

HELPDESK RESPONSE 31

Using EdTech to Support Learning Remotely in the Early Years

Rapid Literature Review of Evidence from the Global Response to Covid-19

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About this document

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About the EdTech Hub Helpdesk

The Helpdesk is the Hub's rapid response service, available to FCDO advisers and World Bank staff in 69 low- and lower-middle-income countries. It delivers just-in-time services to support education technology planning. We aim to respond to most requests in 1–15 business days. Given the rapid nature of requests, we aim to produce comprehensive and evidence-based quality outputs, while acknowledging that our work is by no means exhaustive. For more information, please visit <https://edtechhub.org/helpdesk/>. This Helpdesk topic brief was prepared by a team of researchers from Education Development Trust, in partnership with EdTech Hub.

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Abbreviations and acronyms

ARNEC	Asia-Pacific Regional Network for Early Childhood
CDC	Centers for Disease Control and Prevention
CHV	Community Health Volunteer
CST	Caregiver Skills Training
ECD	Early childhood development
ECE	Early childhood education
ECWI	Early Childhood Workforce Initiative
EEF	Education Endowment Foundation
EJOL	Early Journey of Life
ELM	Early literacy and maths
ELP	Early Learning Partnership
FCDO	Foreign, Commonwealth & Development Office
GSF	Global Schools Forum
HIC	High-income country
HMIC	High- and middle-income country
ICBF	Institute for the Wellbeing of Families (Columbia)
IDB	Inter-American Development Bank
IPT-G	Interpersonal Therapy for Groups
IRI	Interactive radio instruction
ISSA	International Step by Step Association
LIC	Low-income country
LMIC	Low- and middle-income country
MoEST	Ministry of Education, Science and Technology

NGO	Non-Governmental Organisation
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
Ofsted	Office for Standards in Education, Children's Services and Skills
PLH	Parenting for Lifelong Health
PSA	Public Service Announcement
R4D	Results for Development
RCT	Randomised Control Trial
RTI	Refugee Trauma Initiative
SEND	Special Educational Needs and Disabilities
WHO	World Health Organisation

Summary of findings

This topic brief examines the literature on technology-based, remote approaches to supporting learning in the early years for children from birth to age five. It

- highlights promising practices based on limited evidence from the early childhood education (ECE) sector in low- and middle-income countries (LMICs);
- incorporates some evidence from other sectors such as health and parenting as well as high-income contexts where helpful;
- draws on: the [nurturing care framework](#);¹ the Principles for Digital Development²; and best practice in early childhood education pedagogy for analysis;³
- identifies significant gaps in robust evidence.

The topic brief will build on a thorough and detailed report by the Office of Research – Innocenti, UNICEF’s dedicated research centre, published in December 2020: Covid-19 [Trends, Promising Practice and Gaps in Remote Learning for Pre-Primary Education](#). Readers are encouraged to consult the UNICEF Innocenti Report for further examples intentionally not covered here to avoid duplication.⁴

We use the term EdTech to cover digital, data or technology used anywhere in the education system — by students (at home or in the classroom), by teachers and others in the education workforce or the education system. For the purpose of this review, remote learning in the early years refers to all learning that is carried out in the home or community, outside of formal learning centres, facilitated by caregivers with or without specialised input

¹ A framework developed by WHO, UNICEF and the World Bank Group in collaboration with the Partnership for Maternal, Newborn and Child Health, the Early Childhood Action Network and many other partners to support policymakers and practitioners to maximise quality and impact of early childhood interventions.

² The Digital Principles referred to in this report are the nine Principles for Digital Development outlined [here](#) and explained in more detail in [Section 1](#). (1) design with the user; (2) understand the existing ecosystem; (3) design for scale; (4) build for sustainability; (5) be data driven; (6) use open standards, open data, open source and open innovation; (7) reuse and improve; (8) address privacy and security; (9) be collaborative; see also [Haßler \(2020\)](#) for a version of the Digital Principles tailored to education.

³ See [‘Background and scope’](#) for more information.

⁴ See [Figure 2](#) for a summary of main findings and list of case studies included in the UNICEF Innocenti report (Nugroho et al. 2020, p. 24 [P&E, OBS →]).

from child development practitioners. This can be achieved via any kind of digital or non-digital tools such as TV, radio, SMS, phone calls, and smartphone applications including Whatsapp and Viber, video conferencing or online learning.

[A summary table of the main interventions](#) considered in the review is available in [Section 1](#) highlighting how they link to the main findings summarised below. Each finding is further supported by wider literature and evidence explored in the main body of the document.

Findings

Finding 1: *Educational technology has significant potential to support early learning remotely but we need more robust evidence of what works for whom and in what contexts.* Put simply, not enough has been done and not enough has been evaluated to enable us to determine empirically what works, for whom, and in what contexts when it comes to technology-enabled interventions for remote learning in the early years in LMICs. However, some evidence from LMICs⁵ suggests that remote modalities have the potential to increase reach and impact beyond interventions that are restricted to face-to-face delivery only. Several other studies from the fields of parenting, health and social care in high- and middle-income countries (HMICs) and some studies from LMICs find significant positive outcomes from remote delivery of support to caregivers in the home. There is some strong evidence of positive impact from meta-analyses and systematic reviews in HMICs. If done well, remote approaches to enhancing early learning outcomes at home could significantly improve lifelong outcomes for a much greater number of children in LMICs.

Finding 2: *Caregivers⁶ are central to achieving impact — remote interventions should either target their needs directly or support them to mediate their children’s access to and learning through technology.* In LMIC contexts, this requires a deep understanding of the challenges of reaching and influencing caregivers in the home, including socio-economic barriers, connectivity and culture such as norms, behaviour, and embedded beliefs about how children learn. All approaches need to be designed, implemented and evaluated with the caregiver at the centre (Follow Digital Principle 1:

⁵ Emerging evidence (mostly anecdotal).

⁶ ‘Caregivers’ is defined as any individual who provides for the needs of children in LMIC contexts. Caregivers can be parents, elder siblings, extended family members, and / or community members.

‘design with the user’ and Digital Principle 2: ‘understand the ecosystem’. Caregivers need:

- A basic understanding of what ‘learning’ looks like in the early years and evidence-based training⁷ and materials appropriate for the specific age of the child / children in their care.⁸
- Support with their own mental health and well-being in order to support their children at home — interventions must be designed to minimise family stress.
- Interventions to work around their family constraints and scheduling preferences.
- Differentiated / tailored support to meet the needs of *all* children.

Finding 3: *Access to technology is uneven — open access, open data, open source (Digital Principle 6) information and resources are critical to empowering the workforce and caregivers at home.* Several global and national initiatives to provide open access, open data, open-source information and resources prior to and during the pandemic have enabled:

1. Early childhood education planners and practitioners to design and implement their interventions more effectively;
2. caregivers to feel more supported to provide nurturing care and early learning opportunities for their children at home;
3. practitioners and caregivers to feel empowered and supported with their mental health and well-being.

Planners and practitioners need to work collaboratively (Digital Principle 9) with global, national, and local organisations to build and develop coordinated open access, open data and open source platforms that can support all planners and practitioners anywhere anytime.

Finding 4: *Selecting the most appropriate technology — or a mix of technologies⁹ — for specific interventions is complex but critical to maximising reach, impact, and equity.* Combined evidence¹⁰ suggests that:

- Different tasks are better suited to different technology modalities.

⁷ Training for caregivers must be informed by what we know about how adults learn best, i.e, through a combination of knowledge input, practice, and self and group reflection.

⁸ Much can be learnt from the field of behaviour change and parenting programmes.

⁹ The ‘mix of technologies’ may include a ‘no technology’ element to overcome technology-related barriers to access.

¹⁰ The evidence summarised here is nuanced in detail in the main body of the review in terms of strength and relevance for early childhood education in LMICs where derived from HIC contexts or from other sectors.

- Interactive radio instruction (IRI) has potential as a tool to support and facilitate interactions between caregivers and children around learning.
- Non-digital solutions such as television, pre-recorded videos, and radio programming show promise for children in the early years.
- SMS messaging interventions have high potential, but must be carefully designed to incorporate the local community and supplement existing local initiatives.
- Support to caregivers via SMS can have greater impact when combined with other forms of two-way communication, such as telephone calls.
- The use of synchronous video communication with caregivers has shown the greatest promise with the youngest children in the context of parenting interventions due to the enhanced potential to ‘coach’ caregivers and develop their skills.
- Currently, most global initiatives that aim to support early years’ children who present with Special Educational Needs and Disabilities (SEND) with their learning remotely through technology rely heavily on access to the internet and video capabilities.
- The use of simple technology modalities can be effective to support caregivers of children presenting with SEND if they are designed to meet the needs of caregivers (Digital Principle 1: ‘design with the user’).

Understanding the cost-effectiveness of using different forms of technology for different tasks is necessary to optimise planning and delivery. Planners and practitioners should carefully consider and compare (through rigorous cost-benefit analysis) different options / combinations of options and track cost-effectiveness for optimisation *and* equity. Where programme delivery relies heavily on internet access and high-tech devices, these must be provided equitably to all families and remote learning materials should be available in a format that meets the needs of *all* children (Digital Principles 1 and 2).

Finding 5: *A commitment to Digital Principle 4: ‘build for sustainability’ and Digital Principle 5: ‘be data driven’ maximises the potential to reach scale.* In the interventions reviewed for this report, we found the greatest potential for scale and impact where content and functionalities were:

1. designed in collaboration with local and national governments and aligned with national requirements, regulations, and quality standards;
2. flexible and adaptable to feedback and data on reach and impact.

Planners and practitioners should have a clear ‘route to scale’ when designing and delivering remote approaches to enhancing early learning in the home. In

most cases, this is likely to involve strong collaborations with national governments and a process of ‘data-driven’ monitoring, evaluation, and learning that enables them to be agile and responsive to feedback and changes in circumstances (Digital Principal 5). Technology is a great enabler of efficiency, offering opportunities for automated and / or systematic data collection on reach and impact. This should be leveraged through the design and scaling process.

Finding 6: *Quality early childhood education pedagogy is ‘play-based learning’ — all tech-based interventions must reflect this.* We know what works in early years pedagogy but we don’t know what works via EdTech. All tech-enabled approaches to supporting learning remotely in the early years must adhere to the evidence-based theory, principles, and best practice in early years pedagogy and must not seek to apply pedagogical approaches from older age groups that are not appropriate. Other specific pedagogical considerations emanating from the literature review include the need to:

- support children to learn independently through exploration, play, and discovery;
- enable children to have a choice in what they do and when;
- enable peer interactions which can provide motivation and improve learning outcomes;¹¹
- design activities based on what is feasible using only resources that are commonly available at home.

Finding 7: *Solutions delivered by / through the early childhood education workforce must address the gap in skills and competencies and support their mental health and well-being.* The early childhood education workforce requires skills in how to engage and communicate with caregivers through remote modalities. Early childhood education practitioners and teachers need to be supported to find ways to assess children’s learning and development remotely via the primary caregivers, in order to offer tailored advice and guidance. Furthermore, the early childhood education workforce is better able to provide practical and emotional support to caregivers when their own well-being is taken care of.

Gaps

Early childhood education in LMIC contexts is under-invested and under-researched (face-to-face and remote). Very little is known about remote

¹¹ Evidence from high-income contexts and older age groups but included here given alignment with principles of early years pedagogy

interventions in the early years across all sectors of early childhood development (ECD), including early childhood education. On the other hand, there is currently a great opportunity for the global early childhood development community to learn from the wide variety of innovations that have emerged as a result of Covid-19, many of which are featured in this brief. More robust research and evaluations of existing interventions would greatly enhance our understanding of the potential of stimulating early learning through play and nurturing care remotely, as well as the cost-effectiveness of different options. *Overall, we need a coordinated approach to monitoring, evaluation and learning (MEL) to capture reach, impact, and cost-effectiveness data that can be aggregated and disaggregated to understand better what works, for whom and in what contexts. Specifically, we don't know enough about the following.*

1. The beliefs and attitudes of male and female caregivers towards child development in LMIC contexts. A review of the literature on remote approaches to adult behaviour change in relation to child development in LMICs is vital to ensure that interventions achieve their intended impact.
2. How peer-to-peer interactions can be facilitated remotely in LMIC contexts in the early years. The technology / connectivity barriers could be overcome using low-tech approaches such as sending audio / video files but there is currently no evidence available to support planners.
3. Which technological and pedagogical approaches suit which tasks and types of content.
4. The relative impact of different interventions to upskill the workforce.
5. The most effective ways of remotely assessing learning outcomes in the early years.
6. Successful or promising approaches to remote safeguarding for children in the early years.
7. Ways of reaching and meeting the needs of vulnerable children (cost-effectively). We did not find any studies that focused on the impact of remote learning interventions through technology in the early years for 'girls' or 'children presenting with SEND' in LMICs.

Background and scope

The United Kingdom Foreign, Commonwealth & Development Office (FCDO) has requested support from the EdTech Hub helpdesk to prepare a topic brief based on a ‘rapid literature review’ of the ‘evidence on the use of technology in the early years of learning’ to support the programming and design of the [THRIVE](#) early childhood development research programme. It is being openly published in order to inform the FCDO’s [THRIVE](#) research programme as well as serving as a global public good for policymakers and practitioners designing and implementing early childhood education interventions in LMIC contexts. [THRIVE](#) aims to support programming in FCDO partner countries to improve the effectiveness and efficiency of early childhood development programme interventions including early childhood education working at scale. The brief is also a helpful addition to the evidence base that can support policymakers, programme teams, and practitioners from the EdTech community and the ECD community.

We use the term EdTech to cover digital, data or technology used anywhere in the education system – by students (at home or in the classroom), by teachers and others in the education workforce or the education system. For the purpose of this review, remote learning in the early years refers to all learning that is carried out in the home or community, outside of formal learning centres, facilitated by caregivers with or without specialised input from child development practitioners. This can be achieved via any kind of digital or non-digital tools such as TV, radio, SMS, phone calls and, smartphone applications including WhatsApp and Viber, video conferencing, or online learning.

The topic brief will build on a thorough and detailed report by the Office of Research – Innocenti, UNICEF’s dedicated research centre, published in December 2020: Covid-19 [Trends, Promising Practice and Gaps in Remote Learning for Pre-Primary Education](#) (hereinafter referred to as the ‘UNICEF Innocenti Report’). The UNICEF Innocenti Report examined remote learning modalities available to pre-primary children (aged 3–5 years) through a survey of 122 ministries of education on Covid-19 responses. It dives deeply into ten case studies and concludes with seven key recommendations as outlined in [Figure 1](#) below (Nugroho et al. 2020, p. 24 [P&E, OBS →]¹²). Interested readers are strongly encouraged to read this report and the UNICEF Innocenti Report

¹² For a brief explanation of the coding process used here to indicate BE2 strength of evidence in the studies we refer to see Table 1.

together for a full picture of promising practice and gaps in evidence on remote learning for children aged ‘birth-5 years.’

The focus of the literature review in this brief is on evidence for the ‘birth-5 years’ age group from low- and middle-income countries (LMICs) during the period of the Covid-19 crisis¹³ (January 2020–to date). We acknowledge that the early years extend from ‘birth-8 years’, however we have opted to focus this study on the age range prior to accessing basic education settings as this has been a difficult and under-researched area. We differentiate the needs of children, caregivers, and the early childhood education workforce as well as any proposed responses and solutions for different age groups (‘birth–3’ and ‘3–5 years’) where the evidence available allows us to do so.

The brief draws on evidence from across multiple sectors to inform potential approaches to reaching the needs of the youngest children which are often met through parenting, social protection, counselling, and health and nutrition interventions with caregivers. This does not expand the scope beyond early childhood education into early childhood development but it does acknowledge the need to look beyond the education sector to learn about the best approaches for supporting remote learning in the early years and the importance of multi-sectoral interventions with this age group — i.e., learning can not be dissociated from development and care.

We also draw on evidence from high-income countries (HICs) where it is deemed relevant and has potential to inform approaches to research and delivery enhancement in the [THRIVE](#) beneficiary countries. Analysis of why this evidence could be helpful in LMIC contexts is provided to justify its inclusion.

The brief does not investigate the content¹⁴ of technology solutions or offer any analysis of the findings in terms of their implications for working at scale. As this is not a systematic review and the scope is limited, not all relevant evidence will be included.

The brief includes academic sources and grey literature for completeness and due consideration is given to the strength of the evidence following the [Building Evidence in Education \(BE2\) guidance](#) where relevant.¹⁵

¹³ Evidence from prior to the crisis is considered on occasion as proxy indicators of the potential of similar interventions for which there is no robust impact data during the period under review.

¹⁴ I.e., programming, curriculum alignment, contextual appropriateness, etc.

¹⁵ For academic literature and publications demonstrating robust use of research methods.

Table 1. BE2 Strength of evidence — A brief explanation of the coding process for single studies.

e.g. (Naylor, 2019 [P&E, OBS, ↑↑])		This means it was written by Naylor in 2019 and was a primary/empirical study (collected new data), using an observation method (see list below) and was well reported.
The first part of the code tells the reader what sort of study design was used		The second part of the code gives the reader more detail
P&E	Primary and empirical New data collected.	OBS — Observational methods (cross-section, cohort /longitudinal, analysis of FGs and Ints, ethnography, case study, political econ analysis, mixed-methods)
		QEX — Quasi-experimental designs
		EXP — Experimental designs
S	Secondary Existing data used or analysed. e.g., Evidence papers, literature reviews, rapid evidence reviews, policy analysis	SS — Systematic review
		RR — Rigorous review
		NSR — Non-systematic review
TC	Theoretical or conceptual	n/a
The final part gives a broad indication of the quality of the research and how well findings are reported		
↑↑	very high /very good	Demonstrates strong adherence to principles of appropriateness / rigour, validity, and reliability; strongly demonstrates principles of conceptual framing, openness / transparency, cogency, cultural appropriateness, and value for money.
↑	high /good	Demonstrates adherence to principles of appropriateness / rigour, validity, and reliability; likely to demonstrate principles of conceptual framing, openness /transparency, cogency, cultural appropriateness, and value for money.
→	moderate /ok	Some deficiencies in appropriateness / rigour, validity, and / or reliability, or it is difficult to determine these; may or may not demonstrate principles of conceptual framing, openness / transparency, cogency, cultural appropriateness, and value for money.
↓	low / bad	Major and / or numerous deficiencies in appropriateness / rigour, validity, and reliability; may / may not demonstrate principles of conceptual framing, openness / transparency, cogency, cultural appropriateness, and value for money.

The review clearly links the findings and considerations to the [EdTech principles from the world bank](#)¹⁶ and the [Principles for Digital Development](#)¹⁷ to draw insights on the overall delivery risks and likelihood of impact of different interventions. The Principles for Digital Development are a tool to help planners and practitioners make the most of the potential of ICT to increase efficiency, cost-effectiveness and impact of interventions in international development. The principles have been endorsed by UNICEF, the FCDO, World Bank and dozens of other global organisations working across all sectors in international development.¹⁸ They must be applied with due consideration for evidence-based pedagogy when planning interventions in the education sector. A critical look at how interventions fare against these principles will help determine their likely viability in achieving equitable impact at scale. The review also considers the guiding principles of the [Nurturing Care Framework](#) (NCF) for early childhood development to define the needs of the youngest children and their caregivers and to make qualitative judgements of the appropriateness of some interventions targeting children aged birth to three years.

Remote interventions for children in the early years are either mediated by caregivers or target them directly to support and influence how they care for their children and enable their learning. Therefore, all approaches need to be designed, implemented, and evaluated with the caregiver at the centre (Digital Principle 1: ‘design with the user’ and Digital Principle 2: ‘understand the ecosystem’). The review considers the needs of caregivers in accessing and achieving remote learning through EdTech under each section of the review rather than as a separate component.

Main research questions:

1. What does existing evidence suggest as effective and efficient ways of using EdTech to support caregivers to improve early learning outcomes, given the constraints and access to digital platforms and resources in LMICs?
2. What are the key considerations to maximise impact?
3. What are key gaps in existing knowledge and evidence on supporting early learning through EdTech?

¹⁶ The five principles are: (1) Ask why; (2) at scale, for all; (3) empower teachers; (4) engage the ecosystem; (5) data driven.

¹⁷ (1) Design with the user; (2) understand the existing ecosystem; (3) design for scale; (4) build for sustainability; (5) be data driven; (6) use open standards, open data, open source and open innovation; (7) reuse and improve; (8) address privacy and security; (9) be collaborative.

¹⁸ <https://digitalprinciples.org/endorse/endorsers/>

Sub-questions — divided into four areas of focus:

1. Early childhood pedagogy ('play-based learning')
2. Early childhood education workforce
3. Technology modalities
4. Equity and Inclusion

Early childhood pedagogy is a highly skilled specialist area that must be the foundation of any early childhood education intervention whether face-to-face or remote. It is critical to examine the challenges and opportunities that early childhood pedagogy offers when designing remote learning interventions through technology. We know from global evidence that teaching quality is the most important factor in determining learning outcomes at all levels of education, including in the early years. In the context of remote delivery, we must understand the additional and varied needs of early childhood education practitioners who are expected to work via caregivers in the home to achieve the same learning outcomes they aim for when working face-to-face. Selecting the right technology modality or mix of modalities for each specific context and for users is key to maximising reach, scale, and impact. It is therefore important to establish the main considerations for planners and practitioners when making decisions on what technology to use and how (radio, TV, phone calls, SMS, video, etc.). Finally, but most importantly, is the challenge of achieving equity and inclusion with remote delivery. This is a key consideration for any policy or intervention across any sector in any context, not least when it comes to the world's youngest children.

Early childhood pedagogy (play-based learning)

- What pedagogical approaches work most effectively to support young children's learning using technology without compromising best practice?
- What are the key principles for designing EdTech products, services and tools that support play-based, interactive learning?
- What are the needs (including tech, knowledge, socio-emotional, mental health) of caregivers in ensuring pedagogical approaches are adhered to and effectively used for remote learning?

Early childhood education workforce

Early childhood education teachers and practitioners are responsible for supporting caregivers with remote learning for the youngest children. What are the needs of the workforce in supporting remote learning in the early

years? How have teachers and practitioners been supported to work with caregivers to ensure safeguarding¹⁹ of children in the early years? What can we learn from other sectors and programmes, such as parenting, social protection, and health and nutrition programmes to inform emerging principles for effective professional development for the early childhood education workforce?

Technology modalities

Tech modalities for remote learning in preschool (ages 3–5 years) are well documented in the UNICEF Innocenti Report that this review builds upon. Our literature review considers any alternative, new or additional resources not covered in the UNICEF Innocenti Report and focuses more heavily on the ‘birth-3 years’ age group. How can children from ‘birth-3 years’ and their caregivers be effectively reached through technology / digital media / social media? A one-size-fits-all approach is unlikely to reach the most marginalised learners who may lack access to the connectivity, data, or devices required for high-tech approaches. What modalities (high-tech, low-tech, blended learning) are most appropriate for learners in this age group and their caregivers? How can they be used in combination with each other for learning? What are the needs of caregivers in relation to the different technology modalities and how can they be best supported to use technology to support their children with their learning?²⁰

Equity and inclusion

Using technology can exacerbate existing inequalities if it does not adhere to the [Principles for Digital Development](#)²¹ and the [World Bank EdTech principles](#).²² If used effectively, it can help reach marginalised learners. The urban–rural divide and implications for connectivity, equity, and inclusion in pre-primary are sufficiently covered in the UNICEF Innocenti Report. This review focuses on other forms of marginalisation, particularly gender and Special Educational Needs and Disabilities (SEND) used to describe any and all children who require extra provisions to access and participate in education and to learn. What, if any, are the essential differences in access to technology to support early learning appropriately for boys and girls and also children

¹⁹ Safeguarding includes: (1) online / technology safety and (2) well-being and physical safety.

²⁰ We refer to ‘caregivers’ to encompass any and all individuals who care for children including parents, other family members, community members, etc.

²¹ See also [Haßler \(2020\)](#) for a version of the Digital Principles tailored to education.

²² (1) Ask why; (2) at scale, for all; (3) empower teachers; (4) engage the ecosystem; (5) data driven.

presenting with SEND? What are some of the important considerations required to ensure equity in access to and learning through technology for the most vulnerable groups of children aged from 'birth-5 years'? What are the needs of caregivers in relation to the most vulnerable groups²³ of children? How can they best be supported to facilitate remote learning using technology?

²³ Specifically this report focuses on: (1) children presenting with SEND (including visual and hearing impairments, learning and behavioural difficulties); (2) girls.

1. Introduction

1.1. Context and problem definition

The case for investing in early childhood development to achieve sustainable development goals is clear.²⁴ Ninety per cent of brain development takes place during the first five years of a child's life. Children from birth to 2 years need 'nurturing care', defined by WHO, UNICEF and the World Bank as: "good health, adequate nutrition, responsive caregiving, physical and emotional security and safety, and early learning stimulation" to thrive as illustrated in the Nurturing Care Framework illustrated in Figure 1 below.²⁵



Figure 1. Nurturing Care Framework.

Source: WHO et al., 2018 [TC, ↑↑].

The Nurturing Care Framework was developed by WHO, UNICEF and the World Bank Group in collaboration with the Partnership for Maternal, Newborn and Child Health, the Early Childhood Action Network and many other partners to support policymakers and practitioners to maximise the quality and impact of early childhood interventions.

Missing out on nurturing care can lead to lower cognitive, language and psychosocial outcomes in later life (GEM, 2019 [P&E, OBS, ↑↑]). From ages 3–5, children continue their development through play, reading, singing, and interacting with peers and caring adults at home and in early education settings. From an education perspective in LMICs, 44% of children who attended early childhood education programmes are on track in literacy and

²⁴ The UNICEF Innocenti Report summarises the overwhelming evidence on the importance of quality early childhood experiences for children, in terms of life-long learning and economic gains, and for society, in terms of poverty, inequality, social inclusion and health and well-being of nations (UNICEF, 2017; UNICEF, 2019; Muroga et al., 2020; Woodhead, 2016). It also clearly articulates the benefits of quality pre-primary programmes for the most vulnerable children and its potential to significantly reduce the inequality gap (UNICEF, 2019; Waldfogel, 2015).

²⁵ [Early Childhood | The Key — Theirworld.](#)

numeracy skills when they reach primary school compared with only 12% for those who did not attend any programme (UNICEF, 2019).

Investing in early childhood development also yields considerable economic gains. WHO et al. (2018) estimates that every USD 1 spent yields a USD 13 return on investment. The global children's charity 'Theirworld' estimates a return up to USD 17 for the most disadvantaged children.²⁶ In Jamaica, providing toddlers with psychosocial stimulation increased earnings by 25% twenty years after the investment was made (World Bank, 2019). Richter et al. (2017) estimate that Nicaragua will lose the equivalent of 4.1% of GDP in unrealised potential if they do not expand universal preschool. The Inter-American Development Bank (IDB) carried out the first multi-country (140 countries) forecast of the impact of pre-primary programme closures resulting from Covid-19 on future earnings and found that a six-month closure represents a loss of 5.3% of GDP in Peru, 4.1% in Mexico and 3.5% in Jamaica (López Boo et al., 2020 [S, NSR, ↑]).

“Science tells us that a child’s experiences from conception through their first five years will go on to shape their next 50. It tells us that the kind of children we raise today, will reflect the kind of world we will live in tomorrow. It tells us that investing in the start of life is not an indulgence, but economically, socially and psychologically vital to a prosperous society.”

– Jason Knauf, CEO of the Royal Foundation, 2020

Access to quality early childhood education is insufficient and inequitable. Despite overwhelming evidence to support the importance of early childhood education, more than 175 million children — representing nearly half of all pre-primary-age children — are not enrolled in pre-primary education. In low-income settings, only 20% of children are accessing formal early childhood

²⁶ Bright and Early: How financing pre-primary education gives every child a fair start in life (June 2017)  Theirworld.

education opportunities compared with 80% in HICs (UNICEF, 2019). Inequality is exacerbated within low-income countries where children from affluent families are eight times more likely to attend early childhood education programmes than children from poorer backgrounds (UNICEF, 2019). Black et al. (2017) estimate that 250 million children under five (43%) in LMICs will not reach their full potential, which is equivalent to a loss of 19.8% in adult annual income.

Governments and donors spend significantly less on early childhood education than they do on primary and secondary education despite the potential return on investment. In many countries in sub-Saharan Africa, less than 2% of the education budget is spent on pre-primary education (World Bank, 2021). Organisation for Economic Co-operation and Development (OECD) countries spend on average just over 0.7% of GDP on early childhood education and care. In 2017, nine major donors in health, nutrition, education, and sanitation spent less than 6% of total official development assistance (ODA) on early childhood development (Zubairi and Rose, 2018). Only 1% of all early childhood development aid was spent on education.

The early childhood education sector is highly vulnerable to shocks, such as the Covid-19 global pandemic, and remote solutions can be more challenging to implement than with older age groups. Early childhood education is largely privately delivered (UNESCO, 2020) and has been notably absent from national responses to the pandemic, particularly in LMICs Nugroho et al. (2020 [P&E, OBS →]). The challenges associated with connectivity and the limited transferability of early years pedagogy (play-based learning) and nurturing care to remote delivery²⁷ were significant barriers even where efforts were being made to reach children under five years old. Children in early childhood education often did not have access to their teachers or remote learning and the nature and extent of engagement in home learning was mixed (Proulx et al., 2021, p. 3 [S, RR, ↑]). This was echoed by several organisations interviewed in the development of this report.

Caregivers, particularly those from most vulnerable families have experienced heightened stress and trauma as a result of the pandemic, which is negatively affecting their children at home. The nonprofit human development organisation FHI360 and the Lego Foundation published a research brief based on a review of 112 scholarly and scientific studies examining the impact of the Covid-19 pandemic on three pillars of the Nurturing Care Framework (responsive caregiving, early learning and play, and children's safety and

²⁷ Hands-on, exploratory learning that requires a deep understanding of child development and cognitive growth is not easily transferred to caregivers at home.

security).²⁸ The report found that caregivers suffered from increased levels of stress and poor mental health as a result of the pandemic, which was associated with “lower parent-child closeness, harsher parenting attitudes and increased parent-child conflict” (Proulx et al., 2021, p. 3 [S, RR, ↑]).²⁹ Mothers continue to be disproportionately responsible for childcare and housework, but some studies noted an encouraging increase in male caregiver responsibilities during the pandemic. Evidence from 16 studies indicates a reduction in the number of referrals to child protective services during lockdown suggesting an increase in safeguarding issues going unnoticed (Proulx et al., 2021 [P&E, OBS, ↑]).

²⁸ A framework developed by WHO, UNICEF and the World Bank Group in collaboration with the Partnership for Maternal, Newborn and Child Health, the Early Childhood Action Network and many other partners to support policymakers and practitioners to maximise quality and impact of early childhood interventions.

²⁹ Eighty-nine of the 95 studies reviewed focus on HICs. LMICs represented included: Bangladesh, Cambodia, Ethiopia, India, Nigeria, and Mexico.

“There is an urgent need for action-oriented studies – those that go beyond identifying trends and begin to pinpoint “what works” to effectively promote and protect nurturing care during health emergencies and school closure. In particular, there is a need to identify effective interventions and strategies for families experiencing income loss, food insecurity, for mothers with young children, families with disabled children, and those with pre-existing mental health challenges. A substantially greater amount of inquiry is needed into the effects of lockdowns on play, and the quality of the caregiver-child playful interactions”

– Proulx et al. 2021, p. 4 [S, RR, ↑]

It is in this context that EdTech Hub and FCDO are seeking to understand the potential role of EdTech in supporting remote learning in the early years as part of holistic approaches to early childhood education in LMIC contexts.

1.2. The potential of EdTech as part of the solution

There is anecdotal evidence of the potential value and impact of educational technology to support learning remotely in the early years in LMICs and a clear need for more robust, empirical research. Several international and local organisations and country governments initiated or expanded existing technology products, services and tools to reach caregivers with advice and guidance for remote learning during the pandemic. In some cases, the use of technology-enabled greater reach and access than prior to the pandemic. Evidence on the uptake of remote learning approaches for primary- and secondary-age children is slightly more prevalent globally than evidence available for the early years. We found very limited evidence of the impact of these interventions on child development and learning outcomes. Therefore,

there is currently no way of empirically determining what works, for whom and in what contexts in LMICs.

“There is need to leverage technology and use a community-based approach to support continuity of nurturing care services with timely referral and follow-up to a wide range of cross-sectoral services including psychosocial support.”

– Shumba et al., 2020, p. 13

There is some evidence on the potential for EdTech to facilitate learning for all ages (including early years) in emergency contexts (both in classrooms and remotely). Save the Children conducted a rigorous review, intentionally including grey literature as well as rigorous academic literature, to build a holistic understanding of how EdTech can impact learning and under what conditions in humanitarian contexts. They conducted a narrative synthesis to analyse and draw out the elements of programmes that were deemed to have contributed to their success and to identify patterns to inform future programming. Thirty-five per cent of the case studies analysed were from LICs and / or fragile states and 9% focused on interventions in the early years (Tauson and Stannard, 2018 [S, RR, ↑↑]). Table 2 below, highlights some of the key findings from the report and provides our analysis of what this could mean for the use of EdTech for remote learning in the early years in LMICs.

Table 2. *Interpretation of findings on EdTech use from emergency settings for early years in LMICs. Source for Save the Children findings: Tauson and Stannard, 2018, [S, RR, ↑↑].*

Save the Children Key Findings	Relevance for early years settings in LMICS
Impact evidence exists but is not utilised appropriately	■ Follow the Principles for Digital Development ■ Scope out the most relevant evidence for the type of intervention being planned (i.e., positive parenting, play-based learning, foundational literacy and numeracy, etc.)

	■ Monitor and evaluate impact and adapt as you go
The provision of hardware alone is not sufficient to improve learning outcomes	■ Think of technology as a tool that enables implementation of a targeted intervention, not as the solution itself ■ Design the intervention then select the tool
EdTech is a tool that needs to be constructed with the principles of pedagogy in mind, such as active learning, engagement, and content that hooks onto previous learning	Ensure all tech-based approaches are built on the theory and principles of the nurturing care framework and play-based pedagogy .
EdTech must be implemented in line with the local curriculum	Ensure all content aligns with the national early years' curriculum where there is one under implementation. Ensure alignment with best practice where there is no national curriculum in place.
EdTech must be responsive / adapt to the learners' level	Provide options for caregivers to adapt activities to meet the learner at their level
Examples must be relevant to the learners' context	■ Ensure all activities are tailored to the local context or that tools / guidelines are provided to support the workforce and caregivers to adapt activities to their contexts ■ Restrict activities to what can be done with resources commonly available in all homes
Material that is contextually appropriate can be used by families and can help increase opportunities for social engagement	
EdTech must supplement and not substitute teaching if it is to be successful	Use technology as one tool among many that can support holistic approaches to early childhood education
How EdTech is used matters more than <i>what</i> EdTech is used	Ensure that the technology is used to facilitate interactions between children and with adults in the home, then select the most appropriate technology — not the other way around
Teachers' opinions and perspectives matter when it comes to effective EdTech use	The early childhood education workforce must be consulted and engaged in developing

	tech-based products, services and tools to enable to remote learning in the early years
Poor teacher training leads to poor results	The early childhood education workforce requires training and professional development to use EdTech to support caregivers with remote learning
Parents' perception of technology is important for learning	■ Understand caregivers' perception of technology ■ Tailor messages and support to address their beliefs as well as their skills and capabilities
The history and context of the country and education systems will influence the usage of EdTech for learning	Understand the history and context (ecosystem) to help determine the potential of EdTech to support learning (i.e., if remote learning has been a feature of the education system previously — such as in humanitarian settings or during previous health emergencies — build on it)
EdTech can, but does not necessarily, represent the best value for money or sustainability	Assess / estimate the cost-effectiveness of different types of interventions using different technology modalities (or no-tech modalities) to determine the best value for money (i.e., regular but short sessions with a speech therapist versus investment in assistive technology)
Infrastructure is a major barrier to the successful utilisation of EdTech	Ensure that technology modalities are selected based on existing infrastructure and connectivity
EdTech can be effectively used alongside accelerated learning programmes	Seek out ways to use EdTech to support caregivers to work with children in the home in areas where they may be developmentally delayed (tailored / targeted support) or where they may have missed out on opportunities for preschool (such as during the pandemic, or as a result of socio-economic barriers).
Boys and girls perform the same when not facing barriers to	Hardwire for inclusion — always consider the barriers to equity and inclusion and integrate

access but barriers are both gendered and pervasive	mitigation actions to overcome them in the solution design. Design interventions to be gender-responsive and / or gender-transformative.
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Evidence from HMICs suggests that educational technology has significant potential to support early learning. A global systematic review by Hsin et al. (2014 [S, SR, ↑]) on empirical studies of how technology influences learning for children from birth to 8 years found that technologies had positive effects on children's performance across developmental domains. While this was a global study skewed towards high-income contexts, one-third of the interventions included children from immigrant or low socio-economic status families or presenting with special educational needs. Topping et al. (2020 [S, RR, ↑])³⁰ conducted a scoping review of 1,540 studies on online and blended learning in HMICs and examined interventions by age and school level. Of the interventions focused on early years and kindergarten, 70% reported better outcomes than traditional instruction. The researchers highlight this as an interesting and unexpected finding given widely held assumptions that early years and kindergarten groups are unlikely to be responsive to digital technology solutions. The extent to which this evidence is relevant and transferable to LMIC contexts is unknown given the differences in exposure to digital technology in the home. It may be that part of the reason they are effective in HMIC contexts results from children being exposed to digital devices in the home from an early age. Given the limitations to connectivity and internet access, high-tech solutions to support remote learning in the early years in these contexts are likely to be highly inequitable even if they are made contextually and culturally appropriate. More robust research and evaluations are needed to understand the potential of online learning, blended learning, computerised educational games, and computer-supported collaborative learning for early years in LMICs.

Several other studies from the fields of parenting and social care in HMICs and some studies from LMICs find significant positive outcomes from remote delivery of support to caregivers in the home. These are explored in detail in [Section 4](#) on technology modalities.

³⁰ The review focused primarily on HMIC contexts, including 73 studies from Taiwan, 35 from Indonesia, 31 from Turkey, 21 from China, and 15 from Hong Kong. Some reviewed studies have yet to be published. The authors accept that while this review is generally positive, further work is required for their final report to avoid publication bias (i.e., positive findings surrounding EdTech are more likely to be published and thus may skew the results of this scoping review).

The report builds on the evidence, findings and key recommendations from The UNICEF Innocenti report summarised in Figure 2 below.

Figure 2. *Summary of key recommendations and related findings from the UNICEF Innocenti Report. Source: (Nugroho et al., 2020, p. 24 [P&E, OBS →]).*

KEY RECOMMENDATIONS AND RELATED FINDINGS

1. Ensure that pre-primary learners are meaningfully included in Covid-19 remote learning responses.
2. Combine multiple remote modalities to increase reach and impact.
3. Leverage and contextualize existing evidence-based remote early learning resources.
4. Ensure that pre-primary remote learning is pedagogically sound.
5. Engage and support parents and caregivers of pre-primary children at home.
6. Support pre-primary teachers and educators in their new role.
7. Monitor how remote learning offerings are being used by children and their caregivers.

The UNICEF Innocenti Report includes the following case studies.³¹

- Bahamas Ministry of Education virtual learning for preschool children
- El Salvador Ministry of Education online learning for initial and preschool Education
- Kosovo Ministry of Education, Science and Technology digital early childhood development platform
- Interactive Radio Instruction for pre-primary children in Malawi
- Sesame Street in the Americas and beyond
- Educational television with Ubongo's Akili and Me in sub-Saharan Africa
- Educational television by the Ministry of Education in Indonesia
- Provision of printed early-learning booklets in Argentina
- WhatsApp-based early-learning and parenting support in Jordan

This review considers additional and complementary sources of emerging evidence on promising approaches to the use of EdTech to support remote learning in the early years, offering some considerations for planners and practitioners and perhaps most importantly, highlighting the gaps and critical need for further robust research and evaluations. For example, the Early

³¹ To avoid duplication, this report will not cover the case studies highlighted in the UNICEF Innocenti Report but will expand the scope to cover examples of promising practice from other countries and organisations, including those operating outside of the education sector where helpful

Learning Partnership (ELP) Trust Fund awarded 28 grants (15 in education, total value USD 1.1 million) to support emergency-response early childhood development initiatives in LMICs during the pandemic, many of which relied on remote delivery via technology. These provide researchers with interesting opportunities to investigate these solutions and their impact.³²

[Table 3](#) summarises the main interventions considered in the development of this report in terms of:

- what it is / how it works;
- the technology modalities used to deliver;
- the type of content and / or pedagogical basis (if known);
- the role of the workforce.

Readers should refer to [Table 3](#) as they navigate the review as interventions are sometimes referenced across multiple sections in relation to the different findings.

³² See Early Learning Partnership: [List of Emergency COVID-19 Funding Round Proposals Approved](#).

Table 3. Summary of interventions reviewed.

Intervention	Technology modality	Content type / pedagogy	Role of ECE workforce	Outcomes	Relevance to Findings #
Feed the Monster — developed to help Syrian refugee children aged 5–10 with literacy and psychosocial well-being <i>Multiple countries with large populations of Syrian refugees — now available in 25 languages including Kiswahili, Oluganda, Yoruba, Brazilian Portuguese, Hindi, and Turkish</i>	Education app available offline once downloaded	Literacy gaming and psychosocial well-being	N/A — children access directly	Positive learning outcomes across all age groups (including pre-primary) and genders with 22 hours of play (Koval-Saifi and Plass, 2018a [P&E, EXP, ↑↑]) ³³	1, 6
Antura and the letters — supports children aged 5–10 with Arabic literacy development <i>Available free, open access to all countries. Beta tested in Turkey, Jordan, Lebanon, and Morocco.</i>	Educational app available offline once downloaded	Literacy gaming — no specific curriculum, based on the concept of 'stealth learning'	N/A — children access directly	Improved learning across all age groups and genders (including pre-primary) with 27 hours of play (Koval-Saifi and Plass, J. 2018b [P&E, EXP, ↑↑]) ³⁴	1, 6
Lively Minds Together — remote parenting support programme for caregivers	Radio	ECE, play-based learning — Ghana national curriculum; nurturing care; positive	Recording is done by 'local government' teams — in Uganda, these are	Reach data from internal tracking: Delivered in 17 languages, over 2,000 hours	2, 3, 5, 6, 7

³³ Longitudinal RCT by an independent evaluator.³⁴ Ibid.

with children aged 3–6 in multiple local languages <i>Ghana and Uganda (remote areas)</i>		parenting (including the role of fathers)	appointed sub-county staff from sub-counties in Mayuge district, in Ghana, i.e., district GES staff and teachers in numerous districts.	broadcast, over 700 live phone-ins, over 6,000 phone-in comments from listeners	
Kidogo — social enterprise delivering remote ECE support to caregivers <i>Informal settlements in Kenya</i>	SMS messaging; SMS hotline; WhatsApp; community radio	Responsive caregiving and play-based learning	‘Mamapreneurs’ (ECE providers) check in on caregivers remotely once a week to support well-being and remind caregivers of the importance of maintaining responsive caregiving	No impact data	2, 3, 5, 6, 7
BRAC Pashe Achhi (‘Beside You’ in Bengali) — remote psychosocial support to caregivers of children from birth–6 years <i>Rohingya refugee camps in Bangladesh</i>	Tele-counselling platform; Basic mobile phones	Psychosocial support; nurturing care including early stimulation and learning opportunities	Call families and engage in 20 min conversation using scripts — psychosocial support to caregivers for birth–2 years’ age group and direct interaction with children aged 2 years and above.	Reached 80% of beneficiaries in the Rohingya camps and 90% of beneficiaries in the host community ³⁵ Research strategy under development to monitor quality of delivery (but not impact)	2, 6, 7
Sugira Muryango (‘Family Strengthening’ in Kinyarwanda) — Remote	WhatsApp	Parenting support; implementation science	Coach and support caregivers with parenting support	No impact data from the remote delivery model	2, 6, 7

³⁵ Internal monitoring data.

coaching, training, technical assistance, and quality improvement support to caregivers of children from birth–3 years to improve parent–child interactions <i>Rwanda</i>				Promising results from the community-based approach on dietary diversity, more help-seeking for health problems, better socio-emotional and cognitive development outcomes, and reduced violence against intimate partners and children (Betancourt et al., 2020 [P&E, OBS, ↑↑]). ³⁶	
Hippocampus — remote support to caregivers to engage with pre-school children in enquiry-based learning in the home environment <i>India</i>	WhatsApp	Enquiry-based learning; play-based learning	Send out activities via WhatsApp and provide feedback and support	No impact data	2, 3, 4, 5, 6
Ana Aqra — remote weekly ‘mini lessons’ and distributing play kits for children aged 3–6 <i>Syrian Refugee Camps in Lebanon</i>	WhatsApp	Adapted community-based ECE programme (for remote delivery) — play and enquiry-based learning	Share instructions and free online materials aligned with their children’s learning objectives; deliver three ‘mini lessons’ per family per week; create and distribute play kits	No impact data	2, 3, 5, 6

³⁶ Results from a RCT by an external evaluator. Multi-level strategies are being tested in three districts with families with children under 3 years who are eligible for social protection programmes.

Mobile Creches — remote support to caregivers to implement curriculum for pre-school children and provide psychosocial support <i>Delhi, India</i>	Phone calls	Adapted ECE curriculum for remote delivery	Call 5–10 families once a week to discuss activities they can do with their children to stimulate development and disseminate messages on positive parenting and mental well-being	No impact data	2, 3, 4, 5, 6, 7
RTCCD — remote support with ECE and positive parenting to caregivers of preschool children <i>Vietnam — province of Ha Nam</i>	Zalo group messaging	Early Journey of Life (EJOL) programme — tailored approach to ECD and maternal well-being	Deliver (shorter) sessions on Zalo using video clips and infographics; provide ongoing support and feedback to caregivers	By the final, self-issued survey, 98% of caregivers reported opening the materials. Over one-third of women reported sharing materials with husbands ³⁷	2, 3, 4, 5, 6, 7
OneSky — blended approach to professional development for ECE providers <i>Vietnam — industrial zones</i>	Virtual video sessions between coach and trainee provider	Reggio Emilia philosophy — child-centred learning	Follow the professional development course including theory and practice-based learning	No impact data	4, 6, 7
aeioTU — synchronous and asynchronous support to families of pre-school children and to private-sector employees <i>Colombia, Mexico, Panama</i>	Digital platform — Aprendiendo ('Learning'); Video-conferencing; simple mobile phones	aeioTU — 'At home with you' remote curriculum based on play and enquiry using resources available in the home	Deliver synchronous and asynchronous individual and group sessions with families and children; provide general, ongoing support and feedback	No impact data	2, 3, 4, 5, 6, 7

³⁷ Internal monitoring data

Parents as Teachers — US-based NGO providing remote support to caregivers to promote early development, learning and health of most vulnerable children in the early years <i>US, UK, Germany, Switzerland, Canada, Australia</i>	Interactive video-conferencing; phone calls	Nurturing care; play-based learning	Provide support and coaching to caregivers (biweekly calls to each family)	No impact data on remote delivery model. RCT in Switzerland found that children of most deprived families benefited significantly from biweekly home visits reporting improvements in adaptive behaviour, developmental status, and language skills (Schaub et al., 2019 [P&E, EXP, ↑↑]) ³⁸	2, 3, 4, 5, 6, 7
Save the Children, Bangladesh — remote delivery of parenting and ECE support to caregivers of early years' children <i>Bangladesh</i>	Interactive mobile phone messages; telephone hotline with professional counsellors	N/A	Call caregivers and provide coaching and support	No impact data	2, 3, 4, 5, 7
ParentText — automated support for caregivers of children from birth to–17 years in low-income communities <i>India</i>	Basic mobile phones; chatbox	N/A	N/A	N/A — solution under development	
Tiptat Halav — Early childhood health centres delivering remote support to	Interactive webinars	N/A	Host webinars with caregivers and provide support	N/A	4, 5, 6, 7

³⁸ RCT by an independent evaluator.

caregivers on positive parenting and child development <i>Israel</i>					
Save The Children, Nepal — Develop and deliver radio series and PSAs to support caregivers with early childhood development <i>Nepal</i>	Radio, television; basic phones; megaphones	'Building Brains' aligned with national ECE curriculum — collaboration with MoEST	N/A — educators recorded the programmes and messages delivered directly to caregivers via non-digital solutions	Effectiveness study to be published	2, 3, 4, 5, 6, 7
CanalCanoa — deliver supportive technology to enable community-based learning and problem solving with indigenous people <i>Brazilian Amazon</i>	Digital media	Video, songs, stories, and child-rearing practices as documented by the community members themselves	N/A	After participating in 7 meetings, in 30% of the groups, parents and grandparents sang more to their children and in another 30% of groups children requested songs and stories and started sharing them with each other (Center on the Developing Child, 2016 [P&E, OBS, ↑]) ³⁹ .	2, 4, 7
Halo Beba — remote support for caregivers of young children with general information on child development and a tracking	Smartphone app	ECD in line with national health regulations and national quality standards for preschool education	Pick up on referrals made through the app when prompted	No impact data. Downloaded 6,000 times since December	2, 3, 4, 5, 6, 7

³⁹ Robust external evaluation.

system to monitor each child's development. <i>Serbia</i>					
Parenting for Lifelong Health (PLH) ⁴⁰ — Consortium of organisations providing open-source materials on parenting and ideas for play <i>Global</i>	Digital	Based on 'universal core principles found in evidence-based parenting programmes from around the world' ⁴¹	Adapt and use open source materials to meet the needs of caregivers and children through national / local programmes	The Gabriel Project in Mumbai reported a 61% increase in confidence in protecting children from sexual abuse; 77% increase in parent engagement and play; 96% increase in confidence for positive relationships with children and 76% increase in confidence to manage parenting stress. (PLH, 2021) ⁴²	2, 3, 4, 6, 7
SMS4Dads — text messaging programme for fathers sharing information, making connections to online services and mood tracking <i>Rural Australia, Kenya, Colombia</i>	Basic mobile phones	N/A	N/A — one-way text messages	Positive effects on fathers' own well-being and relationship with their partners and infants (Fletcher, 2019 [P&E, OBS, ↑]).	2, 3, 4, 6, 7

⁴⁰ After showing positive results in the evaluations, the programmes are currently being scaled up in over 20 LMICs across sub-Saharan Africa, South-eastern Europe, Southeast Asia, and the Caribbean. Additionally, several studies of the programmes are currently underway to further develop the evidence base for these interventions.

⁴¹ [Parenting for Lifelong Health \(Website\)](#)

⁴² Internal evaluation.

Autism Speaks — open source delivery of youtube videos to support caregivers to work with children with autism at home <i>Global</i>	Digital device	WHO Caregiver Skills Training Programme adapted for remote delivery	N/A	No impact data for the open-source materials. The face-to-face programme works in over 30 countries globally with over 300 trained facilitators reaching over 2,500 families.	2, 3, 5, 6, 7
Cboard — Augmentative Alternative Communication assistive technology to support the development of children with complex communication and speech needs for all ages, including early years <i>Croatia, Montenegro, and Serbia</i>	Assistive technology on a digital device	Speech and language therapy	Support families and children to use the technology	N/A App currently being used at national level in Croatia	2, 3, 4, 5, 6, 7
Mellow Parenting — remote delivery of facilitated group discussions to support parents with children with SEND <i>Tajikistan</i>	Video calls on digital devices (provided to all beneficiaries via the programme)	Based on principles from attachment theory, adult education, and behavioural psychology	Facilitate group discussion with 8–10 caregivers; provide ongoing support and feedback	Hybrid model currently being piloted — results not yet available	2, 3, 4, 5, 6, 7

2. Early childhood pedagogy

Early childhood pedagogy is a highly skilled specialist area that must be the foundation of any early childhood education intervention whether face-to-face or remote. This section examines the challenges and opportunities that early childhood pedagogy offers when designing remote learning interventions through technology.

Figure 3. *Key points on pedagogy.*

- There is very little robust evidence on remote approaches to stimulating early learning and play in any context.
- Tech-based solutions must adhere to the evidence-based theory and principles of early years pedagogy.
- The quality of the relationship between the child and the caregiver(s) is important. Technology solutions must acknowledge and account for this.
- Solutions should not impose a view of who the caregiver should be but work within the local context and culture to support whoever the caregiver is.
- In terms of impact, quality of teaching is more important than the modality through which it is delivered.
- Different approaches to remote learning suit different tasks and types of content.
- Peer interactions can provide motivation and improve learning outcomes and this aligns with best practice in face-to-face early years pedagogy.
- Supporting children to learn independently can improve learning outcomes.
- Enabling children to have a choice in what they do and when is likely to improve learning.
- Caregivers need a basic understanding of what 'learning' looks like in the early years.
- Caregivers may need support to overcome embedded beliefs about what constitutes learning and who can and cannot 'teach' young children.
- Caregivers need support with their own mental health and well-being.

- Interventions to support and educate caregivers must be designed based on evidence of how adults learn best, i.e., through a combination of knowledge input, practice, and reflection and on best practice in behaviour change science.
- Activities need to be tailored to what is feasible using only resources that are commonly available at home.

2.1. Context

There is very little robust evidence on remote approaches to stimulating early learning and play in any contexts, including high- and middle-income countries. FHI360 and the Lego Foundation published a research brief based on a review of 112 scholarly and scientific studies examining the impact of the Covid-19 pandemic on three pillars of the Nurturing Care Framework (responsive caregiving, early learning and play, and children's safety and security).⁴³ 89 of the 95 studies reviewed focus on HICs. LMICs represented included: Bangladesh, Cambodia, Ethiopia, India, Nigeria, and Mexico. The largest number of papers addressed issues relating to responsive caregiving and parental stress and mental health, followed by studies looking at safety and security and relatively few studies relating to opportunities for early learning and play, mirroring the gap identified in the development of this topic brief. "While research considers learning broadly, and distance learning, in particular, the crucial nature of play in child development and the potential of lockdowns to affect how children engage in play, has not found its way into research on the effects of the COVID-19 pandemic" (Proulx et al. 2021, p. 3 [S, RR, ↑]).

Most of the organisations delivering remote interventions featured below report adhering to the principles of the Nurturing Care Framework and best practice in play-based learning outlined below. This section draws on limited evidence available from early childhood education in LMIC contexts, evidence-based early years theory and pedagogy in face-to-face learning, and evidence from other age groups and sectors from high-, middle- and low-income countries to infer some considerations for planners and practitioners in relation to pedagogy. Figure 4 below summarises our analysis

⁴³ Framework developed by WHO, UNICEF and the World Bank Group in collaboration with the Partnership for Maternal, Newborn and Child Health, the Early Childhood Action Network and many other partners to support policymakers and practitioners to maximise quality and impact of early childhood interventions.

of anecdotal evidence from practitioners,⁴⁴ which can be taken forward in further research and planning of remote early childhood education interventions using technology.

Figure 4. *Top tips from the early years practitioners.*

1. Think carefully about the number of activities and time required from caregivers and adapt your provision to what is feasible for them.
2. Focus on clearly communicating the emphasis on playing and talking with children as the most important learning opportunities.
3. Provide caregivers with guidance on how to carry out activities with their children and offer alternatives.
4. If possible, leverage technology to make the learning interactive.
5. Consider how caregivers can record learning throughout the day, either in writing, voice recordings, or photos and encourage them to do so.
6. Find ways to make yourself available to caregivers for feedback and support.

2.2. Quality pedagogy in the early years is play-based learning

It is vitally important that all tech-enabled approaches to supporting learning remotely in the early years adhere to the evidence-based theory and principles of early years pedagogy and do not seek to apply pedagogical approaches from older age groups that are not appropriate.

⁴⁴ Found in blogs and other grey literature sources.



Figure 5. Nurturing Care Framework.

Source: WHO et al., 2018 [TC, ↑↑].

This section draws on the work of UNICEF (2018) and WHO et al. (2018) to define the ‘pedagogical’ needs of children from birth–5 years, crudely divided into ‘conception to age 2’ and ‘3 to 5 years’. Of course, learning and development take place on a natural continuum and these ranges are a tool to help understand the needs of children as they grow.

From ‘conception to age 2’ children need rich, loving, and protected environments and responsible and playful caregiving that foster bonding and secure attachment, contributing to positive socio-emotional development (UNICEF, 2018). The nurturing care framework, which covers this age range, highlights five components of nurturing care.

1. Good health
2. Adequate nutrition
3. Responsive caregiving
4. Security and safety
5. Opportunities for early learning

All components are essential and coordinated, cross-sectoral interventions in the early years are essential for children to thrive. However, this report focuses on components (3) responsive caregiving and (5) opportunities for early learning (WHO et al., 2018 [TC, ↑↑]).

Responsive caregiving

Responsive caregiving covers all aspects of what caregivers do in observing and responding to children’s movements, sounds, gestures, and verbal requests (WHO et al., 2018).

“Effective caregivers observe their child’s cues, interpret what the child wants and needs and respond consistently and appropriately.”

Caregivers provide the foundation for early learning when they make eye contact, follow the child's gaze and talk to the child, taking turns. When caregivers are sensitive, responsive, predictable and loving, they facilitate the child's early social and emotional development, promote secure emotional attachment between the infant and caregiver and help their child to learn" (WHO et al., 2018, p. 14).

Opportunities for early learning

Opportunities for early learning include all aspects of what caregivers do to nurture the acquisition of skills and capacities such as smiling, eye contact, talking and singing, modelling, imitation, and using simple but meaningful gestures (such as waving, doing a high-five). These opportunities can be intentional, such as playing drums with pots and pans in the kitchen, but most are built into daily routines such as talking during nappy changes or bath time (WHO et al., 2018).

“Children have a right to play. Children’s right to play is recognised as so vital to their well-being and development that it is included in the United Nations Convention on the Rights of the Child (UNCRC).

‘Every child has the right to relax, play and take part in a wide range of cultural and artistic activities.’”

– Article 31. UNCRC, 1989

From 3–5 years children continue developing through play, reading, singing, and interacting with peers and caring adults at home and in early education settings. Play helps children explore and make sense of the world around them and develops their imagination and creativity.

Researchers (Smith and Pelligrini (2013); Gleave and Cole, (2012 [S, NSR, →]); Zosh, J. et al. (2017 [S, NSR, →]) agree that playful experiences are characterised as being:

1. Meaningful — children play to make sense of the world, to express and understand their experiences, and connect them to something they already know.
2. Joyful — the overall feeling should be one of enjoyment, motivation, and pleasure even if it sometimes has frustrations.
3. Actively engaging — children become deeply involved, combining physical, emotional, and verbal engagement.
4. Iterative — as children play and practise skills, they revise their views of the world, discover new challenges, and deepen learning.
5. Socially interactive — play allows children to communicate ideas and understand others through interaction with peers and adults. This helps develop their understanding and their relationships.

Play is an integral component of early childhood education curriculums across many countries, including Ghana, Kenya, Tanzania, Lebanon (Community-Based Early Childhood Education Programme), New Zealand (Te Whariki), United Kingdom (Early Years Foundation Stage / Enriched Curriculum), Italy (Reggio Emilia Approach), United States of America (e.g., High / Scope Curriculum) and Ireland (Aistear). A framework has been developed for South Sudan but the curriculum with teachers guide, lesson plans and student workbooks are yet to be developed (as of 2019).

A growing body of literature suggests that positive outcomes in the early years are influenced by the quality of the relationship between the child and the caregiver. Most early childhood approaches and curriculums create space for connecting the early years setting with the home and the community to promote continuity. Again, this highlights the critical importance of putting caregivers' needs at the centre of any intervention to support remote learning in the early years through technology. Planners should not impose a view of who the caregiver should be but rather work within the local context and culture to support whoever the caregiver is (Serpell, 2017).

2.3. General pedagogical considerations

In terms of impact, quality of teaching is more important than the modality through which it is delivered. The only systematic review available at the time of writing, published by the Education Endowment Foundation (2020 [S, SS, ↑↑]) in April 2020, sought to investigate methods that schools could use to support remote learning during school closures. The review covered learners of all age groups and found that “ensuring the elements of effective teaching

are present — for example clear explanations, scaffolding and feedback — is more important than how or when they are provided” (Education Endowment Foundation, 2020, p. 4 [S, SS, ↑↑]). What matters most is ensuring explanation builds clearly on children’s prior learning and how their understanding is subsequently assessed and how they are given feedback. This finding aligns with best practice in Interactive Radio Instruction (IRI), which is the remote approach to learning for which there is the greatest amount of impact data (explored in more detail in [Section 4](#) on technology modalities). Applying this principle to the early years reinforces the importance of the role of caregivers, their understanding of, and their ability to apply, early years pedagogy at home.

Figure 6. *World Bank Group ‘tips’ to maximise the quality of remote delivery through TV or radio. Source: World Bank Group (2020).⁴⁵*

The World Bank Group shared the following ‘tips’ based on their engagement with experts:

- “Invest in quality production to ensure material is engaging for children and families.
- Programs should not need to be experienced in sequence.
- In many households, the device for listening will be in high demand. Recognize that multiple ages may be listening in one household and design content accordingly. Make it engaging and informative for parents and older siblings.
- The design and development of good quality programs usually necessitate high investment costs, but low per-student cost over time.
- Dubbing / translating existing culturally appropriate materials may be the right solution in the short /medium term to ensure decent quality and engaging programming (and this may be the right trade-off even if it means content is not 100% aligned to the country’s curriculum or broader strategy).
- Remember that the language of delivery matters and maternal tongue will be best to engage the youngest listeners.
- Reduce barriers to access by delivering content through multiple modalities (e.g., radio, tv, online, etc.) and ensure any cost or other access barriers are minimized.”

Different approaches to remote learning suit different tasks and types of content. Practitioners must be supported to consider different approaches

⁴⁵ Email issued in November 2020 to World Bank Group partners by Amanda Devercelli, Global Lead for Early Childhood Development, Program Manager for the Early Learning Partnership, World Bank Group.

depending on what they are teaching and the age group of the learners. For example, while there is some evidence of the high impact of using gaming for vocabulary learning in foreign languages, there is less evidence of impact in other subjects. There is some evidence of the impact of high-tech gaming solutions in LMIC contexts. [Curious Learning](#) developed [Feed the Monster](#), an educational app developed to help Syrian children aged 5–10 years learn to read and improve their psychosocial well-being. An evaluation by [Integrated International](#) and [Create Lab](#) at New York University found that the game resulted in positive learning outcomes across all age groups (including pre-primary) and genders with 22 hours of play (Koval-Saifi and Plass, 2018a [P&E, ↑↑]). It is now available in 25 languages including Kiswahili, Oluganda, Yoruba, Brazilian Portuguese, Hindi, and Turkish — languages spoken in areas where a great number of children have either missed out on early literacy learning opportunities or have limited access to them. ‘Antura and the letters’ is an educational app available on smartphones and computers, which supports children aged 5–10 with Arabic literacy development in line with the Jordanian national curriculum. An independent evaluation by the same team that evaluated ‘Feed the Monster’ found evidence of improved learning across all age groups and genders with 27 hours of play (Koval-Saifi and Plass, 2018b [P&E, EXP, ↑↑]). Evidence from the UK suggests that technology can support retrieval practice and self-quizzing can help with knowledge retention for all ages (Education Endowment Foundation, 2020, p. 23 [S, SS, ↑↑]). Research by Ofsted⁴⁶ (2020 [P&E, EXP, OBS, →]) during the period of school closures in the UK also found that some online tools worked better than others for specific tasks with children in their early years. For example, phonics seemed to translate well to a digital medium. Some schools used readily available phonics videos and software. Others recorded their own instructional videos and audio clips which pupils could access from a website or digital learning platform. Further research is needed to determine the applicability of this finding to LMIC contexts and local languages which may not be suitable for a phonics approach to developing foundational literacy skills.

⁴⁶ Ofsted is the Office for Standards in Education, Children’s Services and Skills in the United Kingdom. Ofsted inspect services providing education and skills for learners of all ages and regulate services that care for children and young people.
<https://www.gov.uk/government/organisations/ofsted>

2.4. Facilitating peer interaction, independent learning, and child agency

Evidence from older age groups in high-income contexts suggests that peer interactions can provide motivation and improve learning outcomes, and this aligns with best practice in face-to-face early years pedagogy. Ofsted research (2020 [P&E, OBS, →]) during the period of school closures found that many school leaders were concerned that children may experience learning loss in their social and communication development as a result of a lack of socialisation with other children. Several of the studies reviewed by the Education Endowment Foundation (EEF, 2020) included approaches to supporting peer-to-peer interaction including sharing models of good work and live discussions. Digitally aided peer-to-peer interaction time was one solution used by several schools in the UK to support children to maintain their social skills (Ofsted, 2020 [P&E, OBS, →]). Ostroff (2020) shares examples of teachers in the United States who facilitated group and pair collaboration between children online to support them to plan, work together on assignments, or share their work with each other. Most examples from early years settings in the United Kingdom required access to high-tech synchronous video facilities and skilled teachers / facilitators, which is a significant barrier to replicating these approaches in LMICs. There is a lack of evidence on how this could be achieved remotely in LMIC contexts in the early years. However, the barriers could be overcome using low-tech solutions such as sending audio / video files back and forth between peers. Further research on how to facilitate peer-to-peer interactions remotely in LMICs is desirable.

Supporting children to learn independently can improve learning outcomes. It is unrealistic to assume that caregivers supporting remote learning for young children will be able to provide full-time, dedicated care and attention. Nor is it desirable. Even caregivers with infants need to put their children down and encourage them to explore the world around them independently but while supervised. Independence is a key feature of most early years philosophies and most clearly articulated in the concept of heuristic play. During heuristic play,⁴⁷ which usually starts around the age of 1, children are completely in charge of what they do. They select what they use from common objects around the home, decide how to use them, construct and deconstruct ideas, and whether to share or not share. Research shows that children use

⁴⁷ [Heuristic](#) is an adjective meaning 'enabling a person to discover or learn something for themselves'. The term 'heuristic play' refers to the interactions of babies and children with everyday objects — not toys.

significantly more sophisticated language and creative scenarios when they play autonomously (Ostroff, 2020). One finding from the EEF systematic review states that encouraging children of all ages to reflect on their work and consider what they might do if they get stuck is valuable for their learning (Education Endowment Foundation, 2020 [S, SS, ↑↑]). This aligns completely with wider evidence on metacognition and self-regulation, which applies to children of all ages. Remote approaches to supporting caregivers with young children should also encourage independent learning through exploration, play, and discovery as well as independent and facilitated reflection. Most of the leaders surveyed in the Ofsted research (2020) mentioned that they also aimed to help develop children's independence to ease the burden on caregivers and support their well-being (Ofsted, 2020 [P&E, OBS, →]).

Enabling children to have a choice in what they do and when is likely to improve learning. Children have a deep need for autonomy and competence to develop intrinsic motivation that is essential to the learning process (Soenens and Vansteenkiste, 2010 [S, RR, ↑]; Van Der Kaap-Deeder et al., 2019 [P&E, EXP, ↑↑]). Robichaud et al. (2018 [P&E, EXP, ↑↑]) explain that parents and teachers in times of stress or worry are likely to use tightly controlled learning methods, which is counterproductive to the natural learning process. For example, one prominent early childhood education approach, Reggio Emilia, is based on the premise that teachers are partners in the learning process and guide children through the experiences and projects set out in the curriculum. The teacher's role is to learn alongside the child, to listen closely, observe, and involve themselves in a way that guides the child to explore their interests and reach their potential. Technology solutions must support caregivers to give choice, freedom, and autonomy to children.

2.5. Meeting the complex needs of all caregivers around pedagogy

In many contexts, this requires overcoming embedded beliefs about what constitutes learning and who can and who cannot 'teach' young children. In a qualitative study of remote learning in the early years ('3–6' age group) across the United States and Latin America, practitioners reported that caregivers often lacked the self-efficacy and self-esteem to help their children with their learning. For example, one male caregiver reported that he did not know how to read and was concerned that he could not support his child. The teacher supported the caregiver and explained that he had lots of knowledge that he could pass on through storytelling and other co-learning activities that didn't

involve the written word (Atilas et al., 2021 [OBS, ↗]). While it is beyond the scope of this report, it would be helpful to look into the beliefs and attitudes of male and female caregivers towards child development in LMIC contexts, to help inform interventions that can reach and influence all caregivers equally, and maximise impact for child development. In their pivot to radio delivery of their programme, [Lively Minds](#), a nonprofit organisation in Ghana, have kept their focus on empowering parents with skills and confidence, and breaking down and overcoming the mindset barriers that can prohibit early interventions from having their desired impact. Mindset barriers include beliefs and assumptions such as:

- you need money and resources to be a good parent;
- you need to be an expert to teach children things;
- children will go on to do the same jobs or follow the same paths as their parents.

The social enterprise, [Kidogo](#), found similar challenges with their remote support to caregivers in informal settlements in Kenya. They noted a general lack of awareness of early childhood education and what meaningful learning through interaction and dialogue looks like.

Caregivers need a basic understanding of what ‘learning’ looks like in the early years and evidence-based training and materials appropriate for the specific age of their child / children. The [Lively Minds radio episodes](#) are divided into two types, covering parenting and play, with the specific aim of breaking down mindset barriers and building new habits. The parenting episodes focus on general topics and principles for early childhood development and specific topics such as handwashing, communication, stress management, nutrition, malaria prevention, gender socialisation, and the role of fathers in parenting. The play episodes focus on activities that require no resources such as counting games, problem-solving games, story-telling, singing songs, and memory games. Working through their ‘mamapreneurs’ (early childhood education providers), [Kidogo](#) checked in on caregivers once a week (once every two weeks, following feedback that once a week was too much) to support their well-being and as a reminder of the importance of maintaining responsive caregiving and opportunities for early learning for their children (GSF, 2020). The Ministry of Education in El Salvador issued weekly parent guides including expected learning outcomes and indicators to support caregivers to reflect on their child’s development (Nugroho et al., 2020, p. 5 [P&E, OBS ↗]).

Caregivers need support with their own mental health and well-being. There is strong evidence that caregiver depression impacts children's growth, development, and well-being in LMIC contexts. A meta-analysis by Surkan et al. (2011 [S, SS, ↑]) across 11 LMICs found that eliminating maternal depression could reduce physical stunting in children globally by about 27%. Proulx et al. (2021, p. 3 [S, RR, ↑])⁴⁸ found that during school closures resulting from Covid-19, caregivers suffered from increased levels of stress and poor mental health as a result of the pandemic, which was associated with “lower parent-child closeness, harsher parenting attitudes and increased parent-child conflict”. They urge planners and practitioners to ensure that all response plans and prevention approaches minimise family stress. [Strong Minds](#) carried out a survey across 12,000 women living in low-income communities in Uganda and Zambia, of the mental health distress resulting from the effects of Covid-19.⁴⁹ Columbia University, John Hopkins University, and World Vision International conducted a randomised controlled trial (RCT) of the community-based Interpersonal Therapy for Groups (IPT-G) approach used in Uganda to help reduce depression in mothers, and increase their ability to adopt life-saving health, nutrition, and responsive caregiving for their children. They found a strong correlation between depression and the ability to fully engage in positive behaviours conducive to their children's development. Ten out of twelve non-depressed women were significantly more likely than depressed women to adopt positive behaviours around health, nutrition, sanitation, and hygiene (Pfeiffer, 2021).⁵⁰ This evidence showcases the importance of caregiver mental health and well-being for child development and the criticality of carefully considering the issue in any remote intervention aimed at supporting early learning in the home, particularly in times of crisis.

[BRAC's Pashe Achhi](#) ('BesideYou' in Bengali) provides an example of delivering psychosocial support to caregivers remotely in Bangladesh. There is no empirical evidence of impact yet but a research strategy has been developed to monitor the quality of remote delivery in future. [BRAC](#) field staff delivered

⁴⁸ Research brief based on a review of 112 scholarly and scientific studies examining the impact of the Covid-19 pandemic on three pillars of the Nurturing Care Framework (responsive caregiving, early learning and play, and children's safety and security). Eighty-nine of the 95 studies reviewed focus on HICs. LMICs represented included: Bangladesh, Cambodia, Ethiopia, India, Nigeria, and Mexico

⁴⁹ They used the GHQ-12 health questionnaire to assess levels of distress and dysfunction and found heightened distress levels as compared to pre-Covid-19 times, attributed to fighting alcohol consumption in the home, prevalent gender-based violence, food insecurity, unemployment, and fear about external world events (Strong Minds, 2020 [P&E, OBS, ↑]).

⁵⁰ RCT mentioned in an article but the original source is not available online and cannot be accurately assessed for strength of evidence.

their programme of support over the phone. They launched a nationwide tele-counselling platform to deliver psychosocial assistance and developed a remote curriculum for Play Leaders through a collaboration of 37 play-based curriculum developers and 37 psychologists. They tailored phone scripts to meet the learning needs of children of different age groups and living in different contexts (those in Rohingya camps and those in mainstream settings in Bangladesh). The scripts were piloted, updated, and rolled out through weekly 20-minute conversations with tailored content as follows:

- *“For the ‘birth to age 2’ cohort in the Rohingya camps, they give basic psychosocial support to mothers and caregivers as well as tips on how to take care of infants and stay safe from Covid-19.*
- *For the ‘2–6-year-old’ cohort in the Rohingya camps, the Play Leaders interact with children as well as mothers and caregivers. Children are engaged through activities such as reciting traditional rhymes called kabbiyas, while mothers and caregivers are given basic psychosocial support, health and hygiene tips, and child stimulation tips.*
- *For the ‘4–5-year-old’ cohort in the mainstream setting of Bangladesh, Play Leaders engage with children over the phone through activities such as reciting Bangla [Bengali] rhymes, and also give mothers and caregivers basic psychosocial support, tips on how to engage with children, and health and hygiene messages.” (Ahmad et al., 2020).*

Interventions to support and educate caregivers must be designed based on evidence of how adults learn best, i.e., through a combination of knowledge input, practice, and reflection and on best practice in behaviour change science. The [Sugira Muryango](#) (‘Family Strengthening’ in Kinyarwanda) initiative in Rwanda adheres to the principles of ‘implementation science’, which focuses on coaching, training, and technical assistance as well as quality assurance and quality improvement. Sugira Muryango is a 12-week home-visiting intervention that works through community-based coaches to improve parent–child interactions (Johnson et al., 2020). A cluster RCT in 2017–2018 including 1,049 families found promising results such as improved dietary diversity, more help-seeking for health problems, better socio-emotional and cognitive development outcomes, and reduced violence against intimate partners and children (Betancourt et al., 2020 [P&E, OBS, ↑↑]). The initiative used WhatsApp to maintain remote delivery during the pandemic and continued to collaborate with government structures through remote conferencing facilities, which was essential to maintaining momentum with their plans to scale. Currently, multi-level strategies are being tested in three districts, with families with children under age 3, who are

eligible for social protection programmes (Johnson et al., 2020). The findings of the pilots will inform the route to scale.

Activities need to be tailored to what is feasible using only resources that are commonly available at home. This aligns fully with the concept of heuristic play whereby children explore a range of objects (e.g., empty boxes, pots and pans, or material in a laundry basket) in different ways and move around with them in a safe environment. Maintaining focus on simple activities that require resources commonly available at home minimises the ‘prior knowledge’ required (including literacy skills) and maximises the likelihood that caregivers will engage with the activities. It also helps parents feel less overwhelmed and inadequate, supporting their mental health and predisposition to engage. [Hippocampus](#) in India achieved this via theme-based weekly activities⁵¹ (distributed via WhatsApp) designed to support caregivers in engaging in enquiry-based learning in their environment. They learnt quickly that transferring what you would do in the classroom does not work. [RTCCD](#) developed material to guide caregivers in using ordinary household items for play and developed messaging around stress reduction for caregivers.

“What is most important is creating content that makes topics exciting and facilitates conversation and interaction between the child and the caregiver. The bond is the most important – making it stronger using pedagogy is our key learning”

– Umesh Malhotra, Hippocampus, GSF, 2020

⁵¹ Topics included: plants, animals, water, colours, and many more.

3. Early childhood education workforce

“The early childhood workforce consists of volunteers, paraprofessionals and professionals who promote the healthy growth, development and learning of young children under age 8” (ECDW, n.d.).⁵² The early childhood education (and care) workforce includes childcare workers, early childhood teachers, early-grade primary school teachers and teaching assistants (and their trainers) and education service directors / managers. This section explores the challenges, needs, and opportunities for the early childhood education workforce offered by remote approaches to supporting early learning.

Figure 7. *A summary of key points on the early childhood education workforce.*

- In many countries, childcare workers have limited / no education and training in child development.
- There is a gap in skills and competencies needed for the early childhood education workforce to support caregivers remotely.
- There is a lack of evidence of the impact of the different interventions to support the workforce to deliver support remotely.
- A combination of training, written guidelines and tools, and ongoing support are necessary for early childhood education practitioners and teachers to effectively support remote learning in the early years.
- The early childhood education workforce requires skills in how to engage and communicate with caregivers through remote modalities.
- Early childhood education practitioners and teachers need to be supported to find ways to assess remotely children’s learning and development via the primary caregivers, in order to offer tailored advice and guidance.
- Equal attention must be paid and support provided to care for the health and socio-emotional well-being of teachers and practitioners themselves.
- Providing open access, open data, open source (Digital Principle 6) information and resources is one way of supporting workers with their mental health and well-being and enabling them to support the families in their care.
- Lessons from parenting programmes and refugee trauma responses and support programmes offer valuable insights into the mental

⁵² [Workforce Definition and Typology.pdf \(earlychildhoodworkforce.org\)](#)

health needs of frontline workers, including those supporting highly vulnerable children and families remotely.

- Covid-19 has exacerbated the challenges that existed previously and brought the sector into a state of crisis.

3.1. Context

In many countries, childcare workers have limited or no education and training in child development. Early childhood teachers tend to have less training than primary school teachers. Early childhood personnel are paid low wages⁵³ and tend to have unstable employment status (many operate unregistered centres in their homes in LMIC contexts). What is more, they have heavy workloads and limited access to resources and work in challenging environments – all of which affects job satisfaction and impacts on retention. Early childhood programmes report significant challenges in recruiting and retaining qualified personnel.

Covid-19 has exacerbated all the challenges that existed previously and brought the sector into a state of crisis. It is in this context that we examine the needs of the early childhood education workforce in using technology to deliver remote support to caregivers. The UNICEF Innocenti Report made the case for the “importance of providing training and instruction for pre-primary teachers in implementing remote learning, despite their important new role” (Nugroho et al., 2020, p. 5 [P&E, OBS →]). This report extends the learning to account for the needs of the workforce responsible for supporting children from birth to 3 years of age and to cover the well-being and mental health needs of all early years teachers and practitioners.

Globally, there is a gap in the skills and competencies needed to enable the early childhood education workforce to support caregivers remotely. In a context of remote delivery, we must understand the additional and varied needs of early childhood education practitioners, who are expected to undertake their work via caregivers in the home to achieve the same learning outcomes they aim for when working with children and caregivers face-to-face. UNESCO Bangkok, UNICEF and the Asia-Pacific Regional Network for Early Childhood ([ARNEC](#)), the Early Childhood Workforce Initiative

⁵³ In the US, the median pay for childcare workers was \$24,230 per year in 2019 in contrast to \$59,420 for kindergarten and elementary school children (ECWI, 2020). In South Africa, 83% of early childhood development operators were not able to pay full salaries during lockdown (Bridge et al., 2020).

([ECWI](#)) and International Step by Step Association ([ISSA](#)) conducted a desk review and launched a joint survey to assess the impact of Covid-19 on the early childhood education workforce in the Asia-Pacific region. Only 20% of survey respondents reported having had prior training on delivering distance learning and as little as 1.28% on crisis and disaster management. Hebi City, in China, launched online training for the city's 500 kindergarten staff covering the following topics.

1. Epidemic prevention and control.
2. Distance learning strategies.
3. Guidance for pandemic-related education when schools reopen (UNESCO, 2020).

Only 35.2% of respondents reported receiving psychosocial support. [Early Childhood Australia](#) provides tips and guidelines to ensure the mental health and well-being of the early childhood education workforce (UNESCO, 2020).

“One of the key messages that emerged was the importance of investing in “pre- and in-service teacher training on adapting to new technologies, socio-emotional skills as well as preventing, preparing for and responding to crises.”

– UNESCO, 2020, p. 2

3.2. Support the workforce with digital skills development

A combination of training, written guidelines and tools, and ongoing support are necessary for early childhood education practitioners and teachers to effectively support remote learning in the early years. World Bank EdTech Principle 3: ‘Empower teachers’ was core to [Ana Aqra](#), [Mobile Creches](#) and [RTCCD](#)’s responses to the Covid-19 crisis (Walsh., 2020). Prior to building their virtual education model (based on a detailed needs assessment as described in [Section 4](#)), [Ana Aqra](#) identified the skills their staff would need to transition to distance delivery. They mapped these needs with teachers’ existing skill sets and reassigned roles and responsibilities. They created guidelines for the

'mini-lessons' and follow-up activities and trained all their teachers on the new online modality, including approaches to assessment and ways of engaging effectively with caregivers. Their distance learning framework and guidelines are [available open source, online](#), demonstrating adherence to Digital Principle 6: 'use open standards, open data, open source and open innovation.' [Mobile Creches](#) developed a virtual training programme for frontline workers (including guidance on how to engage with and support caregivers at home), which led to a request from the Indian government to help them develop and deliver a remote training curriculum for workers in government-run centres as well. "Mobile Creches also worked with other early childhood development NGOs, sharing educational activities, audio files, and other resources, including in new domains" (Walsh, 2020, p. 24). [RTCCD](#)⁵⁴ had been using the free messaging app Zalo⁵⁵ since 2018 for communication between their central team in Hanoi and the community-based facilitators in Ha Nam. They used Zalo to adapt the facilitator training for online delivery. The community-based facilitators encouraged parents to have stimulating interactions with their children and asked them to film sixty-second interactions between parent and child and submit them on Zalo. [RTCCD](#) provided backpacks and picture books for the winning children as prizes (Walsh et al., 2020). [Lively Minds](#) co-developed and scripted, hour-long radio shows and ran training workshops to help facilitators understand the model, structure, and sequence of the shows and to record episodes in pairs. They developed quality standards for each stage of the show development process (rehearsal, translation, recording, etc.) and had regular follow-up workshops to embed the process. Given that the programme is delivered through a structured cascade model with [Lively Minds](#) supporting local district and community teams, it was important to provide intense and consistent support to maintain standards and quality.⁵⁶ [OneSky](#) developed a blended learning approach to improve the effectiveness of in-person training for early childhood education service providers in industrial zones in Vietnam. All of this was based on the [Reggio Emilia](#) principles of child-centred learning, informed by global evidence on early childhood development (as detailed in [Section 2](#)), the training centres supported the workforce in developing responsive relationships with children, promoting communication skills and stimulating development. The training combines in-person classroom sessions with

⁵⁴ Research and Training Center for Community Development delivering the Early Journey of Life (EJOL) programme, a low-cost, structured, and comprehensive approach to early childhood development and maternal well-being in Ha Nam.

⁵⁵ Free messaging app similar to WhatsApp and used widely in Vietnam.

⁵⁶ Information obtained through an interview with Geoff King, Content Director, [Lively Minds](#).

in-person and virtual-group home visits by trainers who coach the providers twice a month. An online learning platform accessible on mobile phones '1GiaDonhLon ('1GDL' — meaning '1BigFamily') provides access to material and helps them track their progress on the course. The training is approved and certified by the provincial Department of Education and Training. The remote sessions allow coaches to give ongoing support and individualised guidance as they develop their skills, and the portal enables them to record photos and videos, which can be shared with peers.

While there is anecdotal evidence of what these organisations have done to upskill the workforce, there is a lack of evidence of the impact of the different interventions. We know it is important, we have some insights into innovative approaches that have been trialled but we do not know what works and how particularly in LMIC contexts.

The early childhood education workforce requires skills in how to engage and communicate with caregivers through remote modalities. The Education Endowment Foundation (EEF, 2020 [S, NSR, ↑]) in the UK developed a Guidance Report for primary and secondary schools on 'Parental Engagement' with practical tips and a step-by-step process for improving the relationship between the school and the home to facilitate enhanced learning. The content is aimed at primary and secondary schools but the concept is transferable to early years providers. The guide is structured around four key recommendations, all based on evidence of what works⁵⁷ and is appropriately referenced.

1. Critically review how you work with parents.
2. Provide practical strategies to support learning at home.
3. Tailor school communications to encourage positive dialogue about learning.
4. Offer more sustained and intensive support where needed (EEF, 2020 [S, NSR, ↑]).

It would be helpful to have guidance and tools such as this to support the early years workforce to plan their remote engagements with caregivers and young children in LMICs.

Early childhood education practitioners and teachers need to be supported to find ways to assess children's learning and development remotely, via the

⁵⁷ Many of the references used to inform the guide come from the field of parenting programmes and community-based interventions.

primary caregivers, in order to offer tailored advice and guidance. This not only requires systems for remote assessment but also approaches to building caregivers' capacity to accurately assess their children's progress. One of the participants in the qualitative study across the United States and Latin America explained that her biggest challenge was assessment. She was unable to feel satisfied with evaluating the child's learning without having observed the process (Atilas et al., 2021 [P&E, OBS, ↑]). More robust research is needed to determine effective ways of assessing learning outcomes from remote learning interventions in the early years in LMICs.

3.3. Supporting the well-being and mental health of the workforce through technology

Equal attention must be paid and support provided to care for the health and socio-emotional well-being of teachers and practitioners. Early years teachers and practitioners carry significant responsibilities in supporting the social and emotional well-being of children and their families. They cannot do this without first receiving the support they need from peers and / or specialised professionals who can help them cope through the crisis (UNESCO, 2020). When services are being delivered remotely in a time or context of crisis, there is an enhanced likelihood that early childhood education practitioners and teachers are dealing with their own trauma. They might be experiencing stress, worry, grief and sadness, isolation and loneliness, and feeling overwhelmed by juggling childcare and homeschooling for their own children as well as meeting the needs of their employers and families (Malta Campos and Fraga Viera, 2021).

Providing open access, open data, open source (Digital Principle 6) information and resources is one way of supporting workers with their mental health and well-being and enabling them to support the families in their care. The [Rapid Response-Virtual Home Visiting collaborative](#) (RR-VHV) run by the Institute for the Advancement of Family Support Professionals provides best practice principles, strategies, and resources including webinars to support the workforce. They cover topics like 'virtual reflective supervision' and 'virtual recruitment and onboarding'. The [Serbian Psychological Society](#) provided a list of volunteer psychologists who provide free counselling for parents of preschool children over the phone or Viber (UNICEF Innocenti, unpublished). [Parents as Teachers](#) is a United States organisation working to support and engage caregivers to promote early development, learning, and health of children for the most under-served and vulnerable families. During Covid-19,

they expanded their virtual service delivery (services delivered through interactive video conferencing technology and phone calls) allowing two-way, real-time, audio-visual communication between the home visitor and caregivers. The model has been replicated in the United Kingdom, Germany, Switzerland, Canada, and Australia (Parents as Teachers, 2021). A recent RCT in Switzerland found that children of the most deprived families in Switzerland benefited significantly from biweekly home visits from [Parents as Teachers](#) practitioners reporting improvements in adaptive behaviour, developmental status, and language skills (Schaub et al., 2019 [P&E, EXP, ↑↑]).

“There’s an interesting parallel in the experience with families — home visitors also need a space to share just like them.” Katelin Wilton, International Rescue Committee.

– ECWI, 2021

Addressing the mental health and emotional well-being of early childhood workers and families has been a priority for BRAC’s [Pashe Achhi](#) (‘BesideYou’ in Bengali) team in Bangladesh. During Covid-19, the project pivoted to remote delivery of psychosocial support, health, hygiene, early stimulation messages for caregivers, and playful learning activities for children. The team of Play Leaders — early childhood facilitators — were provided with conversation-based scripts and a 9-month curriculum to support them in delivering their services remotely. However, most importantly, the initial training for Play Leaders focused on their own healing. They then received initial virtual training and monthly refreshers to provide families with the psychosocial support they need. They recently launched a tele-counselling hotline staffed by trained psychologists, which supports both staff and families (ECWI, 2021). [Save the Children, Bangladesh](#) has also placed great importance on the need to train early childhood care and development staff in psychosocial first aid. Once trained, they use interactive mobile phone messages to contact parents and caregivers to discuss socio-emotional education, self-care, child stress, and positive parenting. At the time of writing their annual report in September 2020, Save the Children planned to establish a telephone hotline staffed with professional counsellors who can provide direct support and ensure appropriate referrals are made where necessary

(Save the children, 2020b). [Kidogo](#) in Kenya supported their ‘mamapreneurs’ with weekly check-ins to monitor and support them, making referrals and escalating issues with families to other government support services on their behalf (GSF, 2020).

The [Early Childhood Workforce Initiative](#) (ECWI) offers some lessons and insights from ‘Parenting Programmes’ on how best to support frontline workers who are playing critical roles in promoting positive and responsive caregiving, supporting health and nutrition, and enhancing social and child protection. Parenting Programmes rely on strong, trusted relationships between families and personnel and provide ongoing support to promote positive parent–child interactions, mitigate risk factors, and ensure appropriate referrals are made where necessary for specialised support. Like early childhood education providers and educators around the globe and as mentioned in [Section 4](#), many parenting programmes pivoted to remote delivery via video conferencing, messaging, radio, and telephone services. [ECWI](#) points to the importance of increasing psychosocial support for personnel through tailored supervision and peer-to-peer support; encouraging flexibility and managing expectations, and providing positive messaging and recognition as positive ways to support the workforce during Covid-19 (Hatipoglu, 2021 [P&E, OBS, →]).

Lessons from refugee trauma responses and support programmes offer valuable insights into the mental health needs of frontline workers supporting highly vulnerable children and families remotely. The [Refugee Trauma Initiative](#) (RTI) ‘Baytna’ (‘our home’ in Arabic) works with refugee families in Greece providing psychosocial care to “strengthen parent-child attachment and mitigate the effects of trauma and toxic stress” (ECWI, 2021, p. 5). During the crisis, they pivoted to deliver their services via weekly calls, socially distanced visits, and messaging through WhatsApp. The initiative increased training and peer support for the teams of facilitators to deal with their own trauma and stress and provided training and clinical supervision for Community Psychosocial Facilitators from supervisors who had first-hand experience of being a refugee.

There is very little evidence of successful or promising approaches to safeguarding remotely for children in the early years and there is an urgent need for further research. Evidence from 16 studies indicates a reduction in the number of referrals to child protective services during lockdown, suggesting an increase in safeguarding issues going unnoticed. There is a

need for the early childhood workforce to be trained and supported to recognise safeguarding risks in virtual / remote delivery models — Design Principle 7: ‘address privacy and security’ (Proulx et al., 2021, p. 3 [S, RR, ↑]).⁵⁸ In this topic brief we make the case that all remote approaches to supporting learning in the early years should target caregivers, enabling them to facilitate learning through play. Caregivers therefore also require guidance on how to protect their children from harmful content when accessing online tools such as YouTube or interactive learning games. [Kidogo](#) in Kenya worked with their ‘mamapreneurs’ to check in with families over the phone once a week and escalate or refer any concerns for children’s safety and well-being, but they were limited to what they could glean over the phone (GSF, 2020). [UNICEF Serbia](#) produced a digital guide for online safety for caregivers, preschool and school teachers of children aged 4–8, which provides information and support to enable children in the early years to use the internet safely. ParentText, an automated text messaging service for parents of children from birth to age 17, has a chatbox designed to recognise high-risk keywords, which might be indicative of a person at risk. After detection, the chatbot is automated to offer follow-up referral suggestions and contact details (police, ambulance, hotline) as well as supportive messages. The user receives an empathetic and empowering response and contact details on where to access professional or urgent help.⁵⁹ In the United Kingdom, the government has established standards and expectations for online service providers targeting children and is currently working on a legal framework to hold them to account (Children’s Commissioner, 2020). There are toolkits for parents and children which were developed in response to the Covid-19 crisis — a ‘Digital 5-a-Day’ tool to support parents to discuss how they achieve a healthy and balanced ‘digital diet’ but these are targeted towards children in upper primary and secondary schools and are most relevant to online learning.

⁵⁸ A research brief based on a review of 112 scholarly and scientific studies examining the impact of the Covid-19 pandemic on three pillars of the Nurturing Care Framework. Eighty-nine of the 95 studies reviewed focus on HICs. LMICs represented included Bangladesh, Cambodia, Ethiopia, India, Nigeria, and Mexico

⁵⁹ [Parenttext-Concept.pdf \(covid19parenting.com\)](#)

4. Technology modalities

A one-size-fits-all approach will not reach the needs of all young learners who may lack access to the connectivity, data, or devices required for high-tech approaches. This section considers the benefits and disadvantages of a variety of different modalities (high-tech, low-tech, blended learning) to enhance learning opportunities for the youngest learners remotely.

Figure 8. *A summary of key points on technology modalities.*

- Selecting the right technology modality or mix of modalities for each specific context and users is key.
- There is very limited evidence on the impact of remote interventions for early years in LMICs or on the value of technology as part of the solution for improving access to education. There is also very limited data on cost-effectiveness.
- Remote modalities can offer significant benefits that have the potential to increase reach and impact beyond interventions that are restricted to face-to-face delivery only.
- Success in designing effective remote interventions for early learners starts with Digital Principle 1: ‘design with the user’ and 2: ‘understand the ecosystem.’
- Content and functionalities must (1) be culturally sensitive and appropriate; (2) align with local requirements, regulations, and quality standards.
- Digital Principle 5: ‘be data driven’ enables interventions to be agile and responsive to feedback and changes in circumstances.
- Digital Principle 4: ‘build for sustainability’ creates the conditions for scale.
- Digital Principle 6: Providing open-source and evidence-based parenting resources is helpful to support the workforce and caregivers.
- Studies from prior to the Covid-19 crisis provide a clear case for the importance of joint media engagement.⁶⁰
- Evidence on the use of interactive radio instruction demonstrates the potential of technology as a tool to support and facilitate interactions between caregivers and children around learning.

⁶⁰ ‘Joint media engagement’ is defined as the practice of people sharing media experiences together. It can involve caregivers and children using technology to engage in activities together (such as playing, reading, creating or viewing content). (Takeuchi and Stevens, 2011).

- Non-digital solutions show greater promise for the early years.
- SMS messaging can be an impactful way of communicating with caregivers and can incentivise them to carry out activities with their children. However, it must be designed to incorporate the needs of the local community and supplement existing local initiatives.
- Support to caregivers via SMS has greater impact when combined with other forms of two-way communication, such as phone calls.
- The use of synchronous video communication with caregivers is most effective in achieving impact with the youngest children because it enhances the use of the parent-coaching model — low-tech solutions could also be designed to focus on developing caregiver skills through coaching.

4.1. Context

Selecting the right technology modality or mix of modalities for each specific context and different users is key to maximising reach, scale, and impact. It is therefore important to establish the main considerations for planners and practitioners when they are making decisions on what technology to use for remote learning in the early years (radio, TV, phone calls, SMS, video, etc.) and how. The use of technology for education across all ages in LMICs is not new but most use has focused on face-to-face solutions for older children and many solutions were poorly adapted to the local context and hugely inequitable. As a result, many of the interventions have failed to generate their intended impact.

Prior to the pandemic, pre-primary enrolment rates in LMICs were already considerably lower than in HICs, at 42.2% in LMICs and 14.9% in LICs (López Boo et al., 2020 [S, NSR, ↑]). During lockdown, almost 70% of students attending pre-primary education prior to school closures did not have access to digital or broadcast learning opportunities and over 70% of children who cannot be reached live in rural areas (UNICEF, 2020).

There is limited evidence on the impact of remote interventions in the early years in LMICs and of the value of technology as part of the solution for improving access to education and very limited data on cost-effectiveness. The extent of the evidence available depends on the type of technology used. Given the emphasis on targeting caregivers for remote learning in early years, it is most relevant to consider evidence from remote approaches to adult

behaviour change to understand which modalities are likely to have the greatest impact. Many of the examples used in this section are designed to affect adult behaviour change in relation to their children's education but there may be lessons to learn from other sectors too. While it is beyond the scope of this paper, a review of the literature on remote approaches to adult behaviour change could provide useful lessons for planners and practitioners seeking to influence caregiver behaviours with their children in the home. A review of the use of technology for integrated early childhood development could also be useful to add to the evidence base for early childhood education.⁶¹

This section examines the challenges and opportunities for tech-based solutions for remote delivery of early learning support to reach all children in their early years beyond the few who are already enrolled in formal early childhood education.

4.2. Technology offers new opportunities for reach, impact, and scale

The case for combining multiple remote modalities to increase reach and impact in remote learning in the early years is clear — and addressed comprehensively in The UNICEF Innocenti Report. The existing evidence backs up the importance of Digital Principle 2: 'understand the existing ecosystem'. In the short term, the selection of modalities must be based on what is available and commonly used by *all* of the intended population, which in the case of early childhood education, includes the primary caregivers of children from birth to 5 years old. This will most likely require the use of multiple modalities in order to achieve equity (World Bank, 2020a; Nugroho et al., 2020, p. 24 [P&E, OBS →]). Broadcast and online modalities can reach more children directly and most cost-effectively in the majority of LMICs (and these modalities lend themselves well to the younger students) but paper-based supplements can be necessary to reach those without access to technology (Nugroho et al., 2020, p. 24 [P&E, OBS →]).

⁶¹ For example, [Jamii ni Afya](#) is a programme for mothers and children under 5 years in Zanzibar which uses digital tools, including a mobile app, to guide Community Health Volunteers (CHVs) to monitor milestones, coach the family with pedagogically sound interactive play, communication, and early learning activities all based on the Nurturing Care Framework. Jamii ni Afya was being scaled to three districts with 400 CHVs serving more than 40,000 households in 2020 and plans to reach 11 districts, supporting 1.6 million people in 2021.

Remote modalities can offer significant benefits that have the potential to increase reach and impact beyond interventions that are restricted to face-to-face delivery only. There is emerging evidence on the potential to increase cost-effectiveness and scale using technology but more robust empirical research is needed to compare the cost-benefit of different approaches to more traditional face-to-face options. [RTCCD](#) and [Ana Aqra](#) highlight the following opportunities offered by remote approaches to supporting caregivers with young children.

- Staff can observe and support parent–child interactions through naturally occurring routines, such as mealtimes.
- Staff can engage with caregivers more frequently and with multiple caregivers in the household where helpful.
- Messages can be disseminated and repeated in multiple ways.
- Resources can be deployed more efficiently by minimising transport costs and allowing scheduling flexibility to meet the needs of caregivers and children (Hatipoglu, 2021 [P&E, OBS, ↗]).

[OneSky](#) developed a blended learning approach to improve the effectiveness of in-person training for early childhood education service providers in industrial zones in Vietnam. They report a combination of benefits in terms of quality and cost-effectiveness of training, which will continue to improve as the programme scales to cover 19 provinces — on request from the Vietnam Ministry of Education and Training (Ministry of Education and Training, Vietnam National Institute of Educational Sciences and UNICEF, 2016 [P&E, OBS ↗]).

The [Tipat Halav](#) service (early childhood health centres) in Israel, originally aimed to establish a group of champions to effect positive behaviour change in parents and improve early childhood development outcomes. During the Covid-19 crisis, they started a series of webinars for nurses to support them with the challenges they were facing in their work due to the crisis. Topics included:

- how to manage stress and uncertainty;
- how to practice self-care;
- how to engage with parents who are stressed and isolated, etc.

The webinars disseminate knowledge and provide space and time for discussion and group reflection. Engagement was high despite the significant pressures on frontline health workers. The nurses then began leading online

groups with parents on positive parenting approaches. They received support from the service in the form of short training, ongoing technical support, content development, and supervision. The experience has fast-tracked existing plans to digitise some services in [Tipat Halav](#) but it has also offered new insights on what can be achieved and the potential for increased reach, cost-effectiveness, and impact at scale using technology (Yaari and Schuman-Adatto, 2020).

4.3. Adhering to the ‘Digital Principles’ is effective⁶²

Emerging evidence from innovative responses to meeting the needs of the youngest learners throughout school closures suggests that where the Digital Principles are closely adhered to, early childhood education providers have been successful in meeting the needs of caregivers and learners remotely throughout Covid-19.

Success in designing effective remote interventions for early learners starts with Digital Principle 1: ‘design with the user’ and 2: ‘understand the ecosystem.’ [Saving Brains](#), a collaboration of Grand Challenges Canada and its partner organisations, supports innovations for early childhood development in LMICs (Walsh., 2020). They looked at the experiences and solutions from [aeioTU](#) in Colombia, [Mobile Creches](#) in India, [RTCCD](#) in Vietnam and [Ana Aqra](#) in Lebanon to draw out the common themes that they consider having been key to their success. All innovators “conducted an assessment of families circumstances, priorities and capacity to access services under social distancing” (Walsh., 2020, page 4). [aeioTU](#) gathered information from all their families on child development and access to technology, finding that only 51% had access to the internet and only 38% had a smartphone. [RTCCD](#) conducted a phone survey to determine the economic and social impact on families under lockdown to inform adaptations to their programming content. [Ana Aqra](#) worked with partner organisations to do a systematic needs assessment across 10,000 families to determine the technology they have access to, their preferred communication channel, when they would prefer to receive material, and the amount they would like to receive each week. Due to the lack of any form of connectivity in some remote areas of Peru, UNICEF [installed loudspeakers to broadcast lessons](#) for older learners in indigenous

⁶² The Principles for Digital Development (or ‘Digital Principles’) are a tool to help planners and practitioners make the most of the potential of ICT to increase efficiency, cost effectiveness and impact of interventions in international development. A critical look at how interventions fare against these principles will help determine their likely viability in achieving equitable impact at scale.

communities (Alcazar, 2020). The early childhood development team working on pivoting their national face-to-face programme for children from 6 to 36 months used loudspeakers and walkie-talkie radios (used by community volunteers) to disseminate messages in the most remote areas. [Save the Children, Nepal](#) also carried out a media access survey to identify the most effective tools to use across their programmes in different parts of the country. They designed a series of Public Service Announcements (PSAs) targeting parents, children and teachers in regional languages (Maithili, Awadhi, and Nepali) disseminated through 300 community FM stations and the state-owned Nepal television. They also used a tuk-tuk, which toured the hardest-to-reach areas and broadcast messages on home learning, positive parenting, warning against violence against children, and promoting well-being via strategically placed megaphones (near religious sites and public venues) (Save the Children, 2020a).

Content and functionalities must be culturally sensitive and appropriate. As mentioned in [Section 2](#), effecting behaviour change in relation to early childhood development may require breaking down mindset barriers using behaviour change approaches. It also requires embracing (sometimes leveraging) culture, beliefs, and habits to achieve buy-in and maximise impact. Serpell (2017) points to the importance of embracing ‘African cultural wisdom’ about child development and good parenting to develop interventions that are contextually appropriate. For example, he suggests that interventions should proactively assign a guiding role to older children in the household, recognising the reality that they play an important role in the learning and development of younger children. Too great an emphasis on mother–child interactions through didactic play may not be appropriate or effective in a context where adults are rarely involved in children’s play but older siblings are. [CanalCanoa](#) is an interesting, tech-based intervention in one of the most remote towns in the Brazilian Amazon. Indigenous people used digital media to document their songs, stories, and child-rearing practices, which were shared with small groups, mirroring traditional practices of community discussion and problem solving⁶³ to stimulate discussion, reflection, and change to improve early childhood development practices by caregivers. In total, 1,186 adults and 1,148 children participated, with the intervention reaching a further 44,000 indirect beneficiaries who accessed the videos through their networks. After participating in seven meetings, in 30% of the

⁶³ In traditional villages, the whole community meets early every morning to talk about issues and problem solve collectively

groups, parents, and grandparents sang more to their children. In another 30% of groups, children requested songs and stories and started sharing them with each other. In 56% of the urban groups, participants began planting food at home based on an enhanced appreciation for locally grown, organic products. By embracing long-established traditions of community-based, collaborative problem solving, the tech-based solution was able to achieve great impact (Centre on the Developing Child, 2016 [P&E, OBS, ↑]). Working with local stakeholders enabled [Lively Minds](#) to tailor the content of the radio shows to each community (i.e., names and examples are provided by local government staff from the district, at the time of translation) and, in Ghana, the radio shows were translated into 16 different local languages to maximise accessibility and relatability of the content.⁶⁴

Content and functionalities must align with local requirements, regulations, and quality standards. [Halo Beba](#) — Your Parenting Companion is a free smartphone app developed by UNICEF Serbia in collaboration with the Public Health Institute in Belgrade to support caregivers from the day their children are born. The content builds and expands on an existing phone counselling service by the same name. It has online and offline categories of content and functionalities in order to maximise access. It includes general information and supporting material on child development. In addition, it provides tailored support for each child within a family, tracking their individual development and milestones, and highlighting areas of concern that can be followed up through medical appointments and other referral services. The four main functions enable caregivers to track children's growth and keep up to date with health check-ups and vaccination schedules in line with the national health regulations. Since its launch in December 2020, the app has been downloaded over 6,000 times and anecdotal feedback suggests that caregivers are mostly satisfied with the content but that the functions required additional work as part of the optimisation process. [Learning Passport](#) is a global partnership between UNICEF, Microsoft, University of Cambridge, and supported by the Boston Consulting Group to provide access to content online and offline for children, parents and / or the education workforce. Different countries are using it for different purposes. The aim of the [Learning Passport](#) in Serbia is to strengthen professional development opportunities through access to different resources and professional exchange between preschool practitioners. The digital preschool platform aims to build a national community of practice between teachers and other professionals,

⁶⁴ Information obtained through an interview with Geoff King, Content Director, [Lively Minds](#).

with shared objectives around early learning and development. It is not intended to be used directly with children and complements [Halo Beba](#), which targets caregivers in the home. The content will support preschool practitioners to meet the national quality standards for preschool education.

Adhering to Digital Principle 5: ‘be data driven’ enables interventions to be agile and responsive to feedback and changes in circumstances. Technology is a great enabler of efficiency and cost-effectiveness, offering opportunities for automated and / or systematic data collection on reach and impact. This should be leveraged through the design and scaling process. The Colombian Institute for the Wellbeing of Families (ICBF) developed the [Bienestar app](#), with support from the World Bank, to monitor and evaluate the quality and effectiveness of their Covid-19 emergency response supporting pregnant women, families, and vulnerable children below the age of 5 with:

1. Phone-based continuous support with health, nutrition, child development and psychosocial first aid.
2. The distribution of learning materials as hard copy kits with other additional early learning and play activities disseminated through social media.
3. The distribution of food baskets.

The app captures information almost in real-time on the support provided to families and the developmental, nutritional, and socio-emotional state of children, which enables rapid, tailored follow-up by ICBF. It has tremendous potential to enhance the reach⁶⁵ and cost-effectiveness of in-person, early childhood development service delivery in future, and is currently being further developed for national scale-up (Kelly, 2021a). The Peruvian national early childhood development programme [Cuna Mas](#) pivoted to remote delivery⁶⁶ with support from the World Bank and developed a mobile app for field staff to monitor remote counselling services and enable tailored support for community volunteers to meet the needs of each family. The app has improved the responsiveness of programme staff to the needs of community volunteers and it has reduced the time spent on processing and sending

⁶⁵ ICBF extended parenting support to almost all of the families targeted for the early childhood development services — more than 1.5 million families (88% of the total targeted families) have been reached with stress management and early learning support through 50 million phone calls.

⁶⁶ Community volunteers were trained and provided with 30-minute, scripted phone calls to offer one phone call per week to each family, plus small-group exchanges for two hours each month. Staff followed up with text messages in between phone sessions with content on stress management, Covid-19, nutrition, and play.

information, which, in turn, increases the time available for service delivery (Kelly, 2021b).⁶⁷ [Hippocampus](#), an early childhood education service provider in India, was using WhatsApp successfully for many months to engage with parents during school closures. Ahead of schools re-opening, they started an online programme, trying to bring teachers and children together virtually in small groups but it didn't work. Caregivers fed back that they do not have time to sit down and learn with their children and that their devices and phones are often not in the home during the day. [Hippocampus](#) found that caregivers were asking for simple activities that were easy to do at any time of the day. They built their theme-based programme (detail provided in [Section 2](#)) around these needs and continued delivering via WhatsApp (GSF, 2020). [Kidogo](#) in Kenya found that caregivers sometimes had to sell their smartphones or could no longer afford data as they suffered the economic impact of Covid-19 lockdowns. This information led them to double down on their SMS efforts and rely less on WhatsApp (GSF, 2020).

A commitment to Digital Principle 4: 'build for sustainability' creates the right conditions to reach scale. [Lively Minds](#) was already working in partnership with government and local community structures to deliver parenting support to caregivers in Ghana and Uganda so when they scaled a radio programme in response to Covid-19, they were able to activate non-financial resources at all levels of government (in 16 local languages in Ghana) to reach a maximum number of beneficiaries across eight regions in Ghana and the Busonga region of Uganda.⁶⁸ [Save the Children, Nepal](#) worked in collaboration with the Ministry of Education Science and Technology and the Centre for Education and Human Resource Development and the Nepal Education Cluster to develop four radio series to support early childhood development that fully aligned with the national curriculum.⁶⁹ As a result, the programmes were disseminated widely through national and local radio stations and in multiple local languages. An effectiveness study, unpublished at the time of writing, suggests that the activities were "widely accepted by the target beneficiaries with a good prospect of continuing some programme activities in the future."⁷⁰ The virtual programming aspects of [aeoITU](#), [RTCCD](#), [Ana Aqra](#) and

⁶⁷ As of March 2021, remote counselling has reached 170,360 young children, including 8,718 pregnant women.

⁶⁸ Information obtained via interview with Geoff King, Content Director, [Lively Minds](#).

⁶⁹ (1) Early Literacy and Math (ELM) at Home — radio series targeted to children aged 3–5; (2) 'Hamro School' — a radio series targeted to Grades 1–3; (3) 'Ramaundai Sikhdei' ('Enjoy and learn') — a radio series targeting caregivers; (4) Radio series for parents with children from birth to age 3 on early stimulation and positive parenting.

⁷⁰ Obtained through interview with the [Save the Children, Nepal](#) team on 12th April 2021

[Mobile Creches](#) are now fully integrated into each organisation's scaling strategy alongside in-person services to ensure maximum reach and impact for the most underserved populations (Walsh, 2020).

Providing open-source (Digital Principle 6) and evidence-based parenting resources for caregivers is one way of supporting them remotely through the Covid-19 pandemic and beyond. The World Bank recommends that policymakers and practitioners "Support parents with ideas, information, materials and options to support their children's learning, including learning through play / early stimulation via mobile phone, TV, radio, direct outreach and material delivery" (World Bank, 2020b, p. 11). [Parenting for Lifelong Health \(PLH\)](#)⁷¹ provide open-source materials covering parenting topics and ideas for play. All materials are available in 100+ languages and have reached over 139 million people globally via the website, email, social media, text messaging, print media, radio, video and webinars. Organisations who have used the resources to support caregivers at home through their own programmes include:

1. [Gabriel Project](#) in Mumbai, an NGO supporting vulnerable children in the slums and under-served rural villages in the Indian state of Maharashtra.
2. [RISE North Macedonia](#), a project implementing cost-effective parenting interventions for the prevention of child mental health problems in LMICs in Eastern Europe.
3. [Forgotten Voices](#), a partnership initiative working with local churches across Malawi and Zambia to empower and support orphaned and vulnerable children and their caregivers.

Impact is measured at the level of each project. The [Gabriel Project](#) in Mumbai reported a 61% increase in confidence in protecting children from sexual abuse; a 77% increase in parent engagement and play; a 96% increase in confidence for positive relationships with children and a 76% increase in confidence in managing parenting stress⁷² (PLH, n.d.). UNICEF has an open-access portal for parents with resources on child development, child care, health and food and nutrition.⁷³

⁷¹ In collaboration with the World Health Organisation (WHO), UNICEF, the Global Partnership to End Violence Against Children, USAID, Centers for Disease Control and Prevention (CDC), Oxford University, the LEGO Foundation and many other partners

⁷² https://www.covid19parenting.com/assets/impacts/impact-briefs/impact-brief_mumbai1.pdf

⁷³ UNICEF Parenting | UNICEF Parenting

Reference is made to the other principles in other sections on the workforce ([Section 3](#)), pedagogy and inclusion ([Section 2](#)).

4.4. Interactivity between children and caregivers around (multimodal) technology

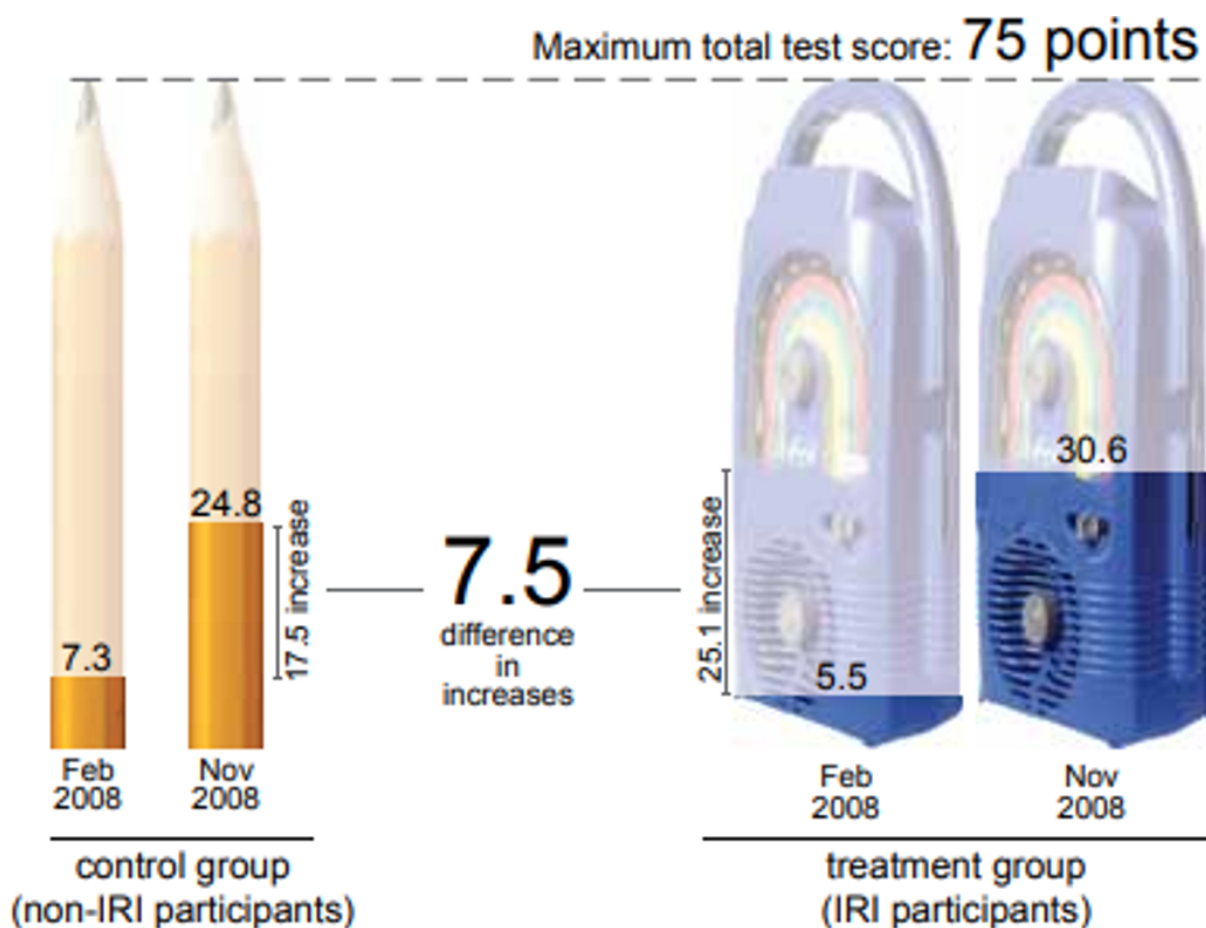
Studies from prior to the Covid-19 crisis already made a clear case for the importance of joint media engagement — regardless of the specific modality — for achieving impact with remote learning for all ages. “What goes on between people around the media can be as important as what is designed into the media” (Takeuchi & Stevens, 2011 [P&E, OBS, →]). In the early years, the context in which remote modalities are used, the people with whom they are used, and how they are used is critical, and more evidence is needed to determine impactful ways of achieving joint media engagement in LMIC contexts.

Evidence on the use of Interactive Radio Instruction (IRI) demonstrates the potential of technology as a tool to support and facilitate interactions between caregivers and children around learning. Interactive radio instruction seeks to improve quality using methods that require active listening / learning and physical and vocal responses to questions and exercises. Pauses are built in to give time for reflection and interaction with the learning facilitator (teacher, caregiver) is encouraged and promoted as they collaborate to solve problems. Interactive radio instruction series are developed based on sound pedagogy, lessons build on previous knowledge and learners are stimulated through storytelling, music, and characterisation. The programmes target a very specific audience on a specific subject (e.g., Grade 1 maths) and build in cycles of feedback, observation, and review. USAID has been the main supporter of interactive radio instruction since 1974 when it was first used in Nicaragua. Dock and Helwig (1999) carried out a review of the evidence on 24 interactive radio instruction programmes, including four on early childhood development in LMICs and found that they elevate quality when combined with in-classroom teaching and help address barriers to access for rural and isolated learners cost-effectively. Interactive radio instruction has helped improve the quality of education in remote and urban areas in Australia, Bolivia,⁷⁴ the Dominican Republic, El Salvador, Honduras, South Africa, and Thailand.

⁷⁴ Two of the Bolivia programmes focused on early childhood development.

In Zanzibar, the [Radio Instruction to Strengthen Education \(RISE\)](#) project, funded by USAID, aimed to reach children in underserved areas with early childhood education. It used interactive radio instruction and child-friendly pedagogy in 30-minute, broadcast sessions in non-formal centres and formal government schools. Results from baseline and outcome tests demonstrated that the project's interactive radio instruction beneficiaries outperformed control students by 10%, with the highest gains in Kiswahili. Learning gains among treatment girls were greater than those of boys, demonstrating a girl-friendly and inclusive approach (Morris, et al., 2009 [P&E, OBS, ↑]). In a follow-up study, students who had benefited from RISE participation generally continued to perform better than the control group six years after the intervention (RISE & ZTUR, 2015 [P&E, OBS, ↑]).

Figure 9. Effectiveness of the Interactive Radio Instruction delivery model (Morris et al., 2009 [P&E, OBS, ↑]).



However, overall performance levels in English and maths were very low across all study groups. The programme has not been sustained due to lack of

funding, but in the wake of Covid-19, the Zanzibar Ministry of Education and Vocational Training has increased its output of radio and video programming based on the previous engagement with the RISE project. In Rwanda, the ‘First Steps’ project partnership with local and international representatives planned a multimodal approach that included radio to reach the families of children from birth to 3 years. A positive impact across the areas of child development, parental time, and parental confidence in supporting their children was observed six months and 2.5 years after the start of the project. Importantly, it was the low-cost, easy-to-access medium and ‘co-learning’ with parents that amplified the economies of scale (Justino, et al., 2019 [P&E, OBS ↑]).

Non-digital solutions show greater promise for children in the early years. The World Bank calls for policymakers and practitioners to “Explore TV / radio programming for younger learners (likely to have greater reach than online methods) and adapt existing high-quality content if budget and time constraints limit opportunities to develop new content” (World Bank, 2020b, p. 11). [Save the Children, India](#) are also promoting early childhood development for children by sharing videos with parents on how to integrate early learning into household activities (Save the children, 2020b). Nugroho et al. (2020 [P&E, OBS →]) feature three case studies on the use of educational TV:

1. Expanding access to Sesame Street in the Americas.
2. Educational TV with Ubongo’s Akili and Me in sub-Saharan Africa.
3. Educational TV and teacher support in Indonesia.

A meta-analysis of 24 studies in 15 countries found that exposure to Sesame Street was correlated with positive cognitive outcomes (Mares and Pan 2013 [S, NSR, ↑]). Sesame Street issued a guidance note to support the World Bank Group and other agencies to use the [Caring for Each Other](#) initiative as part of their emergency Covid-19 response. Early years leaders in the United Kingdom reported greater use of television and short, pre-recorded video lessons in relation to children in pre-primary and early grade settings in schools (Ofsted, 2020 [P&E, OBS, →]). More robust research and evaluations are needed into the impact of non-digital interventions with children in the early years in LMIC contexts.

“[...] live lessons were a less appropriate delivery method for younger pupils [...] engaging younger pupils was much more challenging when done remotely. Most of the primary schools used short pre-recorded video lessons instead whilst ensuring that any external resources used fitted appropriately within their intended programme of work.”

– Ofsted Research, Ofsted, 2020 [P&E, OBS, ↗]

4.5. Interactive and multimodal engagement with caregivers

There is good evidence that SMS messaging can be an impactful way to communicate with caregivers and incentivise them to carry out activities with their children. Overall, the potential for text messaging to improve parental engagement is clear across low- and high-resource contexts. Studies on reaching the parents of primary learners also linked messaging interventions to learning gains. Berlinski, et al. (2016 [P&E, EXP, ↗↗]) found significant impacts of a text messaging intervention on test scores and attendance in Chilean elementary schools. Parents receiving text messages on student outcomes (e.g., absenteeism, grades, student conduct) was shown to reduce grade repetition and school dropout rates. In Uruguay, receiving text and audio messages three times a week for 24 weeks increased the frequency of parental involvement (0.24 standard deviation) and improved several measures of parenting quality, according to an RCT design study of 24 early childhood centres (Bloomfield et al., 2019 [P&E, EXP, ↗↗]). In the United States, text messages to pre-primary children’s caregivers targeting the behavioural barriers to engaged parenting had a positive impact on parental involvement at home and school and generated impact on literacy outcomes (York et al., 2017 [P&E, EXP, ↗↗]). Results showed the greatest impact for tailored, personalised messages (Doss et al., 2018 [P&E, EXP, ↗↗]). [SMS4dads](#), a text messaging programme providing new fathers with information, connections to online services, and mood tracking is currently being scaled up in rural Australia and adapted and trialled in Kenya and Colombia after the initial trial in Australia reported positive effects on the fathers’ own well-being and

relationship with their partners and infants (Fletcher, 2019 [P&E, OBS, ↑]).

[Kidogo](#) used SMS to broadcast messages to caregivers twice a week during the Covid-19 crisis. They also opened an SMS hotline for caregivers to ask questions, receiving on average 50 questions per day. They used WhatsApp to share videos of teachers simulating what they would normally do in a classroom environment and paired up with community radio to deliver 15 broadcasts per day across different stations (GSF, 2020). [ParentText](#) is an automated text messaging service being developed by the University of

Oxford and UNICEF India for parents of children from birth to 17 years, which is delivered using RapidPro, an open-source application serving low-income communities without smartphone access. Parents are reached through multiple face-to-face and online channels and receive messages in three ways: scheduled text messages, on-demand content, and weekly assessments. The content seeks to “localise global parenting for SMS delivery (PLH, n.d.).” A text messaging initiative by the World Bank delivering two messages per week to parents of young children encouraging positive health-promoting behaviours in rural Ecuador in 2015 had significant positive effects on child health indicators.⁷⁵ SMS messaging interventions have high potential, but must be carefully designed to involve the local community and supplement existing local initiatives (Barrera et al., 2020 [P&E, EXP, ↑↑]).

Emerging evidence suggests that support to caregivers via SMS has greater impact when combined with other forms of two-way communication, such as phone calls. Angrist et al. (2021) studied the effects of SMS interventions combined with 5–20-minute phone calls with parents of Grade 3–5 students (upper primary) in Botswana. During the 5–20-minute phone conversation, a facilitator engaged with both the parent and the student about the maths problem that had been shared with them via SMS. Results show that receiving the SMS alone did not result in learning gains whereas the combination of SMS and follow-up phone call led to a reduction in innumeracy by 31% (Angrist et al., 2021 [P&E, OBS, ↑]). [Save the Children, Nepal](#) delivers distance learning support to parents over the phone, including practical advice on how to ensure a “safe, loving and stimulating home environment that promotes their well-being” (Save the Children, 2020b, p. 14). They also piloted the use of free interactive voice receivers, in partnership with [Voxcrow](#),⁷⁶ to build caregivers’ knowledge and skills around playful and positive parenting (as part of their

⁷⁵ [How Text Messages Helped Parents in Rural Ecuador Improve Their Children's Health \(worldbank.org\)](#)

⁷⁶ A supplier of a voice-based communication platform.

‘Ramaudai Sikdai’ — ‘learn and enjoy’ programme) with content recorded in local languages (Save the Children, 2020b). The content was delivered in 10 lessons over a period of 22 days reaching 813 households (1,059 children, 538 male and 521 female). They used Blazon software to deliver a missed call / call-back system to listen to previously broadcasted lessons free of charge. Voice broadcasting is used to send announcements to the beneficiaries, so they know when to expect the next lesson. They can either listen immediately when they receive the call or wait for the next call back (Voxcrow Pvt. Ltd, 2020). There is no impact data available but feedback from participants and retention throughout the programme suggest it was well received.

However, while SMS messaging has been shown to support parents, caregivers, and families in their child’s learning, increased parental engagement does not always translate to learning gains. Barrera et al. (2020 [P&E, EXP, ↑]) examined an intervention in rural Nicaragua where parents and caregivers were sent text messages about nutrition, health, the home environment, and other topics. There was no impact on learning or psychosocial outcomes for learners, despite significant changes in self-reported parenting practices. The study noted that when local leaders were sent text messages, there was instead a decrease in parental activity and negative effects on learner outcomes (potentially due to a lack of coordination with, and outreach to, local leadership).

Evidence from the field of parenting programmes in HICs suggests that the use of synchronous video communication with caregivers is most effective in achieving impact with the youngest children whereas telephone conversations and SMS-based interventions deliver mixed results. Poole et al. (2020) attribute this in part to the way tele-intervention is naturally set up to support a caregiver ‘coaching approach’ rather than early intervention providers⁷⁷ working directly with the child as they tend to do when working face-to-face.

⁷⁷ Early Intervention services are designed to support the development of infants and toddlers with special needs and to strengthen the capacity of families to promote their development.

“Tele-intervention pushes the provider to increase the amount of explicit caregiver coaching strategies they use and requires the caregiver to engage with the child directly during sessions.”

–Poole, et al., 2020

A multi-site study RCT evaluating the benefits of early intervention with infants and young children via tele-practice in the United States found that children in the tele-practice group scored statistically significantly higher than children in the in-person group for children who are deaf or hard of hearing (Behl et al., 2017 [P&E, EXP, ↑↑]). Again, the findings point towards the enhanced use of the parent-coaching model as the main contributing factor alongside decreased cancellations, greater flexibility in scheduling, and greater access to specialised services. While there are significant challenges in applying these tools and approaches at scale in LMIC contexts, the findings can translate into helpful guidelines for remote learning for young children in LMICs. Specifically:

- Design remote interventions to focus on developing the skills of the primary caregiver (e.g. through the use of coaching techniques).
- Work around the scheduling preferences and constraints of families.
- Ensure differentiated support is offered and provided where necessary to meet the varying needs of *all* children.

An ongoing telementoring trial in Bangladesh of parents and university graduates / students could offer some insights into this form of support at scale in an LMIC context when they become available (estimated end March 2021).⁷⁸

Other examples of approaches using a wide variety of modalities to support remote learning in the early years include:

1. numo.mon.gov.ua in Ukraine — a platform developed by the Ministry of Education and UNICEF Ukraine including tips, videos, exercises, and

⁷⁸ <https://www.socialscienceregistry.org/trials/6395>

games to assist parents of 3–6-year-olds.⁷⁹ A chatbot⁸⁰ is also available on Viber and Telegram, which sends tailored messages to parents, based on their children's age and developmental needs.

2. The Mshoblis Skivri (Parent's Box) in Georgia is a Facebook page and group, supported by the Ministry of Education, Science and Sports, to engage and support parents of children with disabilities. It hosts weekly live discussion sessions with experts and Ministry representatives. Parents can submit questions and access sessions asynchronously if they are not available at the time of broadcasting (UNICEF Innocenti, unpublished).⁸¹

⁷⁹ Topics include: interactions with adults, emotional competence, digital literacy and mathematics.

⁸⁰ A computer programme designed to simulate conversation with human users, providing predetermined responses to a set of questions and requests that users are able to make.

⁸¹ The most viewed sessions were on inclusive education, effective communication, and distance learning, each viewed around 8,000 times (one session on the role parents in the process of developing individual curriculum has had over 18,000 views, although most of the questions / comments received were from teachers).

5. Equity and inclusion

Using technology can exacerbate existing inequalities if its implementation does not adhere to the [Principles for Digital Development](#)⁸² and the [World Bank EdTech principles](#).⁸³ If used effectively, it can help reach marginalised learners. The urban–rural divide and implications for connectivity, equity, and inclusion in pre-primary are sufficiently covered in the UNICEF Innocenti Report. This section focuses on other forms of marginalisation, particularly with regard to gender and SEND — used to describe any and all children who require extra provisions to access and participate in education and to learn.

Figure 10. *A summary of key points on equity and inclusion.*

- We did not find any studies that focused on the impact of remote learning interventions through technology in the early years for ‘girls’ or ‘children presenting with SEND’ in LMICs.
- There are many barriers to effectively using EdTech for young children presenting with SEND in LMICs and very little evidence on how to overcome them.
- A rapid evidence review by the EdTech Hub demonstrates that when barriers to access to EdTech are overcome, female students of all ages benefit equally or more than male students from interventions to support their learning across LMICs.⁸³
- The gap is evident even in HICs across all age groups, demonstrating the scale of the challenge at a global level.
- Some children benefited greatly from the move to remote learning with caregiver support.
- Remote learning materials should be available in a format that meets the needs of *all* children (Digital Principles 1 and 2).
- Currently, most global initiatives that aim to support early years learning remotely through technology for children who present with SEND, rely heavily on access to the internet and video capabilities.
- Where programme delivery relies heavily on internet access and high-tech devices, these must be provided equitably to all families to meet the needs of vulnerable children.

⁸² (1) Design with the user; (2) understand the existing ecosystem; (3) design for scale; (4) build for sustainability; (5) be data driven; (6) use open standards, open data, open source, and open innovation; (7) reuse and improve; (8) address privacy and security; (9) be collaborative; also see [Haßler \(2020\)](#) for a version of the Digital Principles tailored to education.

⁸³ ([Webb et al., 2020](#) [S, NSR, ↑])

- The use of simple technology modalities can be effective to support caregivers of children presenting with SEND if they are designed to meet the needs of caregivers (Digital Principle 1: ‘design with the user’).

The final, but perhaps the most important challenge, is that of achieving equity and inclusion with remote delivery of support to caregivers for early years learning. Children from the poorest households are the least likely to enrol in pre-primary education programmes (Zubairi and Rose, 2018). “A high proportion of marginalised children, in particular girls and children with disabilities who face multiple layers of discrimination, are often excluded from early childhood development services (Walker, J. & Baboo, N., n.d.). This is a key consideration for any policy or intervention across any sector, in any context. This is particularly true for all early childhood development services, where children from disadvantaged backgrounds, as a result of poverty, gender or disability, are the most likely to benefit from investment in early childhood development (Zubairi and Rose, 2018). “Children who attended preschool are 24% more likely to be enrolled in primary school at endline [on completion of preschool] compared to the control group [who did not attend preschool], and are more likely to enrol at the appropriate age” (Martinez et al., 2012, p. 3, [P&E, EXP, ↑]). The compounded challenges faced by marginalised children at a young age are extremely difficult to overcome later in life.

“If school or pupil level disadvantage means that pupils do not have access to the technology needed to engage with remote learning then it is likely to cause the attainment gap to widen.”

**— Education Endowment Foundation, 2020,
p. 24 [S, SS, ↑↑]**

The urban–rural divide and implications for connectivity, equity, and inclusion are sufficiently covered in the UNICEF Innocenti Report. This section focuses on other forms of marginalisation, particularly gender and children presenting with SEND.

We did not find any studies that focused on the impact of remote learning interventions through technology in the early years for girls or children presenting with SEND⁸⁴ in LMICs. Where there is reach and / or impact data, it is not disaggregated by gender and other inclusion criteria, making it very difficult to identify promising approaches to reaching the most marginalised young learners.

There are many barriers to effectively using EdTech for young children presenting with SEND in LMICs and very little evidence on how to overcome them. EdTech Hub summarises the barriers for children of all age groups as:

1. A lack of understanding of the potential benefits of EdTech and assistive technology for SEND students.
2. The short supply of accessible technology.
3. Unequal access to internet connectivity and poor infrastructure.
4. Lack of money.⁸⁵

Interviews conducted in the development of this report with [UNICEF Serbia](#), [Save the Children Nepal](#), [Hippocampus](#) in India and [Lively Minds](#) in Ghana focusing specifically on the early years, revealed a significant gap in using, disseminating, and adapting technology to meet the needs of young learners with SEND. Colleagues in India simply stated that children with SEND were ‘invisible’ in the formal early years education sector. The UNICEF Serbia team working on [Halo Beba – Your Parenting Companion](#) recognises the missing content and limited support available for caregivers of children who present with SEND and the need to develop this soon. For now, the system can flag areas of concern / suspected developmental delays based on what caregivers input into the app in terms of development milestones. [The Learning Passport](#) initiative, tailored to meet the needs of the early childhood education workforce in Serbia, includes different resources for the professional development of preschool practitioners, as well as webinars and forums for professional exchange. The platform content will support the enhancement of competencies in the areas of direct work with children, development of cooperation and communities of practice, and development of professional practice.⁸⁶

⁸⁴ This report focused on two categories of vulnerable groups: girls and children presenting with SEND. The rural–urban, poverty and connectivity divide are well covered in the UNICEF Innocenti report

⁸⁵ [Learn more about SEND](#).

⁸⁶ Information obtained through interview with the [UNICEF Serbia](#) team.

The gap is evident even in HICs across all age groups, demonstrating the scale of the challenge at a global level. A YouGov survey⁸⁷ across the United Kingdom found that 59% of parents of a pupil presenting with SEND said that

“their child has been disengaged with remote learning, compared with 39% of parents of children without additional needs [...] Fewer than half (46%) of the teachers surveyed stated that their school offered additional remote learning arrangements for pupils with SEND” (Ofsted, 2020 [P&E, OBS, ↗]). School leaders from the two ‘special schools’ emphasised the importance of adapting the remote curriculum to make it ‘tangible’ rather than digital to enable children with complex sensory needs to engage better with content (Ofsted, 2020 [P&E, OBS, ↗]). Some children benefited greatly from the move to remote learning with caregiver support. Ofsted attributes these benefits to the ability to work more at their own pace, to take breaks when they need rather than at prescribed times, and the opportunity to work in a space in which they experience less sensory overload” (Ofsted, 2020 [P&E, OBS, ↗]).

A rapid evidence review by the EdTech Hub ([Webb et al., 2020](#) [S, NSR, ↗]) demonstrates that when barriers to access to EdTech are overcome, female students of all ages benefit equally or more than male students from interventions to support their learning — this is true for many LMICs. For example, the Radio Instruction to Strengthen Education (RISE) project in Zanzibar found that learning gains among treatment girls were greater than those of boys. Most studies considered in the rapid evidence review acknowledge a deep-rooted digital gender divide that mirrors wider gender bias within society. The rapid evidence review noted an important limitation of the findings in terms of potential lessons for remote learning interventions in the early years — that most studies understood technology to be a computer or tablet rather than other low-tech solutions that may be more accessible such as radio, TV, or mobile phones ([Webb et al., 2020](#) [S, NSR, ↗]). We echo the call for more robust research into the potential for low- and high- EdTech solutions to alleviate gender biases through remote, gender-responsive, gender-transformative early years pedagogical interventions.

Remote learning materials should be available in a format that meets the needs of *all* children (Digital Principles 1 and 2). The Peruvian Government has developed materials for home learning from pre-primary to secondary level,

⁸⁷ Commissioned by Ofsted, 2020.

tailored to include sign language on almost all video lessons, large font versions and pictograms, audio lessons, audio guides and documents for all parents, as well as differentiated materials for children with special needs (UNICEF Innocenti, unpublished).⁸⁸ Save the Children have adapted their 'Early Literacy and Math at Home' package for children aged 3–5 years to meet different needs such as sensory, physical / motor, and information processing difficulties. To ensure households with all levels of access to technology and connectivity can access the package, content is made available through posters, printed materials, phone texts, calls, audio messaging and videos (Save the Children, 2020b).

Currently, most global initiatives that aim to use technology to support remote learning for children in the early years with SEND rely heavily on access to the internet and video capabilities. Of the interventions explored in this topic brief, none have impact data available online. [Autism Speaks](#) (2020) developed a video training series, available freely on YouTube, to help caregivers support children with autism at home. They developed the [Caregiver Quick Tips](#) video series in partnership with the WHO, based on best practice in their traditional in-person Caregiver Skills Training (CST) programme. The series consists of six videos, each around 2.5 minutes, and teaches caregivers to use play and everyday routines to help their child learn and develop. The materials have been integrated into the WHO Caregiver Skills Training online platform which will be used to deliver the full CST programme virtually (UNICEF Innocenti, unpublished). The face-to-face programme consists of a combination of group sessions and individual home visits, covering topics including communication, behaviour management and caregiver well-being and self-care. It works in over 30 countries globally, with over 300 trained facilitators reaching over 2,500 families (Autism Speaks, 2019). [Naked Heart Foundation](#) hosts an online platform for specialists and parents of children with special needs to support them to meet the needs of children with Autism Spectrum Disorder (ASD), Down syndrome and other developmental disabilities in Russia. In Macedonia, [ranaintervencija.mk](#) is an online platform for early intervention services for children aged 0–6 years. Caregivers get in touch over the telephone and schedule an initial developmental assessment meeting, which is conducted online and leads to an individualised profile with personalised content, tips, and guidelines (text, image and video) (UNICEF, unpublished).

[Cboard](#) in Croatia, Montenegro, and Serbia is a free digital application (available on tablets, smartphones and via the web) to support all children to

⁸⁸ <https://aprendoencasa.pe/#/orientacion/orientation.families> [accessed 26th March 2021]

improve their communication skills but is particularly helpful for pre-primary children with communication development delays and is most effective when used early on. It was developed in partnership with speech therapists from the health and education sectors, teachers and parent organisations (including one organisation working with children with autism). The app is currently being piloted with 125 children. In Serbia, it is being used by over 700 professionals across the country who are working directly with families. UNICEF is working with the national agency for health insurance to ensure that it is promoted and integrated into the national health system. A pictographic symbol set will be made available for printing to support communication work with children using paper-based resources where technology or the internet are not accessible (UNICEF Media, 2020). The app represents a significant breakthrough in the use of assistive technology to support development in the early years in Serbia. The app is already being used at the national level in Croatia, which has been hugely impactful for families living on islands away from the mainland, where access to professionals is a challenge. The team at [UNICEF Serbia](#) implied that the cost of the app is negligible when compared to the cost of providing regular, weekly (or more frequent) sessions with speech therapists (at government expense). It emphasises the value of investing in assistive technology, which can then be available in the home at all times. However, the challenge of achieving equity remains as some children and parents face access and connectivity barriers (devices are not provided by the government or through insurance).⁸⁹

Other examples of creative solutions to support children with special educational needs online (using high-tech solutions) include [autismmap.md](#) in Moldova and *Özelim Eğitimdeyim* ('I am special, I am in education') in Turkey. The latter is an application for families of children with vision impairment, hearing impairment, mild / moderate / severe learning disabilities, ASD, and learning difficulties.

Where programme delivery relies heavily on internet access and high-tech devices, these must be provided equitably to all families to meet the needs of vulnerable children. The [Mellow Parenting](#) programme in Tajikistan works with groups of 8–10 parents over a period of 14 weeks through parent- and child-centred activities. During the Covid-19 pandemic, sessions were run via smaller group video calls, without a separate children's session. Feedback

⁸⁹ Interview with UNICEF Serbia team, 7th April 2021.

video sessions were then tailored to what was observed during the parenting sessions with facilitators modelling the desired behaviours. UNDP and the [Open Society Foundations](#) provided caregivers in need of devices or connectivity with the resources and tools they needed to access the programme. Parents shared two issues with the remote approach: (1) lack of privacy and confidentiality; (2) the difficulty of caring for children while participating in sessions. The organisation is currently trialling a hybrid model but results are not yet available (UNICEF Innocenti, unpublished).

The use of simple technology modalities can be effective to support caregivers of children presenting with SEND if they are designed to meet the needs of caregivers (Digital Principle 1: 'design with the user'). A small researcher-led study of a WhatsApp-based support group for parents of children with ASD found the initiative useful in providing emotional support to caregivers and supporting them to manage behavioural difficulties. While discussions are designed to be led by caregivers, the presence of a speech and language therapist in the group was deemed to have contributed to the positive outcomes (Cole et al., 2017). In Turkey, a private Facebook group of caregivers with children with ASD found that it helped them to understand their children's needs, cope better emotionally, and better navigate the services available to them (Yildiz et al., 2019 [S, NSR, →]).

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