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POSITION PAPER

EdTech Horizon Scan

Rapid scan on emerging EdTech research during the Covid-19 pandemic

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Notes

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Abbreviations and acronyms

EiE	Education in Emergency
NFE	Non-formal education
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
ROSIE	Research on Scaling the Impact of Innovations in Education
SDG	Sustainable Development Goal
SOA	School on Air
TLMs	Teaching and learning materials

1. Introduction

EdTech Hub horizon scans are publications designed to provoke thinking and provide insight into a range of topics related to the design, implementation, oversight, and monitoring and evaluation of educational technology (EdTech) tools, products, services, and related ideas.

The scans DO contain a range of sources that have been identified by the authors as interesting and insightful. These have been synthesised to foster ongoing conversation as the EdTech field rapidly evolves. These scans ARE NOT designed to be comprehensive, and should not be confused with systematic literature reviews or academic literature. They are quick guides that are part of the Hub's commitment to sharing knowledge fast and learning out loud. Should you have any questions or feedback on this horizon scan please do [contact us here](#).

This edition of the Hub's Horizon Scan provides a high-level summary of research, blogs, and think-pieces published between October and December 2021, that provide insights and learnings on the adoption and utilisation of EdTech during the Covid-19 pandemic. The main themes of the summaries are:

- Leveraging EdTech in times of crises
- Responsive education for vulnerable populations
- Building teacher capacity for improved teaching and learning
- Adopting open educational resources in a pandemic.

2. Leveraging promising EdTech to create systemic change in times of crises

Since the disruption of education across the world as a result of Covid-19, many countries have adopted some form of EdTech to respond to the growing learning crises ([↑Munoz-Najar et al., 2022](#)).

This study is the first annual brief of a cross-national, multi-team, design-based research and professional support initiative — Research on Scaling the Impact of Innovations in Education (ROSIE).

Title: Scaling education innovations for impact in low- and middle-income countries during the Covid-19 pandemic ([↑Olsen, 2021](#))

Publication date: December 2021

Resource type: Annual Brief

Focus countries: Low- and middle-income countries

ROSIE brings together researchers and practitioners to study the process of scaling education initiatives across 26 countries. The brief reports on the first round of information gathering and thus only captures the initial experiences of the first ROSIE collaborators' cohort.

Results from the first round of information gathering identified a number of lessons, including the following.

1. School closures created favourable conditions to strengthen school–family engagement; this enabled teachers and families to build closer relationships to ensure that effective teaching and learning continued.
2. The increased reliance on technology during the pandemic exacerbated the pre-existing digital divide. Some capacity challenges such as access to and the cost of the internet became more pronounced, especially in rural communities.
3. The cost of using online resources (internet and hardware costs) contributes to the widening digital divide.
4. Scalars of EdTech and researchers need to engage local personnel and ensure sufficient training is conducted during initial planning in order

to help users understand and maintain the hardware needed for EdTech innovations.

5. Although many governments expediently adopted EdTech solutions to mitigate learning losses, these solutions were more focused on quickly providing access to learning and, in general, have not considered the longer-term cost of deployment and hardware maintenance.
6. Donors, governments, and development partners were not the only allies and champions of the effective use of EdTech during the Covid-19 pandemic. Families, community groups, and volunteers play a significant role in the uptake of EdTech initiatives, especially outside the school.
7. Teachers can become fatigued when asked to teach in new ways or use online platforms without proper training; building the capacity of teachers in the use of EdTech and retaining them is essential.

3. Responsive education for vulnerable populations

Having access to equitable and quality education is a fundamental human right ([↑UNESCO, 2019](#)). Girls are among those most affected by the unfavourable situation created by the Covid-19 pandemic ([↑Break Free Alliance, 2021](#)). Refugees also face numerous challenges related to access to quality and equitable education ([↑Rolla & Sakai, 2017](#)). The following studies discuss the implementation of EdTech to support the learning of vulnerable populations.

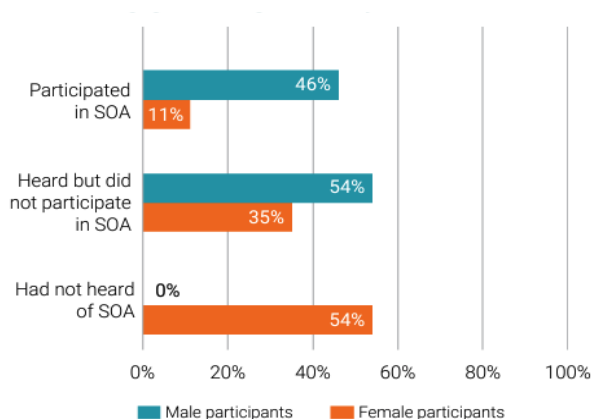
Title: Gender-responsive education in emergency in Nigeria: Safeguarding girls' presents and futures ([↑Ossai, 2021](#)).

Publication date: November 29, 2021

Resource type: Policy Brief

Focus country: Nigeria

Figure 1. *Engagement of girls and boys in SOA.* Source: [↑Ossai, 2021](#).



The 'School-on-Air' (SOA) programme in Nigeria leverages radio broadcasts to deliver content that aims to enhance the quality of lesson delivery in remote areas with few teachers.

This policy brief uses data collected using various methods (focus group discussions, surveys, etc.) to analyse the SOA programme launched by the Oyo State government in Southwest Nigeria, focusing on girls' education.

Findings from the SOA programme indicated that girls lacked control over their time and essential resources due to their domestic responsibilities, in particular, providing care for younger siblings.

Focus group discussions revealed that girls did not have the same access to personal mobile devices as boys. This phenomenon was attributed to parental fear and distrust rather than cost.

Findings indicated that Oyo State Education in Emergency (EiE) planners did not consider gender-related barriers in the design and implementation of the SOA programme because of cultural dispositions, demonstrating a common shortsightedness on the part of government planners in the state.

Title: Unlocking Learning: The implementation and effectiveness of digital learning for Syrian refugees in Lebanon ([↑Dreesen et al., 2021](#))

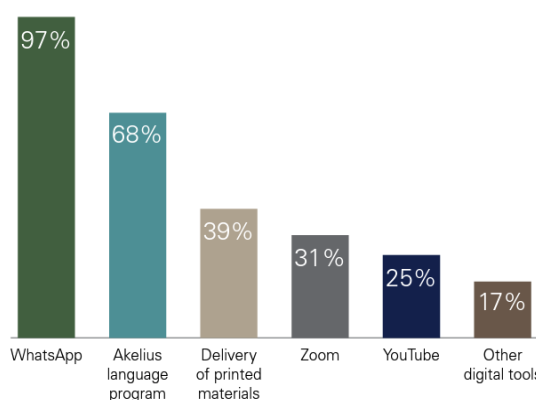
Publication date: December 2021

Resource type: Research Report

Focus country: Lebanon

In 2017, a UNICEF-Akelius Foundation Innovation in Education Partnership implemented a digital course aimed at language learning on tablets and mobile phones in Lebanon. The report presents findings across 64 non-formal education (NFE) centres covering 7,237 refugee students.

Figure 2. Modalities of communication and content used for remote learning. Source: [↑Dreesen et al., 2021](#).



The course was designed to help refugees transition to Lebanon's trilingual education system by strengthening English and French and accelerating language learning for marginalised children.

Findings from participant teachers indicate that using a blended learning approach led to improvements in their classroom environment and students' confidence, motivation to go to class, and speaking skills. Blended learning approaches allowed teachers to provide psychosocial and technological support to families by developing and delivering guides on using technology, providing data package top-ups, and even helping to install internet routers within communities.

Successful transition to remote digital learning relied on frequent clear communication between educators and households and ongoing support from educators to overcome challenges, including unreliable internet connectivity.

The report provides the following five recommendations to policymakers, education practitioners, and EdTech developers.

1. Governments should prioritise their investments in reliable electricity supply and strengthen their relationships with the private sector to ensure affordable access to data.
2. Communication with families and communities should continue to ensure a sustained increase in caregiver engagement and participation in their children's learning.
3. Investing in the digital skills of teachers and facilitators is essential for the implementation of digital learning during school closures.
4. A holistic approach is required for implementing digital learning during school closures. Governments and education providers must cost and invest in the entire EdTech ecosystem, including human resources, monitoring and evaluation, and implementation research to understand how digital learning works.
5. Software development should align with the needs of teachers and contextualise the constraints of the learning environment.

4. Building teacher capacity for improved teaching and learning

Building the skills and competencies of teachers is a fundamental aspect of developing a strong education system. Governments around the world make significant investments in teacher training to develop policies to improve learning outcomes ([↑Burns & Gottschalk, 2019](#)).

The next study presents a systematic review of 22 research papers indexed in Elsevier's abstract and citation database (SCOPUS) ([↑Burnham, 2006](#)) on teacher digital competence and social sustainability based on the [PRISMA model](#).¹

Title: Understanding Teacher Digital Competence in the Framework of Social Sustainability: A Systematic Review ([↑De la Calle et al., 2021](#)).

Publication date: November 30, 2021

Resource type: Review

Focus countries: Global

This study analyses how research on teacher digital competence is currently being addressed in scientific publications and how social sustainability is integrated into current research on teacher digital competence.

According to the review, over the last seven years (2015–2021), scientific publications on the topic of teacher digital competence have focused on:

1. How teachers make use of certain technologies (augmented reality, social networks, or educational robotics) to facilitate teaching and learning.
2. Identifying teacher-training needs.
3. The training needs of teachers to achieve the objectives of a digital society.

The review also identified the following gaps in research; this helps to identify research opportunities on teacher digital competence.

1. The studies do not pay explicit attention to the nuances of the context in which teachers work, their socioeconomic levels, the possible biases in the research due to gender issues, or the lack of accessibility to

¹ See <https://prisma-statement.org/> Retrieved on 20 August 2022.

information and communication technology for the research participants or their students.

2. Although there are instances where studies highlight the use of mobile phones to access the internet, which often results in teachers developing their digital competence, these studies are mainly related to preparation for classes but not in their delivery of lessons.

5. Adopting open educational resources in a pandemic

Over the last two centuries, the number of children attending school globally has improved significantly (↑[Winthrop & McGiveney, 2015](#)). With growing enrollment rates across the world, there is pressure to create more teaching and learning materials (TLMs) (↑[Read, 2015](#)). The study below discusses the adoption of open educational resources to support teaching and learning.

Title: Teacher's adoption of an open and interactive e-book for teaching K-12 students Artificial Intelligence: a mixed-methods inquiry (↑[Zhang et al., 2021](#))

Publication date: December 2021

Resource type: Article

Focus country: China

This study uses a two-phased, explanatory, sequential mixed-methods approach to explore the impacts of open educational resources and interaction on learning to design an open and interactive e-book for teaching K–12 students.

The study further uses mixed methods to investigate the factors affecting teachers' acceptance of the open and interactive e-book based on the [Technology Acceptance Model](#)² (perceived usefulness and ease of use).

The study's findings indicate that the perceived ease of use is a stronger indication of perceived usefulness (i.e., of whether or not teachers are more likely to consider open and interactive e-books to be easy to use and as useful for delivering lessons to K–12 students). Within the context of this study, the findings suggest researchers should emphasise generating evidence on the design process of e-books.

Findings indicate that guidelines about the age-appropriateness of content contributed to teachers' ability to use the e-book in their teaching methods efficiently. However, teachers found the designed ebook difficult to use on their mobile devices.

² See

https://en.wikipedia.org/wiki/Technology_acceptance_model#:~:text=The%20technology%20acceptance%20model%20. Retrieved 20 August 2022

Further, findings identified that if an e-book is perceived as easy to use, teachers will be more likely to have a positive attitude towards using it. The open feature of the e-book made it easier for teachers to reuse the resources, hence motivating them to use them for teaching.

Although one major limitation of the study is the small sample size, it provides a deep understanding of teacher behaviours in the acceptance of open and interactive e-books. This study will require additional analysis into the correlation between two external variables (openness and interaction) and the four constructs of the Technology Acceptance Model (perceived usefulness, perceived ease of use, attitude, and continuance intentions).

6. Additional resources

UNESCO Repository of Education Indicator Reports³

This knowledge repository on education data shows the different web links to national reports that include statistical data on enrolment, repeaters, teachers, and school infrastructure.

Published: 2022

UNESCO SDG 4 Data Digest 2021⁴

The 2021 edition of the “*SDG 4 Data Digest, National SDG 4 Benchmarks: Fulfilling Our Neglected Commitment*” by the Unesco Institute of Statistics and the Global Education Monitoring Report presents agreed benchmarks on a selected set of seven SDG 4 indicators: early childhood education attendance; out-of-school rates; completion rates; gender gaps in completion rates; minimum proficiency rates in reading and mathematics; trained teachers; and public education expenditure.

Published: 19 Feb 2021

³ See <https://tcg.uis.unesco.org/data-resources/repository-education-indicators/> Retrieved on 20 August 2022

⁴ See <https://tcg.uis.unesco.org/> Retrieved on 20 August 2022

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These references are available digitally in our evidence library at <https://docs.edtechhub.org/lib/UWlQTDFf>

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