

Pakistan Digital Learning Landscape Analysis

Date April 2022

Author Asma Zubairi
Abdullah Khalayleh
Imdad Baloch
Haani Mazari
Tom Kaye
Caspar Groeneveld

DOI 10.53832/edtechhub.0093



THE WORLD BANK

About this document

Recommended citation

Zubairi, A., Khalayleh, A., Baloch, I., Mazari, H., Kaye, T. & Groeneveld, C. (2022). *Pakistan Digital Learning Landscape Analysis*. Technical Report. EdTech Hub, UNICEF. <https://doi.org/10.53832/edtechhub.0093>
Available at <https://docs.edtechhub.org/lib/HEXCEXFK>. 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

Anna Acker, Caitlin Moss Coflan, Noreen Hasan, Sofia Hvittfeldt, Sakina Tayyebi, Thaer AlSheikh Theeb and Ellen Van Kalmthout

Acknowledgements

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

List of figures	5
List of tables	6
Abbreviations and acronyms	8
Executive summary	9
1. Introduction	13
1.1. Background to report and context	13
1.2. Purpose of this study	15
1.3. Methodology	16
1.4. Report outline	16
2. Digital landscape mapping	18
2.1. Digital learning tools	21
2.2. Digital learning initiatives	29
3. Pakistan's EdTech landscape: key challenges and opportunities	38
3.1. Poor and unequal infrastructure	38
3.2. The focus of the digital learning landscape is narrow	43
3.3. Governance of the sector is not well-integrated between different entities	46
3.4. Financing landscape for digital learning solutions is unpredictable	48
3.5. Digital learning solutions are not transitioning from pilots to scale	50
3.6. Weak monitoring of student access to and learning with digital learning solutions	52
3.7. Capacity of teachers and parents in using technology is poor	53
3.8. Parents are concerned about the use of digital learning solutions	55
3.9. Content provision fails to meet the needs of the child or align with the curriculum	56
3.10. Users are not aware of digital learning options	57
3.11. Section summary	59

4. Student profiles	62
4.1. Children who are out of school	62
4.2. Students who are girls	65
4.3. Students from poor households	67
4.4. Students from rural locations	69
4.5. Students with Special Education Needs and Disabilities	71
5. Proposed digital learning principles	74
5.1. Design with end-users in mind	74
5.2. Put marginalised students first	75
5.3. Play a convening role and engage with all levels of government	75
5.4. Ensure stakeholders receive appropriate training	76
5.5. Improve content regulation and safeguarding	77
5.6. Embed monitoring and evaluation into all digital learning interventions	77
Bibliography	79
Annex 1: Survey Response Tables	85
Annex 2: Analysis of T4 survey data on Pakistani teachers' experiences and perspectives on the Covid-19 pandemic	93
Annex 3: Interview guide	99

Figures

Figure 1. Structure of this document	10
Figure 2. Challenges and opportunities in Pakistan's EdTech ecosystem	11
Figure 3. Principles for UNICEF engagement with Pakistan's digital learning landscape	12
Figure 4. Analysis within EdTech Hub's approach to the landscape review	15
Figure 5. Key steps to conduct the landscape analysis	16
Figure 6. Matrix of tools included in the survey	22
Figure 7. Primary users of digital learning tools	23
Figure 8. Secondary users of digital learning tools	24
Figure 9. Target school level of digital learning tools	25
Figure 10. Primary purpose of digital learning tools	26
Figure 11. Type of digital learning tool	27
Figure 12. Type of devices required for digital learning tools	27
Figure 13. Type of interface used for digital learning tools	28
Figure 14. Type of power used for digital learning tools	28
Figure 15. Required internet connectivity for digital learning tools	29
Figure 16. Number of students targeted through select interventions (intervention reach)	32
Figure 17. Primary purpose of digital learning interventions	33
Figure 18. Locations of digital learning interventions (province / region)	33
Figure 19. Type of geographic area of digital learning interventions (urban / rural)	34
Figure 20. Language of digital learning interventions	35
Figure 21. Subject of digital learning interventions	35
Figure 22. Teacher training accompanying digital learning interventions	36
Figure 23. Were the digital learning interventions evaluated?	37
Figure 24. How do existing tools address infrastructural challenges?	43
Figure 25. How was the market focus challenge addressed?	45

Figure 26. How was the market focus challenge addressed?	46
Figure 27. How are the coordination challenges being addressed	48
Figure 28. How was the financing challenge addressed (interviews with EdTech providers)?	50
Figure 29. How was the scale challenge addressed (interviews with EdTech providers)?	51
Figure 30. How was the monitoring challenge addressed (interviews with EdTech providers)?	53
Figure 31. How was the capacity challenge addressed (interviews with EdTech providers)?	54
Figure 32. How was the content provision challenge addressed?	56
Figure 33. How was the content provision challenge addressed?	57
Figure 34. How was the awareness challenge addressed?	58
Figure 35. Out-of-school rate by education level	63
Figure 36. Completion rates for students enrolled	65
Figure 37. Completion rates for students enrolled	67
Figure 38. Share of students achieving minimum proficiency in reading, end of primary. Source: †UNESCO-UIS, 2021	68
Figure 39. What digital resources were schools encouraged to use by their schools?	95
Figure 40. Did teachers do any of the following during the Covid-19 pandemic?	97
Figure 41. Frequency by which teachers use digital resources	98

Tables

Table 1. Organisations and stakeholders	17
Table 2. Organisations and tools analysed through online surveys	19
Table 3. Digital Learning Initiatives	29
Table 4. Summary of key challenges related to Pakistan's EdTech Landscape	59
Table 5. Who is the primary user of the tool?	85
Table 6. Who are the secondary users of the tool?	85

Table 7. School level	86
Table 8. What type of product is this?	86
Table 9. What is the tool's primary purpose?	87
Table 10. What type of device is required?	87
Table 11. What type of power is required?	87
Table 12. What type of internet connectivity is required?	88
Table 13. Was this tool implemented as part of an intervention?	88
Table 14. What were the primary purposes of the intervention?	89
Table 15. Where did the intervention take place?	89
Table 16. In what languages was the intervention conducted?	90
Table 17. Was this implemented in a rural or urban setting?	90
Table 18. In which setting did this intervention take place?	90
Table 19. Was the intervention targeting a specific demographic?	91
Table 20. What was the socio-economic background of the beneficiaries?	91
Table 21. What grades was the intervention targeting?	91
Table 22. What subjects did the intervention address?	92
Table 23. Was there any kind of accompanying teacher professional development activities?	92
Table 24. Were there any evaluations conducted on this intervention?	92

Abbreviations and acronyms

ASER	Annual Status of Education Report
B2B	Business to business
B2C	Business to customer
DIL	Developments in Literacy
ECE	Early Childhood Education
EdTech	Educational technology
ERP	Enterprise Resource Planning
FGD	Focus Group Discussion
GiZ	German Agency for International Cooperation
JICA	Japan International Cooperation Agency
IRI	Interactive Radio Instruction
KII	Key Informant Interview
LMS	Learning Management System
MoFEPT	Ministry of Federal Education and Professional Training
MoITT	Ministry of Information Technology and Telecommunication
M&E	Monitoring and Evaluation
OER	Open Educational Resource
OOSC	Out-of-school children
SEND	Special Educational Needs or Disability
SELD	Sindh Education and Literacy Department
TAKMIL	Teach a Kid Make Individual Life
TPD	Teacher professional development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nation Children's Fund

Executive summary

The Covid-19 pandemic has resulted in a dramatic increase in the role educational technology (EdTech) plays in education delivery. As schools have closed worldwide, EdTech has played a critical role in keeping children learning. However, as the pandemic has persisted, the optimism around EdTech has plateaued. It has given way to fears that children who are using EdTech are not learning, and that the most marginalised children are falling further behind due to the emergence of a digital divide. On average, only 34% of households across Pakistan have digital access and only 12% have access to laptops or computers ([Government of Pakistan, 2021](#)). The access challenge is further intensified by demographics including gender, locality, and socio-economic status. This divide must be addressed if EdTech is to support effective learning for all children across all contexts in Pakistan. If left unaddressed, EdTech interventions can exacerbate a digital divide that further compounds the disadvantage of marginalised groups.

Across the world, UNICEF has supported governments globally to deploy EdTech tools in response to the Covid-19 pandemic. To support this endeavour in Pakistan, UNICEF Pakistan is building evidence on digital learning to support the EdTech ecosystem in Pakistan. Evidence in this landscape review will support stakeholders including the Ministry of Federal Education and Professional Training (MoFEPT) and UNICEF Pakistan to develop long-term strategies to fortify Pakistan's EdTech ecosystem.

The purpose of this landscape review is to identify the challenges, emerging trends, and opportunities for engagement within Pakistan's EdTech ecosystem. To do this, the landscape analysis collected and analysed data (both primary and secondary, and quantitative and qualitative) relating to technology-facilitated learning in Pakistan. In this way, this landscape analysis can both inform MoFEPT and UNICEF's strategies and provide a resource for stakeholder (e.g., federal, provincial, and regional government agencies, development partners, and the private sector) engagement in technology-facilitated learning in Pakistan. [Figure 1](#) below shows the structure of this document, which is described in more detail below.

Figure 1. *Structure of this document.*

[Section 1](#) sets out the background and context of this report, while also detailing the purpose, methodology and report outline.

[Section 2](#) presents data gathered through a crowd-sourced self-reported survey of tools focused on student learning. This list is non-exhaustive and does not include all tools available in Pakistan. Among the findings, we noted that the majority (62%) of existing solutions require only intermittent connectivity while 25% require full connectivity. Out of 48 of these existing tools, ten were designed as part of a specific intervention. Most interventions were designed with the primary objective of delivering in-school learning (nine interventions out of ten), but eight interventions have expanded to accommodate distance learning during school closures.

Stakeholder interviews were conducted to build on the insights derived from the survey mentioned in [Section 1](#). These helped identify challenges and opportunities in Pakistan's EdTech ecosystem and are summarised in [Figure 2](#) below. [Section 3](#) presents an analysis of the data collected from the interviews and four focus group discussions (FGDs).

Figure 2. *Challenges and opportunities in Pakistan's EdTech ecosystem.*

Domain	Challenges	Opportunities
Data	Weak monitoring of access and learning means few insights into EdTech ecosystem	Asynchronous data collection systems exist and can be expanded upon and aligned with one another
Infrastructure	Infrastructure is poor and access highly unequal	Access through low-tech approaches and offline offerings exist and can expand; All-in-one financing can increase availability of content and devices
Foundational skills	Due to poor profitability, few solutions include foundational skills or target out-of-school children	EdTech providers can use a "future customer" model that offers free or cheap content to young learners who grow into paying customers later
Governance	Governance is not well integrated between different entities, resulting in duplicated efforts	The government's "Distance Learning Wing" can bring cohesion across stakeholders including EdTech providers, national and provincial ministries and donor partners
Finance	The government's financing landscape is inconsistent and unpredictable	EdTech providers offer cross-subsidisation programmes; Tax deductions on EdTech procurement can bring down costs
Content alignment	Content does not always meet needs of children or align with the curriculum	Disseminating content through large school networks via B2B models can help align content at a large scale
Digital learning knowledge	Users have poor knowledge of the digital options that exist for learning	Government can provide a single online repository with endorsed initiatives; Advocacy and awareness campaign may increase knowledge
Parental concerns	Parents have concerns about letting their children access digital learning solutions	Research can explore and suggest solutions to socio-cultural barriers; Advocacy and behavioural change campaigns can alleviate parental concerns, while broader safety policies should be implemented to address valid concerns about online safety

Student profiles were developed to help better understand the challenges and opportunities faced by the most marginalised groups of children in Pakistan: out-of-school children, girls, poor households, rural students, and students with special educational needs and disabilities (SEND). Running across all profiles is the theme that poverty is a predictor of educational disadvantage for all groups. Since the children who are excluded from access to resources

and opportunities are more marginalised (↑Unwin et al., 2020c), there is a real risk that the pre-existing disadvantage due to poverty will be compounded in the case of EdTech because the disadvantage will result in a widening digital divide, leaving the most marginalised children even further behind.

Furthermore, children being out of school can be the result of multiple intersecting disadvantages. [Section 4](#) aligns each profile with a deep dive into five relevant tools / interventions (by Developments in Literacy, Knowledge Platform, SABAQ/Muse, TAKMIL and WonderTree) and unpacks its possibilities for scalability in terms of affordability, accessibility, and functionality.

Based on the analysis provided in the prior desktop review, Sections 2, 3, and 4 of this report, and international literature, with [Section 5](#), the document concludes with a set of principles that UNICEF should consider when attempting to effectively engage in Pakistan's digital learning landscape. These are summarised in [Figure 3](#) below.

Figure 3. Principles for UNICEF engagement with Pakistan's digital learning landscape.

<p>1. Design with end-users in mind: Designers of digital tools need to consider the specific needs of each country, region, and community and find cost-effective ways to empower end-users (including marginalised learners) to make decisions over the design of interventions.</p>	<p>2. Put marginalised learners first: In order to minimise any digital divide, any EdTech intervention should be designed around ensuring access and learning amongst the most marginalised children.</p>	<p>3. Play a convening role and engage with all levels of Government: Stakeholders should convene rather than fragment the landscape. All relevant Government agencies, donor partners, and EdTech providers should be engaged as early as possible in the design process.</p>
<p>4. Ensure stakeholders receive appropriate training: Effective EdTech interventions require appropriate user training. Adequate teacher/parent training (including digital literacy) is critical to the successful deployment of EdTech tools. Time and resources for this must be built into any roll-out.</p>	<p>5. Improve content regulation and safeguarding: Improve the processes for approving and regulating EdTech content. This should include prioritising the safeguarding of children using digital learning tools through online safety policies.</p>	<p>6. Embed M&E into all digital learning interventions: Much is still to be understood about the reach and impact of digital learning tools in Pakistan. Any digital learning initiative should include M&E processes that also support the agile and iterative refinement of interventions.</p>

1. Introduction

This section sets out the background and context of this report, while also detailing the purpose, methodology, and report outline.

1.1. Background to report and context

Even before the pandemic, Pakistan was facing a learning crisis, with significant disparities in literacy and numeracy across socio-economic status, locality and gender ([UNICEF, 2021](#); [ASER, 2020](#)). The Covid-19 pandemic worsened the existing crisis. School closures led to 51 weeks of lost schooling for over 46 million Pakistani children and compounded the challenge of reaching the 22.8 million children already out of school, of which approximately 56% are girls ([UNESCO, 2021](#)).¹

In response, national and provincial governments launched a variety of digital learning solutions to mitigate learning losses. One example is 'Teleschool', a multimodal approach combining TV, radio, and SMS learning content ([Tabassum et al., 2020](#); [Wilson et al., 2022](#)). However, small-scale surveys suggest that the impact of these interventions has varied widely, and has highlighted a stark digital divide ([Wilson et al., 2022](#); [Zahra-Malik, 2020](#)). The digital divide is not the only barrier to uptake—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](#); [Wilson et al., 2022](#)). This raises the question: What challenges hinder the use of EdTech in Pakistan and what opportunities do stakeholders have to address them? This report has been commissioned by UNICEF to further the goal of strengthening Pakistan's education system by supporting the federal and provincial governments, along with other stakeholders, by providing evidence-based recommendations to explore how digital learning solutions can be mainstreamed to support student learning.

The potential for technology to support learning is well-documented globally. However, identifying to what extent and in what ways digital technologies can deliver education to the poorest and most marginalised remains a major challenge for governments. Without taking the poorest and most

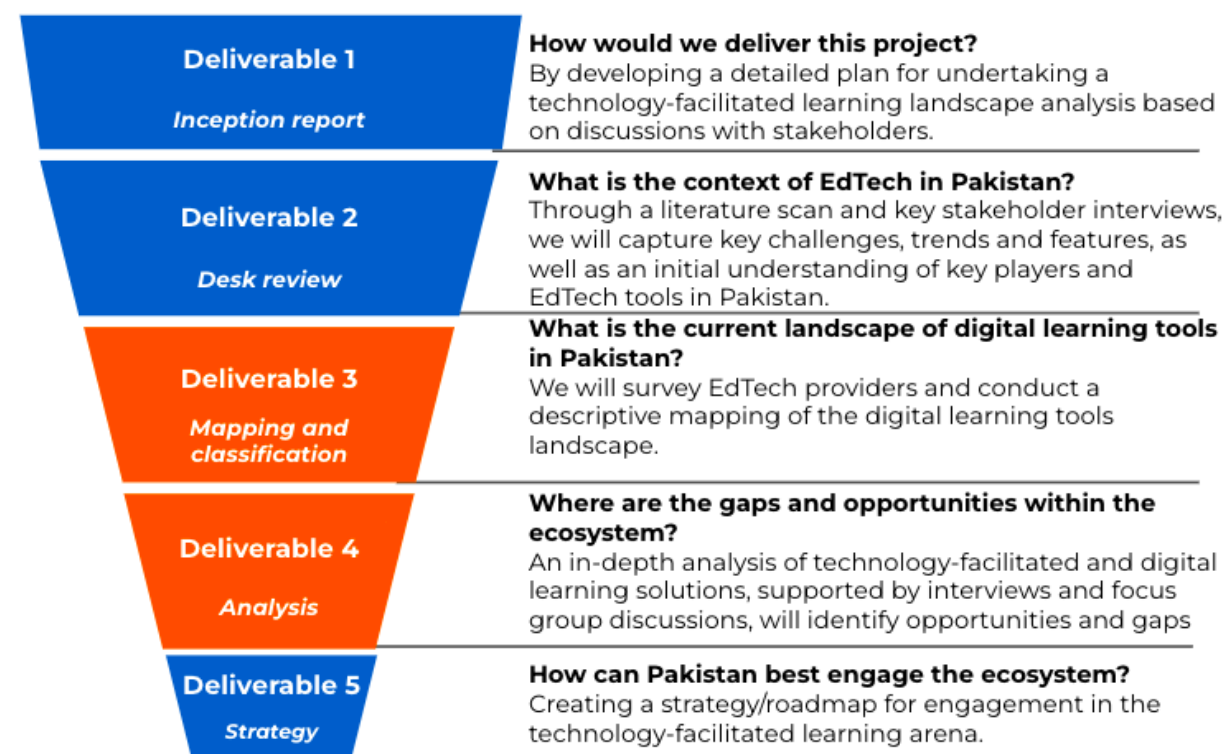
¹The 22.8 million figure, however, is likely to be a significant underestimate and is likely to have risen due to drop-out rates occurring as a consequence of the Covid-19-related school closures. [ASER \(2021\)](#) reports the number of out-of-school children to have increased by 2% between 2019 and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

marginalised into consideration, which requires aligning with the local context, digital technologies can increase inequalities ([↑Unwin et al., 2020b](#)).

A large gulf exists, however, between technology's *potential* to deliver transformative change for Pakistan's education system and its *current* state. EdTech Hub and UNICEF's *Desk Review of Technology-Facilitated Learning in Pakistan* identified significant equity challenges that should be considered when delivering digital learning to marginalised children. Although Covid-19 has increased further development of digital solutions to support the most marginalised, "increased access by itself will not bring these children back to school" ([↑Wilson et al., 2022](#)).

The objective of this landscape analysis is to diagnose how EdTech can best support student learning in Pakistan, including what gaps and opportunities exist. More specifically, we will answer the question: What type of learning solutions and tools are being used in Pakistan and to what extent do these reach marginalised children?

This landscape analysis is part of a wider landscape review which delivers five outputs as set out in [Figure 4](#) below. This document combines the third and fourth deliverables into a single landscape analysis that supplies both the mapping and classification, which are then used as the foundation for the analysis of Pakistan's technology-facilitated learning landscape.

Figure 4. Analysis within EdTech Hub's approach to the landscape review

1.2. Purpose of this study

By highlighting the challenges and opportunities of Pakistan's EdTech landscape, this study aims to equip stakeholders with the evidence required to develop informed and effective digital learning strategies. To do this, the landscape analysis has collected and analysed data (both primary and secondary, and quantitative and qualitative) relating to technology-facilitated learning solutions in Pakistan. This report builds on findings from the *Desk Review*, which examined EdTech in Pakistan primarily using existing secondary resources ([Wilson et al., 2022](#)). This landscape analysis complements the desk review by bringing out additional insights through additional primary data. This includes mapping learning tools and digital learning interventions in Pakistan via data collected through surveys, key informant interviews, and focus group discussions. Together, these qualitative and quantitative methods are complemented with desk research to identify both gaps and opportunities within the current landscape. This adds unique value in several ways, including:

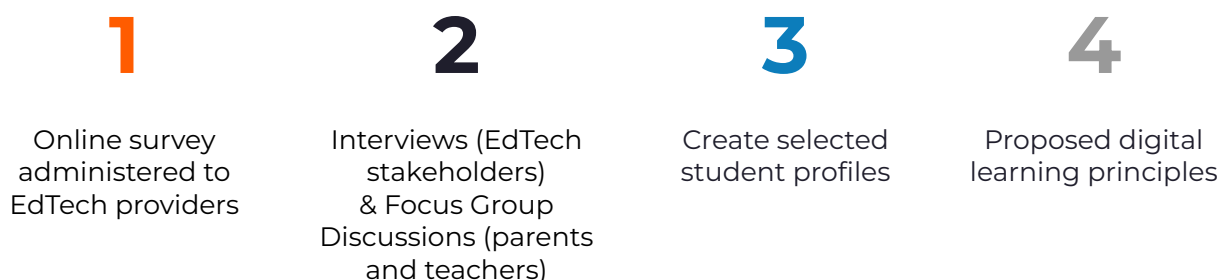
- Mapping the digital learning landscape in Pakistan and its accompanying characteristics to present emerging patterns.
- Interviewing key EdTech stakeholders from the EdTech ecosystem to supplement information on Pakistan's digital learning landscape.

- Focusing on how EdTech can be used to promote equity for marginalised groups.

1.3. Methodology

The landscape analysis triangulates primary data collection with findings from the initial desk review as outlined in [Figure 5](#).

Figure 5. *Key steps to conduct the landscape analysis*



First, we used an online survey targeting EdTech providers operating in Pakistan. The survey captured information on key indicators relating to digital learning solutions. The second step gathered qualitative data via key informant interviews and focus group discussions with stakeholders including government actors, development partners, parents and teachers. This step identified what key stakeholders within the EdTech system considered the main gaps and opportunities in the current landscape. The third step involved creating student profiles as a mechanism to identify how marginalised students within Pakistan’s education system can most effectively engage with EdTech solutions. This identified these groups’ disadvantages both when it comes to education more generally, and EdTech specifically. The fourth and final step was to use the information gathered through the first three stages to develop a set of digital learning principles which should be central to UNICEF’s country engagement strategy. These learning principles will guide the development of the final deliverable — a strategy to guide UNICEF’s engagement in Pakistan’s digital learning landscape.

1.4. Report outline

The report is organised as follows:

Section 1, this section, sets out the background and context of this report, while also detailing the purpose, methodology, and report outline.

[Section 2](#) presents a mapping of the digital learning landscape. This mapping is based on a crowd-sourced survey in which 17 organisations in Pakistan elected to submit the tools they have produced or used to facilitate digital learning. Online self-reported surveys identified 48 tools used across (but not necessarily produced by) 17 organisations involved in providing digital learning solutions in Pakistan. The survey consisted of 42 questions about the type of intervention offered and its targeted beneficiaries. Tools have been categorised based on the number of students targeted, the geographic location of their intervention, user characteristics, device requirements, funding source and, if available, the tool's impact on learning.

[Section 3](#) presents stakeholders' insights on the challenges and opportunities related to Pakistan's EdTech system. This includes data from 17 interviews and five focus group discussions with government, schools, teachers, and parents. A semi-structured approach was used to reveal rich understandings of available solutions, stakeholder priorities, and the experiences of marginalised groups. [Table 1](#) highlights the breadth of stakeholders engaged in this process.

Table 1. *Organisations and stakeholders.*

Method	Participants
Key informant interviews (government stakeholders)	12 participants
Key informant interviews (EdTech Providers)	Six interviews from five EdTech providers
Focus group discussions (Teachers and Parents)	33 participants across five focus group discussions

[Section 4](#) sets out profiles on groups of marginalised students (who are at risk of further marginalisation via a digital divide. Additionally, it showcases how existing learning tools are combating marginalisation and details the extent to which these interventions are scalable. These are intended to capture the current challenges these students face in relation to education and have helped inform the principles set out at the end of the report.

[Section 5](#) concludes with a set of principles which should guide UNICEF as it considers how to engage in Pakistan's digital learning landscape. These are strongly guided by equity considerations and have been driven by perspectives raised in the stakeholder interviews conducted for this report. These principles are supported by wider global work done in this area.

2. Digital landscape mapping

This section presents a mapping of Pakistan's digital learning landscape. It is based on a survey designed to identify the type, purpose, and experience of organisations designing and implementing these tools. Findings from the survey build upon the initial scan of tools conducted through the [Desk Review](#). This section uses data to understand to what extent interventions serve students across grade levels, languages, regions, resources, and types of school. The survey was adapted from similar surveys conducted in sub-Saharan Africa. The Pakistan version was reviewed by local and international experts including the UNICEF Pakistan team.

Specifically, this section presents trends emerging from the survey. It includes data on the types of users targeted, as well as their demographic information. It explores the intended purpose of the tools, and the types of devices and connectivity needed. Further data from the survey is in [Annex 1](#).

The survey was divided into two sections: the first asked about the digital learning tools themselves, while the second explored the interventions within which these tools were implemented. A total of 17 organisations submitted data reporting 48 separate digital learning tools. Ten of these tools were implemented as part of a broader educational initiative. [Table 2](#) below provides an overview of the organisations and tools identified through the submissions.

Table 2. *Organisations and tools analysed through online surveys.*²

Organisation (organisation type)	Tool names
Adam Smith International (non-profit)	<ol style="list-style-type: none"> 1. Literacy and Numeracy Drive 2. Induction and Programme Learning Management
AzCorp Entertainment (for-profit)	<ol style="list-style-type: none"> 1. Sheeba and the Private Detectives 2. Century 3. Taleem ka Safar
Developments in Literacy	<ol style="list-style-type: none"> 1. Technology-Enabled Academic Learning 2. Read to Grow Read to Know
Edkasa (for-profit)	<ol style="list-style-type: none"> 1. Edkasa app 2. Edkasa Connected Classrooms
Family Educational Services Foundation (non-profit)	<ol style="list-style-type: none"> 1. Pakistan Sign Language Digital Learning
Idara-e-Taleem-o-Aagahi (non-profit)	<ol style="list-style-type: none"> 1. Life-Skills Based Videos 2. Chalo Parho Barho 3. Storybytes 4. Single National-Curriculum-Aligned Videos
Knowledge Platform (for-profit)	<ol style="list-style-type: none"> 1. Learn Smart Classroom 2. Learn Smart Pakistan 3. 1 on 1 Quiz 4. Teach Smart Pakistan 5. Virtual Campus
My Inter Academy	<ol style="list-style-type: none"> 1. Intermediate—Grade 11 and 12 2. Century 3. Matriculation Grades 9 and 10 4. TSB Education

² Disclaimer: This is a non-exhaustive list of tools available /used in Pakistan. There are EdTech providers that have not participated in the survey and some of the providers included offer solutions for which data has not been collected.

Orenda / Taleemabad (for-profit)	<ol style="list-style-type: none"> 1. Single National-Curriculum-Aligned Taleemabad (K–6) 2. Taleemabad Apps 3. Digital Teacher Training 4. Taleemabad Learning management system (LMS) and Enterprise Resource Planning (ERP) 5. Digital Lesson Plans
Oxford University Press, Pakistan (non-profit)	<ol style="list-style-type: none"> 1. My e-Mate
PTCL (telecommunications provider)	<ol style="list-style-type: none"> 1. QTaleem
SABAQ / Muse (for-profit)	<ol style="list-style-type: none"> 1. Muse Learning App (K–5) 2. Muse Kids App 3. Sindh Education and Literacy Department 4. Muse Worksheets
UNESCO (non-profit)	<ol style="list-style-type: none"> 1. Interactive Radio Instruction
Teach a Kid Make Individual Life (non-profit)	<ol style="list-style-type: none"> 1. TAKMIL School-in-a-Box
Teach the World Foundation (non-profit)	<ol style="list-style-type: none"> 1. ELAN (Enhancing Literacy and Numeracy) 2. ELAN In-School Tablet Intervention 3. ELAN One Room Digital Microschools 4. ELAN Smartphone Program 5. Teach the World Foundation
The City School (for-profit school)	<ol style="list-style-type: none"> 1. Microsoft Teams 2. Century
The Learning Hut (for-profit)	<ol style="list-style-type: none"> 1. LMS for Academia 2. Learning to Teach Online 3. Basic Skill Courses 4. Provision for Adapting to Online Teaching 5. eLearning Enablement
17 organisations	48 tools

The remainder of this section presents the analysis of the data collected through this survey.

2.1. Digital learning tools

The 48 tools discussed in this report serve different functions in the facilitation of digital learning. Some tools have the primary objective of delivering learning content, while others focus on the provision of learning management systems (LMSs). Although some tools have overlapping functions and target groups, [Figure 6](#) below describes the main objective and audiences that the tools seek to reach. For instance, some organisations offer LMSs to schools but their main focus is on content development and provision. Some of these tools, particularly those with the primary objective of exam preparation, offer assessments to support remedial learning. The tools that focus on exam preparation tend to be by for-profit EdTech providers, while only one out of the six organisations that focus on out-of-school children is a non-profit organisation. This for-profit organisation, AzCorp Entertainment, developed *Taleem Ka Safar* in partnership with a donor partner.

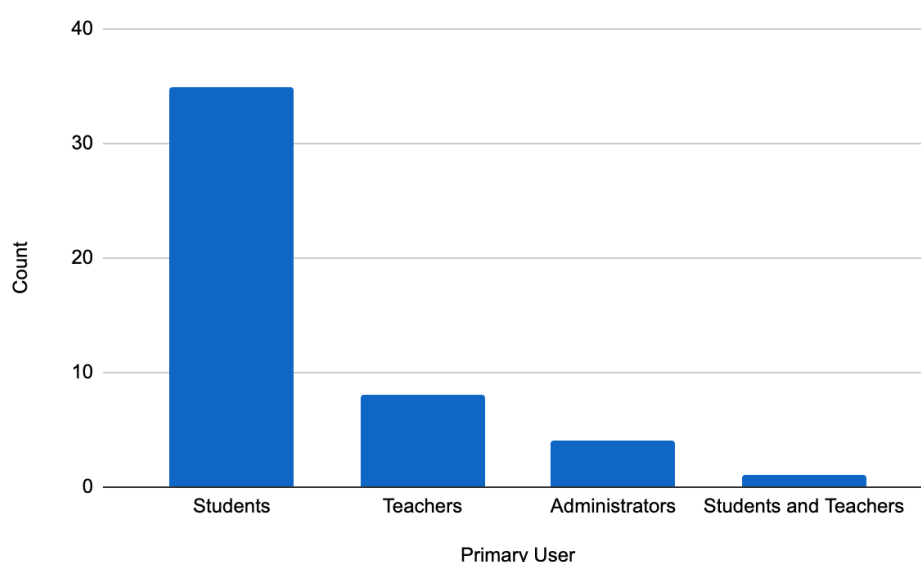
Figure 6. Matrix of tools included in the survey.³

Tool Purpose	Functional Literacy	Exam Preparation	TPD
	<div>1. Teach the World Foundation (ELAN — Enhancing Literacy and Numeracy)</div> <div>2. Teach the World Foundation (ELAN — one room digital microschoools)</div> <div>3. Teach the World Foundation</div> <div>4. AzCorp Entertainment (Taleem Ka Safar)</div> <div>5. Adam Smith International (literacy and numeracy drive)</div> <div>6. TAKMIL (School in a Box)</div>	<div>1. My Inter Academy (Intermediate)</div> <div>2. My Inter Academy (Century)</div> <div>3. My Inter Academy (Matriculation)</div> <div>4. The Learning Hut (Basic skill courses)</div> <div>5. Orenda/Taleemabad (Taleemabad Apps)</div> <div>6. Knowledge Platform (Learn Smart Pakistan)</div> <div>7. Knowledge Platform (101 Quiz)</div> <div>8. Edkasa (Edkasa App)</div>	<div>1. The Learning Hut (Learning to Teach Online)</div> <div>2. Orenda/Taleemabad (Digital Teacher Training)</div> <div>3. Orenda/Taleemabad (Online Lesson Plans)</div> <div>4. Knowledge Platform (Teach Smart Pakistan)</div>
Tool Main Feature	Content Repository	Learning Management System	
	<div>1. AzCorp Entertainment (Sheeba and the Private Detectives)</div> <div>2. Azcorp Entertainment (Century)</div> <div>3. The Learning Hut (Learning to Teach Online)</div> <div>4. The Learning Hut (Basic skill courses)</div> <div>5. Family Educational Services Foundation (Pakistan-Sign-Language based learning resources)</div> <div>6. Orenda/Taleemabad (Taleemabad Apps)</div> <div>7. Orenda/Taleemabad (Digital Teacher Training)</div> <div>8. SABAQ/Muse (MUSE Kids App)</div> <div>9. Idara-e-Taleem-o-Aaghi (Chalo Parho Barho)</div> <div>10. Knowledge Platform (Learn Smart Pakistan)</div> <div>11. Knowledge Platform (Learn Smart Classroom)</div> <div>12. Teach a Kid Make Individual Life (School in a Box)</div> <div>13. Edkasa (Edkasa App)</div>	<div>1. The Learning Hut (LMS for Academia)</div> <div>2. Adam Smith International (Induction Programme Learning Management System)</div> <div>3. Pakistan Telecommunication Company Limited (QTaleem)</div>	
Power & Connectivity	<div><div><div><div><div><div></div><div></div></div><div></div></div><div>Battery</div><div>23 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Offline</div><div>4 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Intermittent Electricity</div><div>12 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Full/Constant Electricity</div><div>10 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Partial Connectivity</div><div>33 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Full/Constant Connectivity</div><div>8 tools</div></div></div></div></div></div></div></div></div>		
	<div><div><div><div><div></div><div></div></div><div></div></div><div>Radio</div><div>4 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Tablet</div><div>35 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>TV</div><div>8 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Mobile Phone</div><div>36 tools</div></div><div><div><div><div><div></div><div></div></div><div></div></div><div>Comp./ Laptop</div><div>29 tools</div></div></div></div></div></div></div>		

³ This is a non-exhaustive list of tools available in Pakistan. The tools have been described through self-reported surveys filled out by some EdTech providers operating in Pakistan.

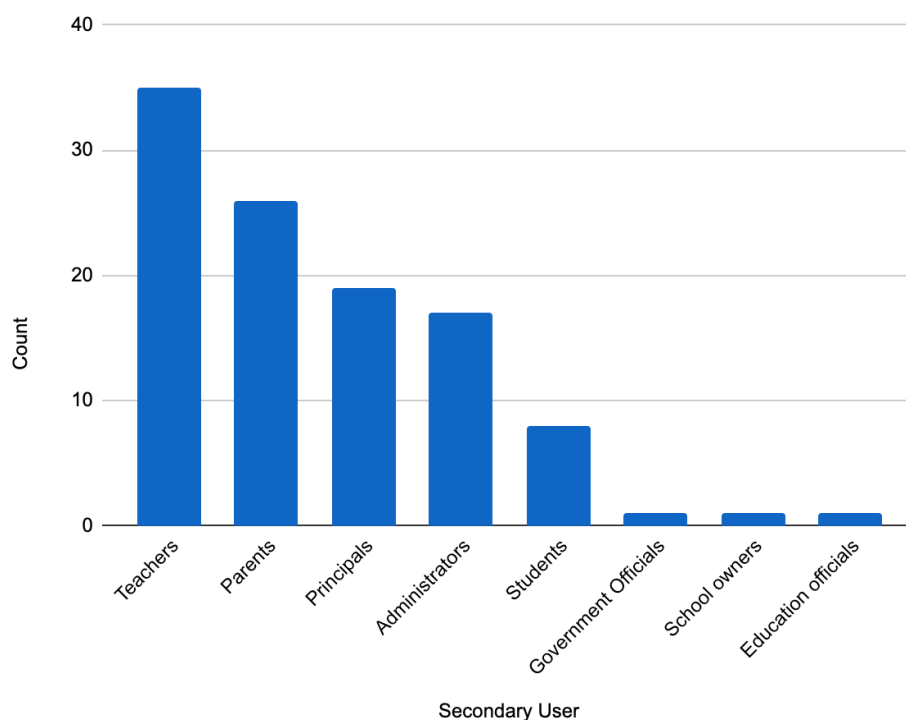
Digging deeper into the objectives of the tools described in Figure 6, findings from the crowd-sourced survey will be unpacked to show the overlapping functions, objectives, and students that the tools seek to reach. The surveyed tools predictably target students and teachers, with administrators and other stakeholders falling far behind. Most of the surveyed EdTech providers have solutions primarily targeting students (35 tools), while only eight tools focus on teachers (Figure 7). An organisation submitted a tool that targeted both students and teachers (one tool), whereas other tools identified only targeted teachers or administrators (four tools). The tool that focuses equally on students and teachers, Microsoft Teams, is not a learning solution. Used by the ‘City School’ network, it can be assumed that this tool was used to facilitate communication and lessons during school closures.⁴

Figure 7. *Primary users of digital learning tools.*

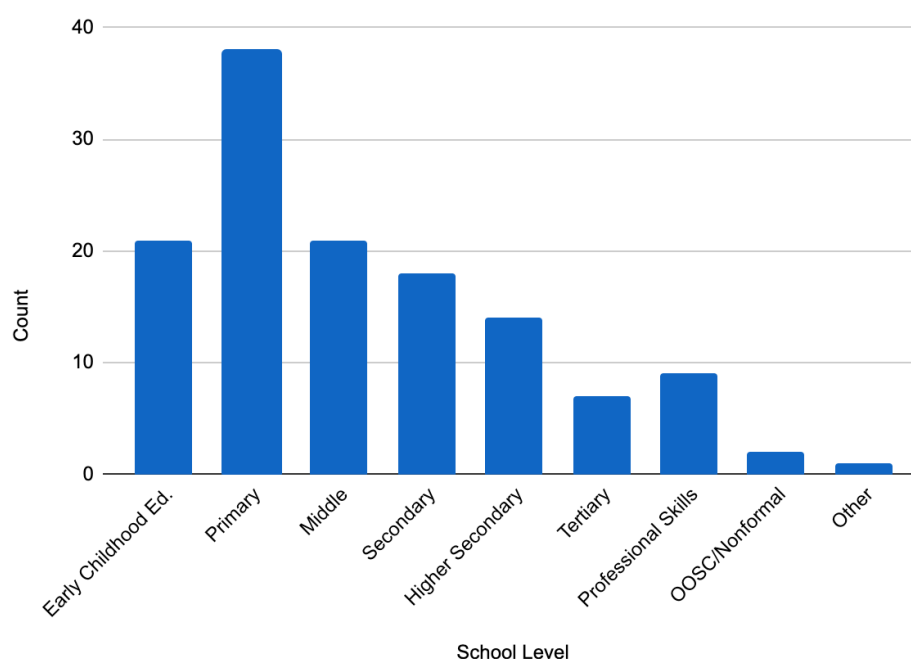


While tools are generally designed according to the primary user’s needs, secondary users often use learning solutions to track learner data and support primary users (Figure 7 above). For this particular survey question, respondents could select multiple secondary users. Teachers were identified as the main secondary users for 35 tools, followed by parents (26 tools), principals (19 tools) and administrators (17 tools). Government officials, school owners, and education officials were rarely identified (one tool each) as secondary users. This suggests that it is worth exploring the extent to which any available learning data is used to refine interventions.

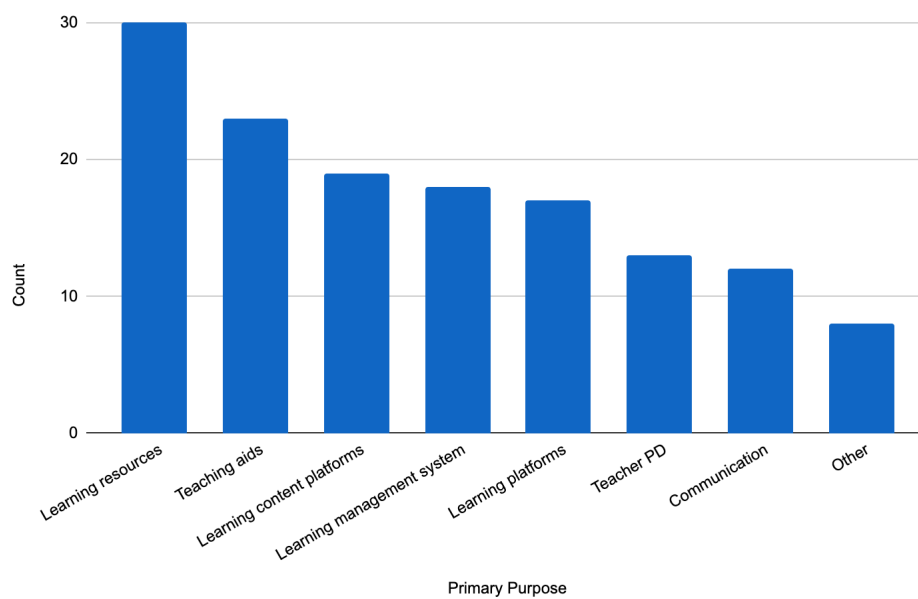
⁴ One organisation, The City School, responded to the crowd-based survey. The City School is one of the largest private school networks in Pakistan and not an EdTech provider.

Figure 8. *Secondary users of digital learning tools.*

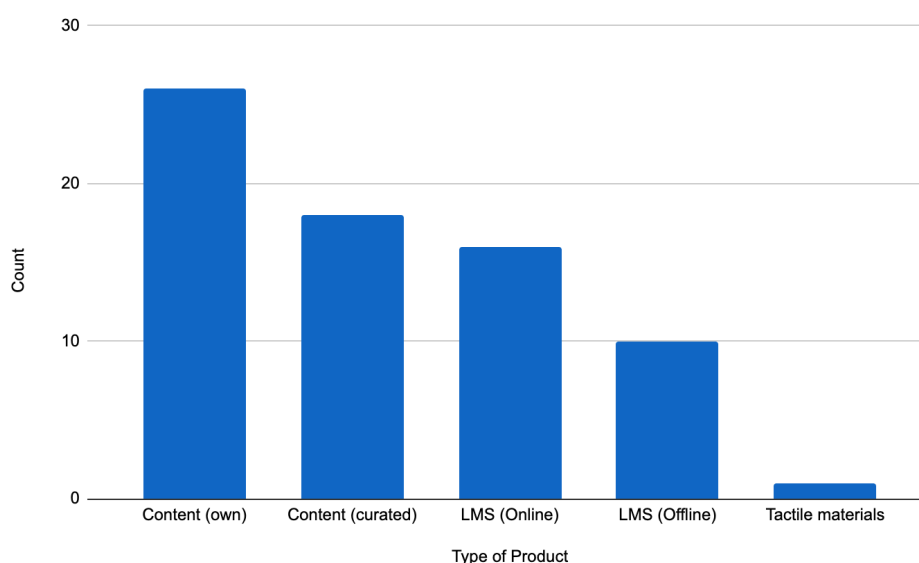
Most of the digital learning tools (38 tools) targeted primary-age students (Figure 8 above). Early Childhood Education (ECE) and Middle School are the next most frequently targeted (21 tools each). After the primary school level, it appears that the number of learning interventions available decreases by grade level: Secondary School (18 tools) and Higher Secondary School (14 tools), with the number of tools decreasing more drastically for tertiary students (7 tools). The data also suggests that out-of-school children are greatly underserved. There are only two tools of the total 48 tools (by AzCorp Entertainment and TAKMIL) that target out-of-school children and non-formal education, while there are nine tools that facilitate professional-skills-related interventions.

Figure 9. Target school level of digital learning tools.

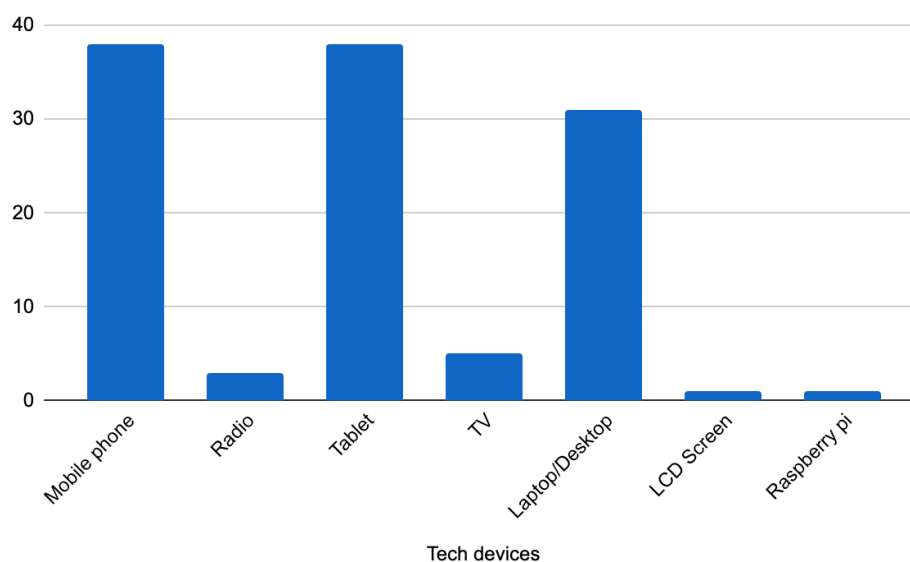
The tools serve several overlapping purposes but most frequently provide and manage learning content (Figure 9 above). Although Figure 6 mentions that only three organisations list LMSs as their primary focus, many tools that focus on delivering content include LMSs in their offering. Of the tools, 32 provide access to learning resources, 23 include an LMS and 19 serve as teaching aids. There were a small number of tools that were designed to focus on teacher professional development (TPD) (10 tools) and communication (12 tools) with different users.

Figure 10. *Primary purpose of digital learning tools.*

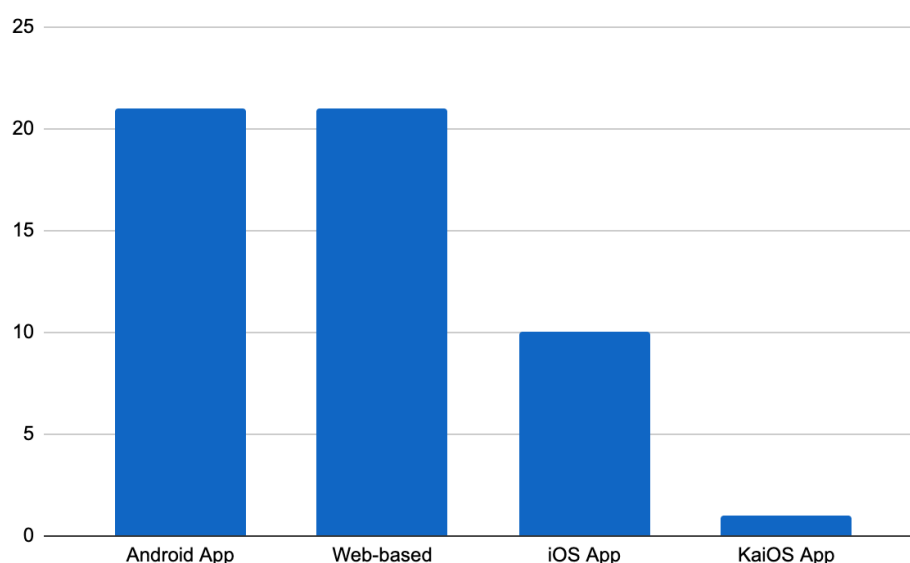
Many tools use content developed in-house (36 tools), indicating that it is worth exploring whether efforts in content development are duplicated across organisations. Fewer tools use curated content (18 tools). Of the tools, 17 only provide LMS access online, while ten provide access offline. This raises the question: To what extent are these digital learning tools accessible across infrastructural constraints? To answer this question, we will unpack the tools according to their technological and infrastructural requirements.

Figure 11. *Type of digital learning tool*

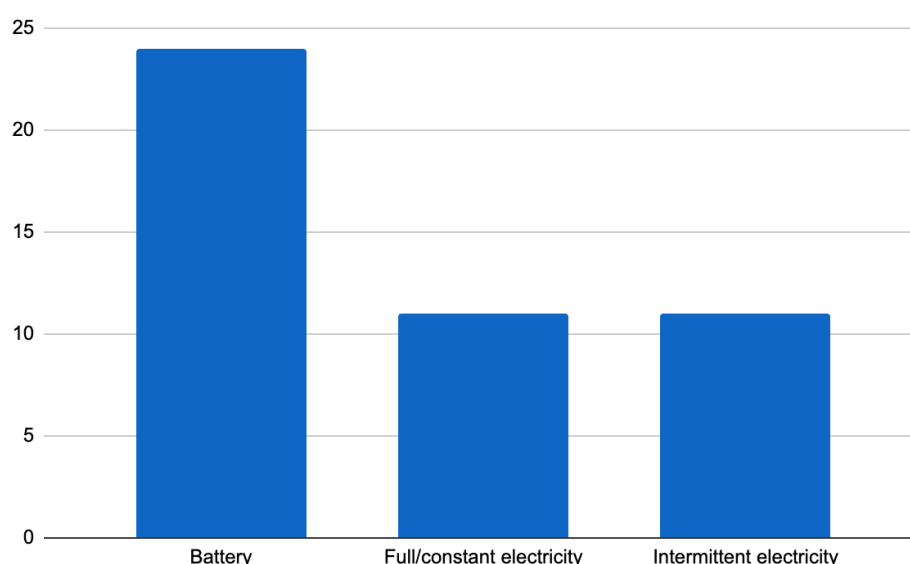
Tablets and mobile phones were used for the highest number of tools (38 tools each). These were followed by desktops and laptops (31 tools each), TVs (5), radios (3 tools), LCD screens (1 tool) and Raspberry pi (1 tool).

Figure 12. *Type of devices required for digital learning tools.*

For access, Android or web-based applications appear to be the most widely used interfaces (21 tools each), compared to iOS apps (10 tools) and KaiOS apps (1 tool) (Figure 13).

Figure 13. *Type of interface used for digital learning tools.*

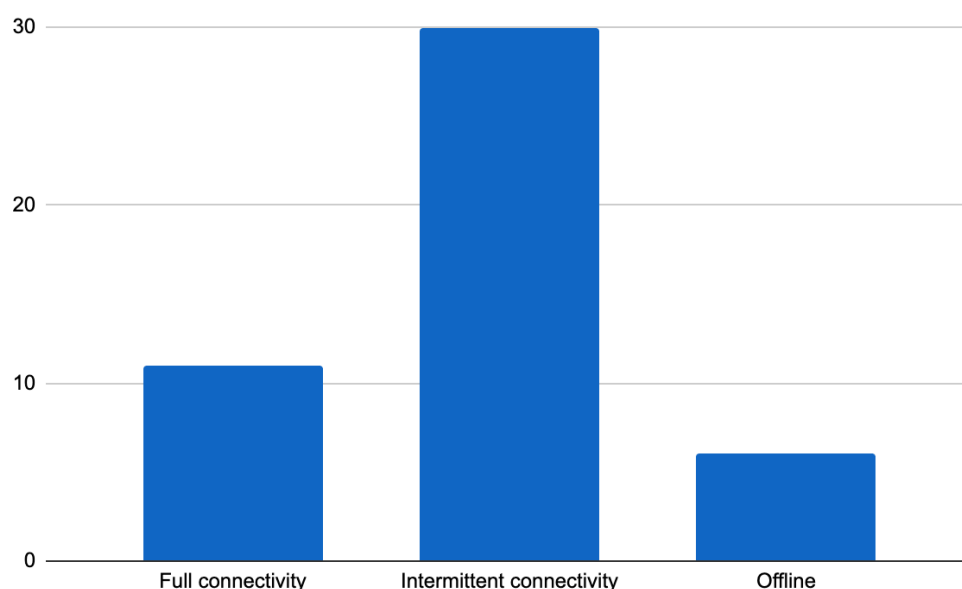
While an equal number of tools required either full / constant electricity or intermittent electricity (11 tools each), most tools only worked using batteries (24 tools). See [Figure 14](#) below.

Figure 14. *Type of power used for digital learning tools.*

The majority of the tools surveyed require intermittent connectivity (30 out of 48) to be used and updated. The small number of tools that were available offline (6 tools) have the capacity for students to save content locally for offline usage, but it is uncertain whether they too require connectivity for content updates. One of the surveyed tools available offline is through a low-tech

modality (UNESCO's radio intervention), while other tools are uploaded with content prior to dissemination (tablet interventions by Teach the World Foundation, Idara-e-Taleem-o-Aagahi and SABAQ / Muse, and School-in-a-Box solutions by TAKMIL). See [Figure 15](#) below.

Figure 15. Required internet connectivity for digital learning tools.



2.2. Digital learning initiatives

Of the 48 tools, 10 tools were reported to have been implemented as part of a broader educational intervention. Most of these tools supported in-school learning (9 tools). This section will map how the tools support digital learning initiatives in terms of their scope, reach, and evaluation. This will highlight the extent to which various interventions engage with marginalised students.

Table 3. Digital Learning Initiatives.⁵

Organisation	Name of Intervention	Description of Intervention	Location
Teach the World Foundation	ELAN Triple Play	"ELAN is a simple and scalable e-Learning play, deployable in-school and out-of-school	Punjab Sindh Gilgit-Baltistan

⁵ The information in this table has been obtained from self-reported surveys, in which respondents identified whether their organisation was involved in any digital learning initiatives.

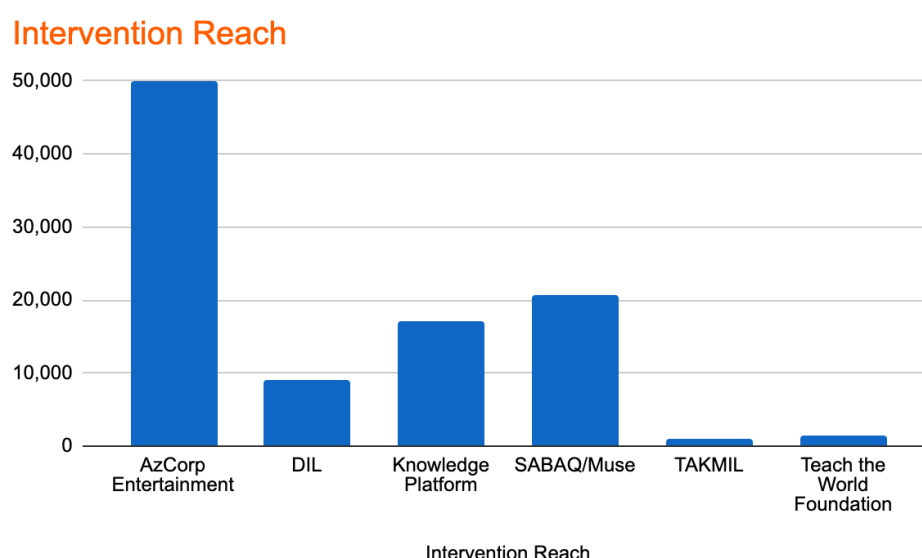
(non-profit)		learning in English, Maths, and a local language. Using award-winning gamified applications on tablets and smartphones, there is no need for reliance on a trained teacher," <i>(Teach the World Foundation, survey respondent).</i>	
AzCorp Entertainment (for-profit)	Mein Hero	"The Mein Hero programme has been integrated with a school-based art curriculum, USAID's school enrichment program, and is now currently being implemented as a part of a girls' education advocacy program," <i>(AzCorp Entertainment, survey respondent).</i>	Sindh
My Inter Academy (for-profit)	TCF Virtual College	"TCF Virtual College is a pilot project to help students learn virtually. Currently, 50 students are enrolled on this programme. TCF has partnered with My Inter Academy for the LMS and content," <i>(My Inter Academy, survey respondent).</i>	Sindh
Adam Smith International	Scripted Lesson Plans	"These are lesson plans designed for Grade 2 teachers," <i>(Adam Smith International, survey respondent).</i>	Khyber Pakhtunkhwa
	Teachers' Induction Programme	"The Teachers Induction Programme is offered to all new teachers in Khyber Pakhtunkhwa and is delivered through a combination of digital training content (provided on an android tablet) and face-to-face training," <i>(Adam Smith International, survey respondent).</i>	Khyber Pakhtunkhwa
Family Educational Services Foundation	Deaf Reach	"Over 20,000 Pakistan Sign Language dictionaries were published and distributed across the country. During the Covid-19 school closures, the students at Deaf Reach were provided content-enabled laptops for learning at home. The content	Nationwide

		was created in house with the support of local partners,” <i>(Family Educational Services Foundation, survey respondent)</i> .	
UNESCO	Radio, My Best Friend	“UNESCO Islamabad launched an Interactive Radio Instruction (IRI) programme in 19 isolated and marginalised districts of Pakistan. The programme was launched in collaboration with the MoFEPT and funding support from the Italian Agency for Development Cooperation,” <i>(UNESCO, survey respondent)</i> .	Nationwide
SABAQ / Muse	Sindh Education and Literacy Department (SELD) App	“SABAQ—in collaboration with SELD—launched the SELD App by MUSE in collaboration with the Sindh Government to provide learning resources to students across Sindh during Covid-19. However, the adoption of the app has been low,” <i>(SABAQ/Muse, survey respondent)</i> .	Sindh
Knowledge Platform	Jazz Smart Schools	“Jazz Smart School programme was implemented in collaboration with Jazz, it impacted 70,000+ girls students in Islamabad, where we observed noticeable improvement in results after our intervention,” <i>(Knowledge Platform, survey respondent)</i> .	Islamabad
TAKMIL	School-in-a-Box for Out-of-School Children in Remote Communities	“This School-in-a-Box is managed by a local community member trained to facilitate the learning environment. Every community adopts the solution as per their needs, giving opportunity to children engaged in the labour force or house chores to study for 3–4 hours daily in morning or evening as per their convenience.” <i>(TAKMIL, survey respondent)</i> .	Balochistan Punjab Khyber Pakhtunkhwa Sindh

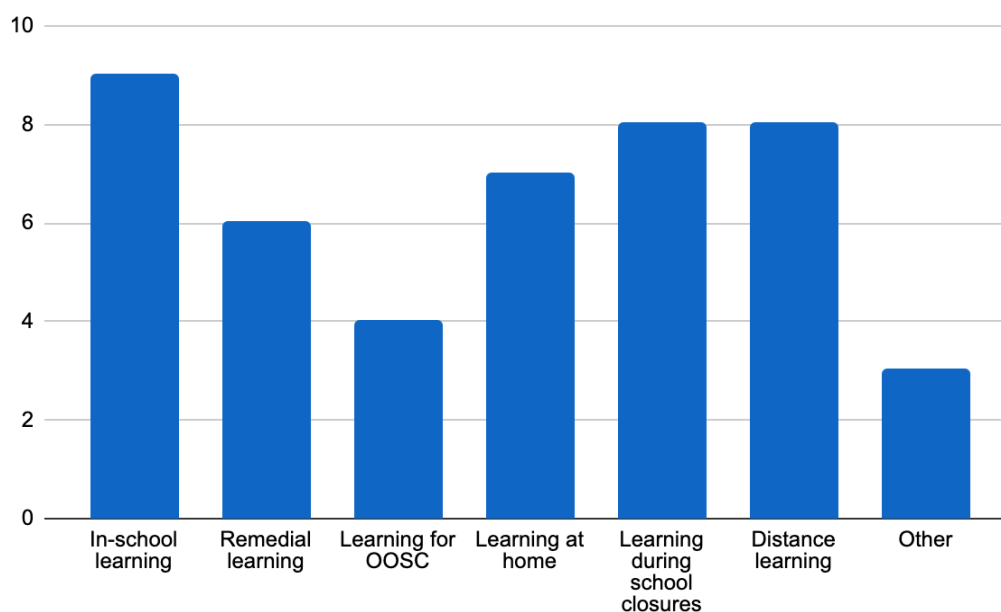
The number of students targeted varies by tool. The intervention with extensive reach (AzCorp Entertainment's *Mein Hero*) targeted students across 50 different schools in Sindh through USAID's school enrichment programme with a printed version of their comics. Although UNESCO's *Radio, My Best Friend* solution is not included in Figure 15, it is expected to have reached over 28 million students.

One of the solutions with a smaller reach, TAKMIL (Figure 16), targets out-of-school children with an accelerated literacy programme through a School-in-a-Box solution.

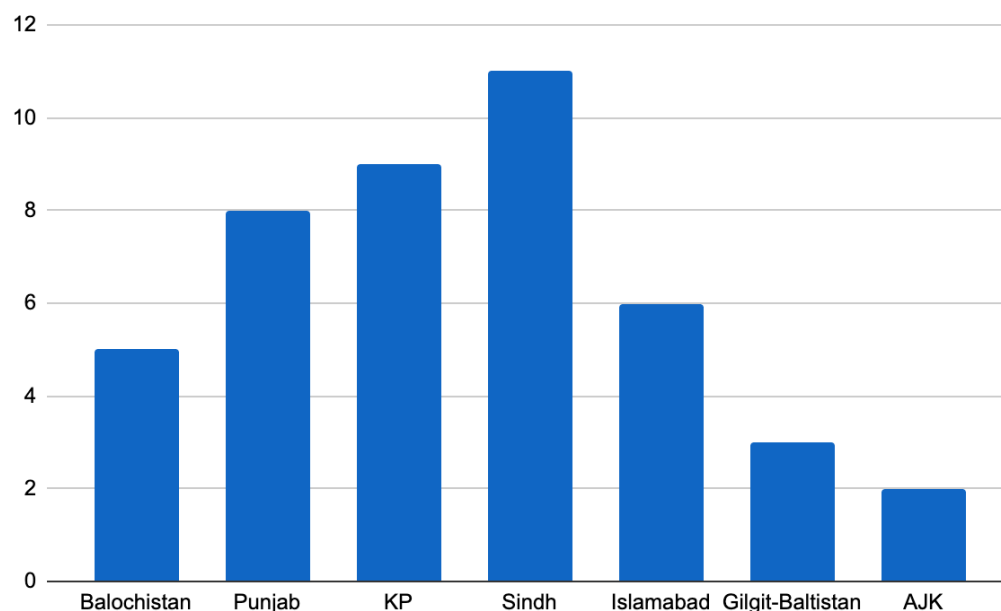
Figure 16. Number of students targeted through select interventions (intervention reach).



Nine of the interventions listed in Table 3 were geared towards supporting in-school learning. Of these, eight interventions were extended to support distance learning during school closures. Learning at home was supported by seven interventions, however, it is unclear whether these interventions were developed as a result of school closures or not. The tools with the primary objectives of in-school learning, learning at home and learning during the school closures required either full connectivity or intermittent connectivity. Out of the ten interventions, four interventions are reported to have reached out-of-school children and they either required partial connectivity or were available offline (TAKMIL). See Figure 17 below.

Figure 17. *Primary purpose of digital learning interventions.*

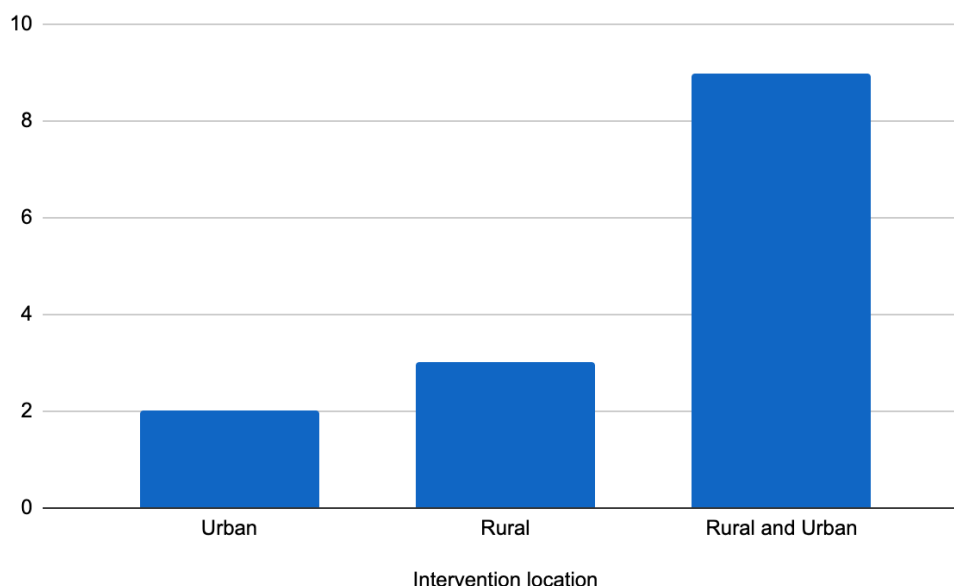
Interventions were variably spread across the country ([Figure 18](#)). Sindh had the most, followed closely by Khyber Pakhtunkhwa and Punjab. Gilgit-Baltistan and Azad Jammu and Kashmir were the most underserved regions.

Figure 18. *Locations of digital learning interventions (province / region).*

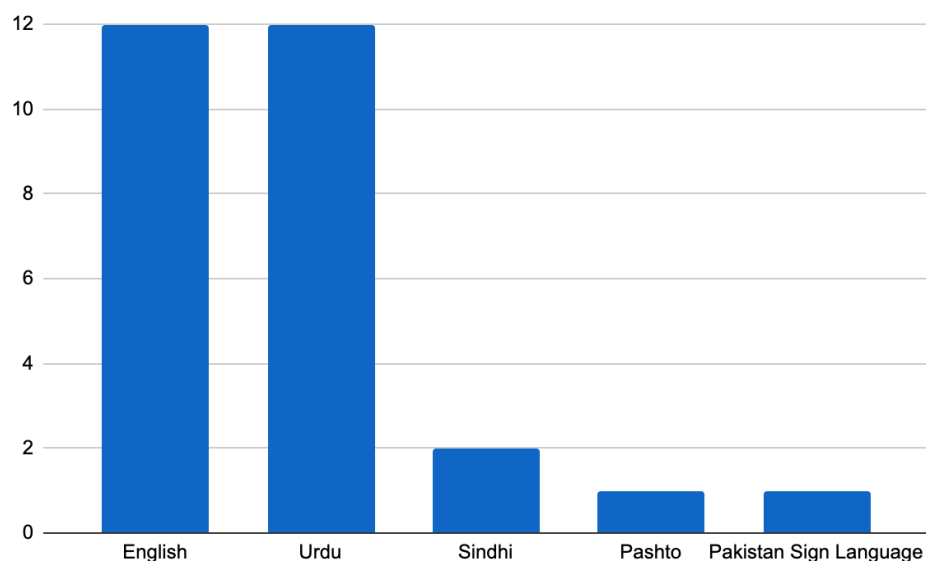
Across the provinces and regions, the interventions targeted both rural and urban localities ([Figure 19](#)). Nine interventions were not designed to be

implemented by locality, and instead, reached students in both urban and rural localities. Meanwhile, three interventions were designed to align with the needs of rural students and two interventions with urban students.

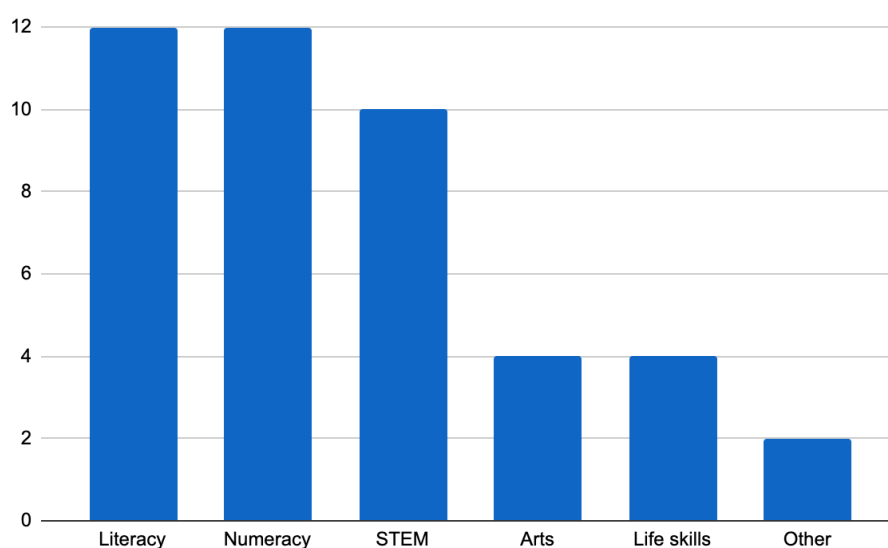
Figure 19. *Type of geographic area of digital learning interventions (urban/rural).*



Although interventions reach many provinces and regions, not all local languages are catered to (Figure 20). The analysis indicated that English and Urdu were the main focus of interventions. Few interventions catered to regional or provincial languages: two interventions catered to Sindhi speakers and one to Pashto speakers. The Pashto intervention focused on training teachers to teach numeracy and literacy skills to early primary students, rather than on promoting student learning. No intervention catered to other linguistic groups like Punjabi, Balochi, and Saraiki, despite Punjabi being the most commonly spoken mother tongue language in Pakistan.

Figure 20. *Language of digital learning interventions.*

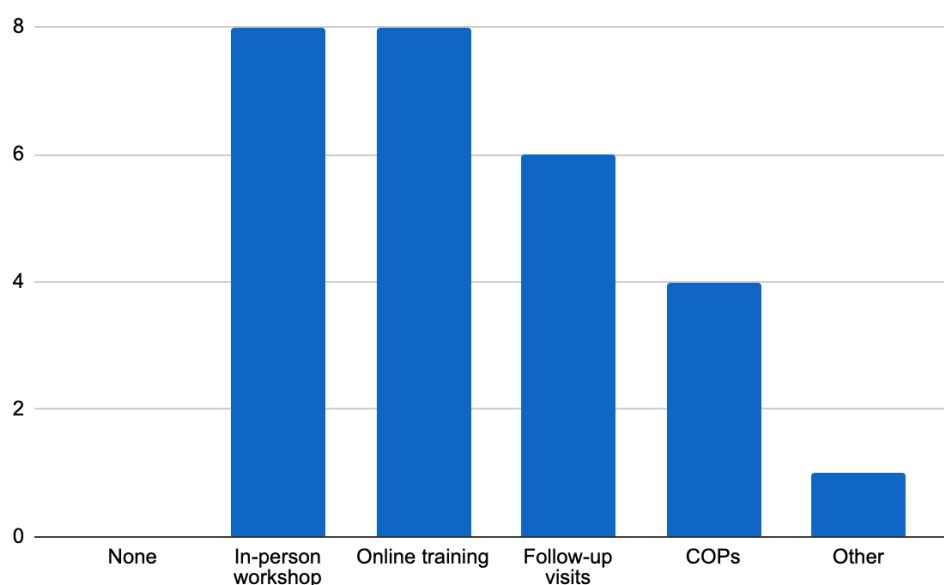
Overall, literacy, numeracy, science, technology, engineering and mathematics (STEM) subjects were commonly focused on in the interventions. Arts and life skills were available in just four interventions ([Figure 21](#)).

Figure 21. *Subject of digital learning interventions.*

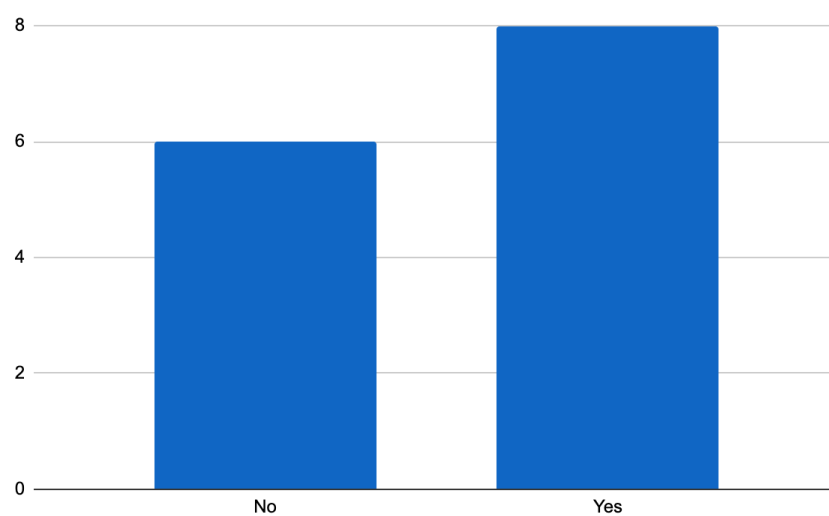
It is reported that the teacher training components of learning solutions are equally likely to be hosted face-to-face as online ([Figure 22](#)). Most interventions include follow-up visits, while some interventions scale up to support networks through learning circles (four interventions) or communities of practices (COPs—four interventions). Learning circles are groups formed between

teachers and students to solve specific issues, while COPs include practitioners discussing and solving common problems.

Figure 22. *Teacher training accompanying digital learning interventions.*



Of the surveyed interventions, eight organisations self-reported their interventions as being evaluated. However, these evaluations appear to be conducted internally, rather than through an external party or standardised mechanism. Some evaluations measured learning gains (Developments in Literacy (DIL), Teach the World Foundation, and Knowledge Platform), while a few surveyed access challenges ([Figure 23](#)). Stakeholder interviews provide more insight into what impact weak or inconsistent evaluation systems have on the EdTech landscape as a whole.

Figure 23. *Were the digital learning interventions evaluated?*

3. Pakistan's EdTech landscape: key challenges and opportunities

Section 3 of this report presents key challenges and opportunities within the EdTech landscape in Pakistan. The section presents an analysis of the data collected from 18 key informant interviews (KIIs) and four focus group discussions (FGDs).⁶ These were carried out with:

1. Parents
2. Teachers
3. EdTech providers
4. Government officials
5. Development partners.

This section also expands upon the survey data outlined in [Section 2](#) as it relates to the challenges / opportunities identified by stakeholders. It is supplemented with secondary literature to support findings and concludes with a summary of all challenges and how they were addressed in the KIIs and FGDs (see [Table 4](#)). The challenges and potential opportunities are summarised through boxes in each section (Figures 24 to 34). In these summaries, responses to each challenge that have already been implemented by stakeholders are marked as 'implemented', while those suggested by stakeholders are identified as 'suggested', for example.

3.1. Poor and unequal infrastructure

3.1.1. Poor infrastructure to support effective learning

In Pakistan, an average of 33% of households have internet access ([↑Government of Pakistan, 2021](#)), indicating that access is a challenge many students will face in using learning solutions. In terms of hardware, over 45% of households own mobile phones (pre-pandemic, approximately 53% own basic phones, 23% feature phones, and 22% smartphones ([↑LIRNE Asia, 2018](#)) and TV ownership is relatively high (63%) in contrast to household ownership of computers (12%) and radios (6%) ([↑Government of Pakistan, 2021](#); [↑National](#)

⁶ An interview guide can be found in [Annex 3](#).

[Institute of Population Studies \(2019\)](#).⁷ This poor infrastructure impacts the methods and modalities that can be used to support effective learning.

In a recent survey performed by T4, over two-thirds of teachers in Pakistan indicated that they were encouraged to use messaging and social media to engage with their students during the Covid-19-related school closures. Approximately three-quarters of teachers used SMS or WhatsApp to send content or information to students ([Pota et al., 2021](#)). This was reflected in the data collected in this research. In the FGD discussions conducted in four schools, teachers indicated they used WhatsApp to send assignments, together with instructions on how to complete them.

The FGDs and KIIS also revealed a mismatch between the technology available to the school and that which the parents or communities possessed, due to the limited availability of basic infrastructure. In one school, for example, teachers indicated that during school closures they developed notes to send to their students via parents through WhatsApp. While 80–90% of teachers had Android phones, the majority of parents did not. In those cases where a household did own a phone, it was mostly either a basic or feature phone. This reinforces the findings of [Wilson et al. \(2022\)](#), who noted that apart from Balochistan and Gilgit-Baltistan, provincial sector plans fail to properly consider how the limitations of basic infrastructure (in particular connectivity and electricity) will impact the way in which EdTech can be deployed.

Many of the tools analysed (21 out of 48) ran on Android, which can signal potential issues of access. In the few cases where parents did own Android phones, this did not guarantee a child's access to them for learning. The FGDs indicated that phones — mainly owned by fathers — were taken to work and largely unavailable for children's learning during the day. In such circumstances, children may have access to the device for a limited time only in the evenings and this is mainly time spent accessing non-educational content (*Taleemabad spokesperson*). Moreover, due to prohibitive data charges, owning a smartphone does not mean being able to access the internet. The most recent Multiple Indicator Cluster Survey (2017) notes that while 82% of the poorest households own a mobile phone, only 4% have access to the internet ([Malik, 2020b](#)). This was again reinforced by the FGDs conducted for this review. Teachers indicated that while in some cases parents bought gadgets to support their children's learning continuity, they were unable to afford the high recurrent costs of buying data bundles. This meant children were unable to attend online classes.

⁷ The most recent figures of national radio and TV ownership were published by the [National Institute of Population Studies \(2019\)](#) in the Pakistan Demographic and Health Survey..

The uneven infrastructural development in Pakistan — together with issues relating to affordability — has meant that for the most hard-to-reach there has been a reliance on no- or low-tech solutions such as television and radio (*Development partner spokesperson*). Many tools appear to support intermittent internet connections (30 out of 48), but few (six tools) are completely available offline. It is important to consider that the tools available offline are high-tech devices (School-in-a-Box and tablets) with pre-uploaded content. Although connectivity challenges have been addressed by most EdTech providers, lack of access is a challenge noted in many stakeholder interviews. These are

3.1.2. Digital divide over multiple criteria

Within Pakistan, inequity in access to EdTech to participate in learning is affected by a number of factors, such as, where a learner is based location-wise, what type of school they attend, and what grade they are in. These factors are well-documented in the wider literature review, and when discussing the digital learning landscape were elaborated on at length by key stakeholders. In particular, interview responses from stakeholders largely focused on the ‘access’ divide. Students from poor or rural households as well as teachers were identified as being ill-equipped to use technology for educational purposes (*Development partner spokesperson*). Despite this, many of the interventions discussed were not designed specifically according to whether they were to be deployed in urban or rural areas ([Figure 19](#)).

Disparity between locations

A number of stakeholders referenced the very different experiences of accessing digital learning solutions depending on geographic location (e.g., between provinces, rural, and urban areas). In spite of this, our survey’s findings show that many interventions target both urban and rural areas, which raises the question: *To what extent should interventions be customised according to location?* As an example, the experience of students accessing the Teleschool programme was vastly different for Khyber Pakhtunkhwa or Karachi compared to the urban areas of Punjab (*Development partner spokespersons*). In Balochistan, the Teleschool programme was similarly found to be inappropriate for a context where the majority of the province is without electricity for up to 20 hours per day (*Government spokesperson*). These findings complement an earlier UNICEF study that found that early in the pandemic, parents from urban areas were less likely to report difficulties in accessing technology for learning, compared to parents in rural areas ([UNICEF, 2021](#)).

Disparity by school type

Another disparity affecting access to remote learning occurs between students attending different types of schools. Technology-based solutions are almost entirely absent from government schools (*EdTech provider spokesperson*). Not only that, but students attending these schools also tend to be from low socio-economic backgrounds and are unlikely to have access to devices needed for learning continuity (*FGD with parents and teachers*). In high-cost private schools, distance learning is facilitated through interfaces such as Zoom or Google Classrooms (*EdTech provider spokesperson*). In low-cost private schools, the lack of devices and technological infrastructure meant a greater reliance on WhatsApp as the main medium through which teachers shared lessons with students during school closures (*EdTech provider spokesperson*).

Disparity between grades

The 'low-hanging fruit' in Pakistan's EdTech landscape, according to several stakeholders interviewed for this study, appears to be at the higher grades of the education system. The majority of EdTech interventions that follow a for-profit model are currently targeting students from Grades 9–12 as this is where the market is most lucrative (*EdTech provider spokesperson*). The reason for this is the greater demand parents place on interventions that have a direct output of improved results relating to high-stake examinations. The clearer outcomes also make these a comparatively more appealing market for EdTech providers compared to lower grades (*EdTech provider spokesperson*). Although stakeholders echo the sentiment that early grades were not effectively catered to, our survey indicates that 79% of the tools offer learning solutions for primary school compared with secondary (38%) and higher secondary (29%) respectively. However, although solutions may cater to primary school students, they could enhance their design to more effectively cater to young students.

Even when it comes to publicly-supported digital learning solutions, interventions often fail to prioritise the very early grades. As far as Teleschool was concerned, for instance, one donor indicated that the early grades were neglected in its roll-out, which resulted in sparse content being available to young students (*Development partner spokesperson*). Parental and teacher feedback supported this, indicating that the lack of interactive, colourful content minimised interest among children in the Teleschool programme (*FGD with parents and teachers*). This is somewhat supported by a Gallup poll that was conducted asking parents how satisfied they were with Teleschool.

Aside from neglect in the EdTech landscape, compared to older students, students in younger grades also needed much more parental support and supervision in the use of devices, (FGD with parents and teachers). During school closures, this presented a huge challenge for households where caregivers were not sufficiently digitally literate to be able to support younger students. One stakeholder went so far as to indicate that technology for younger children (pre Grade 9) was “useless” as they do not have the skills to make good use of it for their learning (FGD with parents and teachers). The challenges experienced by households with multiple children of school-going age and limited devices meant older siblings had more access to devices (FGD with parents and teachers).

Disparity between gender

Several stakeholders discussed gender inequity in the digital landscape in Pakistan. Currently, access “is heavily focused in favour of the boy” (EdTech provider spokesperson). This aligns with findings by the [Malala Fund \(2020\)](#), which concluded that girls in Pakistan had less time available to study using digital devices compared to boys. Our interviews also concluded that girls’ access to technology decreased due to parents being much stricter about girls’ device use (Development provider spokesperson). The FGD discussions verified this, with parents raising fears about the content their children (in particular girls) could access through digital devices.

The compounding impact of multiple metrics of disadvantage is particularly acute in relation to access to digital learning. For example, girls’ exclusion from regular access to technology was particularly acute for those from the poorest households in rural areas ([Malik, 2020a](#)). Similarly, interviews with stakeholders illustrated the very different experiences of girls in being able to access technology depending on which province they lived in. An example from the rollout of a radio programme illustrates this disparity. Bringing girls from different households into one house to listen to programmes was identified as a barrier in the Kohistan district (in Khyber Pakhtunkhwa province). This barrier was absent in Kashmir or Gilgit-Baltistan, however, and girls could congregate in one household to listen to the programme (*Development partner spokesperson*). These differences in context are important, therefore, in the design of any intervention.

Figure 24. How do existing tools and implemented interventions address infrastructural challenges?

How do existing tools and interventions address infrastructural challenges?

- **Implemented: Adopt low-tech approaches.** Remote areas can be reached through educational radio and television programming. For example, in our survey, UNESCO mentioned reaching over 28 million students across Pakistan over the radio. While using local cable operators or private radio channels has the potential to reach all communities — including the remotest — at minimal cost, TV and radio ownership in Pakistan is limited and access is reduced further by infrastructural challenges.
- **Implemented: Use more accessible technology.** WonderTree previously required additional hardware to be purchased to use their software. As laptops became more advanced, they were able to adapt their app to be used with basic laptop cameras, greatly reducing costs for users.
- **Implemented: Offer all-in-one (offline) solutions.** To reach out-of-school children in remote areas, TAKMIL adopted an end-to-end community-based approach. This included not only offline content, but facilitator training and solar-powered hardware as well.

3.2. The focus of the digital learning landscape is narrow

The twin issues of high numbers of out-of-school children and a lack of foundational learning while in school are two areas that stakeholders frequently identified in interviews as the main challenges facing Pakistan's education system.⁸ These are areas that digital learning solutions could potentially address. However, interviews with stakeholders showed these to be

⁸ These are two challenges which currently define the education system in Pakistan and for the purpose of Section 3.2 have been presented separately. However, it is worth noting their interconnectedness. As learning data — which has been made more transparent over the last decade — illustrates the crisis of quality in the schooling system, parents may question its benefit. This may be especially true for marginalised households for whom sending a child to school already represents a high opportunity cost.

relatively neglected areas to date. Findings in our survey reflect that only 2 out of 48 tools target out-of-school children. Additionally, 6 out of 48 tools focused on literacy and numeracy, while 8 out of 48 tools focused on exam preparation.

3.2.1. Lack of focus on foundational skills

The aforementioned survey found that 44% of EdTech tools can be used in early childhood education. This finding is of interest, as research has shown that the education of children in early childhood education requires a focus on learning through play, social interaction, fine motor skills development, and other skills and abilities that are not as easily facilitated through technology. Interestingly, in contrast to the findings of the survey, insights from the FGDs suggest the survey overestimates the uptake of tools in early childhood education.

Interestingly, given the low levels of achievement in foundational literacy and numeracy in Pakistan, stakeholders interviewed discussed how digital tools need to focus more explicitly on developing basic literacy and numeracy. This is because many digital solutions focus on examination and college preparation. Even for the solutions that target younger grades, there is a heavy focus on examination preparation. This is driven by private firms identifying this space as a potentially lucrative market (EdTech provider spokespersons).

While venture capital is relatively limited in the context of Pakistan, the experience of neighbouring India shows that venture capital in the digital learning market is targeted towards test preparation and online certification. [Agarwal \(2020\)](#) found that 88% of the USD two-billion market was invested in these areas. Investment in those parts of the education system which focus on foundational grades in Pakistan, on the other hand, is less well-established and makes up only a small part of the market (EdTech provider spokesperson).

3.2.2. Lack of focus on out-of-school children

Another gap identified in the interview responses is in non-formal education (*Development Partner, EdTech provider spokespersons*). Specifically, when it comes to the 22.8 million children who are estimated to be out of school, stakeholders indicate this market is not financially viable for many EdTech providers (*Development Partner, EdTech provider spokespersons*). Based on the aforementioned survey, 15% of interventions and only 4% of tools target out-of-school children.

Figure 25. *How do existing tools and interventions address the market focus challenge?*

How is the challenge of the EdTech solution's market focus being addressed?

- **Implemented: Fast track curriculum for out-of-school children.** Of the tools that target out-of-school children, most have been implemented in non-formal settings and their content can be used offline or with intermittent connectivity. For example, TAKMIL has customised a fast-track curriculum that teaches foundational skills in one year, while Knowledge Platform is currently preparing a non-formal curriculum with storylines about working children with support of Japan International Cooperation Agency (JICA) and approved by the Government of Sindh's School Education and Literacy Department. Both interventions have assessment components as well; however, there is no systematic evidence available to make conclusions about their effectiveness.

Additionally, of the digital learning solutions that do exist, many fail to adequately meet the needs and aspirations of out-of-school children. Few EdTech programmes in Pakistan, for example, currently focus on developing technical skills that could help with generating additional income. Such programmes could not only meet the demands of this particular subset of students but also engage them more in EdTech programmes (*EdTech provider spokesperson*), see [Figure 26](#) below.

Figure 26. *What models can help address the market focus challenge?***How is the market focus challenge being addressed?**

- **Implemented: “Future customer” model.** Providing free learning material and software to younger students, in the anticipation that they will be future customers. The students will, supposedly, be accustomed to their content and software, and will be more likely to purchase it when older. This can be leveraged as a market-driven incentive to target demographics that typically have less purchasing power. (*Author’s personal communication with several EdTech providers.*)
- **Reportedly unsuccessful: low price point for education of out-of-school children.** An EdTech provider developed a low-cost (USD 0.30 per learner per month), tech-supported education offering for out-of-school children. This low price point, however, was not enough to incentivise families. As a result, the programme was not financially sustainable.

3.3. Governance of the sector is not well-integrated between different entities

The governance of EdTech systems is often disjointed and EdTech providers are at risk of duplicating efforts ([↑Unwin et al., 2020a](#)). Interviews conducted for this study identified a similar problem of fragmented EdTech governance including lack of coordination between ministries at the national level.

Specifically, in Pakistan, in 2018, the Ministry of Information Technology and Telecommunications (MoITT) and the Government of Pakistan formulated the *Digital Pakistan Policy* in response to the country's rising digital technology demands and growth ([↑MoITT, 2018](#)). This policy forms the basis of numerous initiatives supported by the MoITT. Although the MoITT is currently mandated to provide e-governance services to all federal government ministries and departments (*Government spokesperson*), the MoITT developed a learning management plan and EdTech strategy during the Covid-19 pandemic which would have benefitted from input from the Ministry of Education.

Plans like these “being prepared or drafted in isolation are going to hurt Pakistan in the longer term” (*Government spokesperson*). Emergency responses to the pandemic highlighted these challenges. The practical experience of the roll-out of the Teleschool (Federal Government) and Taleem

Ghar (Punjab Government) programmes exposed many coordination challenges and poor cross-sectoral engagement plans. This was partly due to the number of government departments involved in their roll-out and was further impacted by a lack of a framework for engagement with for-profit EdTech providers ([↑Zacharia, 2020](#)).

Pakistan's highly decentralised structure of governance means that many decisions relating to education are made at the provincial and regional levels. This results in a separate planning process in each province, with different timelines and approaches ([↑HRW, 2018](#)). [↑Wilson et al. \(2022\)](#) identified the very different stages of development of EdTech policy and implementation by province, thereby suggesting how certain provinces could potentially be at risk of falling behind. [↑Zubairi et al. \(2021a\)](#) also raise the variability in the capacity provinces have in policy planning. Within provinces, the cohesive approach needed for an effective EdTech ecosystem is currently weak and not formalised.

However, interviews with provincial government officials suggest some level of collaboration. There are examples of where the provincial IT boards and the provincial department for education have worked together well. For example, in Khyber Pakhtunkhwa and Punjab, the IT board and the departments for education have worked together to incorporate ICT into schools. Similarly, in Khyber Pakhtunkhwa, the IT board assisted both the elementary and secondary education departments to launch a tech-based literacy initiative for early grades (*Government spokesperson*). However, the general consensus is that, like at the national level, provincial IT boards and departments of education need to integrate their approaches as collaboration is weak. Efforts made towards training stakeholders could potentially enhance the collaborative effort across the landscape.

Figure 27. How are governance and coordination challenges being addressed by stakeholders (Ministry of Federal Education & Professional Training, 2021)?

How is the governance challenge being addressed?

- **Implemented:** The MoFEPT has established a Distance Learning Wing within the ministry with the aim of supporting and guiding distance learning across Pakistan. The wing will play a coordinating role for distance and blended learning within government (provincial, federal and cross-ministerial) as well as across organisations (private sector, academia and NGOs) to achieve Pakistan's vision for distance and blended learning.

3.4. Financing landscape for digital learning solutions is unpredictable

To date, the financing landscape for digital learning has been dominated by resources from development partners. Among the largest donors to this sub-sector of education are the Foreign, Commonwealth and Development office of the UK (FCDO), the German Agency for International Cooperation (GIZ), USAID, and the World Bank ([↑Baloch & Taddese, 2020](#)). Donor investment has, according to one stakeholder, largely focused on small-scale learning solutions to understand what works and what can be scaled up. However, the impact of these solutions has been limited for a number of reasons, one of which includes the poor funding sources available for government schools (EdTech provider spokesperson).

Public funds from the government have, on the other hand, been unpredictable and are characterised by an absence of continuity. This is reflected in how, currently, there is no separate budget line that is specifically dedicated to EdTech (*EdTech provider spokesperson*). A number of stakeholders discussed the unpredictable nature of domestic public funding to EdTech citing the example of the Teleschool initiative (*Development Partner, EdTech provider spokespersons*). With content for the initiative being provided by private entities, the Teleschool rollout was initially funded by the World Bank. Despite it being an example of a programme that is relatively easy to scale ([↑World Bank, 2021](#)) and one that has use beyond Covid-19, the over-reliance on donor funding combined with doubts around government funding cast doubt over its continuation (*EdTech provider spokesperson*).

For-profit funding models

The use of “home” versus “school” models for the design of digital learning solutions — and the consequences related to public and / or private funding — were discussed extensively by EdTech providers. These were discussed mainly in relation to the challenges of moving to a business to customer (B2C) model.

The first problem was the suitability of the B2C model when working in underprivileged areas. For example, one EdTech provider currently operating on a business to business (B2B model) and working directly with schools, indicated that during the Covid-19 pandemic, moving to a B2C model was challenging due to the incompatibility of outdated technology available to parents with their learning solution. A B2B model — unlike a B2C model — means that the cost involved in investing in more updated technology can be shared between a number of students, thereby reducing the unit cost (*EdTech provider spokesperson*). This was corroborated by another EdTech provider following a not-for-profit model that changed its model to drive down the unit costs (*EdTech provider spokesperson*). A second challenge identified with shifting to a B2C model during the Covid-19 pandemic was the experience of providing technical support directly to parents rather than to schools. Parents’ capacity to follow instructions was more limited than that of teachers. This inhibited the company from being able to shift to a B2C model (*EdTech provider spokesperson*). A third challenge was parental inability or unwillingness to pay for solutions. One EdTech provider which has made the shift to B2C models indicated this made more sustainable streams of financing difficult (*EdTech provider spokesperson*).

Similar challenges beset B2B models for providers adopting a for-profit model. This is especially true if they aim to support students from underprivileged areas. WonderTree, who works in such contexts, signalled that schools’ inability to pay meant WonderTree had to greatly reduce their costs to accommodate schools’ finances (*EdTech provider spokesperson*). Similarly, SABAQ / Muse indicated that while some schools are paying the full cost of the intervention, most schools are given discounts up to 90% (*EdTech provider spokesperson*).

Figure 28. *How is the challenge of financing digital solutions being addressed and what can be done further (interviews with EdTech providers)?*

How is the challenge of financing digital learning solutions being addressed? What can be done further?

- **Implemented: Cross-subsidisation.** Several EdTech providers are able to provide services to more marginalised groups by cross-subsidising. This can be through charging different amounts to different customers, such as low-fee vs. high-fee private schools, or having international vs. local rates. It can also be through providing separate services entirely, such as an EdTech company that provides augmented reality learning material offering its services to develop AR marketing material for private companies.
- **Suggested by Interviewees: Tax deductions.** One other suggested solution is incentivising private schools to invest in EdTech by offering them tax incentives if they purchase services from a pre-approved list of EdTech vendors. This would theoretically stimulate the EdTech market and allow it to scale, particularly in the low-fee private school market, while pushing private schools to invest more in the quality of their offering. This approach has reportedly been implemented in other sectors in Pakistan.

3.5. Digital learning solutions are not transitioning from pilots to scale

Designing for scale is one of the principles espoused by the digital principles for development ([↑Digital Principles, N.D.](#)). As part of this, digital design needs to look beyond piloting and make choices regarding affordability and usability, which allow it to be scaled to a larger set of users. In Pakistan, the DfID-funded (now FCDO) Pakistan Innovation Fund — known as the IIm Ideas-2 project (2015–2019) — intended to scale up promising interventions. However, this has had mixed success as far as digital learning solutions are concerned.

Designing for scale is dependent on multiple factors including:

1. Government support for infrastructure
2. Public and private investment for infrastructure
3. Evaluation of EdTech effectiveness
4. A strong focus on capacity building ([↑Bapna et al., 2021](#)).

The EdTech landscape in Pakistan continues to be defined by small-scale programmes which do not have the capacity to be taken to scale (*Development partner spokesperson*). This is unlike neighbouring India which has, to a degree, achieved the scale needed to reach more students with digital learning solutions (*Development Partner, EdTech provider spokespersons*). Part of the reason for this has been that India already has infrastructure in place to produce its own devices, unlike Pakistan which relies on imports (*Development partner spokesperson*). This stems from the comparatively lower wages in Pakistan's neighbouring countries, high duties on parts, and the absence of a framework for domestic manufacturing ([↑GSMA, 2020](#)). As an example, QMobile is the only Pakistani company in the top ten largest mobile handset vendors in the country; however, its phones are made in China ([ibid](#)).

The lack of reliable learner data also contributes to the problem of scaling. For example, the current estimate of 22.8 million out-of-school children was mentioned as inaccurate by several stakeholders even before the Covid-19 pandemic. Imperfect information requires investments of time, effort, and resources to more accurately understand the context and identify areas where digital solutions should be targeted (*EdTech provider spokesperson*). Added to this, evaluations of 'what works' when it comes to EdTech are lacking. This is particularly the case when it comes to assessing the impact of interventions on heterogeneous populations ([↑Zubairi et al., 2021a](#)). This was also corroborated by the survey findings where only 62% of the interventions that implemented the tools reported having conducted an evaluation.

Elsewhere, solutions have not been scaled due to a lack of connection between EdTech providers and government agencies. The public sector accounts for the largest share of the EdTech market, yet the market has challenges in working with public procurement processes, as a result of opaque procurement processes, a lack of clarity in the published tenders, and periods between publication of the tender and submission of the proposal that are too short.

Figure 29. *How is the challenge of scaling up EdTech solutions being addressed and what can be done further (interviews with EdTech providers)?*

How is the challenge of scaling up EdTech solutions being addressed? What can be done further?

- **Suggested by interviewees: Tax deductions.** As mentioned above, the suggested solution to incentivising private schools to invest in EdTech is through offering tax incentives if they purchase services

from a pre-approved list of EdTech vendors. Stimulating a previously less-accessible market to EdTech providers would also allow them to scale in the private school market. Reportedly, this market, especially low-fee private schools, was not incentivised to invest in EdTech, for reasons including lack of competition.

- **Planned: Cross-Sectoral Partnerships.** EdTech providers mentioned a lack of partnerships between the Government and the private sector as a challenge to scalability. In one interview, an EdTech provider mentioned that partnerships are emerging in the Federal government and that there are plans in place to develop more. These are perceived to be required to allow pilots to cascade into larger school systems.

3.6. Weak monitoring of student access to and learning with digital learning solutions

In Pakistan, monitoring access to distance learning initiatives is a challenge (Development Partner, EdTech provider spokespersons). For example, for the Teleschool programme, it is difficult to determine whether recorded viewers are parents or children (*Development partner spokesperson*). This compounds the aforementioned lack of learner-related data.

Another weakness is monitoring impacts on learning outcomes (*Development partner spokesperson*). This is particularly the case for programmes like Teleschool and Taleem Ghar, where the one-way communication makes it challenging to assess learning ([↑Zacharia, 2020](#)). This means that little is known about the efficacy of interventions (*EdTech provider spokespersons*).⁹ The lack of clarity around what works and, crucially, what is cost-effective, hinders scaling ([↑Bapna et al., 2021](#)). This is particularly problematic for offline digital learning solutions, which are common in Pakistan due to a lack of internet. One EdTech provider, for example, indicated how in rural areas digital learning solutions are unable to track individual learner progress. Tracking learner progress would require that the learner is able to access interactive content, that they use it, and that the software supports tracking progress, all of which require internet connectivity (*EdTech provider spokesperson*).

⁹ The majority of stakeholders interviewed for this study supported how this was a challenge defining landscape. One EdTech provider, working in a rural context, indicated, however, that they have been able to capture data pre- and post-assessment using offline mode. However, they are unable to monitor children's progress over time.

One positive example of monitoring distance education in Pakistan comes from Teach for Pakistan. During the Covid-19 pandemic, Teach for Pakistan used local networks (e.g., mosques or shops) to gather information on 1,800 of their 2,500 students. Subsequent to this they found that 60% of students could be contacted through their parents, neighbours, or other community members' phones ([↑Kaye et al., 2020](#)). The Teleschool programme aimed to use text messaging to assess student learning in the short-term ([↑Zacharia, 2020](#)).

Figure 30. *How is the weak monitoring of digital learning solutions being addressed (interviews with EdTech providers)?*

How is the weak monitoring of digital learning solutions being addressed?

- **Implemented: Asynchronous data collection.** Offline solutions can still transmit data asynchronously when the device finds an internet connection, or when the data is physically gathered on-site. Broadcast media can also be supplemented with the use of mobile phones/ SMS (or even paper-based materials) to collect data on student engagement and learning.
- **Implemented: Collect data through local networks.** Local networks in community centres have been used to gather information on students ([↑Kaye et al., 2020](#)).

3.7. Capacity of teachers and parents in using technology is poor

A study by [↑Beg et al. \(2019\)](#) suggests that providing teachers with technology has the potential to generate a greater positive effect on learning outcomes than providing students with the same tools. However, EdTech providers interviewed for this study identified that teachers were not eager to use digital tools in their pedagogical approaches (*EdTech provider spokespersons*).

In Pakistan, teacher resistance to using technology, and hence changing their way of working, seems to stem from a lack of teacher familiarity with technology, especially among older teachers ([↑Arif & Riasat, 2019](#); [↑Zubairi et al., 2021a](#)). In the case of Balochistan, for example, prior to the pandemic, few teachers had used email (*Government spokesperson*). Resistance to the use of technology was mainly concentrated among older teachers who had no prior experience using technology (*FGD with parents and teachers*).

The large number of schools without access to digital equipment exacerbates the problem. For example, 25% of teachers participating in the global T4 teacher survey reported that they had to bring their own devices into school ([↑Pota et al., 2021](#)). What is more, while more ICT teachers are being recruited into the system, these schools do not have the necessary infrastructure to support these posts (*Government spokesperson*). One ICT teacher indicated that the absence of a computer lab at his school meant that he taught “Microsoft Word, PowerPoint and everything for computers [by] drawing the shapes on the board” (*FGD with parents and teachers*). Beyond inexperience in the use of technology, perceptions that increased reliance on technology were somehow indicative that they were not fulfilling their responsibilities also increased teacher resistance to technology (*EdTech provider spokesperson*).

Parental engagement in a child’s learning can have a marked impact on outcomes, especially among the poorest children. In Punjab, 29% of 7–14-year-olds from the poorest households who had someone read to them managed to attain foundational literacy skills. This was compared to 15% who had no one read to them ([↑Brossard et al., 2020](#)). While Covid-19 has resulted in a fundamental shift in how parents are expected to support learning, the low formal educational attainment and skills of parents in the most marginalised contexts has often been at odds with the expectation that they can help deliver educational content ([↑Unwin et al., 2020b](#)).

The FGDs with parents and teachers reflected this challenge, relating this specifically to the poor digital skills of mothers. One teacher — also a parent — indicated how even as an educated mother, she encountered challenges as a first-time user of technological interfaces such as Zoom due to her limited skills. Beyond the skills of parents, the low levels of mothers’ engagement with their children’s education using digital devices were also attributed to the time intensity involved. Supervision of children using technology and being on-hand to provide advice was brought up as a challenge, especially in households with more than one school-aged child (*FGD discussions*).

Figure 31. *How is the challenge of teaching the capacity challenge addressed (interviews with EdTech providers)?*

How is the capacity challenge (of teachers’ and parents’ using technology) being addressed?

- **Implemented: Designing with teachers/facilitators.** One EdTech provider reported adapting the design of the programme for each new school/area they work in. This is done by approaching the

facilitator / teacher as a design partner rather than just a user in each new context.

3.8. Parents are concerned about the use of digital learning solutions

Parental perceptions of how technology is used for educational purposes were surprisingly negative (*FGD with parents and teachers*). Parents recalled having to supervise students engaging in the Teleschool programme — which they did not always have time to do — or students would switch to other channels. They also expressed their reluctance to let their children use their Android phones for fear that children would misuse them. Rather than see it as a tool that can support learning, giving children access to phones was perceived by parents as indulging them. Technology was seen as a mechanism through which children would access entertainment, rather than educational content. This reflects parental perceptions outside of the Pakistani context. For example in Kenya, the negative perceptions of the influence of technology made parents reluctant to allow for their use for educational purposes ([†Tembey et al., 2021](#)).

Parents also referenced the incompatibility of technology with religious beliefs as a reason for refusing to allow children to access technology. This was largely related to smartphones and television. In relation to Teleschool, for example, one parent indicated how they did not allow their child access to the television given its negative influence on children's morals (*FGD with parents and teachers*). One donor discussed the more widespread acceptance of radio in these more conservative contexts (*Development partner spokesperson*). Therefore, the general acceptance of technology within these contexts must be considered and access issues to the radio should be addressed.

Besides worries about misuse of technology, parents also expressed fear that the educational content provided may not be suitable, or else children would somehow access content outside of these platforms that ended up being harmful. Development partners indicated that currently, the vetting and regulation of content being produced by EdTech providers is weak, which does little to allay parents' fears (*Development partner spokesperson*). Specifically, access to digital technologies within education systems is one of the main ways in which children become exploited or abused ([†Unwin et al., 2020e](#)). Globally, parental concerns over safety have been one of the reasons why girls,

in particular, have limited access to educational content through digital devices ([†Allier-Gagneur & Moss Coflan, 2020](#)).

Figure 32. *How can the challenge of parental concerns be addressed?*

How can parental concerns be addressed?

Raising parents' awareness through advocacy. Although parents did not mention a solution to this challenge, [†Allier-Gagneur & Moss Coflan \(2020\)](#) suggest that raising parents' awareness around the benefits of educational resources could help tackle parental concerns that prevent children, and in particular girls, from accessing digital content.

Alternative modalities. Considering that some parents are apprehensive about exposing their children to content from the TV, one donor discussed how more widespread acceptance of radio in more conservative contexts could overcome this challenge (*Development partner spokesperson*).

Safety training. Parents, teachers, and students alike must be trained to understand online safety in order to be better equipped to identify and deal with any potential harms resulting from digital usage.

3.9. Content provision fails to meet the needs of the child or align with the curriculum

Pakistan's education system implements three curricula in parallel for public, private, and madrassa schools ([†Baloch & Taddese, 2020](#)). A challenge characterising the EdTech landscape in Pakistan is that many start-ups, or those which are in their pilot phase, fail to engage with the national curriculum when designing or testing their intervention. One government official from Balochistan, for example, indicated that there is no centralised or external vetting of materials and content provided by EdTech providers (*Government spokesperson*).

Even in circumstances where digital learning solutions do align themselves to the curriculum, they may face resistance from principals, teachers, or parents. This may be due to perceived misalignment with the curriculum, which then creates “more work” for these users. The SABAQ application, for example, aligns with the national curriculum. But when students and parents open the app they do not see the alignment with the textbooks the school is using or the homework set. Similarly, at the school level, the application was seen as “adding” to teachers' workload rather than complementing it (*Government*

Girls High School Kinnaird). Because the app did not “word-for-word” in following the syllabus — which the principal ultimately was worried about finishing — there was more resistance from teachers to its use.

Developing contextually appropriate, curriculum-aligned content is also a challenge, especially when it comes to customising content to the context of the learner, including their location, and the type of school they attend. This is complex and expensive to do. Language was an added challenge that stakeholders identified. In a multi-ethnic and multilingual society like Pakistan, imposing the dominant language through the education system can be a source of grievance which links to the wider issue of social and cultural inequality ([UNESCO, 2016](#)). Open Educational Resources (OER), which some EdTech providers rely on, do not address these challenges. In Pakistan, few if any OER that are designed to align with the curriculum are available in regional languages spoken in Khyber Pakhtunkhwa or Balochistan, maintaining the language barrier for children who access digital content (*EdTech provider and Government spokespersons*).

Some of the EdTech providers interviewed discussed how important parental (and learner perceptions) were in designing an intervention that aligns with their needs. For out-of-school children, for example, a skill-oriented design that is directly relevant and beneficial to the child’s or parent’s main source of income may be more positively received compared to one that focuses on content taught in schools (*EdTech provider spokespersons*).

Figure 33. *How was the content provision challenge addressed?*

How is the content provision challenge being addressed?

- **Implemented: Targeting school networks.** By targeting large school networks and pursuing a B2B model, EdTech companies can justify the expense of aligning their material to a specific curriculum. This is because this alignment will immediately result in a large contract, often reaching tens of thousands of students.

3.10. Users are not aware of digital learning options

Programmes to support Pakistani children to learn at home included Teleschool, education.pk, education radio, Punjab’s Taleem Ghar and Sindh’s Digital Learning Platform ([Tabassum et al., 2020](#)). A number of communication campaigns helped give visibility to these programmes. These included announcements through the local mosque, social media, and

newspaper advertising and ensuring that the links to the lessons and broadcast schedule could be found in one place ([↑World Bank, 2021](#)).

However, a number of teachers and parents interviewed across the four schools included in this study were not aware of the available resources. One teacher indicated this was likely to be different for parents living in urban areas, who were generally more educated than those living in rural areas. Rural parents were both more likely to be unaware of these interventions or, where they are aware, they are more likely to be unaware of the scheduling of these interventions (*FGD with parents and teachers*). Taleem Ghar's scheduling, for example, was available online ([↑Taleem Ghar, no date](#)).

Figure 34. *How was the awareness challenge addressed?*

How can the awareness challenge be addressed?

- **Suggested by interviewees: Single online repository.** Some focus group discussion participants suggested having a single government-curated repository for all the digital learning initiatives that are endorsed by the government.

3.11. Section summary

Table 4. Summary of key challenges related to Pakistan's EdTech Landscape.

Legend: Implemented; Planned; Suggested by interviewees; Reportedly unsuccessful

Challenge	Summary	How is / was this challenge being addressed?
3.1 Poor and unequal infrastructure	<ul style="list-style-type: none"> ■ Poor digital infrastructure to support effective learning. ■ Digital divide across multiple criteria, including gender, location, grades, and schools. 	<ul style="list-style-type: none"> ■ Low-tech approaches ■ Adapting to more accessible technology ■ All-in-one (offline) offering / "School-in-a-box" ■ All-in-one device financing
3.2 The focus of the digital learning landscape is narrow	<ul style="list-style-type: none"> ■ Focus on the test preparation market over foundational skills. ■ Lack of focus on out-of-school children. 	<ul style="list-style-type: none"> ■ "Future customer" model —providing a free offering for younger students in the hopes they become paying customers when they're older ■ Low price point for OOSC education

3.3 Governance of the sector is not well-integrated between different entities

- Coordination challenges across government, including provincial, federal, and cross-ministerial.

- [Establishing the MoFEPT Distance Learning Wing](#)

3.4 Financing landscape for digital learning solutions is unpredictable

- Public financing is scarce, often limited to pilots and provided by donors.
- Purchasing power of marginalised groups is often low, making commercial sustainability difficult.
- Venture capital and for-profit models threaten to leave the most vulnerable behind.

- [Cross subsidisation](#)
- [Tax deductions](#)

3.5 Digital learning solutions are not transitioning from pilots to scale

- Pakistan's EdTech landscape is populated with small-scale pilots that fail to scale.
- Lack of infrastructure, investment, evidence of impact and information on students all pose obstacles to scale.

- [Tax deductions.](#)
- [Cross-sectoral partnerships](#)

3.6 Weak monitoring of student's access to and learning with digital learning solutions

- Monitoring and evaluating access and learning is difficult, especially in distance and offline learning contexts.

- [Asynchronous data collection](#)

3.7 Capacity of teachers and parents in using technology is poor

- Resistance from parents and teachers often poses obstacles to adoption.

- [Designing with teachers / facilitators](#)

	<ul style="list-style-type: none">■ This resistance often stems from a lack of capacity, time and/or infrastructure.	
3.8 Parents are concerned about the use of digital learning solutions	<ul style="list-style-type: none">■ Parental preconceptions around the role of technology for education are often negative.■ Conflicting religious and cultural beliefs, perceptions of the value of education and fears about children's misuse and safety of technology all impact adoption.	<ul style="list-style-type: none">■ Raising parental awareness■ Alternative modalities (radio)
3.9 Content provision fails to meet the needs of the child or align with the curriculum	<ul style="list-style-type: none">■ Having several parallel curricula in Pakistan makes it difficult for EdTech providers to align content and appeal to all students / schools, and may also form a barrier to scale.■ The belief that material must match the syllabus "word-for-word" prevents the adoption of supplementary learning material.	<ul style="list-style-type: none">■ Targeting school networks
3.10 Users are not aware of digital learning options	<ul style="list-style-type: none">■ Teachers and parents are unaware of the digital learning options that exist, despite communication campaigns.	<ul style="list-style-type: none">■ Single online repository

4. Student profiles

Section 2 and Section 3 highlighted challenges related to Pakistan's digital learning ecosystem. An underlying theme here was how the system is deeply unequal. While actors are working to address the challenges of access and learning, in some cases, interventions actively disadvantage marginalised children.

In Section 4, we present 'profiles' of these marginalised students. We also explore the extent to which digital learning solutions can reach these groups. Understanding the barriers these students face is an important step in understanding how digital solutions can reach them more effectively. This includes profiles on:

1. Children who are out of school
2. students who are girls
3. students who are poor
4. students from rural locations
5. students with SEND

Each profile includes a 'solution spotlight', which emphasises existing opportunities to address marginalisation. A common theme running across all profiles is that poverty is the dominant predictor of disadvantage when it comes to educational outcomes across all of these groups.

4.1. Children who are out of school

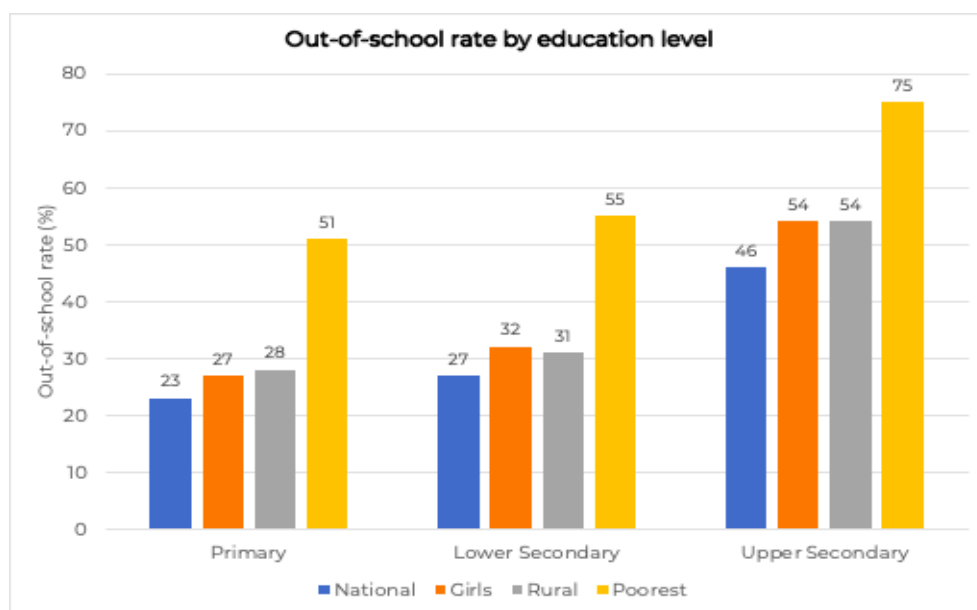
4.1.1. Out-of-school children and adolescents' access to education

It is estimated that there are 22.8 million¹⁰ five to 16-year-olds out of school in Pakistan ([UNICEF Pakistan, 2021](#)). Across the different categories of out-of-school children, poverty appears to be the largest predictor of being out of school ([Figure 35](#)). Numbers for out-of-school children are also skewed by geography. The chances of being poor and out of school in rural Punjab is 25%.

¹⁰ 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 \(2021\)](#) reports the number of out-of-school children to have increased by 2% between 2019 and 2021.

This rises to 41% for a girl situated in rural Khyber Pakhtunkhwa ([↑ASER, 2020](#)). Among out-of-school children, one unique sub-group is made up of refugees. Pakistan hosts 1.43 million registered refugees, of which 44% consist of children under the age of 18 ([↑UNHCR, 2021](#)).

Figure 35. Out-of-school rate by education level. Source: [↑ASER, 2020](#).



The challenges that Pakistani out-of-school children face accessing education are multi-dimensional. One stakeholder interviewed for this study mentioned that, “the challenges vary in each and every context ... some where the problem is due to cultural factors, and others where the formal schooling infrastructure is not present” (*EdTech provider spokesperson*).

- *Inadequate school infrastructure and resources:* Out-of-school children tend to be concentrated in remote areas where school infrastructure is missing, and where there is a shortage of trained teachers.
- *Demand constraints:* Studies have identified a lack of parental willingness, the cost of education, and children being too young / old as constraints.
- *No enforcement of compulsory education:* Currently there is no enforcement of Pakistan’s constitution, which states that 5–16-year-olds should receive free and compulsory education ([↑HRW, 2018](#)).
- *Parental perceptions relating to education:* Stakeholder interviews identified that parents of out-of-school children do not see education credentials as creating an effective pathway to secure jobs.

4.1.2. Out-of-school children and technology

Challenges that out-of-school children faced with regard to digital learning

solutions included:

- *EdTech programmes are misaligned with out-of-school children's needs:* Stakeholder interviews found that unless participation in digital learning solutions led to an increase in earnings, out-of-school children were not willing to take part in these programmes. As such, there was a greater demand by out-of-school children and their families for digital learning solutions which focused on skills development. However, these tend to be financially unviable for most EdTech providers, and are only provided in small pockets by a few not-for-profit providers.
- *EdTech programmes need to deliver outcomes in a short time frame to retain demand:* Experience from providers indicates that the level of attrition is higher for out-of-school children the longer a programme goes on.

4.1.3. Digital learning solution for out-of-school children: TAKMIL

Of the 14 digital learning interventions for which data was collected for this study, out-of-school children were the target group in two of these (14%). One of those is TAKMIL.

TAKMIL focuses on that subset of out-of-school children who have never been to school and live in remote communities where the “traditional” schooling infrastructure is absent. TAKMIL’s intervention is made up of three main components:

1. Community engagement
2. ICT integrated learning
3. Technology

Using a ‘school-in-a-box’ model, TAKMIL delivers content through offline resources which require minimal electricity. A projector delivers video content to students, while teachers monitor student participation through the use of a phone. Students are assessed through a tablet (there is one tablet available for every five students as assessment is rotated). The cost to deliver the TAKMIL model is approximately US\$100 per child per year. TAKMIL’s not-for-profit model is almost entirely funded through benefactors of the Pakistani diaspora community living in North America. This relies on charitable giving (*zakat*) as part of its funding model.

4.1.4. Potential for scale

Although the tool’s reach is presently limited, it presents an opportunity to be scaled up for out-of-school children across Pakistan. Its content and delivery model involves all key actors, for example, children, teachers, parents, and

communities. It offers opportunities for teacher professional development and provides customised learning content which is aligned with the national curriculum and available in Urdu. The tool covers all subject matter areas taught at primary and middle-grade levels. The tool is already being implemented across Pakistan, mostly in marginalised groups. With little adaptation in terms of language, delivery model, and content the tool can be further scaled up in relevant communities. Offline delivery with minimal requirements of power makes it more adaptable.

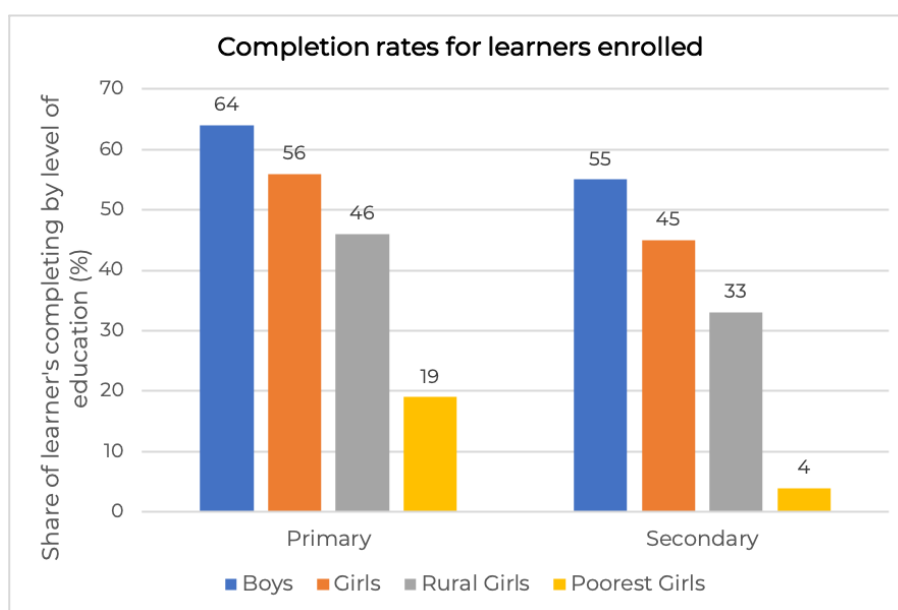
4.2. Students who are girls

4.2.1. Girls' access to education

It is estimated that 12.1 million out of the 22.8 million out-of-school children (between the ages of 5–16) in Pakistan are girls ([UNICEF Pakistan, 2021](#)). This disparity is compounded by location and poverty. Just 19% of girls from the poorest households complete primary education, compared with 64% of boys (see [Figure 36](#) below). While girls do worse than boys in every province across the country, the widest gender gaps when it comes to primary completion are in Balochistan, Khyber Pakhtunkhwa, and Sindh.

Girls also have poorer learning outcomes. Of boys, 48% can read at least one sentence in English compared to only 36% of girls. Furthermore, only 36% of girls were able to do subtraction versus 43% of boys ([ASER, 2020](#)).

Figure 36. Completion rates for students enrolled. Source: [UNESCO-UIS, 2021](#).



Girls' challenges in accessing education are multi-faceted. These include:

- **Security issues:** Insecurity— which can include sexual harassment, kidnapping, crime, conflict, and attacks on education — are cited as

reasons why parents often withdraw their girls from school ([↑HRW, 2018](#)). This is exacerbated when children travel long distances from home to attend school or when there is a lack of safe washrooms or facilities.

- *Shortage of female teachers:* Female teachers are less likely to be deployed in rural areas. The shortage of female teachers contributes to the poor enrolment of girls in school ([↑Malala Fund, 2020](#)).
- *Social and cultural norms:* These may result in the belief that girls should not be educated, or else that they should not study beyond puberty. Marriage is often a reason for withdrawing girls from school with 21% of girls marrying before the age of 18 ([↑HRW, 2018](#)).

4.2.2. Girls and Technology

Pakistan's digital architecture, according to one stakeholder interviewed, “as of now, and in the future, is heavily focused in favour of the boy” (*EdTech stakeholder*). The highest barrier to the use of different types of technologies appears to relate to a lack of family support ([↑GSMA, 2020](#)).

- Women are 38% less likely than men to own a mobile phone and 49% less likely to use the internet ([↑GSMA, 2020](#)).
- During school closures, girls were 40% more likely than boys to state that they never had access to mobile phones; the most frequently cited reason for this was being afraid to ask to use mobile phones ([↑Malala Fund, 2020](#)).
- Even with broadcasting technologies, there is a gender divide. When it comes to radio, for example, female listenership is 5% compared to 14% for males ([↑Tabassum et al., 2020](#)).

4.2.3. Digital learning solutions for girls: Knowledge Platform

Of the 14 digital learning interventions for which data was collected for this study, girls were the target group in five of these (38%). One of those five is Knowledge Platform.

Knowledge Platform is a Singapore-based global company that was founded in 2000. It currently has three products: Learn Smart Classroom, Learn Smart Pakistan, and Teach Smart Pakistan. To facilitate blended learning, laptops in schools are pre-loaded with digital lessons aligned with national/ provincial curricula, which contain videos, activities, and assessments. Files can be accessed at home by both teachers and students.

Knowledge Platform partnered with Jazz and the Federal Department of Education to pilot an intervention targeting girls' schools in Islamabad. According to Knowledge Platform, around 73% of girls performed well in maths and 50% performed well in English. Their content “deals with issues of

equity” by featuring female protagonists. In another intervention that reached one million students, the storyline featured a girl in a leadership role.

Potential for scale

The Learn Smart Pakistan solution makes personalised learning (videos, games, and assessments) available to students for free at home. The Learn Smart Classroom solution costs just over USD 1,000 per school to set up a digital learning centre. After an initial download, content is available offline on laptops and shared with students through projectors. Although Learn Smart Classroom was piloted in girls’ schools, the solution is suitable for all schools that have electricity and partial internet connectivity (for content updates).

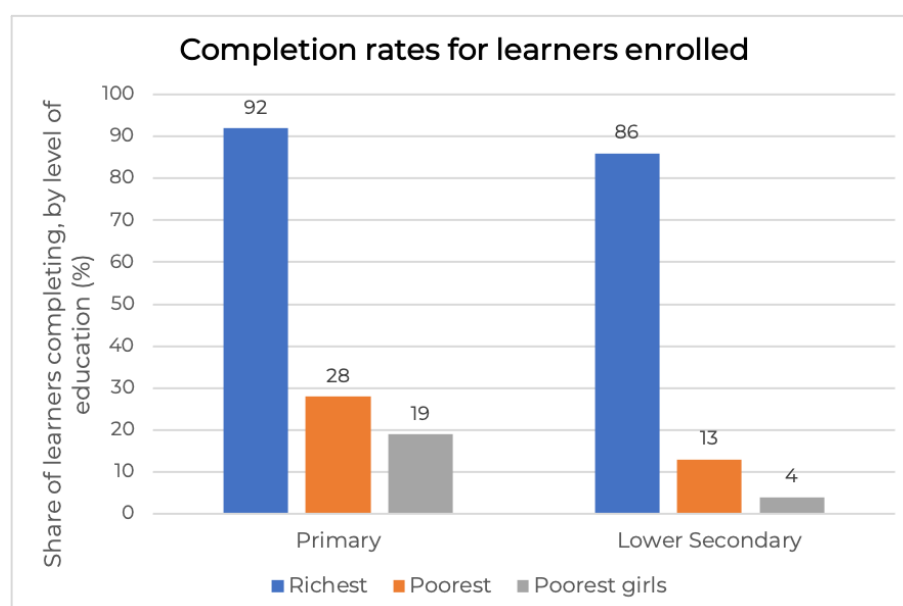
4.3. Students from poor households

4.3.1. Access to education by the poorest households

Poverty is a strong predictor of whether a child will access education. The latest data estimates that half of primary aged children from the poorest quartile were out of school, compared to 4% from the richest households.

Even when in school, poverty is likely to determine whether a learner will complete a full cycle of education. Just 28% of the poorest students enrolled at the primary level complete a full cycle, compared to 92% coming from the richest (see [Figure 37](#)).

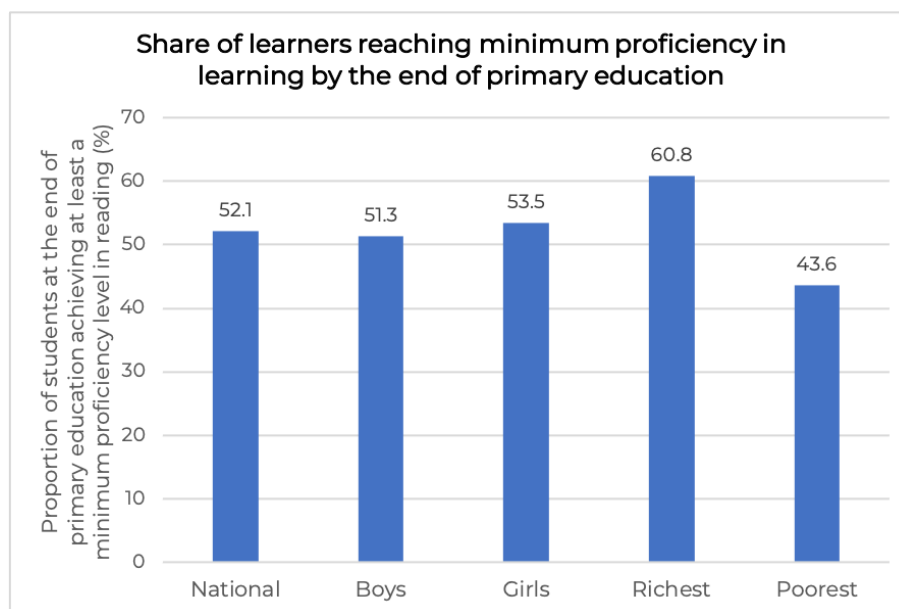
Figure 37. Completion rates for students enrolled. Source: [UNESCO-UIS, 2021](#).



Poor students are much more likely to attend government schools than their richer counterparts, who are much more likely to attend private schools. During the Covid-19 pandemic, students attending government schools experienced a greater decline in learning outcomes than those attending

private schools ([↑ASER, 2021](#)). [Figure 38](#) below shows that less than half of all students from the poorest households are likely to have attained the basic proficiency skills in reading by the end of the primary cycle.

Figure 38. *Share of students achieving minimum proficiency in reading, end of primary.* Source: [↑UNESCO-UIS, 2021](#).



Barriers to education for the poorest families include:

- *School-related costs:* While children from the poorest families are largely concentrated in government schools and do not pay fees, discretionary school expenses mean families still incur costs which they struggle to meet.
- *Poverty forces many into child labour:* It is estimated that 3.4 million children over the age of ten are in child labour in Pakistan ([↑Idris, 2020](#)).
- *Inadequate school infrastructure:* Children from poor families are situated in rural areas which experience an absence or shortage in infrastructure, teachers, and other school inputs.

Poorest students and technology

In terms of digital devices, in particular, lack of access is a major barrier for children from poor households.

- [↑ASER \(2021\)](#) found disparities in access to technology by household wealth:
 - 2.4% of the poorest own a TV vs. 96.7% of the richest
 - 8.5% of the poorest own a smartphone vs. 95.9% of the richest

- 2.8% of the poorest have access to the internet vs. 44.6% of the richest
- Children from more affluent households, or whose parents were educated were found to be more likely to watch the Teleschool programme, compared to those from the poorest or least educated households ([↑Crawfurd et al., 2021](#)).

4.3.2. Digital learning solutions for poor households: Developments in Literacy

Of the 14 digital learning interventions in this study, 11 (85%) targeted children from poor backgrounds. One of those 11 is Developments in Literacy.

The Developments in Literacy (DIL) programme targets children from underprivileged backgrounds, currently working in 130 rural schools. For its Technology Enabled Academic Learning (TEAL) intervention DIL creates their own content and aligns this to the national curriculum. Lessons are personalised according to the individual child's needs based on a formative test. Initially, DIL adopted a one tablet per child approach. However, the high costs meant they moved to broadcasting these lessons through an LED screen. This new model is a quarter of the prior cost (*EdTech provider spokesperson*). The TEAL lessons — once downloaded — become available even without the internet.

Potential for scale

Due to its flexibility and adaptability, DIL's TEAL tool could offer great potential for scalability, particularly for socio-economically disadvantaged students. TEAL videos have already been used by the Federal Directorate of Education for its *TeleSchool* initiative. Since the tool enables digital content to be accessed offline, if TEAL is offered beyond schools managed by DIL it can easily be integrated into government schools in urban and rural areas. In addition to creating customised learning opportunities for students, the tool also allows teachers to enhance their teaching capacity.

4.4. Students from rural locations

4.4.1. Rural students' access to education

Approximately 77% of children aged 5–16 live in rural Pakistan ([↑NEMIS, 2021](#)). Of those in rural areas, approximately 17% of children aged 6–16 are out of school. This compares to 6% of the same age group in urban areas. We even see differing levels of 'rurality'. A child living in rural Balochistan is ten times more likely to be out of school than a child living in rural Islamabad ([↑ASER, 2020](#)).

Learning outcomes also vary considerably for students between urban and rural areas. For example, 45.3% of those enrolled in Grade 3 in rural areas can read a sentence in Urdu/ Pashto / Sindhi compared to 58.6% in urban areas. This also varies considerably by province. In rural Sindh, the equivalent is 23.5%, while for rural Azad Jammu and Kashmir the equivalent is 67.2% ([↑ASER, 2020](#)).

4.4.2. Rural students and technology

Rural households in Pakistan are less likely to have access to devices that allow children to engage in education remotely than their urban counterparts. Just 38% of rural households have access to mobile phones (compared to 55% in urban areas). Similarly, 24% of rural households had access to the internet versus 51% of urban households ([↑ASER, 2020](#); [↑Government of Pakistan, 2021](#)). Fewer facilities are also available in rural government schools compared to urban government schools.

These absences in infrastructure often affect students' digital learning experiences. The lack of internet facilities, for example, has meant that many digital learning platforms are not interactive and are only available offline. This makes it challenging to customise them according to an individual learner's needs. The non-interactive design also means individual user data which would traditionally be used to monitor student progress is absent.

4.4.3. Digital learning solutions for children from rural areas: SABAQ/Muse

Of the 14 digital learning interventions in this study, 12 (92%) targeted children from rural areas. One of those is SABAQ / Muse.

SABAQ was founded in 2016 and focuses on pre-primary and primary levels. Its digital learning solution is subscription-based and it produces digital videos and content in the form of cartoons, animations, and stories. It currently works with a number of different types of technology including SABAQ Tab which contains content for kindergarten to Grade 5, a SMART kit (which converts projector displays into teaching resources), and the MUSE e-learning app.

SABAQ currently works in government and foundational schools across Pakistan. Its current partners are the Federal Ministry of Pakistan, the Government of Sindh, the State of Azad Jammu and Kashmir, and Gilgit-Baltistan.

4.4.4. Potential for scale

Muse is SABAQ's flagship product that has been implemented across Pakistan in public, private, and community-supported schools. As the tool can be used offline, online, or with partial connectivity, scalability depends on whether

schools have partial connectivity and intermittent electricity or not. It is a feasible option for rural schools that have battery power charging options. Online content is available over an Android app or a browser while offline content is available over the Muse Smart Kit through LCD / LED TVs. Offline and online content has been tested and used across Pakistan and user feedback is regularly incorporated. The content is aligned with the national curriculum and available in three languages—English, Urdu, and Sindhi—with a variety of subject matter content. Content includes animated video lessons, gamified exercises, live-shot lessons, and story-based instruction content for students and teachers. Although predominantly used by schools, it can be downloaded for home usage if a subscription fee is paid. This fee can be negotiated by school systems or the supporting organisations.

4.5. Students with Special Education Needs and Disabilities

4.5.1. Access to education by children with Special Education Needs and Disabilities (SEND)

Identifying the numbers of children with SEND in Pakistan is not a straightforward process because, until relatively recently, national surveys were not accurately collecting this information. Different surveys have arrived at different estimates of the proportion of children with SEND, but generally conclude this to be at between 1–2%. A recent study, using the Washington Group Short Set of Questions on Disability, however, estimates these figures to be a massive underestimate and suggests that as many as one in ten Pakistani children experience some form of disability ([↑Rose et al., 2018](#)). The differences are attributed to a narrower definition of disability adopted by the Government of Pakistan. The consequence is that the number of students with SEND has traditionally been underestimated, with 88% of students with SEND aged 5–16 being vulnerable ([↑Tabassum et al., 2020](#)).

Being a child with SEND in Pakistan increases the probability of being out of school, with girls with SEND more likely to be out of school compared to boys. A survey carried out in rural Punjab — where enrolment is higher than the national average — found that for children with a moderate or severe disability, 25% who were girls were out of school compared to 20% of boys ([↑Malik et al., 2020](#)). The type of disability further affects school attendance, with those affected by communication or physical disabilities being more likely to be out of school. This suggests that schools lack the basic facilities to accommodate these children ([↑Rose et al., 2018](#)).

When in school, children with SEND are also more likely to attend government schools and are also more likely to suffer from worse learning outcomes. For

example, in a survey carried out in rural Punjab, 56% of children without disabilities and in school were able to read a sentence compared to 39% of children with moderate to severe disabilities. The starkest differences in learning outcomes, however, are for children who are out of school. Of those with moderate to severe disabilities, just 3% can read a sentence compared to 26% with no disability ([↑Malik et al., 2020](#)). During data collection for this report, the traditional cultural attitudes towards children with SEND were referenced as being a contributing factor to their poor learning outcomes (*EdTech provider spokesperson*). Parents often either conceal or deny the existence of disability in their children ([↑Akram & Bashir, 2015](#)).

4.5.2. Students with SEND and technology

While technology has a potential role to play in addressing the particular challenges children with SEND face, a challenge identified by both existing literature and our interviews was the poor infrastructure to support these students. During the initial response to Covid-19, [↑Tabassum et al. \(2020\)](#) found that the initial response by government officials at the federal and provincial level to take into account the needs of children with SEND was inadequate.¹¹ A further challenge identified by an EdTech provider specialising in children with SEND was the high-tech needs of its intervention. This meant households with older or low-spec laptops/ PCs could not use this intervention at home.

4.5.3. Digital learning solutions for children with SEND: WonderTree

Of the 14 digital learning interventions in this study, two (14%) targeted children with SEND. One of those two is Wondertree.

WonderTree is a local EdTech startup founded in 2015. Its mission is to design, develop, and provide affordable education and therapeutic solutions targeting children with SEND. It uses augmented reality games to help accelerate learning, and develop the motor and cognitive skills of children with SEND. Through its tool, parents and teachers can access an online psychometric dashboard in order to track and measure the progress of the child.

To date, the tool has been used in classrooms, or else in clinical settings using a USD 300 Xbox connect. This is a one-time purchase that can be used for 30+ children. This is outside of the price range for many parents and so, for the most part, WonderTree follows a B2B model, with schools being the major customers. However, for parents with newer laptops, this model was adapted

¹¹ At the federal and provincial level, responsibility for children with SEND falls outside the Ministry of Education. These responsibilities instead lie with the Ministry of Human Rights at the federal level and the Special Education Department or Social Welfare Department at the provincial level.

to allow the device through laptop webcams (at USD 10–15).

The WonderTree spokesperson noted success stories about how WonderTree has supported students with SEND. For example, some students with mobility-related disabilities were able to sit up without any support in a chair after three months of using WonderTree.

Potential for scale

To increase its scalability, WonderTree has actively looked for methods to reduce its cost. The company expects to scale outside of Pakistan in order to improve the profitability of its solution. Although extending access from Xbox to laptops has significantly decreased the price, there are still challenges that could prevent scalability. Because the solution itself costs between one and three US dollars per child per month (depending on school affordability), WonderTree found that a B2C model is not viable. Additionally, WonderTree requires a relatively new, high-spec laptop (less than six years old), which resulted in many technical challenges when the software was being used from home. Additionally, although the solution is stored locally after being downloaded, it requires a high-speed internet connection for frequent updates and a basic internet connection to prompt a login request and start the game.

Within Pakistan, WonderTree has partnered with for-profit companies and has received a grant from UNICEF's Innovation Fund Investment. It has the potential to increase scale through government partnerships, where one provincial government has shown interest in deploying the solution as part of an after school programme.

5. Proposed digital learning principles

This report concludes with a set of principles recommended by EdTech Hub to guide stakeholders in their approach to engaging in Pakistan’s digital learning landscape. These principles are based on the analysis of the challenges and opportunities presented in [Section 2](#) and [Section 3](#) and insights emerging from the student profiles in [Section 4](#). These sections are based on the previously developed desk review ([↑Wilson et al., 2022](#)), the data collection activities executed during the development of this report (survey, KIIs, and FGDs), and international literature.

Our findings indicate that the growing EdTech landscape has gaps around stakeholder coordination and training that lead to the development of learning solutions which could better cater to the end-user, particularly those who are marginalised. To develop an EdTech environment that encourages effective digital learning and doesn’t compound the existing disadvantages faced by marginalised groups, we suggest the following principles. They will facilitate actions to appropriately integrate international good practices in ways that align with Pakistan’s digital learning landscape.

1. Design with end-users in mind
2. Put marginalised students first
3. Play a convening role and engage with all stakeholders
4. Ensure stakeholders receive appropriate training
5. Improve content regulation and safeguarding
6. Embed monitoring and evaluation (M&E) into all digital learning interventions

5.1. Design with end-users in mind

Designing high-quality, impactful digital interventions requires ensuring that design occurs with the end-user — and the local context — in mind. This requires designers of digital tools to consider two specific things. First, they should “consider the particular structures and needs that exist in each country, region and community” ([↑Digital Principles, N.D.](#)). Second, they should actively take steps to ensure end-users are given genuine power to make decisions over the design of the EdTech intervention ([↑Zubairi et al., 2021b](#)). Involving local stakeholders outside of the formal education system — but who are influential nonetheless — is also important.

In Pakistan, these elements are even more important than in some other contexts. This is due to the very diverse contexts of children's learning — whether this is infrastructural, educational, or cultural (*Development Partner and EdTech provider spokespersons*). In terms of educational contexts, end-users are already well served with a number of commercial exam preparation solutions. Learning solutions catered to improving foundational skills are more impactful, yet stakeholders mentioned there are fewer solutions available because it is not as commercially viable. When foundational content needs to be developed that is culturally relevant or in another language than Urdu, the cost and time required can be prohibitive for commercial organisations. Stakeholders can play a role in advocating for the use of adaptable and versatile Open Educational Resources (OER) and align them with the end-user's needs across any barriers of marginalisation.

5.2. Put marginalised students first

In Pakistan, where a child lives, their gender, their socio-economic status, the type of school they attend, and whether they have a disability all affect their access to education. To combat this, a “progressive universalism” approach that prioritises the most marginalised groups should be adopted to ensure that a focus on digital learning does not exacerbate these divides ([↑Zubairi et al., 2021b](#)). By focusing investment in this area, donor partners may be able to fill a role in a market niche that the private sector may not address, as target users are not able to pay.

5.3. Play a convening role and engage with all levels of government

We recommend that stakeholders play a convening role among the wide range of actors operating in Pakistan's digital learning landscape. National and provincial government stakeholders and donor partners can both coordinate cross-sectoral funding and priorities and overcome challenges that decentralisation can sometimes pose.

Funding digital learning —including infrastructure, devices, training, etc.—is an expensive undertaking. With this in mind, donor partners can leverage their comparative advantage as an internationally recognised brand to convene government stakeholders and inform the deployment of resources above and beyond the funding envelope of donor partners. This could be achieved, for example, by proactively seeking partnerships with mobile network operators and internet providers to subsidise the cost of accessing educational content.

Initiatives in this space should not solely be focused on reducing costs. The ability to convene relevant stakeholders could help increase awareness in

relation to important priorities such as developing local language content, ensuring digital privacy, addressing the gender imbalance and improving digital literacy. Additionally, the federalised approach to education service delivery in Pakistan means that there are many different government agencies — at both the federal and provincial levels — involved in education planning and implementation. This can create complicated overlaps and gaps in service provision. While this is not unusual for education sector initiatives more broadly, in Pakistan, an added level of complexity is involved in the digital learning landscape due to the broader range of actors involved (for example the Ministry of Information Technology and Telecommunications).

To mitigate any negative ramifications, any decisions regarding engagement in the digital learning landscape should be made in collaboration with the many and varied government agencies working in this space. This will help ensure coherence between ministries, minimise duplication, and help align discrete projects. A starting point for this collaboration should be the newly formed Distance Learning Wing within the MoFEPT.

5.4. Ensure stakeholders receive appropriate training

Empowering teachers, parents, and other stakeholders to use digital technologies is one of the most important steps in effectively deploying technology within education systems ([↑Unwin et al., 2020b](#)). During the FGDs, teachers reported that most senior teachers lack foundational digital skills, a phenomenon that also extends to parents, caregivers, and other relevant stakeholders, all of whom can play important roles in digital learning initiatives.

To mitigate this challenge it is important to explicitly contemplate how primary users and other relevant stakeholders acquire the capacity required to effectively implement a digital learning intervention. This explicit consideration needs to go beyond identifying that training is required to consider things like ongoing training over time, enrolment of new users, training approaches (in person, blended, or online), training facilitators, budgets, and much more.

[↑Unwin et al. \(2020d\)](#) provide an eight-step guidance plan on what areas need to be prioritised for teacher competency in the use of technology. These are:

1. Teachers are appropriately trained to use digital technologies
2. Integrated pre-service and in-service training programmes in the appropriate use of digital technologies
3. Schemes are implemented to ensure that all teachers can afford devices and connectivity in their homes or hostels

4. Appropriate and reliable infrastructure (internet connectivity, electricity, devices and digital content) is provided
5. Digital technologies are used as a means to help transform pedagogy
6. The use of digital technologies for learning is integrated across the school curriculum, and not taught merely as a subject in itself.
7. Teachers are closely involved in the design and crafting of relevant training programmes
8. Safety, security, and privacy are featured prominently in all training

5.5. Improve content regulation and safeguarding

Access to digital technologies within education systems is one of the main ways in which children can be exploited by those seeking to abuse them ([↑Unwin et al., 2020e](#)). The privacy and security of users should be carefully considered when planning how data will be collected, used, stored, and shared ([↑Digital Principles, N.D.](#)). This is of specific concern in the Pakistani context for two main reasons. First, Pakistan has limited data storage warehouses. Second, Pakistan does not currently have extensive data protection legislation to specifically regulate the processing of personal data ([↑Rehman, 2021](#)).

Stakeholders should evaluate what gaps exist in data protection approaches, and what needs to be strengthened in order to safeguard children in the use of digital technologies ([↑Digital Principles, N.D.](#)). They should also encourage others entering this space to do the same. Further, they should consider how children who are being exposed to digital learning can be acclimated to the safe use of digital technologies before they are used for educational purposes and include online safety training for parents and teachers.

5.6. Embed monitoring and evaluation into all digital learning interventions

Most digital learning interventions found during this research lack clear and transparent monitoring and evaluation (M&E) and reporting mechanisms. During the Covid-19 pandemic, distance learning initiatives were often launched without clear M&E systems in place. This can result in a lack of evidence in programming. While M&E is important in education provision more broadly, adopting robust M&E approaches is particularly pertinent in digital learning interventions as there is still so much that is unknown about how these initiatives best support learning.

Stakeholders should ensure that any digital learning initiatives include a rigorous approach to collecting, analysing, and disseminating data collected through the initiatives. Where possible, these insights should be used to refine interventions in real-time, rather than waiting until midline and endline evaluations are complete to make adjustments to programming.

Bibliography

This bibliography is available digitally in our evidence library at <https://docs.edtechhub.org/lib/HEXCXFK>

ASER. (2020). *Annual Status of Education Report: ASER-Pakistan 2019 (National)*.
http://www.aserpakistan.org/document/2019/reports/national/ASER_National_Urban_2019.pdf. (details)

ASER. (2021). *Measuring the Impact of COVID-19 on Education in Pakistan*.
http://aserpakistan.org/document/aser/2021/ASER_2021_Measuring_the_Impact_of_COVID_19_on_Education_in_Pakistan_FINAL_REPORT.pdf. (details)

Agarwal, M. (2020). *With the largest share of funding, test prep startups leading the EdTech charge in India*.
<https://inc42.com/datalab/with-the-largest-share-of-funding-test-prep-startups-leading-the-edtech-charge-in-india/>. (details)

Akmal, M., Crawford, L., Hares, S., & Minardi, A. L. (2020). *COVID-19 in Pakistan: A Phone Survey to Assess Education, Economic, and Health-Related Outcomes*. Harvard Dataverse. <https://doi.org/10.7910/DVN/EGQ4XO>. Available from <https://dataverse.harvard.edu/citation?persistentId=doi:10.7910/DVN/EGQ4XO>. (details)

Akram, B., & Bashir, R. (2015). Special Education and Deaf Children in Pakistan. *Journal of Elementary Education*, 22(2), 33–44.
https://www.humanitarianlibrary.org/sites/default/files/2014/02/Article%20No.%203_V22_2_12.pdf. (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)

Arif, S., & Riasat, L. (2019). *Teachers' resistance towards change in Punjab public schools: Implications for school effectiveness*. 7th International Conference on Research in Education, University of Punjab.
https://www.researchgate.net/publication/337415153_TEACHERS%27_RESISTANCE_TOWARDS_CHANGE_IN_PUNJAB_PUBLIC_SCHOOLS_IMPLICATIONS_FOR_SCHOOL_EFFECTIVENESS. (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](#))
- 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](#))
- Beg, S. A., Lucas, A. M., Halim, W., & Saif, U. (2019). *Beyond the Basics: Improving Post-Primary Content Delivery through Classroom Technology* (Working Paper No. 25704). National Bureau of Economic Research. <https://doi.org/10.3386/w25704>. Available from <http://www.nber.org/papers/w25704>. ([details](#))
- Brossard, M., Cardoso, M., Kamei, A., Mishra, S., Mizunoya, S., & Reuge, N. (2020). *Parental Engagement in Children's Learning: Insights for remote learning response during COVID-19* [Innocenti Research Brief]. <https://www.unicef-irc.org/publications/1091-parental-engagement-in-childrens-learning.html>. ([details](#))
- Crawford, L., Hares, S., & Minardi, A. (2021, May 11). New data on learning loss in Pakistan. *Center for Global Development*. <https://www.cgdev.org/blog/new-data-learning-loss-pakistan>. ([details](#))
- Digital Principles. (N.D.). *Principles for Digital Development*. <https://digitalprinciples.org/>. ([details](#))
- Government of Pakistan. (2021). *Pakistan Social and Living Standards Measurement: District Level*. Pakistan Bureau of Statistics. https://www.pbs.gov.pk/sites/default/files/pslm/publications/pslm_district_2019-20/PSLM_2019_20_District_Level.pdf
- GSMA. (2020). *Pakistan: progressing towards a fully fledged digital economy*. <https://www.gsma.com/asia-pacific/wp-content/uploads/2020/06/24253-Pakistan-report-updates-LR.pdf>. ([details](#))
- HRW. (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](#))
- Idris, I. (2020). *Impact of COVID-19 on child labour in South Asia*. University of Birmingham. <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15448>

/819_Impact_of_COVID-19_on_Child_Labour_in_South%20Asia.pdf?sequence=1&isAllowed=y. Available from https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15448/819_Impact_of_COVID-19_on_Child_Labour_in_South%20Asia.pdf?sequence=1&isAllowed=y. (details)

Kaye, T., Groeneveld, C., & Bashir, A. (2020). *Monitoring Distance Education: A Brief to Support Decision-Making in Bangladesh and Other Low- and Lower-Middle Income Countries* (Edtech Hub Helpdesk Response No. 30). EdTech Hub. <https://doi.org/10.5281/ZENODO.4140104>. Available from <https://doi.org/10.5281/zenodo.5652092>. Available under Creative Commons Attribution 4.0 International, Open Access. (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)

Malala Fund. (2020). *Girls' education and Covid-19 in Pakistan*. Malala Fund. https://assets.ctfassets.net/0oan5gk9rgbh/5NYWB1DMSyo5a8VaQfOg7t/0386baa8673eecf0c4589be9f5c1be73/Pakistan_Report_16_MF.pdf. (details)

Malik, R. (2020a). *Challenges and opportunities for Pakistan education systems in the COVID-19 response*. <https://www.cambridge.org/partnership/research/challenges-and-opportunities-pakistan-education-systems-covid-19-response>. (details)

Malik, R. (2020b). *The impact of COVID-19 on education in Pakistan*. Cambridge University Press & Assessment. <http://www.cambridge.org/partnership/research/challenges-and-opportunities-pakistan-education-systems-covid-19-response>. (details)

Malik, R., Raza, F., Rose, P., & Singal, N. (2020). Are children with disabilities in school and learning? Evidence from a household survey in rural Punjab, Pakistan. *Compare: A Journal of Comparative and International Education*, 52(2), 211–231. <https://doi.org/10.1080/03057925.2020.1749993>. Available from <https://www.tandfonline.com/doi/full/10.1080/03057925.2020.1749993?scroll=top&needAccess=true>. (details)

MoITT. (2018). *Digital Pakistan Policy*. Ministry of IT & Telecom. [http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY\(22-05-2018\).pdf](http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY(22-05-2018).pdf). Available from [http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY\(22-05-2018\).pdf](http://moib.gov.pk/Downloads/Policy/DIGITAL_PAKISTAN_POLICY(22-05-2018).pdf). (details)

- National Institute of Population Studies. (2019). *Pakistan Demographic and Health Survey, 2017–18*.
<https://dhsprogram.com/pubs/pdf/FR354/FR354.pdf>
- NEMIS. (2021). *Pakistan Education Statistics 2017-18*. National Education Management Information System.
<http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf>. (details)
- Pota, V., Hennessey, S., Koomar, S., Kreimeia, A., Zubairi, A., Aerts, C., & Gault, C. (2021). *Turning to technology: A global survey of teachers' responses to the Covid-19 pandemic*. T4 Education & EdTech Hub.
<https://t4.education/turning-to-technology/>. (details)
- Rehman, S. (2021). *Pakistan — Data Protection Overview*. RIAA Barker Gillette.
<https://www.dataguidance.com/notes/pakistan-data-protection-overview-0>. (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*. Zenodo.
<https://doi.org/10.5281/ZENODO.1247087>. Available from
<https://zenodo.org/record/1247087>. (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)
- Taleem Ghar. (n.d.). *Welcome to Taleem Ghar*. Retrieved May 17, 2022, from
<https://taleemghar.punjab.gov.pk/>. (details)
- Tembey, L., Baier, J., Ogolla, C., & Mohan, P. (2021). *Understanding Barriers to Girls' Access and Use of EdTech in Kenya During Covid-19*. EdTech Hub and Busara Center for Behavioural Economics.
<https://docs.edtechhub.org/lib/JZM7W6QE/download/G5VNJBIF/Tembey%20et%20al.%20-%202021%20-%20Understanding%20Barriers%20to%20Girls%E2%80%99%20Access%20and%20Use%20of.pdf>. (details)
- UNESCO-UIS. (2021). *Data centre*. <http://data.uis.unesco.org/>. (details)
- UNESCO. (2016). *If you don't understand, how can you learn?* (Policy Paper 24). UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000243713>. (details)
- UNESCO. (2021). *Education: From disruption to recovery*. UNESCO.
<https://en.unesco.org/covid19/educationresponse>. (details)

UNHCR. (2021). *Pakistan Overview of Refugee and Asylum-Seekers Population as of December 31, 2021*.

<https://data2.unhcr.org/en/documents/details/90452>. (details)

UNICEF Pakistan. (2021). *Education: Giving every child the right to education*.

<https://www.unicef.org/pakistan/education>. (details)

UNICEF. (2021). *Brief on learning continuity amidst COVID-19 school closures in Pakistan*. UNICEF Regional Office for South Asia (ROSA).

<https://www.unicef.org/pakistan/media/3761/file/Pakistan%20Brief%20on%20learning%20continuity%20amidst%20COVID19.pdf>. (details)

Unwin, T., Naseem, A., Pawluczuk, A., Shareef, M., Spiesberger, P., West, P., & Yoo, C. (2020a). *Education for the most marginalised post-COVID-19: Guidance for governments on the use of digital technologies in education — home page* (No. 2; Education for the Most Marginalised).

EdTech Hub. <https://doi.org/10.5281/zenodo.4684355>. Available from <https://docs.edtechhub.org/lib/AX8D5YK2>. (details)

Unwin, T., Naseem, A., Pawluczuk, A., Shareef, M., Spiesberger, P., West, P., & Yoo, C. (2020b). *Education for the most marginalised post-COVID-19: Guidance for governments on the use of digital technologies in education ACT TWO (OF THREE): FULL REPORT* (p. 118). EdTech Hub,

UNESCO, UniTwin. <https://doi.org/10.5281/zenodo.4684361>. Available from <https://docs.edtechhub.org/lib/UF3XJXGS>. (details)

Unwin, T., Naseem, A., Pawluczuk, A., Shareef, M., Spiesberger, P., West, P., & Yoo, C. (2020c). *Education for the most marginalised post-COVID-19: Guidance for governments on the use of digital technologies in education – Act one* (ACT ONE (OF THREE): EXECUTIVE SUMMARY).

UNESCO, UniTwin, EdTech Hub. <https://doi.org/10.5281/zenodo.4684287>. Available from <https://docs.edtechhub.org/lib/VFERK5JK>. (details)

Unwin, T., Naseem, A., Pawluczuk, A., Shareef, M., Spiesberger, P., West, P., & Yoo, C. (2020d). *Guidance Note 10 Prioritising effective and appropriate teacher training From the Report: Education for the most marginalised post-COVID-19: Guidance for governments on the use of digital technologies in education* (ACT THREE (OF THREE): GUIDANCE NOTES; p. 8).

UNESCO, UniTwin, EdTech Hub. <https://doi.org/10.5281/zenodo.5652081>. Available from <https://docs.edtechhub.org/lib/7E62A3FM>. (details)

Unwin, T., Naseem, A., Pawluczuk, A., Shareef, M., Spiesberger, P., West, P., & Yoo, C. (2020e). *Guidance Note 13 Ensuring that children are safe when using digital technologies for learning From the Report: Education for the most marginalised post-COVID-19: Guidance for governments on the use of digital technologies in education* (ACT THREE (OF THREE):

GUIDANCE NOTES). UNESCO, UniTwin, EdTech Hub.
<https://doi.org/10.5281/zenodo.4684343>. Available from
<https://docs.edtechhub.org/lib/JI5QK62G>. (details)

Wilson, S., Khalayleh, A., Baloch, I., & Kaye, T. (2022). *Desk Review of Technology-Facilitated Learning in Pakistan: A review to guide future development of the technology-facilitated learning space in Pakistan* [Internal Papers]. EdTech Hub. <https://doi.org/10.53832/edtechhub.0071>. Available from <https://docs.edtechhub.org/lib/6FN5VTP7>. Available under Creative Commons Attribution 4.0 International. (details)

World Bank. (2021). *Thinking inside the “Box”: Pakistan turns to education TV during Covid-19*.
<https://www.worldbank.org/en/news/feature/2021/05/19/pakistan-turns-to-education-tv>. (details)

Zacharia, S. (2020). *Education continuity during the Coronavirus crisis: Pakistan—TeleSchool and Taleem Ghar (Educational TV at Home)*. World Bank.
<https://documents1.worldbank.org/curated/en/421821600058352361/pdf/Pakistan-TeleSchool-and-Taleem-Ghar-Educational-TV-at-Home.pdf>. (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)

Annex 1: Survey response tables

Pakistan has seen an explosion of digital learning solutions implemented across its provinces and regions in recent years. This has been further accelerated by the onset of Covid-19. The Ministry of Federal Education and Professional Training (MoFEPT) and UNICEF Pakistan have partnered with EdTech Hub to understand the landscape of digital learning solutions in Pakistan and identify gaps, challenges, and trends.

As part of this research, a survey was launched to gather data from various players in Pakistan's digital learning ecosystem. A total of 17 organisations responded and reported 48 separate digital learning tools.

Tools tables

The following data refers to the digital learning tools developed or implemented by the survey respondents.

Table 5. *Who is the primary user of the tool?*

Primary User	Count	Percentage of tools
Students	35	73%
Teachers	8	17%
Administrators	4	8%
Students and teachers	1	2%
Total	48	100%

Table 6. *Who are the secondary users of the tool?*

Secondary User	Count	Percentage of tools
Teachers	35	73%
Parents	26	54%
Principals	19	40%
Administrators	17	35%
Students	8	17%
Government Officials	1	2%
School owners	1	2%
Education officials	1	2%

Table 7. *School level*

School Level	Count	Percentage of tools
Early Childhood Education	21	44%
Primary School	38	79%
Middle School	21	44%
Secondary School	18	38%
Higher Secondary School	14	29%
Tertiary	7	15%
Professional Skills	9	19%
OOSC/Nonformal Education	2	4%
Other	1	2%

Table 8. *What type of product is this?*

Type of Product	Count	Percentage of tools
Content (own)	26	54%
Android App	21	44%
Web-based	21	44%
Content (curated)	18	38%
Learning Management System (Online)	16	33%
iOS App	10	21%
Learning Management System (LMS—Offline)	10	21%
Other	4	8%
KaiOS App	1	2%
Tactile materials (e.g., smart learning blocks)	1	2%

Table 9. *What is the tool's primary purpose?*

Primary Purpose	Count	Percentage of tools
Learning resources/repository	32	66%
Teaching aids	23	40%
Learning management system	23	48%
Learning platforms	17	35%
Teacher professional development	10	21%
Communication and collaboration	12	25%
Other	2	4%

Table 10. *What type of device is required?*

Type of Device	Count	Percentage of tools
Mobile phone	40	83%
Tablet	39	81%
Laptop computer	33	69%
Desktop computer	30	63%
TV	9	19%
Radio	5	10%
Other	5	10%

Table 11. *What type of power is required?*

Power required	Count	Percentage of tools
Battery	25	52%
Full/constant electricity	11	23%
Intermittent electricity	12	25%
Grand Total	48	100%

Table 12. *What type of internet connectivity is required?*

Internet connectivity required	Count	Percentage of tools
Full/constant connectivity	12	25%
Intermittent/partial connectivity	30	63%
Offline	6	13%
Grand Total	48	100%

Table 13. *Was this tool implemented as part of an intervention?*

Implemented as part of an intervention	Count	Percentage of tools
No	34	71%
Yes	14	29%
Grand Total	48	100%

Intervention tables

The following data refers to the interventions implemented using the digital learning tools developed or implemented by the survey respondents.

Table 14. *What were the primary purposes of the intervention?*

Primary Purpose of Intervention	Count	Percentage of interventions	Percentage of tools
In-school learning	9	69%	19%
Remedial learning	6	46%	13%
Learning for OOSC	4	31%	8%
Learning at home	7	54%	15%
Learning during school closures	8	62%	17%
Distance learning	6	46%	13%
Other	3	23%	6%

Table 15. *Where did the intervention take place?*

Intervention location	Count	Percentage of interventions	Percentage of tools
Balochistan	5	38%	10%
Punjab	8	62%	17%
Khyber Pakhtunkhwa	9	69%	19%
Sindh	11	85%	23%
Islamabad	6	46%	13%
Gilgit-Baltistan	3	23%	6%
Azad Jammu and Kashmir	2	15%	4%

Table 16. In what languages was the intervention conducted?

Languages	Count	Percentage of interventions	Percentage of tools
English	12	92%	25%
Urdu	12	92%	25%
Sindhi	2	15%	4%
Pashto	1	8%	2%
Pakistan Sign Language	1	8%	2%

Table 17. Was this implemented in a rural or urban setting?

Rural/Urban	Count	Percentage of interventions	Percentage of tools
Rural	12	92%	25%
Urban	11	85%	23%

Table 18. In which setting did this intervention take place?

Setting	Count	Percentage of interventions	Percentage of tools
Public schools	8	62%	17%
Private schools	5	38%	10%
NGO schools	7	54%	15%
Education in emergencies	1	8%	2%
Non-formal education	3	23%	6%
Education in vulnerable situations	2	15%	4%
Special needs schools	2	15%	4%
Inside classroom	4	31%	8%
Outside classroom	3	23%	6%
Other	3	23%	6%

Table 19. *Was the intervention targeting a specific demographic?*

Specific target demographic	Count	Percentage of interventions	Percentage of tools
No	6	46%	13%
Students with Special Educational Needs and Disabilities (SEND)	2	15%	4%
Girls	5	38%	10%
Refugees	1	8%	2%
OOSC	2	15%	4%
Other	1	8%	2%

Table 20. *What was the socio economic background of the beneficiaries?*

Estimated socioeconomic background of students	Count	Percentage of interventions	Percentage of tools
Bottom of the pyramid	11	85%	23%
Middle income	7	54%	15%
High income	2	15%	4%

Table 21. *What grades was the intervention targeting?*

School level	Count	Percentage of interventions	Percentage of tools
Early childhood education	3	23%	6%
Primary school	10	77%	21%
Middle school	8	62%	17%
Secondary school	5	38%	10%
Higher secondary school	3	23%	6%
Tertiary	0	0%	0%
Professional skills	2	15%	4%
Other	1	8%	2%

Table 22. *What subjects did the intervention address?*

Subject	Count	Percentage of interventions	Percentage of tools
Literacy	12	92%	25%
Numeracy	12	92%	25%
STEM	10	77%	21%
Arts	4	31%	8%
Life skills	4	31%	8%
Other	2	15%	4%

Table 23. *Was there any kind of accompanying teacher professional development activities?*

Type of accompanying TPD	Count	Percentage of interventions	Percentage of tools
None	0	0%	0%
In-person workshop	9	69%	19%
Online training	9	69%	19%
Follow-up visits	6	46%	13%
Teacher learning circles	4	31%	8%
Communities of practice	4	31%	8%
Other	1	8%	2%

Table 24. *Were there any evaluations conducted on this intervention?*

Evaluated?	Count	Percentage of intervention	Percentage of tools
No	6	46%	13%
Yes	8	62%	17%

Annex 2: Analysis of T4 survey data on Pakistani teachers' experiences and perspectives on the Covid-19 pandemic

Introduction

This summary presents the results of responses from the T4 survey specifically in relation to Pakistan's teachers. The survey collected information specifically on teachers' experiences of teaching during the Covid-19 pandemic. For the purpose of the UNICEF landscape review, the data analysed focused on teacher responses to questions which specifically relate to students' learning.

The data analysed responses from 2,366 teachers of whom:

- 783 (33%) are from rural areas and 1,378 (58%) are from urban arrears
- 1,950 (82%) work in government schools, while 221 (9%) work in private schools
- 2,009 (85%) are female and 326 (14%) are male

This report focuses on summary messages relating to the following questions posed to teachers:

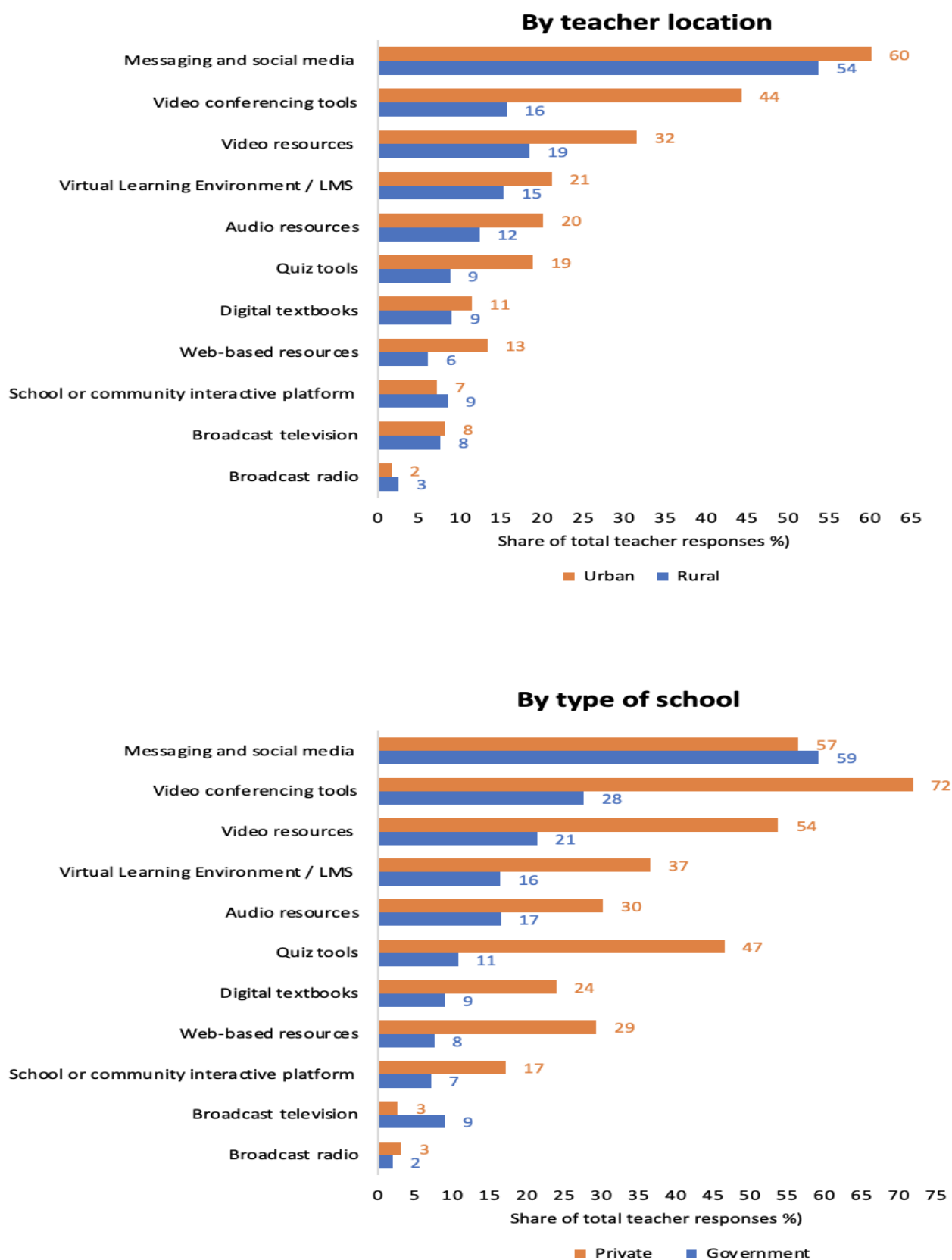
1. Which digital resources did your school encourage you to use? (*Section 1*)
2. Did you do any of the following in the Covid-19 pandemic? (*Section 1*)
3. During the last 12 months, how often did you do the following activities? (*Section 1*)
4. You told us that some or none of your students have progressed their learning (or you didn't know). Have any of these things been affected? (*Section 2*)
5. Have any of these groups of learners experienced more learning loss than other students? (*Section 2*)
6. What should your school do post Covid-19 in teaching, pedagogies or structurally to help learners to catch up? (*Section 3*)

Use of technology over Covid-19 pandemic

Key message # 1: A majority of teachers were encouraged by their school to use messaging and social media tools

In the majority of cases (58%) teachers reported that their school encouraged them to make use of messaging or social media. This was followed by 33% of teachers who reported that their school had encouraged them to make use of video conferencing tools (e.g., Zoom, Google Meet, Microsoft Teams and Skype). At the other extreme, just one in ten teachers indicated that they were encouraged to make use of web resources.

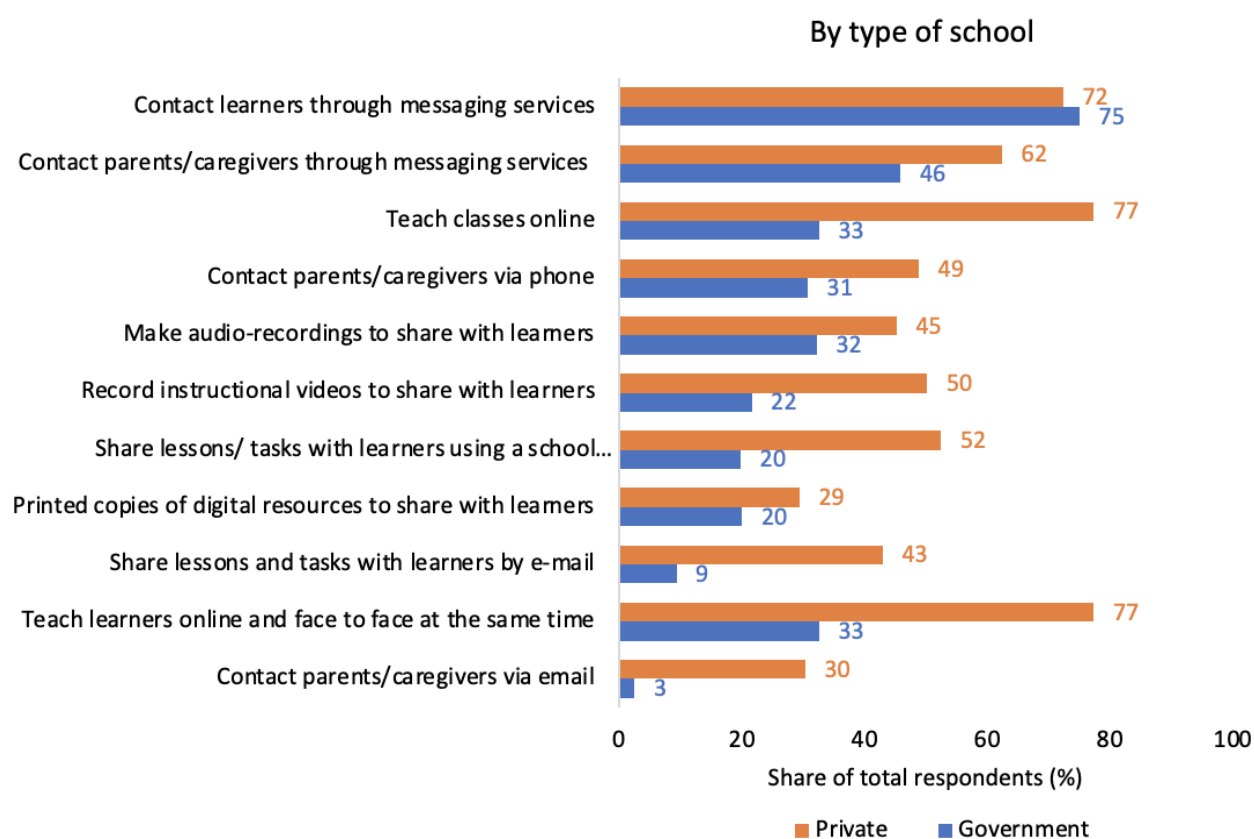
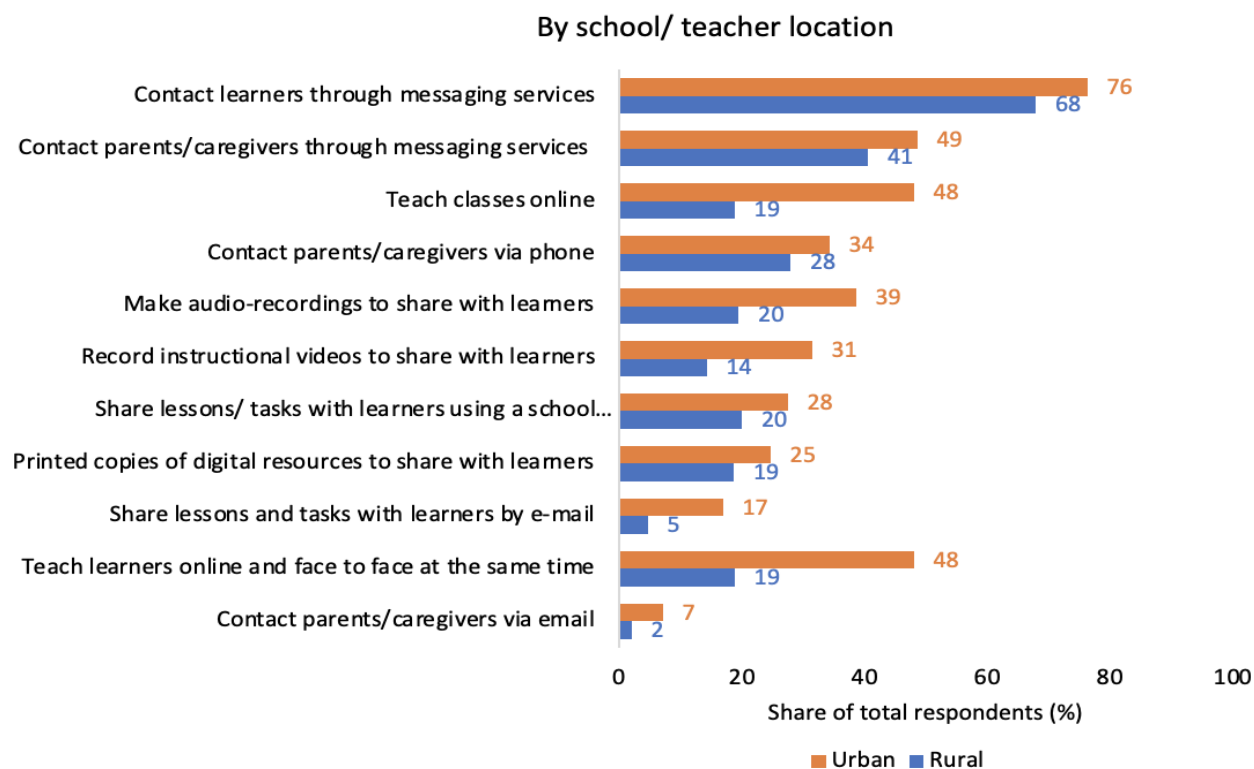
Differences in what digital resources teachers were encouraged to use became much more acute when looking at the type of school or location that a teacher taught in. A larger proportion of teachers working in urban schools or private schools were encouraged to make use of various digital devices compared to teachers working in rural or government schools. For example, while 44% of teachers teaching in urban schools reported being encouraged to use video conferencing tools, the equivalent for teachers in rural schools was 16%. For video resources, the equivalent was 32% and 19% respectively. Similarly, while 72% of teachers working in private schools were encouraged to make use of video conferencing tools, the equivalent for government schools was just 28%. Other large differences for teachers working in government versus private schools in terms of digital devices they were encouraged to use relate to video resources, quiz tools and web-based resources ([Figure 39](#)).

Figure 39. *What digital resources were schools encouraged to use by their schools?*

Key message # 2: During Covid-19, the majority of teachers used technology to contact learners/caregivers through messaging services

Interfaces using phones were much more widely used by teachers to keep in touch with their learners compared to computers. Close to three-quarters of all teachers reported using technology to SMS or Whatsapp their students during the school shutdowns. This was followed by 46% of teachers using these mechanisms to contact either the parents or caregivers over the same period. As a comparison, sharing lessons and tasks with learners by email (12%) or contacting parents/caregivers by email (5%) was a much less widely utilised tool employed by teachers.

When it came to online lessons, just 36% of teachers reported doing this over the period of the Covid-19 pandemic. The gap between rural versus urban and government versus private schools in providing online lessons was notably different when it came to how much technology, as a medium, was used to perform certain tasks. Online classes, for example, were much more prevalent in urban (48%) and private school (77%) settings, compared to rural (19%) and government (33%) school settings ([Figure 40](#)).

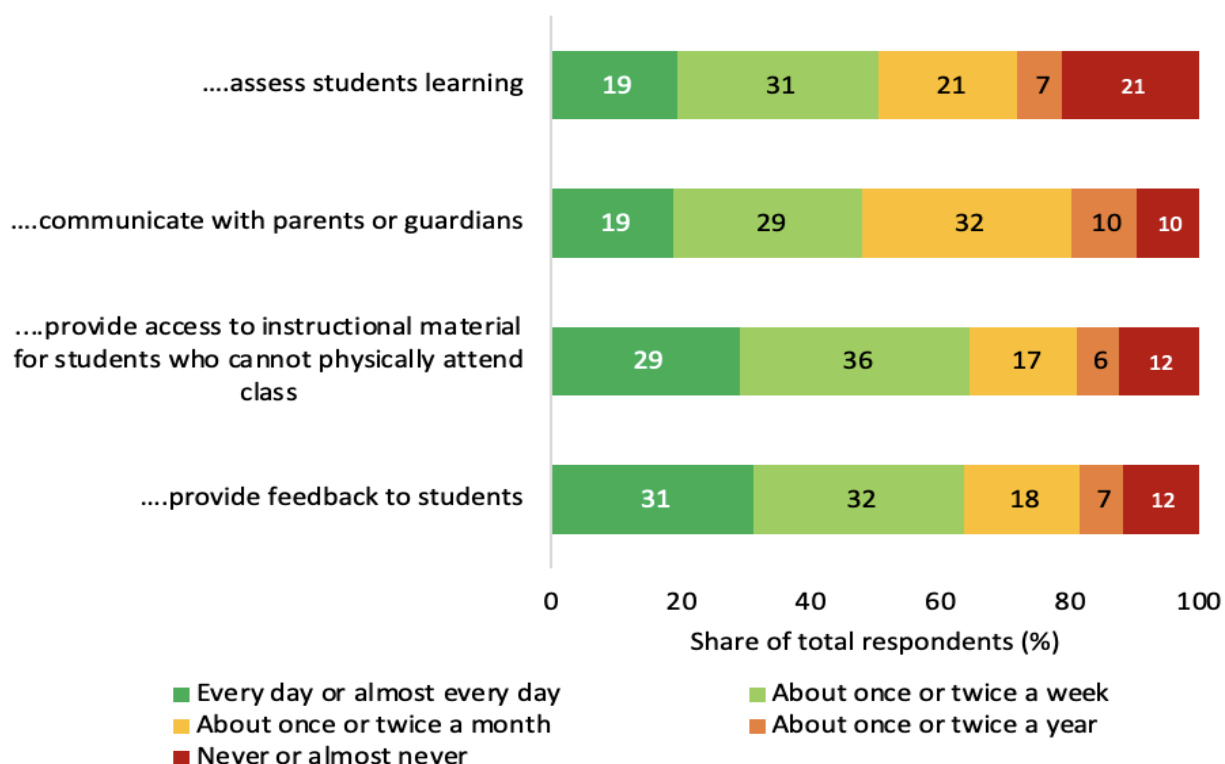
Figure 40. *Did teachers do any of the following during the Covid-19 pandemic?*

Key message # 3: Technology was used by teachers much more frequently to provide students with materials during the course of school closures compared to it being used to assess their learning

When it came to the use of digital resources to undertake activities specifically relating to students, close to one-third of teachers indicated that they had used digital resources every day or almost every day to provide feedback to students or else provide instructional material to students who could not physically attend class. This dropped to 19% when it came to assessing students' learning (Figure 41).

Differences in teachers' use of digital resources were dependent on the location or else the type of school they taught in. In almost one-third of cases, teachers working in rural schools never/almost never used digital devices to assess students' learning. The equivalent for teachers working in government schools was 14%. In the case of government schools almost one in four teachers never/almost never used digital devices to assess students' learning: the equivalent for teachers working in private schools was just 6%.

Figure 41. Frequency by which teachers use digital resources.



Annex 3: Interview guide

This document has been developed to support the execution of a set of key informant interviews (KIIs) and focus group discussions (FGDs) being conducted to gain insight into Pakistan's digital learning landscape. The interviews and FGDs will seek to understand Pakistan's digital learning solutions landscape. This will include key challenges, trends and features, as well as key players and tools in the digital learning solutions landscape in Pakistan.

The document outlines the purpose of the interviews and FGDs, followed by a justification of why to interview the stakeholders we do. This is followed by laying out each guide, by the type of stakeholder interviewed, that will be used to inform the content we hope to generate from each of these sessions with the different stakeholders involved.

Purpose

The purpose of the interviews and FGDs is to develop a richer understanding of the following issues:

1. What users and providers of digital learning solutions see as the **existing solutions** to access and learning challenges.
2. What the **different priorities** are of stakeholders in regard to digital learning solutions.
3. The **experiences of different stakeholders** in the use of digital learning solutions.
4. The **modalities which digital learning solutions employ**, differentiating between distance, blended and in-classroom learning.
5. Understanding the different **experiences of marginalised groups** including exploring:
 - i) the extent to which digital learning solutions in place have been specifically designed to target marginalised (e.g., children with special needs, remote children, etc.) groups; and
 - ii) how it is they do this

Key informant interview questions guide

These will be **one-hour** interviews which will focus on addressing the parameters listed above (*Italicised blue text relates to information/prompts specifically for the interviewer*).

Digital learning solution providers

Interview guide for interviewing digital learning solution providers

Information relating to digital learning solutions

1. Can you give a background of your intervention/tool including:
 - which groups you primarily target (*e.g., girls, low-income, OOSC*)?
 - what education level do you focus on (*e.g., primary, secondary*)?
 - the main device you use (*e.g., smartphone, television, radio*)?
 - the main modality you operate through (*in-person, blended, remote*)?
2. How, if at all, has this been adapted to reflect the Covid-19 situation?
3. How do you believe technology can help the group you are targeting to access quality education?
4. Can you give practical examples of where your digital learning solution has had a positive impact on educational outcomes for *[the group the intervention is focusing on]*?
5. What are the main challenges you have faced in targeting *[the group the intervention is focusing on]* and what are some of the ways your intervention has tried to address these challenges?
 - *If the intervention works in more than one geographic region/province, probe for differences in experience*
6. What is the current business model that is used to fund your digital learning solution (*e.g., Donor/NGO supported, cost-sharing model*)? Can you discuss this also in the context of the cost to the end-user? *[probe detail on fixed/variable costs to the end user]*?
7. How, if at all, did you—or are you planning to—incorporate into the design of your digital learning solution elements which can make your intervention scalable? Can you give some practical examples around this, and what successes/challenges you have faced in doing this?

8. Similarly, to what extent has your digital learning solution incorporated sustainability into its design, and can you give examples as to how this has helped to reach your target group if so?
9. When designing, evaluating or adapting your intervention, which stakeholders have you tended to involve in these processes? Please give details about what this involvement entails (*e.g., end-user involvement, how participatory is it*).
10. Post Covid-19, how are you planning on adapting your digital learning solution intervention if at all? (*e.g., incorporating more modalities, scaling up*)