Life Skills (Siyani Sahelian) for adolescent girls Second Chance Programme for dropout girls EdTech within annual report on assessment, Annual Status of Education Report (ASER)
READ Foundation	Teacher professional development Digital teaching and learning content (supported by low tech) Student assessment
Citizens Foundation	Teacher professional development E-assessment

Alight Pakistan	Digital teaching and learning content for out-of-school children (supported by low tech) Radio programme
UNICEF	Microsoft Learning Passport Technical assistance to support EdTech strategy Mapping of connectivity via Giga initiative Mera Ghar Mera School — with Government. Of Balochistan
USAID	Digitised reading materials for Grades one and two in Urdu, Sindhi, Pashto, Balochi and Brahui. Supplementary reading materials including big books, levelled readers, workbooks, syllabi, charts, teaching reading tips, phonics. FM radio programmes promoting early grade reading and parental support to promote a reading culture. Tablets to early grade teachers, mentors, and assessment experts
DFID (now FCDO)	Ilm IDEA2, which awards grants to local, social EdTech entrepreneurs for developing customised EdTech products / solutions for the education sector in Pakistan.
World Bank	Covid-19 response: 'Pandemic Response Effectiveness in Pakistan (PREP)' provides funding for TeleSchool 'Response, Recovery, and Resilience in Education Project (RRREP)' focused on: ▪ Expanding national distance learning content with added emphasis on developing and disseminating content for primary grades through radio, social media, and mobile phones. ▪ Providing tablets and connectivity devices in districts across the country which are lagging behind. 'Third Punjab Education Sector Project (PESP III)' provides funding for Taleem Ghar.

2.3.2. Conclusions

Several key themes emerge from this overview of the EdTech enabling environment in Pakistan:

- **The level of access to all key infrastructure and hardware varies considerably between regions and provinces and within them**. This is further impacted by significant digital divides that mirror existing inequalities, such as gender inequality.

- **Poverty, gender, and rural localities are major causes of EdTech inequality.**

- **Inequality in access to EdTech infrastructure is often caused by compounding disadvantages, such as gender and poverty**. To ensure that EdTech does not amplify existing divides, implementers must be aware of compounded disadvantages. In particular, the intersection of gender, income, and rural disadvantage combine to limit access to EdTech infrastructure, especially mobile phones.

- **EdTech is historically positioned as developing digital skills for a modern knowledge economy, rather than education facilitated through technology**. As Section 4 will show this emphasis may have shifted during the Covid-19 pandemic as governments prioritise using EdTech for learning continuity. Given the lack of foundational skills at the root of the learning crisis in Pakistan, a fundamental question for the EdTech ecosystem is: can EdTech truly help tackle Pakistan's deep rooted educational challenges?

- **There is a prominent policy emphasis on ensuring schools are equipped with high-tech devices** such as computer labs and tablets, although there is little reference to more accessible technologies such as TV or mobile phones. Notably, there is a lack of emphasis on the accompanying supportive structures and capacity-building among the people who will make EdTech work: teachers, parents and communities.

- **The focus on equity has increased in recent years,** perhaps reflecting advocacy pressure to tackle the learning crisis. However, responses emphasise the fairer distribution of EdTech devices rather than tackling systemic causes of digital divides such as a lack of infrastructure or socio-cultural attitudes.

3. EdTech in practice: Covid-19, equity and impact on learning

3.1. Education and Covid-19 in Pakistan

The Covid-19 pandemic has negatively affected children's education around the world (⬆Save Our Future, 2020). School closures have led to a rapid search for EdTech solutions to keep children learning while exposing significant inequalities in access to technologies (⬆Haßler et al., 2020). The result has been that EdTech has been a major part of education responses to Covid-19. However, the pandemic has exposed challenges in implementation including digital skills, strategy, and reaching the most marginalised.

This section will summarise the impact of Covid-19 on education in Pakistan, examine government responses and consider the challenges and trends that may affect EdTech use in Pakistan in the future.

3.1.1. The impact of Covid-19 on education in Pakistan

In Pakistan, more than 46 million children were immediately affected by school lockdowns, with marginalised groups facing particular disadvantages. As of July 2021, Pakistan's schools had been closed for 51 weeks (⬆UNESCO, 2021). One estimate suggests that nearly a million Pakistani children will not return to school and those who do return will have lost 80% of their year of learning (⬆Geven & Hasan, 2020). While the long-term impact of learning loss remains to be seen the impact of school closures following the 2005 earthquake are instructive: despite only four months of school closures children's earnings were 15–18% lower than they should have been for the rest of their lives (⬆Andrabi et al., 2020).

3.1.2. Government EdTech responses to school closures

Pakistan was one of the first countries in the world to shut its schools, starting in Sindh on 27 February 2020. Most provinces followed by mid-March 2020, leading to more than 46 million young people from pre-primary to university level being forced to pause their education.

At the national level, the government responded quickly, launching 'Teleschool' in April 2020 — a 'multimodal' approach to keep children learning that combined TV, radio, and SMS delivered educational content (⬆Tabassum et al., 2020). Teleschool sought to gather content from a range of leading

EdTech providers,[25] broadcasting classes from 8 am to 6 pm daily. By May 2020 the MoFEPT had released its National Education Response and Resilience Plan for Covid-19, emphasising that "continuity of learning" was a key priority (↑Ministry of Federal Education and Professional Training, 2020).

Figure 9. *Timeline of Pakistan's education response to Covid-19 (2020–2021). (Source: author's own).*
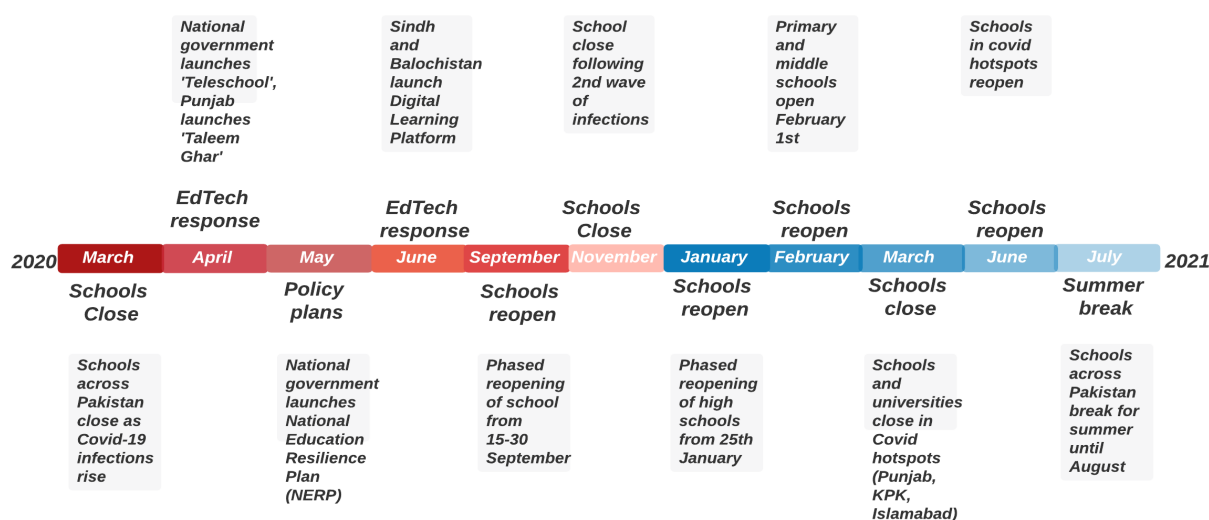
Provincial governments similarly deployed EdTech in distance learning responses. For example, the Government of Punjab launched 'Taleem Ghar' (Education at Home) in April 2020; cable TV and app-based lessons for grades 1–10. In Sindh, the government launched the Digital Learning Platform in May 2020 — a joint initiative between the School Education and Literacy Department (SELD), UNICEF, and Sabaq Muse — involving web-based lessons as well as the Muse/SELD Learning app. In Balochistan, UNICEF supported the government to build on an existing programme — '*Mera Ghar Mera School*' (My home, my school) — that used Whatsapp to deliver maths, English and science video lessons, reaching up to 55,333 children by July 2020. In Gilgit-Baltistan the 'Muallim' programme aimed to use radio channels, aired twice a day, to reach Grades 1–3 with English, Urdu, maths and science lessons (↑Tabassum et al., 2020).

3.1.3. Conclusions

Taken together, these findings highlight a number of challenges for the use of EdTech in the technology-facilitated learning landscape in Pakistan, including:

- **There is a potential mismatch between government EdTech**

---

[25] Muse App, SABAQ, Idara-E-Taleem-O-Aagahi (ITA), Sabaq.pk, Taleemabad, and Knowledge Platform

provision of content and children's access to EdTech devices. As ↑Tabassum et al. (2020) note, during the Covid-19 pandemic, both Punjab and Sindh prioritised online and app-based solutions of cable TV — neither of which are easily available in rural areas. As seen in Section 2.2. on infrastructure (see also Annexe 1 and Annex 2) wide disparities exist in access to EdTech infrastructure making marginalised children hard to reach with high-tech solutions, particularly computer- or internet-based solutions.

- **There is a need to update policies and plans for EdTech in light of Covid-19**, and to provide new strategies for the use of EdTech in basic education. As shown in Section 2 above, policies have traditionally focused on digital skills for the knowledge economy, but the Covid-19 pandemic has meant a greatly expanded role of education technology throughout education. Policies need updating in light of this more substantial role.

- **The Covid-19 pandemic has accelerated the growth of EdTech organisations in Pakistan.** However, the technology, access, and infrastructure requirements of some EdTech solutions put them out of reach of more marginalised populations due to the lack of existing infrastructure and hardware.

- Overall there is a need for a **comprehensive EdTech government strategy**, including a monitoring and evaluation process, to guide the EdTech ecosystem to ensure that efforts of various public, private, and NGO / CSO partners are being aligned towards appropriate solutions.

- **Children need adult supervision — a teaching presence — to support learning through EdTech**, yet parents are challenged and frustrated by the use of technology to support home learning.[26]

- **Beyond access to technologies, there are significant challenges with EdTech implementation**, including the need for digital skills, teacher training and a clear government strategy.

3.2. Ensuring EdTech supports student equity

In Pakistan, the Covid-19 pandemic has highlighted the many challenges involved in reaching the most marginalised through EdTech. There are significant equity challenges that mean that the ways in which the most marginalised children are reached with EdTech in Pakistan must be explicitly

---

[26] Interview Hassan Bin Rizwan (Sabaq / Ilm Association).

considered to ensure they are not further disadvantaged. This section highlights the challenges and potential solutions in reaching marginalised groups with Edtech in Pakistan, in particular girls, children with disabilities, children in hard-to-reach locations, and out-of-school children.

3.2.1. Girls: EdTech challenges and solutions

Around the world, many barriers can prevent girls from learning through technology (⬆Naylor & Gorgen, 2020). Inside the home, girls' access to devices might be limited by family 'gatekeepers' and they are often required to do household chores. Outside the home concerns for their safety limit girls' access to community EdTech facilities (⬆Allier-Gagneur & Coflan, 2020).

In Pakistan, these challenges reflect a wider pattern of gender inequality. As ⬆Martínez (2018) notes, girls face barriers both within the education system (such as low investment and poor enforcement of compulsory education laws) and beyond the classroom (such as poverty or attacks on schools). These barriers translate into a significant disparity in girls' access to education in Pakistan — overall, 15% more boys are enrolled in school than girls (⬆Zubairi et al., 2021a). These gender norms limited girls' ability to learn through technology during Covid-19(⬆Malala Fund, 2020).

A growing evidence base suggests a range of solutions to increase girls' access to education through EdTech. These include the following:

3.2.1.1 Increasing parental awareness of the benefits of girls' access to technology

For example, ⬆Naylor & Gorgen (2020) argue that,

> *"technological platforms can be an effective way to launch back-to-school campaigns for girls. Radio and TV campaigns can ensure they have a broad reach, reaching a wide audience, including girls who do not have access to the internet. Such campaigns also included household, community and policy meetings and, in the case of Somalia, were combined with targeted messaging for hard-to-reach groups, such as teenage mothers and nomadic populations."*

(For more information see UNICEF's Back-to-school guide (⬆Asselin, 2011).

3.2.1.2 Using technologies that girls can access

For example, UNESCO's mobile literacy programme, aimed at young women aged 15–30, established a two-stage programme to reach 1,500 learners. Stage one — a two-month basic literacy course — taught literacy with the aid of

instructional DVDs. Stage two provided learners with mobile phones that sent 600 messages over the course of four months, testing participants' literacy skills. Of the 250 girls who completed the five-month pilot phase, more than 150 had achieved two grades higher in literacy (↑Hanemann & Scarpino, 2016).

3.2.1.3 Increasing girls' access to both physical and online safe spaces to learn

For example, ↑Naylor & Gorgen, 2020 note that,

> *"For girls with access to mobile technology in their homes, this can be facilitated through social media platforms and creating virtual safe spaces for girls during lockdowns. However, in many contexts, marginalised girls will still need to meet physically with other girls and facilitators / teachers for these interactions to take place."*

3.2.1.4 Scheduling broadcasts to accommodate girls' workload and needs

In Mali, UNICEF and EDuco are providing over 1,500 households in the Segou region with solar-power radios and working closely with the school management committee to enable these resources to be used as an after-school resource to meet girls' scheduling needs. (See Educo / UNICEF radio project(↑UNICEF, 2021) in Mali) (↑Allier-Gagneur & Coflan, 2020)

3.2.1.5 Taking a gendered approach to content development

For example Pikin to Pikin Tok (↑Institute for Development, 2016) in Sierra Leone; ↑Allier-Gagneur & Coflan (2020). ↑Naylor & Gorgen, 2020 argue that,

> *"As new distance educational content and resources are generated for both the internet and mass media, funders and producers need to consider how to ensure that females, as well as other disadvantaged groups, are well represented among the generators and presenters of educational content."*

Historically, several projects have used EdTech to reach girls in Pakistan. For example, the Commonwealth of Learning's GIRLS Inspire programme and UNESCO's mobile literacy programme. ↑Zubairi et al., 2021a note that,

> *"The Commonwealth of Learning's Reaching the Unreached programme (GIRLS Inspire) aimed to provide education and employability training to over 5,673 girls who are out of school in Pakistan (↑Commonwealth of Learning, 2017). By training local NGOs in*

the use of technologies for open and distance learning, the project established mobile vocational training centres equipped with DVD and YouTube tutorials and Aptus, an offline mobile learning device. These mobile centres were able to travel across the country to increase access to hard-to-reach girls. At the end of the programme, 74 girls had applied to be considered for full-time work, with 24 being successful. A further 10 girls obtained micro-loans and 84 girls took up internships." (⬆Ferreira, 2017)

An example of an organisation currently working in this area is *Aahung* — a Karachi-based NGO focusing on promoting sexual health and rights for hard-to-reach girls.

3.2.2. Children with disabilities: EdTech challenges and solutions

Around the world, more than a billion people with disabilities require assistive devices, yet only 10% have access to them (⬆Lynch et al., 2021). In low-income countries, for example, less than 3% of people can access the hearing devices they need. In Pakistan, as many as 11% of children may have some form of disability (⬆Rose et al., 2018). For these children, technology can play a significant role in allowing them to access teaching and learning materials to enable them to participate more fully in education (⬆Rose et al., 2018). EdTech can also help learners to develop more varied skill sets, such as improving communication or problem-solving as well as combating exclusion.[27]

Solutions at the policy level[28] include the Government of Pakistan's 'ICT Rights for Persons with Disabilities Act, 2020', which aims to address the rights and learning needs of learners with SEND. This act pledges to ensure that schools are made inclusive by adopting enabling technology and properly equipping special educational institutions (⬆National Assembly of Pakistan, 2020).

An example of organisations using EdTech to assist learners with SEND include:

- *Wondertree* — an organisation providing affordable augmented reality

---

[27] For comprehensive details of 'Description, costs, availability, and examples of accessible and assistive technologies to support children with SEND in low- and middle-income countries' see pp. 16–21 in (⬆Coflan & Kaye, 2020).

[28] See Annex 4 for details of policy recommendations emerging from key messages for policymakers from a recent (2021) systematic review of the literature by ⬆Lynch et al., 2021 on the ways that using educational technology (EdTech) can support better learning outcomes for primary school children with disabilities in low- and middle-income countries (LMICs).

(AR) games to improve motor and cognitive skills for children with special needs.

- *Family Educational Service Foundation* — this organisation aims to improve the quality of education for deaf learners in Pakistan, for example through their Deaf Reach programme and facilitation of digital learning resources in Pakistan Sign Language (PSL).

3.2.3. Hard-to-reach children: EdTech challenges and solutions

The Covid-19 pandemic has illustrated the challenge of reaching children in rural areas through EdTech. Global estimates suggest that of the 580 million students unable to be reached by remote learning, 75% live in rural areas (⬆Dreesen et al., 2020). In Pakistan, more than two-thirds of the population live in rural areas, with significantly lower access to basic services such as health, electricity, and education. Within urban centres, those in slum areas are similarly disadvantaged; schools in urban slums are poorly designed and under-resourced in both teachers and facilities (⬆Pasha, 2018).

The Covid-19 pandemic saw a range of approaches to keep hard-to-reach children learning, such as using broadcasting (Punjab, Gilgit-Baltistan) or mobile devices (Balochistan). During the pandemic, EdTech Hub made a series of recommendations for EdTech solutions for hard-to-reach learners in Pakistan, including:[29]

- Consider low- or no-tech solutions, including printed materials and TV.

- Given the high prevalence of mobile devices, including in rural and slum areas of Pakistan, low- and no-tech solutions can be used to deliver content and support through phone calls, SMS and WhatsApp.

- Ensure Covid-19 response plans focus on those most in need.

- Adapt content to the context, including the language, culture, and competencies of target groups (⬆Baloch et al., 2020).

Examples of EdTech organisations working in this area include:

- *Sabaq Foundation* whose 'Sabaq Lite' project provides content offline via a battery-powered computer.

- *TEXT Private Ltd.* offering low-cost content via basic mobile phones.

---

[29] The recommendations from *Pakistan Topic Brief: Providing Distance Learning to Hard-to-reach Children* (⬆Baloch et al., 2020) are provided in full in Annex 5.

■ *TeleTaleem* whose hardware includes a mobile van with satellite internet.

3.2.4. Out-of-school children: EdTech challenges and solutions

Before the Covid-19 pandemic, Pakistan had the second-highest number of out-of-school children in the world — 22.8 million (↑UNICEF, 2021).[30] Of these, an estimated 17.5 million had never been to school and 5.3 million had been in school and dropped out (↑Zubairi et al., 2021a). Nearly one million children in Pakistan may permanently drop out of school after the Covid-19 pandemic (↑Geven & Hasan, 2020).

While the Covid-19 pandemic effectively meant all children in Pakistan were 'out of school' it is important to distinguish between those at home due to school closures because of Covid-19, and those *permanently* out of school and in a complex web of circumstances that has meant schooling was never an option. Before the pandemic, UNICEF reported that children were kept out of school by both demand-side factors (including gender biases, income poverty, child labour, and socio-cultural attitudes) as well as supply-side factors (including a lack of schools, infrastructure and facilities, teachers and governance issues) (↑UNICEF, 2013). While the Covid-19 pandemic has required the innovative use of a range of low- or no-tech distance learning options, increased access by itself will not bring these children back to school.

In addition to the gender, SEND and hard-to-reach responses above, EdTech responses to school closures have highlighted a range of key lessons to reach the most marginalised that can inform future approaches for children permanently out of school. These include:

■ Marginalised learners require extra support from teachers, parents, and the wider community

■ A 'whole-of-society' approach is needed to address the deep causes of marginalisation through technology

An example of an organisation working in this area is Alight, Pakistan — providing the radio-based education programme 'Muallim' to out-of-school children between the ages of 6 and 16.

---

[30] The 22.8 million figure, however, is likely to be a significant under-estimate and is likely to have risen due to drop-out rates occurring as a consequence of the Covid-19 related school closures. ↑ASER Pakistan (2021) reports the number of out-of-school children to have increased by 2% from 2019 to 2021.

3.3. Using EdTech evidence to improve learning

Historically, there has been a lack of evidence for how EdTech can improve learning outcomes (↑Haßler et al., 2020). Nevertheless, a growing evidence base suggests a range of key components can help EdTech interventions to improve learning outcomes, in particular:

1	**2**	**3**	**4**	**5**
Focus on learning rather than the technology	**People matter:** technology use needs teachers & parents	**Technology is not a silver bullet.** It works best with other interventions	**Support the most marginalised.** Technology can reduce or widen gaps.	EdTech needs **infrastructure, finance and political will** to support it.

Source: ↑Haßler et al., 2020, ↑Unwin et al., 2020, ↑EdTech Hub, 2021

In Pakistan, there are significant gaps in evidence of 'what works' in EdTech. Evidence tends to be low quality, focused on higher-income students in urban areas and often Punjab-centric (↑Zubairi et al., 2021a). In addition, before the Covid-19 pandemic, much evidence focused on individual small-scale projects, particularly by international donors, rather than national interventions at scale.

The Covid-19 pandemic saw the massive expansion of EdTech provision. However, there has been limited evaluation of the impact of these Covid-19 EdTech responses on children's learning outcomes. Small-scale surveys suggest that the impact has varied widely, and have highlighted a stark digital divide (↑Zahra-Malik, 2020). A Malala Fund survey of over 3,000 students and families found that less than 1% were using Edtech for distance learning (↑Malala Fund, 2020). A British Council survey of 600 participants found that 70% thought that Pakistan was not yet ready to move to remote learning. A survey of Teleschool users in low-cost private schools found that although 60% had a TV at home, only 22% watched Teleschool, and these tended to be from more affluent households (↑Akmal et al., 2020).

Evidence suggests implementation challenges have impacted EdTech approaches to improve learning outcomes. This has likely been compounded by the lack of policy guidance, and the need for government and providers to respond so rapidly. For example, some EdTech providers note that, despite agreeing to provide their content for Teleschool for several months, for free, they have yet to be paid for content used throughout the year.[31] Notably, from

---

[31] Interview HB Rizwan / Sabaq.

a donor perspective, Teleschool lacks the monitoring and evaluation required to demonstrate impact.[32] A lack of digital skills among key stakeholders such as teachers and parents has also had an impact. For example, findings from UNICEF's survey on learning continuity (n = 8553) reached four key conclusions:

1. Access to technology may not translate into its use for learning.

2. Gaps in student–teacher communication and relationships need to be addressed.

3. A better understanding is required of how teachers can be more engaged in distance learning and supported in doing so.

4. It is essential to address the technological, social, and psychosocial barriers to learning that children and young people face during school closures (⇡UNICEF & Viamo, 2021)

3.3.1. Conclusions

This scan of the evidence on EdTech's impact on learning outcomes suggests some key challenges and opportunities for UNICEF's future EdTech engagement in Pakistan, including:

■ **The Covid-19 pandemic has led to a growing global evidence base on 'what works' in EdTech that can inform engagement in the Pakistan context.** There may be an opportunity for UNICEF to influence the use of 'evidence-based' approaches to EdTech.

■ **In EdTech, as in education, access does not mean quality learning**. Evidence on the uptake of Teleschool confirms a key finding of UNICEF's survey on learning continuity; that access to technology 'may not translate into its use for learning'(⇡UNICEF & Viamo, 2021).

■ **There is a lack of at-scale, reliable evidence on 'what works' to improve learning outcomes in Pakistan.** This necessarily means the introduction of EdTech carries a range of risks including the exacerbation of the marginalisation of children, the diversion of essential education resources and an optimistic over-appraisal of the capacities of technology rather than a realistic view of its integration within the education system.

---

[32] Interview Talha Zakria

- **There is a clear need for a thorough appraisal of the extent to which EdTech has enabled children to learn throughout the Covid-19 pandemic**, in particular, evidence from regions and provinces beyond Sindh and Punjab.

4. Considerations

With this desk review, we set out to lay the groundwork for later stages of the landscape analysis by providing an overview of key features, challenges, and trends in Pakistan's technology-facilitated learning landscape, as well as providing an initial scan of prominent EdTech organisations and tools. Below is a set of considerations for engaging and further developing Pakistan's EdTech and digital learning sector.

4.1. Digital skills to digital learning

Historically, EdTech has been seen as a tool to build digital skills for the knowledge economy rather than for basic education. The large-scale deployments of EdTech to keep all children learning through the Covid-19 pandemic highlight that the use of EdTech can be adjusted to focus on providing foundational skills such as numeracy and literacy. While digital skills are important, the current lack of foundational learning in Pakistan will constrain students' ability to develop globally competitive digital skills. Pivoting the focus of EdTech policies to focus on foundational skills is an important building block in achieving the Pakistan 2025 outcome of making Pakistan among the ten largest economies of the world by 2047.

4.2. Infrastructure for equity

Significant infrastructural barriers prevent children learning through EdTech, with prominent disparities within and between provinces and regions. These include access to electricity and to the internet and hardware. Mobile phones and televisions appear to be the most widely available, though attention should be paid to how access is influenced by inequalities such as gender and rural locations. Enhancing critical infrastructure — particularly electricity — will be a significant part of the movement to better leverage EdTech to support learning.

4.3. EdTech beyond Covid-19: EdTech for equity?

EdTech has formed an important part of national, provincial, and regional government education responses to the Covid-19 pandemic. Pakistan has invested heavily in distance learning initiatives as schools closed, but how these resources will be used after the pandemic is yet to be determined. The availability of these resources and new capacities could perhaps be better leveraged to support marginalised learners. For example, learning resources

developed during these times may be used to support blended learning in schools. Distance learning practices may support previously unreachable populations and out-of-school children. Similar distance learning practices may even be leveraged to support teacher professional development. This transition, however, needs to be deliberate and support Pakistan's broader learning goals and should form key parts of formal policies. Future EdTech initiatives should also be aware that, beyond infrastructure, real challenges remain in implementing EdTech at scale, including a lack of digital skills, teacher training and government strategy.

4.4 Evidence of EdTech impact

More evidence is needed on the impact of EdTech on learning outcomes. Though EdTech use was prolific during Covid-19, little is known about the level of engagement and learning that resulted. In light of 51 weeks of school closures and potentially significant loss of learning it will be important to capture more evidence on 'what works' in EdTech in Pakistan and what EdTech can do to help children catch up.

4.5. Responsive institutional capacity coherent to learning

While several government policies in Pakistan prioritise infrastructure rollout, infrastructure needs cannot be approached separately from learning. The nature of the hardware and connectivity needed must not only be based on proven pedagogical models but must also be implemented and evaluated according to these models. This ensures that technological infrastructure is empowering teachers and supporting student learning.

For example, a school aiming to promote group learning in the classroom might find that tablets are more conducive to such modes of learning than computer labs. Conversely, this same school would have to adapt its teacher professional development programme to include training on operating these devices and integrating them in instruction. Furthermore, the link between infrastructure and learning must extend beyond the initial design. Implementation and monitoring should be designed to ensure quality of learning rather than just the availability of connectivity or hardware. For example, to monitor infrastructure rollout at a specific school, the indicator should be more than the number of tablets distributed in the school. The school might instead measure the average time it takes for a teacher to set up tablets in class. Such a measure not only addresses the availability of devices,

but also the devices' usability, how well the school is equipped to handle the transfer of these devices, and how well teachers and technicians are trained. Such a measure also provides a much better indication of potential student learning rather than simply the availability of devices.

Building adaptive institutional capacity

Building coherence among multiple departments and organisations requires a lot of coordination and is a major challenge in successfully implementing EdTech nationally. These functions are often taken on by separate departments or entities or are addressed separately in national strategies. For example, infrastructure may be rolled out separately by the ICT department, while teacher professional development programmes are developed and implemented by the teacher training department. Furthermore, even if a national strategy itself aligns these elements, they may still be implemented in silos. Given that the implementation of EdTech is highly contextual and often changing due to evolving technologies, coordination between departments needs to be continuous.

Coordinating these different pieces requires a particular type of institutional capacity — one that allows the separate departments within ministries and entities, including NGOs, schools, and private sector providers to coordinate and pivot at different levels of the education supply chain, from design to implementation to quality assurance and evaluation. How this can be achieved varies according to the nature of the institutions involved. Nevertheless, this may be supported through having some form of coordinating body, adaptive design and implementation practices such as Agile or Problem-Driven-Iterative-Adaptation (PDIA), as well as political support.

Bibliography

This bibliography is available digitally in our evidence library at
https://docs.edtechhub.org/lib/6FN5VTP7

The ICT Rights of Persons with Disability Act 2020, (2020) (testimony of
    National Assembly of Pakistan).
    http://www.na.gov.pk/uploads/documents/1578658292_632.pdf. (details)

ASER Pakistan. (2021). *Annual Status of Education Report. ASER-Pakistan
    2021*. ASER Pakistan Secretariate & Idara-e-Taleem-o-Agahi.
    http://aserpakistan.org/document/aser/2021/reports/national/ASER_report
    _National_2021.pdf. (details)

ASER. (2019). *Annual Status of Education Report*. ASER.
    http://aserpakistan.org/document/aser/2019/reports/national/ASER_Nation
    al_2019.pdf. (details)

Akmal, M., Crawfurd, L., Hares, S., & Minardi, A. L. (2020). *COVID-19 in Pakistan:
    A Phone Survey to Assess Education, Economic, and Health-Related
    Outcomes* [Data set].
    https://dataverse.harvard.edu/citation?persistentid=doi:10.7910/dvn/egq4x
    o. Available from
    https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN
    /EGQ4XO. (details)

Alif Ailaan, & SDPI. (2015). *Alif Ailaan Pakistan District Education Rankings
    2015*.
    https://d3n8a8pro7vhmx.cloudfront.net/alifailaan/pages/537/attachments/
    original/1430979597/DIstrict_Ranking_Report_2015.pdf?1430979597.
    Available from
    https://d3n8a8pro7vhmx.cloudfront.net/alifailaan/pages/537/attachments/
    original/1430979597/DIstrict_Ranking_Report_2015.pdf?1430979597.
    (details)

Allier-Gagneur, Z., & Moss Coflan, C. (2020). *Your Questions Answered: Using
    Technology to Support Gender Equity, Social Inclusion and Out-Of-School
    Learning* (Helpdesk Response No. 14). EdTech Hub.
    https://doi.org/10.53832/edtechhub.0025. Available from
    https://docs.edtechhub.org/lib/VX7UW757. (details)

Andrabi, T., Daniels, B., & Das, J. (2020). *Human Capital Accumulation and
    Disasters: Evidence from the Pakistan Earthquake of 2005*.

https://riseprogramme.org/publications/human-capital-accumulation-an
d-disasters-evidence-pakistan-earthquake-2005. (details)

Asian Development Bank. (2017). *Innovative Strategies for Accelerated Human
Resources Development in South Asia:: Information and Communication
Technology for Education---Special Focus on Bangladesh, Nepal, and Sri
Lanka*. Asian Development Bank. https://doi.org/10.22617/TCS179080.
Available from
https://www.adb.org/publications/innovative-strategies-ict-education-ban
gladesh-nepal-sri-lanka. (details)

Asselin, O. (2011). *UNICEF Back-to-School Guide*. (details)

Azad Government of the State of Jammu & Kashmir. (2018). *Annual
Development Plan 2019/20*.
https://pndajk.gov.pk/ADP/2019-20/ADP%202019-20.pdf. (details)

Baloch, I., & Taddese, A. (2020). *EdTech in Pakistan: A Rapid Scan* (Country
Scan No. 10). EdTech Hub. https://doi.org/10.53832/edtechhub.0035.
Available from https://docs.edtechhub.org/lib/FIQDEKCI. Available under
Creative Commons Attribution 4.0 International, Open Access. (details)

Baloch, I., Kaye, T., Koomar, S., & McBurnie, C. (2020). *Pakistan Topic Brief:
Providing Distance Learning to Hard-to-reach Children* (EdTech Hub
Helpdesk Response No. 17). EdTech Hub.
https://doi.org/10.53832/edtechhub.0026. Available from
https://docs.edtechhub.org/lib/9TKV7H6E. Available under Creative
Commons Attribution 4.0 International, Open Access. (details)

Bapna, A., Nicolai, S., Myers, C., Pellini, A., Sharma, N., & Wilson, S. (2021). *A Case
for a Systems Approach to EdTech*. EdTech Hub.
https://doi.org/10.5281/zenodo.5651995. Available from
https://docs.edtechhub.org/lib//UR6CQL9K. Available under Creative
Commons Attribution 4.0. (details)

Coflan, C. M., & Kaye, T. (2020). *Using education technology to support learners
with special educational needs and disabilities in low- and
middle-income countries*. Zenodo.
https://doi.org/10.5281/ZENODO.3744581. Available from
https://zenodo.org/record/3744581. Available under Creative Commons
Attribution 4.0 International, Open Access. (details)

Commonwealth of Learning. (2017). *Reaching the Unreached through Open
and Distance Learning (ODL) in Bangladesh, India and Pakistan: Final*

Report. Commonwealth of Learning. http://oasis.col.org/handle/11599/2757.
(details)

Department of Elementary and Secondary Education, Government of Azad
government of the state of Jammu and Kashmir. (2020). *AJ&K Education
Policy (2021-2030).* (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 Office of Research - Innocenti.
https://www.unicef-irc.org/publications/pdf/IRB%202020-10%20CL.pdf.
(details)

Education Department Gilgit-Baltistan. (2014). *Gilgit-Balitstan Education
Strategy 2015-2030.*
http://gbdoe.edu.pk/Downloads/Gilgit-Baltistan-Education-Strategy-2015-
30.pdf. (details)

Ferreira, F. (2017). *Reaching the Unreached Through Open and Distance
Learning (ODL) in Bangladesh, India and Pakistan* [Report].
Commonwealth of Learning (COL). http://oasis.col.org/handle/11599/2757.
(details)

GSMA. (2021). *Addressing the Mobile Gender Gap in Pakistan.*
https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2021/
04/Addressing-the-Mobile-Gender-Gap-in-Pakistan.pdf. (details)

Geven, K., & Hasan, A. (2020). *Learning Losses in Pakistan Due to COVID-19
School Closures.* World Bank, Washington, DC.
https://doi.org/10.1596/34659. Available from
http://hdl.handle.net/10986/34659. (details)

Government of Balochistan. (2020). *Balochistan Education Sector Plan:
2020-2025.* (details)

Government of Pakistan. (2021). *Key Findings Report PSLM District Level
Survey 2019/20.*
https://www.pbs.gov.pk/sites/default/files/pslm/publications/pslm_district_
2019-20/Key_Finding_Report_of_PSLM_District_Level_Survey_2019-20.pdf.
(details)

Government of Pakistan. Pakistan Bureau of Statistics, Government of
Pakistan, & Ministry of Planning Development & Special Initiatives. (2020).

Pakistan Social & Living Standards Measurement Survey 2018–19 (p. 40).
(details)

Government of Sindh. School Education & Literacy Department. (2019). *School
Education Sector Plan and Roadmap for Sindh (2019–2024)*.
https://www.globalpartnership.org/sites/default/files/document/file/2020-1
9-Pakistan-Sindh-ESP.pdf. (details)

Government of the Punjab. (2018). *Punjab IT Policy*.
https://policy.pitb.gov.pk/system/files/Punjab_IT_Policy_2018_05062018.pdf
. (details)

Government of the Punjab. (2019). *Punjab Education Sector Plan
2019/20–2023/2024*.
https://www.globalpartnership.org/sites/default/files/document/file/2020-1
9-Pakistan-Punjab-ESP.pdf. (details)

Haßler, B., Nicolai, S., McBurnie, C., Jordan, K., Wilson, S., & Kreimeia, A.
(2020j,‗yl:k). *EdTech and COVID-19 response*. The EdTech Hub.
https://doi.org/10.5281/zenodo.5652040. Available from
https://docs.edtechhub.org/lib/IA9PL99D. Available under Creative
Commons Attribution 4.0 International, Open Access. (details)

Hanemann, U., & Scarpino, C. (2016). *Harnessing the Potential of ICTs: Literacy
and Numeracy Programmes Using Radio, TV, Mobile Phones, Tablets
and Computers*. UNESCO Institute for Lifelong Learning.
https://eric.ed.gov/?id=ED573633. Available from
https://eric.ed.gov/?id=ED573633. (details)

House of Commons. (2021). *International Development Committee Oral
evidence: UK aid to Pakistan*.
https://committees.parliament.uk/oralevidence/2207/pdf/. (details)

Institute for Development. (2016). *Final Evaluation of the Project: Increasing
Access, Retention and Performance in Primary Education*. (details)

Khyber Pakhtunkhwa Elementary and Secondary Education Department.
(2017). *Education Blueprint: 2018-2030*.
https://kpese.gov.pk/wp-content/uploads/2020/01/blue-print-five-year-pla
n.pdf. (details)

LIRNE Asia. (2018). *AfterAccess: ICT access and use in Asia and the Global
South*.

https://lirneasia.net/wp-content/uploads/2018/10/LIRNEasia-AfterAccess-Asia-Report.pdf. (details)

Lynch, P., Singal, N., & Francis, G. A. (2021). *How Can EdTech Support Primary School Learners with Disabilities in LMICs? Recommendations for Policy*. EdTech Hub. (details)

Lynch, P., Singhal, N., & Francis, G. A. (2021). *EdTech for Learners with Disabilities in Primary School Settings in LMICS: A Systematic Literature Review* [Working Paper]. EdTech Hub. https://doi.org/10.5281/zenodo.4348995. Available from https://docs.edtechhub.org/lib/XJ42VUQG. Available under Creative Commons Attribution 4.0 International, Open Access. (details)

Lyons, C. J., & Pettit, B. (2011). Compounded Disadvantage: Race, Incarceration, and Wage Growth. *Social Problems*, *58*(2), 257–280. https://doi.org/10.1525/sp.2011.58.2.257. Available from https://www.jstor.org/stable/10.1525/sp.2011.58.2.257. (details)

Malala Fund. (2020). *Girls' education and COVID-19 in Pakistan*. Malala Fund. https://malala.org/newsroom/archive/girls-education-and-covid-19-in-pakistan. (details)

Martínez, E., & Human Rights Watch. (2018). *"Shall I feed my daughter, or educate her?": barriers to girls' education in Pakistan*. Human Rights Watch. https://www.hrw.org/report/2018/11/12/shall-i-feed-my-daughter-or-educate-her/barriers-girls-education-pakistan. (details)

Ministry of Education, & Education Sector Reform Assistance (ESRA) Program. (2010). *National Information and Communications Strategy for Education in Pakistan, 2004–2005*. Government of Pakistan. https://www.scribd.com/document/30166522/NICT-Strategy-for-Education-in-Pakistan. (details)

Ministry of Education. (2009). *National Education Policy 2009*. Government of Pakistan. http://itacec.org/document/2015/7/National_Education_Policy_2009.pdf. (details)

Ministry of Federal Education and Professional Training. (2018). *National Education Policy Framework 2018*. Government of Pakistan. http://mofept.gov.pk/SiteImage/Policy/National%20Eductaion%20Policy%20Framework%202018%20Final.pdf. (details)

Ministry of Federal Education and Professional Training. (2020). *Pakistan National Education Response Resilience Plan (K-12) for Covid-19*. Government of Pakistan. https://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/pakistan_national_education_response_resilience_plan_covid-19.pdf. (details)

Ministry of IT & Telecom. (2018). *Digital Pakistan Policy*. Government of Pakistan. https://moitt.gov.pk/SiteImage/Misc/files/DIGITAL%20PAKISTAN%20POLICY.pdf. (details)

Ministry of Planning, Development and Reform. Planning Commission. (2014). *Pakistan 2025: One Nation – One Vision*. Government of Pakistan. https://www.pc.gov.pk/uploads/vision2025/Pakistan-Vision-2025.pdf. (details)

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

Naylor, R., & Gorgen, K. (2020). *Overview of emerging country-level response to providing educational continuity under COVID-19: What lessons learned from supporting education for marginalised girls that could be relevant for EdTech responses to COVID-19 in low- and middle-income countries?* EdTech Hub. https://docs.edtechhub.org/lib/?all=marginalised+girls&page=4&page-len=1&sort=score&id=SLJSKY8J. Available from https://docs.edtechhub.org/lib/?all=marginalised+girls&page=4&page-len=1&sort=score&id=SLJSKY8J. (details)

Nicolai, S., Wilson, S., & Jefferies, K. (2021). *EdTech and Covid-19: 10 Things to Know*. EdTech Hub. https://doi.org/10.5281/zenodo.5651983. Available from https://edtechhub.org/edtech-and-covid-19-10-things-to-know/. (details)

Osama, A., Imran, Z., & Jamshan, W. (2015). *Pakistan EdTech Landscape: Using Technology as a Force Multiplier to address the Educational Emergency*. https://vdocuments.mx/pakistan-edtech-landscape-report-2015.html. (details)

Pasha, H. A. (2018). *Growth and inequality in Pakistan : Agenda for reforms*. http://library.fes.de/pdf-files/bueros/pakistan/15252-20190411.pdf. (details)

Rose, P., Singal, N., Bari, F., Malik, R., & Kamran, S. (2018). *Identifying Disability In Household Surveys: Evidence On Education Access And Learning For*

Children With Disabilities In Pakistan (Research and Policy Paper 18/1). REAL Centre, Faculty of Education, University of Cambridge. https://doi.org/10.5281/ZENODO.1247087. Available from https://www.educ.cam.ac.uk/centres/real/downloads/REAL%20Policy%20Doc%20Disability%20Pakistan%20A4%2013pp_FINAL.pdf. (details)

Save Our Future. (2020). *Averting an Education Catastrophe for the World's Children*. Save Our Future. https://saveourfuture.world/white-paper/. (details)

Sen, A. (2001). *Development as Freedom*. OUP Oxford. (details)

Tabassum, R., Hadi, M., Qaisrani, A., & Shah, Q. (2020). *Education technology in the COVID-19 response in Pakistan*. EdTech Hub. https://www.researchgate.net/publication/348002515_Education_technology_in_the_COVID-19_response_in_Pakistan. (details)

Trucano, M. (2016). *SABER-ICT Framework Paper for Policy Analysis : Documenting National Educational Technology Policies Around the World and Their Evolution over Time*. https://openknowledge.worldbank.org/handle/10986/26107. (details)

UNCTAD. (2021). *TECHNOLOGY AND INNOVATION REPORT 2021: Catching technological waves innovation with equity*. https://unctad.org/page/technology-and-innovation-report-2021. (details)

UNESCO. (2021). *Education: From disruption to recovery*. UNESCO. https://en.unesco.org/covid19/educationresponse. (details)

UNESCO. (n.d). *Distance Learning*. https://unevoc.unesco.org/home/distance+learning&context=. Available from https://unevoc.unesco.org/home/distance+learning&context=. (details)

UNICEF, & Government of Khyber Pakhtunkhwa. (2018). *Khyber Pakhtunkhwa: Multiple Indicator Cluster Survey 2016/17*. https://mics-surveys-prod.s3.amazonaws.com/MICS5/South%20Asia/Pakistan%20%28Khyber%20Pakhtunkhwa%29/2016-2017/Final/Pakistan%202016-17%20MICS%20%28Khyber%20Pakhtunkhwa%29%20Final%20Report_English.pdf. (details)

UNICEF, & Government of Punjab. (2018). *Punjab: Multiple Indicator Cluster Survey 2016/17*. https://mics-surveys-prod.s3.amazonaws.com/MICS6/South%20Asia/Pakist

an%20%28Punjab%29/2017-2018/Survey%20findings/MICS%20SFR_Final_
English.pdf. (details)

UNICEF, & Government of Sindh. (2021). *Sindh: Multiple Indicator Cluster
Survey 2018/19*.
https://mics-surveys-prod.s3.amazonaws.com/MICS6/South%20Asia/Pakist
an%20%28Sindh%29/2018-2019/Survey%20findings/Pakistan%202018-19%2
0MICS%20%28Sindh%29_English.pdf. (details)

UNICEF, & Viamo. (2021). *Brief on Learning Continuity Amidst Covid-19 School
Closures in Pakistan*.
https://www.unicef.org/pakistan/media/3761/file/Pakistan%20Brief%20on%
20learning%20continuity%20amidst%20COVID19.pdf. (details)

UNICEF. (2013). *Out-of-School Children in the Balochistan, Khyber
Pakhtunkhwa, Punjab and Sindh Provinces of Pakistan*.
https://reliefweb.int/sites/reliefweb.int/files/resources/pakistan-oosc-report
-2013-en.pdf. (details)

UNICEF. (2021). *Pakistan Annual Report 2020*.
https://www.unicef.org/pakistan/media/3631/file/Annual%20Report%20202
0.pdf. (details)

UNICEF. (2021). *Radio-based learning gets its day in the sun in Mali*.
https://www.unicef.org/stories/radio-based-learning-gets-its-day-sun-mali.
(details)

Unwin, T., Naseem, A., Pawluczuk, A., Shareef, M., Spiesberger, P., West, P., &
Yoo, C. (2020). *Education for the most marginalised post-COVID-19:
Guidance for governments on the use of digital technologies in
education*. United Nations Educational, Scientific and Cultural
Organisation.
https://edtechhub.org/education-for-the-most-marginalised-post-covid-19
/. (details)

Zahra-Malik, M., & BBC. (2020). The coronavirus effect on Pakistan's digital
divide. *BBC Worklife*.
https://www.bbc.com/worklife/article/20200713-the-coronavirus-effect-on-
pakistans-digital-divide. (details)

Zubairi, A., Halim, W., Kaye, T., & Wilson, S. (2021a). *Country-Level Research
Review: EdTech in Pakistan* [Working Paper]. EdTech Hub.
https://doi.org/10.5281/zenodo.4596486. Available from
https://docs.edtechhub.org/lib/NZUHTJBG. (details)

Zubairi, A., Kreimeia, A., Jefferies, K., & Nicolai, Susan. (2021b). *EdTech to Reach the Most Marginalised: A Call to Action*. EdTech Hub. https://docs.edtechhub.org/lib/W8DB96IE/download/XDMFQU9V/EdTech%20to%20Reach%20the%20Most%20Marginalised%20A%20Call%20to%20Action.pdf. (details)