

The background of the entire page is a photograph of two men, likely of African descent, looking at a laptop. The image is overlaid with a semi-transparent purple and blue gradient. In the bottom right corner, there are several white, stylized circular patterns that resemble signal waves or concentric circles.

Education For All in the Time of COVID-19:

How EdTech can be Part
of the Solution



The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators and nearly 400 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

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Executive summary

In early 2020, the coronavirus (COVID-19) plunged the world into an unprecedented education crisis that has affected over 1.2 billion learners. The pandemic has driven several countries to explore new models of delivering education that could augment the physical classroom.

In low and middle-income countries (LMICs), COVID-19 has exacerbated the education crisis in which 258 million children and youth were already out of school.¹ It is estimated that 53 per cent² of children in LMICs cannot read proficiently by age 10, and this figure reaches 80 per cent in low-income countries.³ Widespread school closure is likely to magnify existing inequalities in LMICs by widening literacy, digital and skills gaps, and further threatening academic and professional prospects for young people. Girls and other vulnerable groups who already struggle to access education are at even greater risk of being deprived of their right to education. According to a recent Save the Children report, over 9 million children could miss out on education permanently as a result of COVID-19.⁴

In response to the education crisis, countries around the globe are leveraging technology and remote learning to continue education amid school closures. Educational technology (EdTech), a combination of IT tools and educational practices used to facilitate and enhance learning, has opened access to education for learners in many remote parts of the world. Predicted to triple in value to \$350 billion by 2025,⁵ the EdTech sector has been rapidly gaining ground in countries like India and Kenya where efforts to improve failing education systems have led to a proliferation of online learning solutions. Mobile technology alongside other mass media channels such as radio and television have supported education in LMICs.⁶

With increased mobile penetration rates and wider network coverage in LMICs, mobile has become a catalyst for innovation, especially in the context of COVID-19. Low-tech solutions, such as SMS-based learning systems, have unlocked learning opportunities for the underserved via basic feature phones and offline access options. Mobile technology has also been at the centre of partnership strategies for many EdTech providers, accelerating the impact of online learning solutions in LMICs and providing a lifeline for girls and other vulnerable groups, such as learners in humanitarian settings and learners with disabilities.

In the wake of COVID-19, new coalitions have united around a common goal to address the education crisis in LMICs. Sustaining those efforts and developing holistic learning ecosystems that integrate all education stakeholders will be vital to achieving quality education for all. One powerful alliance is the UNESCO Global Education Coalition, which has brought together partners from civil society, the private sector and international organisations to provide equitable learning solutions and universal access to education through the use of EdTech.

1 UNESCO Institute of Statistics (IUS), "Out-of-School Children and Youth".

2 The World Bank (15 October 2019), Brief: [Learning Poverty](#).

3 The World Bank (17 October 2019), Press Release: [New Target: Cut "Learning Poverty" by at Least Half by 2030](#).

4 Save the Children (2020), [Save Our Education Report](#).

5 Gilchrist, K. (8 June 2020), "These millennials are reinventing the multibillion-dollar education industry during coronavirus", CNBC Make It.

6 Granryd, M. (30 June 2020), [Keynote Address, GSMA Thrive China](#).

In addition to partnerships, sustainable learning models that build on the lessons from COVID-19 are urgently needed. This is particularly important in LMICs where deep-rooted challenges undermine the impact of new learning solutions and the ability to train the next generation for the future of work, which will be shaped by digital transformation in all sectors.

EdTech solutions could become the building blocks of a new, blended approach to education that help school

systems prepare for, and become more resilient to, crises like COVID-19. This new model will require data on EdTech solutions and their impact on users, and Artificial Intelligence (AI) and data analytics can play an important role, not only by revealing what students need, but also by personalising learning and improving learning solutions. Insights from EdTech solutions, such as user metrics on learning outcomes, can help EdTech become an adaptive technology at home and help teachers achieve better results in the classroom.



COVID-19 disrupts already fragile education systems

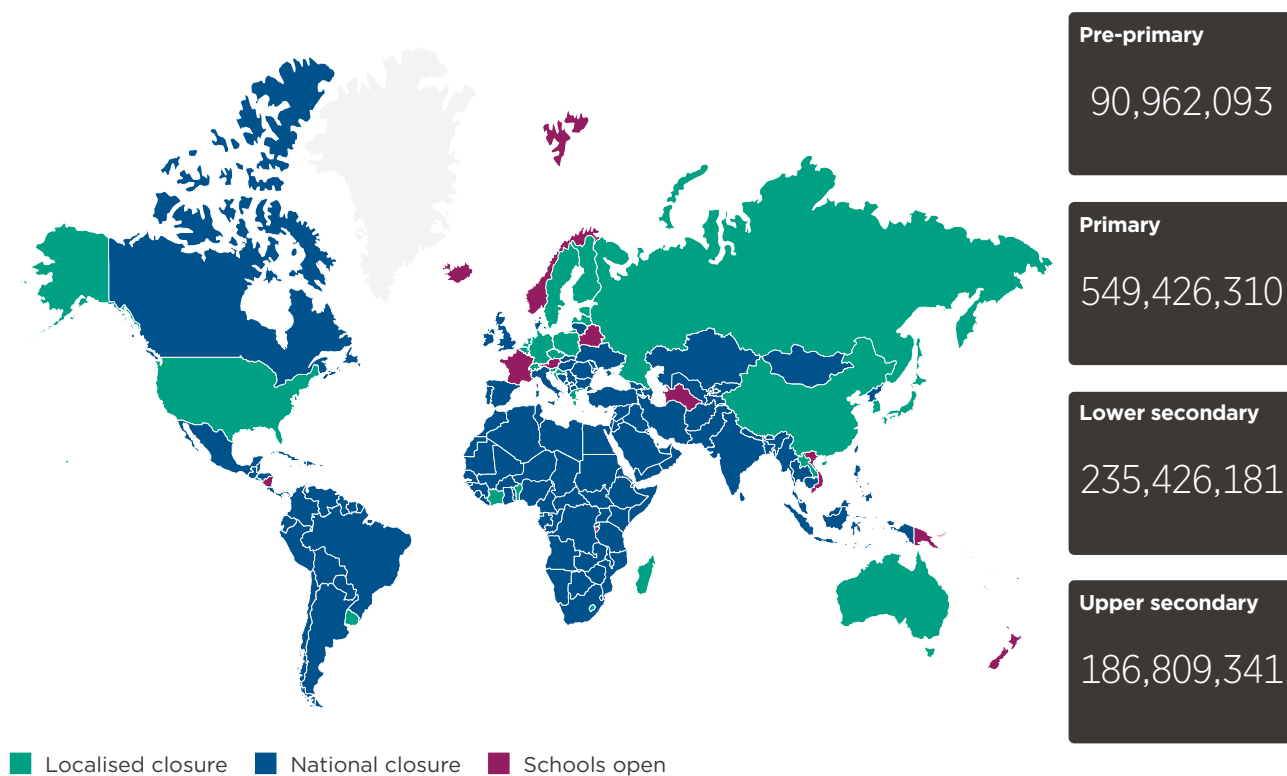
The detrimental impact of school closures

COVID-19 has magnified an education crisis in LMICs whereby 258 million children and youth were already out of school.⁷ At the peak of the restrictions in April 2020, schools in 195 countries were shut and 1.6 billion learners were out of the classroom, from pre-primary school to university.⁸

As of June 2020, 422 million secondary students were still not attending school in person (Figure 1). Interrupted learning, as well as delays and cancellations of examinations, have had a negative impact on education systems around the globe.

Figure 1

Global monitoring of school closures caused by COVID-19, as of June 2020



Source: UNICEF

⁷ Giannini, S. (20 March 2020), Come Together, now!, UNESCO.
⁸ UNESCO, "Education: From disruption to recovery".

School closure is an even greater challenge for vulnerable groups as interrupted education can exacerbate inequalities they already face. Girls are particularly at risk. As of May 2020, 400 million girls were out of school, cutting off their education prospects and making them more vulnerable to domestic violence and sexual abuse, child marriage and teen pregnancy. Based on trends in the aftermath of the Ebola crisis, the Malala Fund estimates that 10 million secondary school-aged girls in developing countries may never return to any form of schooling due to interrupted learning from COVID-19.⁹ Similarly, persons with disabilities are more likely to be excluded

from school or leave school before completing primary or secondary education. Over one billion people need at least one form of assistive technology (AT), and 80 per cent live in LMICs where 90 per cent of children with disabilities do not attend school.¹⁰ Limited access to public health information, significant barriers to providing basic hygiene measures and inaccessible health facilities all contribute to inequality and may create additional threats with COVID-19. As noted in the recent United Nations policy brief,¹¹ *A Disability-Inclusive Response to COVID-19*, learners with disabilities are also least likely to benefit from distance learning solutions.

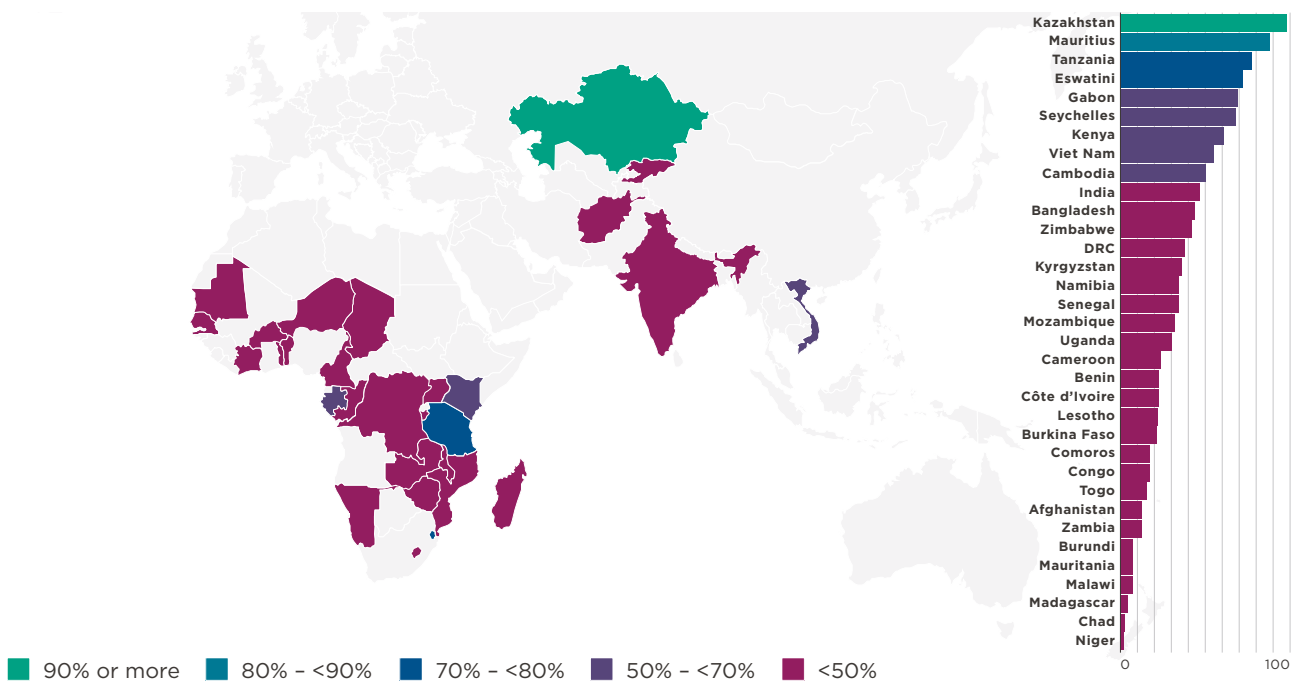
Educational challenges in LMICs are deeply rooted

School closures have added to the burden of already frail education systems, which are characterised by low enrolment and high drop-out rates. Enrolment in school from early childhood provides the foundation for university entry and transition to the workforce.

In Sub-Saharan Africa, only 58 per cent of children complete primary school education, and less than half of those students achieve a minimum proficiency level in reading.¹² According to country data from UNESCO (Figure 2), a high percentage of children and young people in LMICs have low proficiency in reading, with India recording the highest proportion.

Figure 2

Proportion of children and young people at the end of primary education achieving at least a minimum proficiency level in reading



Source: UNESCO Institute for Statistics database, 2020

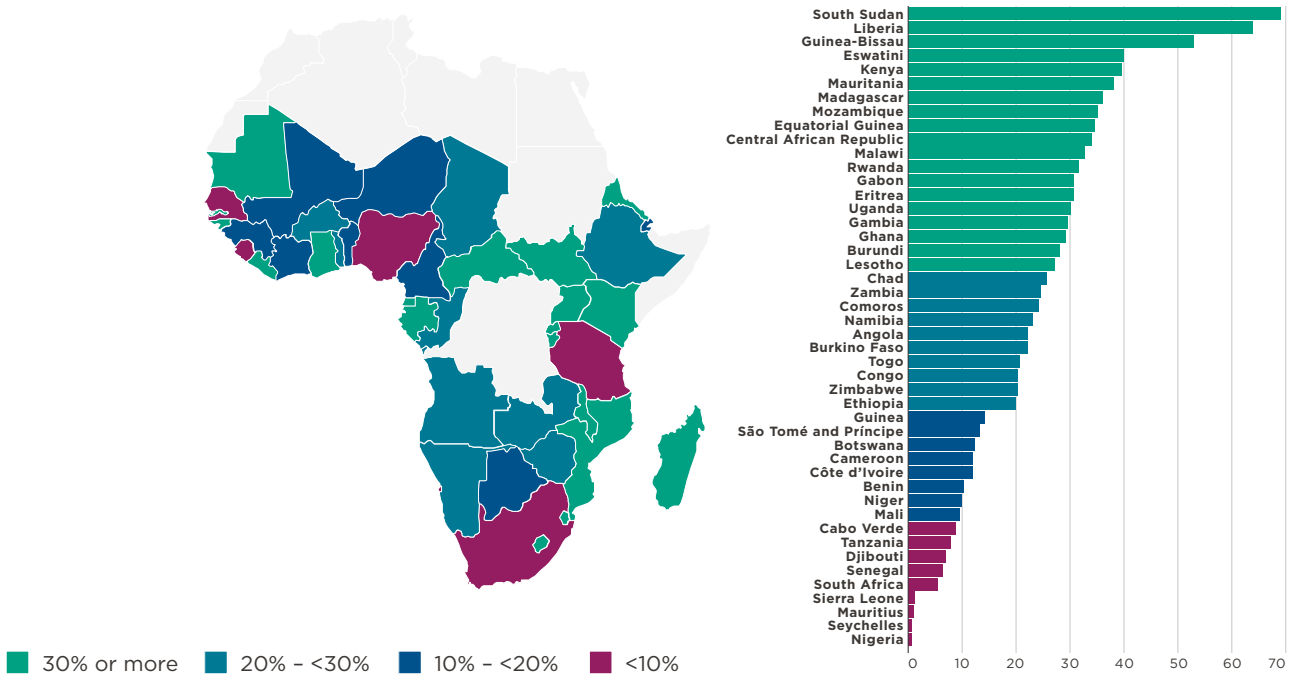
9 Albright, A. and Mwangi-Powell, F. (1 May 2020), "Opinion: Don't let girls' education be another casualty of the coronavirus", Thompson Reuters Foundation News.
 10 UNESCO, "Education transforms lives".
 11 United Nations Sustainable Development Group (May 2020), Policy Brief: A Disability-Inclusive Response to COVID-19.
 12 UNESCO IUS, "Target 4.1", Technical Cooperation Group on the Indicators for SDG 4.

Socio-economic conditions in LMICs can make continuity in schooling difficult and cause students to miss out on parts of the curriculum. Significant repetition of classes indicates overall lower levels of learning achievement. As such, over-age enrolment

in primary school is common in Sub-Saharan Africa (Figure 3). In low-income countries, 89 per cent of children fall into “learning poverty”, which the World Bank defines as the share of children who cannot read and understand a simple text by the age of 10.¹³

Figure 3

Percentage of students enrolled in primary education who are at least two years over age for their current grade, Sub-Saharan Africa



Source: UNESCO Institute for Statistics database, 2020¹⁴

Learning gaps in LMICs are the result of several systemic issues, including:

- **Cost of attending school:** Includes school fees, materials and the cost of travelling to school.
- **Unequal education budgets and weak government support:** High levels of public debt, corruption and poor governance not only hinder quality education, but also affect classroom conditions.
- **Outdated curricula and poor-quality teaching methods:** Children who complete primary school often lack basic reading and writing skills. Teaching methods and curricula are often outdated, leaving students without the knowledge and skills needed to graduate. Systemic challenges for the teachers, including the lack of training and professional development opportunities, low salaries, and remote geographic deployment, affect the teachers’ motivation and performance.
- **Lack of safety and security:** Children in rural areas must often walk long distances, and girls might not be sent to school due to safety concerns. Many schools also lack the necessary security and surveillance, putting marginalised children at risk.
- **Lack of awareness of the importance of school and the universal right to education:** Many parents do not have sufficient understanding of the value of education and that education is a human right. Parents also often underestimate the potential long-term impact of school absence or interruption.

13 Saavedra, J. (11 October 2019), “Ending learning poverty: the call of our times”, World Bank Blogs.
 14 UNESCO IUS, “Target 4.1”, Technical Cooperation Group on the Indicators for SDG 4.

Improving educational systems can be complex

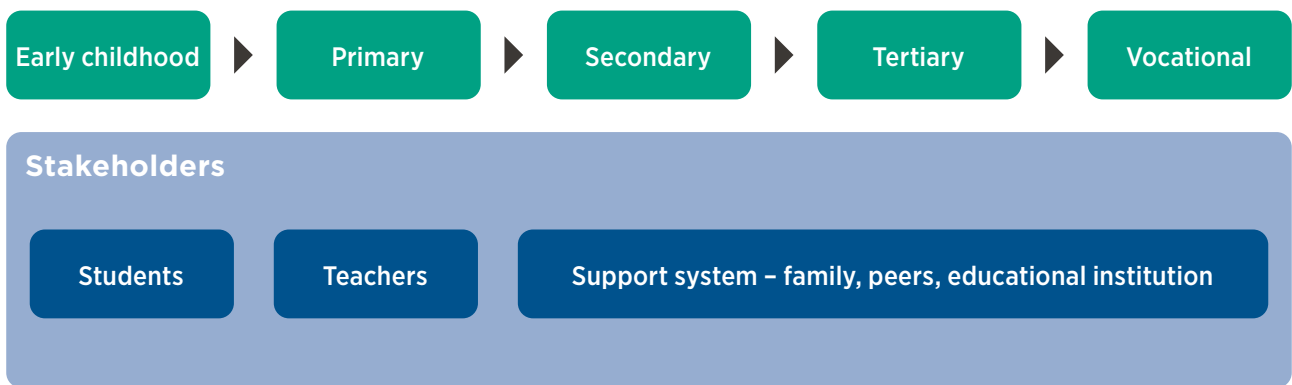
Education is the process of facilitating learning, knowledge and skills by teaching, training, storytelling or life experience. While much learning is informal and acquired through life experience, in formal education a learner studies a set curricula and qualifies to advance via chronological grading systems.¹⁵ For many students, education is delivered through other informal channels.¹⁶

Which, if any, of these forms of education is more effective is debatable. However the factors that tend to determine effective schools include: supporting inputs, teaching and learning processes, the school environment and student outcomes, all of which are influenced by students, teachers and a support system of families, peers and educational institutions (Figure 4).

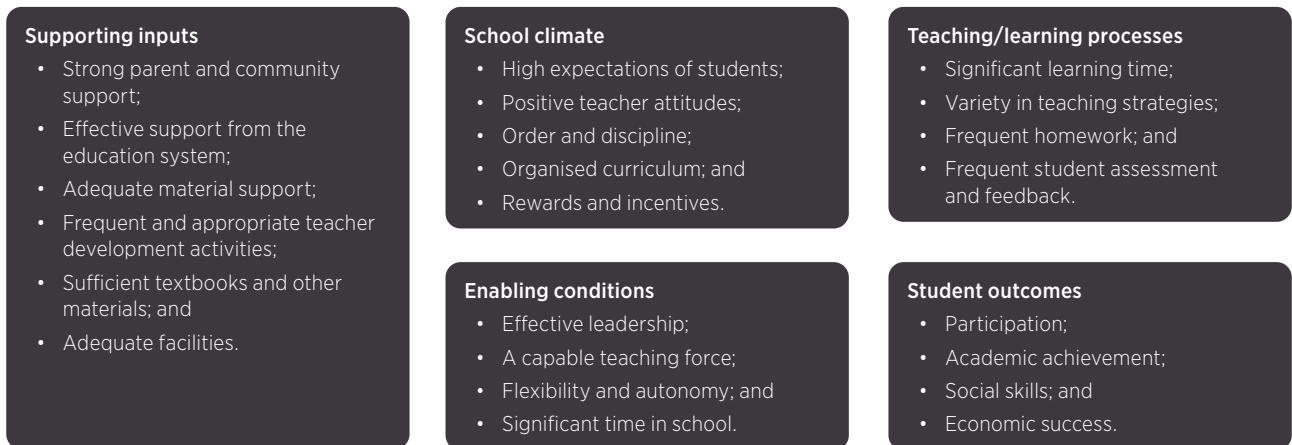
Figure 4

Components of a successful educational system

Typical formal education system



Factors that determine school effectiveness



Source: GSMA; conceptual framework by Heneveld and Craig, 1995

Recent research by UNICEF¹⁷ highlights three main ways to improve schools: (i) ensuring higher standards of professionalism for teachers; (ii) creating a purposeful ethos and shared set of values to energise pupils, teachers and the community; and (iii) holding schools to higher expectations backed by supportive

supervision and better inspection. Another **research** observed that teacher education programmes have a large impact on pupil attainment in LMICs. However, these efforts must be accompanied by simultaneous systemic changes in the education system, schools, public opinion and political will.

15 OECD, "Recognition of Non-formal and Informal Learning - Home".

16 Informal education has no set objective or intention to learn. Non-formal education is an intermediate concept between formal and informal education.

17 Baines, S. (25 June 2019), "Reflections on school improvement", UNICEF Connect.



The potential of EdTech in LMICs

Technology has the potential to solve many challenges related to access, cost and quality of education. EdTech solutions that use software and hardware to improve classroom education and enable remote education have provided some relief to teachers, students and families struggling to cope with the new reality of COVID-19, and the existing education crisis in many LMICs.

EdTech: The state of play

The global EdTech sector is set to be worth \$167 billion by 2021. With the growing penetration of mobile technology in LMICs, EdTech has the potential to reach out-of-school children and youth and provide opportunities to learn under difficult circumstances. This can help empower young generations, bridge gender gaps¹⁸ and prepare students for the workforce.

LMICs have capitalised on EdTech, and mobile has helped it gain traction. India is among the top five countries leading the way in EdTech,¹⁹ with Brazil, the United Kingdom and China accounting for 10 per cent of all EdTech start-ups (Figure 5).²⁰ Home to unicorn start-up BYJU, India has developed an attractive EdTech environment with fast mobile phone adoption, low internet costs, rising disposable incomes and growing demand for reskilling.

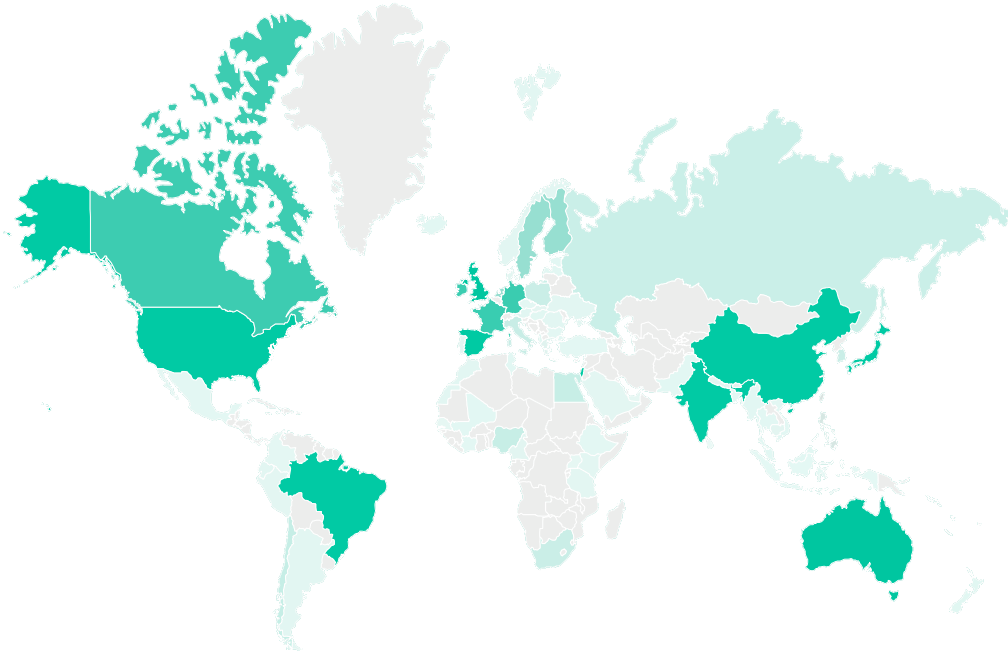
¹⁸ Lindsey, D. (20 April 2020), "Why COVID-19 has increased the urgency to reach women with mobile technology", GSMA Blog.

¹⁹ UK Tech News (17 February 2020), Industry Press Release: 43% of the world's EdTech companies are based in the US, but Sweden leads the way in VC funding.

²⁰ RS (2020), The EdTech Report.

Figure 5

Global spread of EdTech companies, 2019



1 1,400 Number of EdTech companies No data

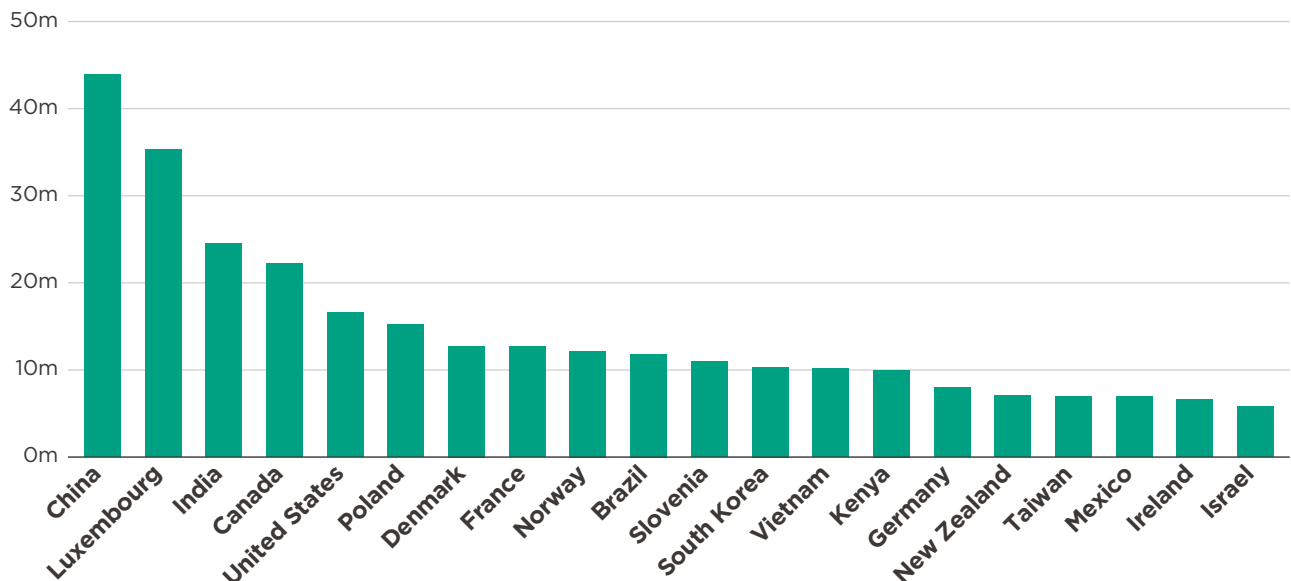
Source: RS (2019), The EdTech Report

Only a third of EdTech companies have received venture capital (VC) funding, with 1,019 companies in the industry pulling in a total of \$14 billion (Figure 6). Emerging markets such as China and India come out

on top with \$44 million and \$23 million in VC funding, respectively. Africa’s EdTech sector is also opening up, and Kenya currently ranks 14th globally, attracting about \$10 million in VC funding.

Figure 6

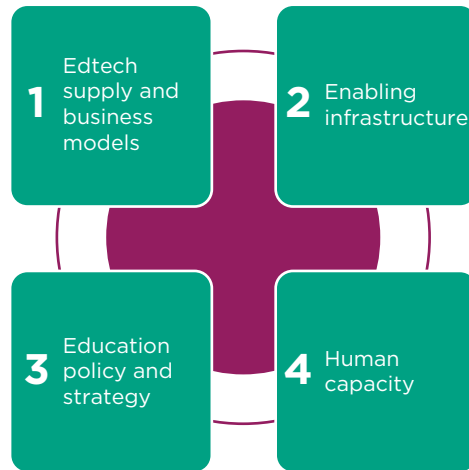
Venture capital funding per EdTech company



Source: RS (2019), The EdTech Report

Several EdTech solutions have seen a significant rise in demand. A notable example is Indonesia's Ruangguru,²¹ an interactive e-learning platform for pre-school to 12th grade (K12) students, that saw the average number of users increase from 7.5 million a month before COVID-19 to over 11 million. The state of emergency in education has spurred the innovation necessary to address systemic challenges in LMICs.

There are opportunities for start-ups to respond to this unparalleled demand for EdTech with innovative solutions. However, scaling these solutions equitably will require addressing several issues within the EdTech ecosystem. The Omidyar Network has captured this ecosystem in four categories:



1 Viable business models are needed to support innovation in EdTech and ensure both equitable access and equitable impact. Sustainable funding can range from private investment to government procurement or grant programmes.

2 ICT support must be in place to optimise the distribution of EdTech, including internet access, EdTech hardware, telecommunications infrastructure and basic electricity.

3 Clear education policy and strategy should be in place at the local government level and supported with durable legislation and equitable education financing. The government should also encourage innovation in EdTech by setting standards for academic achievement.²²

4 Collaboration between education stakeholders is key and should include educators, governments, start-ups, NGO coalitions, school board members and city councillors.

21 A GSMA Ecosystem Accelerator Innovation Fund grantee.

22 Omidyar Network (March 2019), "Executive Summary", Scaling Access & Impact: Realizing the Power of EdTech.

Mass media and low-tech mobile solutions provide education relief

In response to the COVID-19 related learning crisis, education stakeholders have leveraged existing tools and infrastructure to unlock learning opportunities. Along with mass media, low-technology mobile channels – often referring to “low-tech” offline channels, such as voice, IVR, SMS, USSD - have enabled education programmes and learning solutions to reach students after the school closures. An early [assessment](#) by the [EdTech hub](#) shows that along with SMS-based solutions, TV and radio have helped students gain access to learning during COVID-19.

Mobile based low-tech learning solutions

Many SMS and USSD-based solutions have facilitated curriculum-based lessons and assessments in LMICs. [M-Shule](#) and [Eneza Education](#) are among the mobile learning platforms which have opened remote access to K12 courses to a large number of students in East Africa. Beyond learning, WhatsApp groups were formed by educators, NGOs and start-ups to provide families with vital support and information. For instance, NGO [Teach For Uganda](#) collected phone numbers of parents in a number of schools in Uganda to set up chat-based Q&A between teachers and students, providing real-time assistance and support.

Low-tech mobile solutions also enables the [deployment](#) of eBook solutions, accessible for a majority via feature phones. NGO [Worldreader](#) enabled **13.4 million** people to access books in 52 languages via basic phones (as of April 2020). In [Ghana](#), the Worldreader platform was leveraged to disseminate accurate information about the pandemic.

Mass-media channels

Many countries turned to remote online-based education to sustain learning. However, **50 per cent** of the world students do not have access to a computer at home. In a region like Sub-Saharan Africa, **almost 90 per cent** of learners do not have access to household computers. As such, broadcast mediums such as TV and radio

were often at the centre of governments’ strategies to continue providing education in LMICs.

The Ministry of Education in Ethiopia, for example, developed an Emergency Response Plan which includes remote learning through **radio broadcasts** for primary education and TV programmes for secondary school students. In terms of strategies leveraging TV, the Ministry of Human Resource Development (HRD) in India **promoted Swayam Prabha** initiatives, a group of 32 Direct-To-Home (DTH) channels devoted to broadcast educational programmes, adapted to the curriculum of school education and higher education but also to children out of the system. The programmes also included vocational education and teacher training. In addition, some countries in LMICs focused on leveraging radio and TV in order to provide learning opportunities in remote areas, particularly rural ones. In South Sudan, the Ministry of General Education and instruction **launched** a distance learning programme to broadcast primary and secondary school subjects on radio and television, targeting rural areas coverage.

Reaching students and ensuring the continuity of learning were the main objectives of these initiatives. However, leveraging mass-media channels in LMICs comes with challenges, such as the general lack of [expertise in monitoring and evaluation](#) of learning as well as the [absence of pre-existing partnerships](#) for the design and broadcasting of the educational content. Moreover, the implementation of sustainable educational programmes based on broadcast necessitates strong collaborations between broadcasters, education authorities and educators.

Mobile as a catalyst for online learning

Unequal access to connectivity and digital tools is a dividing line in societies and a major factor inhibiting remote learning. Mobile plays a vital role in opening access to online options and equalising learning opportunities around the world, particularly in LMICs.

Mobile is expanding rapidly. With over five billion unique subscribers globally, or over two-thirds of the world's population, mobile has the potential to be a catalyst for the SDGs. The mobile industry's second greatest contribution to the global goals is SDG 4 (Quality Education), with 1.4 billion mobile subscribers using their phones to advance their education or that of their children – an increase of 140 million users since 2017.²³

Almost 90 per cent of the population living in LMICs are covered by a mobile broadband network and over 40 per cent use mobile internet services. The acceleration of network deployment and upgrades in LMICs have opened access to better quality internet services, providing 75 per cent 4G coverage in 2018 compared to just 30 per cent in 2014, and 88 per cent 3G coverage, up from 71 per cent in 2014.

Network expansion has been particularly strong in Sub-Saharan Africa where coverage reached 70 per cent in 2018, an increase from 52 per cent in 2014. As of 2019, there were about 456 million unique mobile subscribers, representing a subscriber penetration rate of 44 per cent. Around 239 million people in the region also use mobile internet regularly. Southeast Asia is another

region catching up quickly with the rest of the world. Mobile subscriber penetration reached 68 per cent in 2018 and smartphone penetration 79 per cent.²⁴ By 2025, about two-thirds of new mobile subscribers are expected to be in Asia Pacific and Sub-Saharan Africa.

Mobile is at the centre of educational innovation.

The proportion of mobile apps being developed in LMICs has been growing at a fast pace, expanding the availability of educational content. Content developers in LMICs were responsible for 25 per cent of active mobile apps in 2018, compared to 15 per cent in 2014.²⁵ Mobile technology has also enabled access to innovative learning methods in LMICs, with e-learning enhancing classrooms and providing learning support for students during the pandemic.

Mobile equalises opportunities. 1.7 billion women own a mobile phone in LMICs and over a billion use mobile internet.

²⁶ As the reach of mobile expands, essential life-enhancing information is being delivered, and learning opportunities have been opened for millions of women for the first time. Mobile also provides better opportunities for persons with disabilities to access basic services and learning solutions. Mobile operators play an important role in developing learning solutions adapted to special needs through partnerships with EdTech providers and NGOs.

Mobile acts as a catalyst for equitable learning by bridging the gender gap, improving digital literacy and meeting the needs of learners with disabilities.

²³ GSMA Intelligence (2019), "Executive summary", 2019 Mobile Industry Impact Report: Sustainable Development Goals.

²⁴ GSMA Connected Society (2018), *State of Mobile Internet Connectivity 2018*.

²⁵ GSMA Intelligence (2020), *The Mobile Economy 2020*.

²⁶ GSMA Connected Women (2019), *The Mobile Gender Gap Report 2019*.

Mobile helps bridge the gender gap



- Mobile has been instrumental in improving educational opportunities for girls in LMICs by providing a gateway to essential life-enhancing information and knowledge.
- A recent GSMA study showed the mobile internet gender gap is closing. In developing markets, 54 per cent of women are currently mobile internet users, up from 44 per cent in 2017.
- The GSMA Connected Women Commitment Initiative has brought together 38 mobile operators since 2016 to enhance digital and financial inclusion for over 35 million women with low to middle-income levels.

Mobile helps improve digital literacy



Mobile operators are addressing the negative effects of low digital literacy on mobile internet adoption and online learning by investing in public education and digital skills initiatives. In Nigeria, 27 per cent of women and 22 per cent of men who do not use the internet have reported that literacy and digital skills are their greatest barriers. Closing the digital skills gap will ease the transition to remote learning in LMICs.

- Mobile operator Tigo Guatemala's Conectadas Project aims to empower girls and women by equipping them with skills and knowledge to use mobile technology. Mobile internet skills training has been delivered to 31,000 women who have expressed an increased desire to continue their schooling.
- The GSMA Mobile Internet Skills Training Toolkit (MISTT) is a set of resources designed to promote digital literacy and equip mobile users with the skills they need for a digital future.

Mobile helps meet the needs of learners with disabilities



About a billion people in the world live with a disability, 80 per cent of whom live in LMICs. Mobile technology has enhanced their participation in society, and mobile operators play a vital role in meeting their needs.

In Jordan, mobile operator Zain has introduced technologies to support persons with hearing impairments using their service, including Ramz, an app that uses animated avatars for real-time translation of text and speech into sign language. This has opened new learning opportunities for people with disabilities.

Turkcell has supported Otsimo, a social enterprise that has developed a digital education platform for people with autism, serving 100,000 users in 168 countries and enhancing the lives of children through early education.

Case studies

Mobile operators realising the power of EdTech

Vodacom

South Africa

Education initiatives

Virtual Teacher is an online platform allowing teachers to deliver lessons in real time.²⁷

Vodacom's e-School platform provides personalised learning for primary and secondary students. Serving nearly one million students, the platform can be accessed with any type of device.

In partnership with UNHCR, the Vodafone Foundation is committed to sustaining the learning of refugees and community students through its Instant Network Schools.

COVID-19 response

In April 2020, Vodacom launched a range of free online educational programmes as part of its commitment to support society during COVID-19.

Vodafone has zero-rated the network cost for many learning platforms to sustain the work of the Vodafone Foundation.²⁸

Orange

Africa

Education initiatives

In 2018, Orange and OpenClassrooms, leaders in French-language online education, partnered to provide digital training in Africa. Backed by the Orange network in Africa and OpenClassrooms' educational expertise, the programme aims to boost development and job creation in Africa.²⁹

Through the Orange Foundation, this partnership has been distributing tablets to schools in Africa since 2014. The programme currently serves 16 countries, 820 schools and 200,000 students.

COVID-19 response

Orange Liberia has granted free access (waived data charges) to online educational content via its website Orange Campus Africa. This enables Orange customers without data allowances to access Khan Academy resources, among others.

Through its Digital Solidarity programmes, Orange Foundation is equipping schools in Africa with online training and digital teaching kits. FabLabs Solidaires for young learners who have left school, and Digital Centres for unskilled and unemployed women, are two programmes helping learners in Angola, Cameroon, Côte d'Ivoire and Mali.

27 Vodacom (4 September 2017), *Virtual teaching becomes a reality through new education technology*.

28 Joosub, S. (23 April 2020), "Vodacom helps to flatten the COVID-19 curve through technological innovation", Vodacom.

29 Orange (23 February 2018), *Press Release: Orange and Open Classrooms have combined forces to train young Africans in digital technology*.

Airtel

India and Africa

Education initiatives

In 2019, Bharti Airtel partnered with global EdTech Shaw Academy to offer free online courses to customers through its Airtel Thanks mobile app. The partnership aims to develop practical skills and knowledge in music, photography, language, financial trading, digital marketing, nutrition and web design.

In 2018, Airtel's Internet for Schools programme partnered with Computers for Schools Kenya (CFSK) and Longhorn Publishers³⁰ to provide free access to internet services in 30 schools in Nyeri County, as well as access to e-learning content from Longhorn Publishers. The partnership aims to enhance digital learning in Africa.

COVID-19 response

In June 2020, Bharti Airtel acquired a stake in EdTech start-up Lattu Media (Lattu Kids) as part of the Airtel Start-up Accelerator Programme.³¹ The partnership will enable Airtel to scale the distribution of quality learning material from Lattu Kids. Airtel currently has 160 million monthly active users across its digital platforms.

In May 2020, Bharti Airtel's Africa arm partnered with UNICEF to provide children with access to remote learning and cash assistance to their families via mobile cash transfers.³² The partnership uses mobile technology to benefit 133 million school age children in 13 countries in Sub-Saharan Africa. Airtel Africa has zero-rated selected e-learning platforms, enabling remote access at no cost.

MTN

Africa

Education initiatives

MTN has been active in offering digital solutions and helping set up educational centres for underserved students in Africa. Through its African branches, the MTN Foundation and MTN Business, the group has had a positive impact in various areas of education across the continent.

MTN Benin has created digital classes for 50 schools and digital literacy training for educators. The initiative has enabled access to learning resources for 15,000 students and 100 teachers.

MTN Ghana has set up an ICT centre for university students to conduct online research. The initiative is benefiting 10,000 learners and lecturers every year. The MTN Foundation Basic Education Programme focuses on improving the quality of education in Nigeria³³ by providing infrastructure, equipment and financing through scholarships and education programmes.

COVID-19 response

From April 2020, MTN South Africa has zero-rated access to a range of education websites for an undefined period. In partnership with the Siyavula Foundation, it is ensuring that primary and secondary school learners can continue their education remotely.

Around the same period, MTN Business provided the Eastern Cape Education Department with 72,000 SIM cards preloaded with mobile data, enabling learners to access online learning platforms.³⁴ In addition to the SIM cards, MTN Business has set up 13 broadcasting studios to conduct virtual classes during lockdown and beyond.

³⁰ Airtel (15 October 2018), [Airtel's Free Internet for Schools Program Continues to Drive Digital Learning in Nyeri County](#).

³¹ Telecomlead (17 June 2020), [Airtel buys stake in education tech startup Lattu Kids](#).

³² ET Bureau (20 May 2020), ["Airtel Africa extends e-learning support to students with UNICEF"](#), The Economic Times.

³³ Center for Education Innovations, ["MTN Foundation Basic Education Program"](#).

³⁴ Mzekandaba, S. (15 April 2020), ["ECape Matrics to get SIMS pre-loaded with data for e-learning"](#), IT Web.

Challenges in deploying mobile-based EdTech solutions

Mobile internet use and coverage gaps

While over two-thirds of the population are connected to mobile internet in North America, Europe and Central Asia, only a third are connected in South Asia and a quarter in Sub-Saharan Africa.³⁵ The connected can be split into two groups. The ‘uncovered’ are those with no access to mobile broadband network coverage while the ‘covered but not connected’ live within the footprint of a mobile broadband network but are not using mobile internet services. In 2019, while only 7 per cent of the global population (600 million people) were uncovered, a staggering 3.4 billion people living in areas covered by mobile broadband were not using mobile internet services. These figures tell us that the digital divide is about much more than having access to mobile internet.

Understanding local barriers to internet use, particularly for women and users in underserved communities, is key to addressing the usage gap in LMICs. To improve digital skills and address cost barriers, stakeholders must work together to:

- Make internet-enabled devices and data more affordable. Supporting appropriate financing options for devices and reducing the cost of data and devices can help.
- Enhance digital skills and confidence in using the internet.³⁶ This can be achieved by integrating mobile internet skills training in local education and training initiatives.

The cost of devices puts remote learning out of reach for many

Device affordability remains a significant barrier to mobile internet access in LMICs, particularly for the poorest 20 per cent of the population.³⁷ Low levels of mobile phone ownership limit mobile internet adoption, especially in South Asia and Sub-Saharan Africa where mobile penetration rates are 53 per cent and 45 per cent, respectively. The cost of a device as a percentage of income remains high for low income earners, especially smartphones.

High rates of poverty are a major contributing factor. In India, for instance, a smartphone can cost on average up to 16 per cent of annual income for extremely poor and low-income groups. Over 134 million people in India are unable to afford one of the cheapest internet-enabled handsets on the market because it exceeds an affordability threshold of five per cent of income.³⁸

Wide skills and gender gaps hinder mobile adoption and remote learning

Lack of digital and literacy skills are major obstacles to mobile internet adoption in South Asia and Sub-Saharan Africa. Adult literacy rates are 63 per cent in Sub-Saharan Africa and 68 per cent in South Asia, compared to 95 per cent in East Asia and the Pacific.³⁹ The lack of quality, comparable data across countries makes it a challenge to measure digital skills.

There is a substantial mobile gender gap across LMICs. Over 300 million fewer women than men access the internet on a mobile phone, and women are eight per cent less likely than men to own a mobile.⁴⁰ This reduces women’s chances of accessing remote learning in LMICs.

35 www.gsma.com/mobilefordevelopment/resources/the-state-of-mobile-internet-connectivity-report-2019/

36 GSMA Connected Society (2020), *Mobile Internet Skills Training Toolkit*.

37 GSMA Intelligence (2019), *2019 Mobile Industry Impact Report: Sustainable Development Goals*.

38 GSMA Connected Society and GSMA Connected Women (July 2017), “Executive Summary”, *Accelerating affordable smartphone ownership in emerging markets*.

39 UNESCO Institute for Statistics (September 2017), *Literacy Rates Continue to Rise from One Generation to the Next*. Fact Sheet No. 45.

40 GSMA Connected Women (2020), *The Mobile Gender Gap Report 2020*.



Case studies

EdTech start-ups leveraging basic mobile platforms

Eneza Education

Challenges

In March 2020, the Kenyan Government closed schools and colleges in response to COVID-19, directly affecting 17 million learners. During this period, the Ministry of Education and other agencies encouraged students to undertake online learning.⁴¹ However, connectivity challenges in remote villages have made learning during COVID-19 difficult for many children during COVID-19.

Solutions and strategy

In 2012, Eneza Education launched Shupavu 291, an SMS-based EdTech solution that can be accessed on feature phones. The solution's "Ask-A-Teacher" feature allows students to ask teachers questions in real time. Developed in-house by local teachers and aligned with the national curriculum, students can access lessons and quizzes on any mobile phone via SMS or USSD daily, weekly or monthly. Following operational success in Kenya, Eneza expanded to Ghana (2018) and Côte d'Ivoire (2019).

In response to COVID-19, Eneza partnered with Kenyan mobile operator Safaricom to provide Shupavu 291 and Shupavu Web free to students for 60 days, ending in

May 2020.⁴² As of 15 May, Eneza had over one million subscribers to Shupavu 291⁴³ and 200,000 students were active on the platform daily, asking an average of 19,000 questions through the Ask-A-Teacher feature.

Impact

Since the launch of its free service, Eneza Education Kenya saw the number of questions increase from 3,000 in January 2020 to 20,000 in June. The start-up has reached over one million learners across the country with an average of 300,000 active learners per day. Across all its operations, over six million learners have benefited from the solution.⁴⁴ According to Eneza, learners experienced a 23 per cent improvement in academic performance on average after using Eneza for nine months.

Future plans

Eneza plans to reach five million more learners with operations in six countries in West and East Africa by 2022. The start-up is also seeking to develop its B2B channel to provide learning management solutions to school districts.

41 Seleina Parsitau, D. and Jepkemei, E. (21 March 2020), "How school closures during COVID-19 further marginalize vulnerable children in Kenya", UKFIET.

42 Safaricom (2 April 2020), Press Release: [Safaricom, Education Content Providers Partner to Enable Free Access to Digital Learning](#).

43 Baraka, P. (15 May 2020), "Creating Impact During COVID-19 Pandemic", Eneza Education Blog.

44 Eneza Education: <https://enezaeducation.com/>

Ruangguru

Challenges

Indonesia has the fourth largest education system in the world, and COVID-19 has had a tremendous impact. According to the World Bank, over 530,000 schools in Indonesia have closed amid the outbreak, directly affecting 68 million students.

Solutions and strategy

Launched in 2014, Ruangguru aims to provide equal access to quality education through technology. Ruangguru is a tech-enabled education provider whose first product was a tutoring marketplace. Since then, the start-up has launched a range of products aimed at accelerating educational outcomes. It also helps teachers crowdsource and distribute educational content to students. Its flagship product is a video learning subscription and questions bank platform. The start-up has other solutions as well, including tutoring and one-on-one classes.

In response to the crisis, Ruangguru launched a free online school programme that allows students to join live classes remotely. Students can choose from 18 live channels that cover all subjects from elementary to senior high school, led by Ruangguru teachers. Together with mobile operators Telkomsel, XL Axiata, Indosat, Smartfren and BYU, Ruangguru offers unlimited free e-learning access. All students, parents and teachers that use internet plans from these operators receive 30 GB of free each month to access the Ruangguru

app. To support distance learning, the group recently launched a platform called Ruangkelas that teachers can use to create virtual classes, provide learning materials and give assignments to students. The product is fully integrated with Ruangguru's main video learning subscription, Ruangbelajar, which allows teachers to assign videos and questions to their students.

Impact

Around 17 million students in Indonesia have used Ruangguru's solutions to date. During COVID-19, seven million students participated in free online classes — 1.5 million on the first day of school closures alone.⁴⁵ According to Ruangguru, over 92 per cent of users reported improved academic performance after three months. 80 per cent of Ruangguru users are outside the capital city Jakarta,⁴⁶ and 70 per cent come from low- and middle-income families.

Future plans

Ruangguru plans to integrate AI to personalise learning for students based on grade level, achievements, engagement and enrolment. Within six months, the group aims to establish a progressive learning system in which the solutions adapt and evolve as students progress.

As EdTech solutions have proliferated during COVID-19, mobile technology is being used in tandem with other advanced technologies. AI has been a particularly valuable tool for personalised learning and easing the transition from classroom learning to remote settings, and will eventually contribute to a more cohesive education ecosystem with the integration of in-person classes.

Schools that were already using a versatile learning format and integrating frontier technologies have been leaders in building a stronger education systems in which remote learning solutions are the building blocks of blended learning.

⁴⁵ As of 12 June 2020, the day of the GSMA Mobile for Development webinar, *Innovating During Crisis: COVID-19 and Digital Education in Developing Countries*.
⁴⁶ Ruangguru: <https://bimbel.ruangguru.com/>

Special focus

Mobile operator-led EdTech solutions in refugee settings

Learning challenges in refugee settings

There are currently 26 million refugees globally.⁴⁷ While children make up a third of the world’s population, half of all refugees are children. Despite global progress in improving education in low-resource environments, a UNHCR study has found that only three in five refugee children attend primary school and one in 100 will pursue tertiary education⁴⁸ and just 23 per cent of displaced young people have access to secondary education, which limits their job prospects.

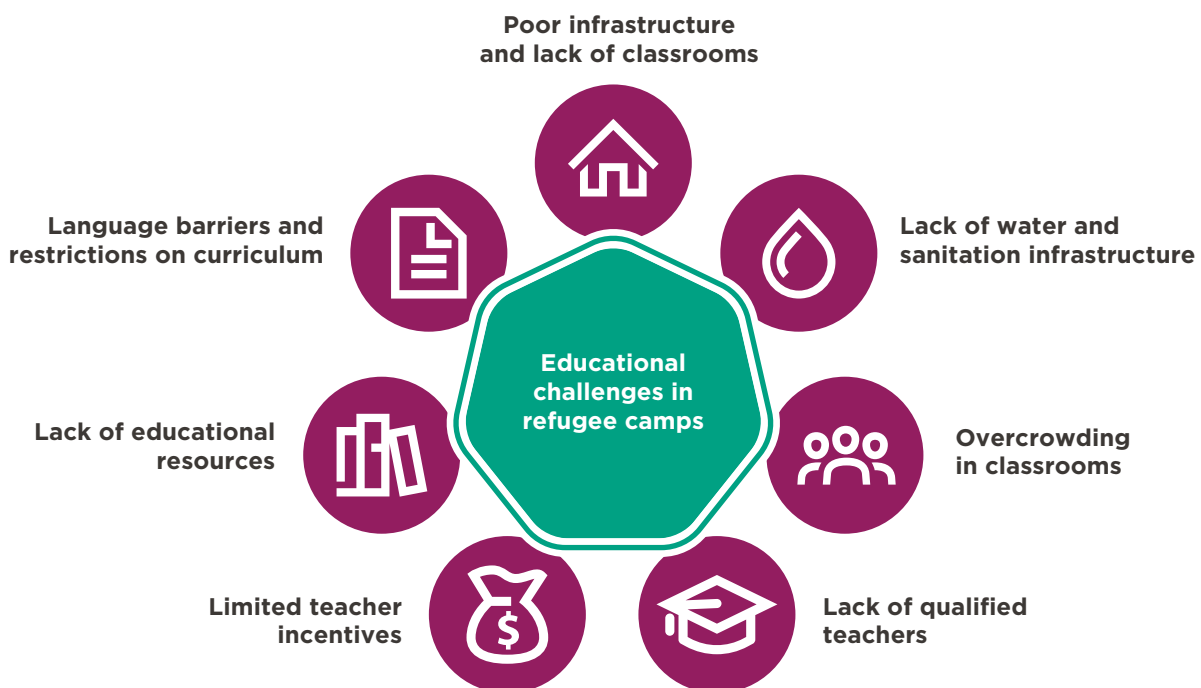
School closures due to the COVID-19 lockdowns have not only deprived students in refugee and conflict

settings access to learning, but also to what is often their only opportunity for safety, protection⁴⁹ and empowerment. Addressing interrupted schooling and finding viable solutions for sustained and equitable learning is therefore urgent.

For those living in refugee camps, UNHCR and its partners provide opportunities for primary and secondary education. However, overwhelming educational challenges, such as poor infrastructure, overcrowded classrooms and a lack of qualified teachers can diminish the quality of education (Figure 7).

Figure 7

Educational challenges in refugee camps



Source: Vodafone Foundation

47 UNHCR (2019), Global Trends: Forced Displacement in 2019.
 48 UNHCR (2016), Left Behind: Refugee Education in Crisis.
 49 European Commission (July 2019), Education in Emergencies in EU-funded Humanitarian Aid Operations.

Low-cost and low-tech solutions have been at the centre of remote learning strategies in refugee settings. Partnerships between MNOs and humanitarian agencies have led to successful projects that follow in the steps of long-established programmes like Vodafone Instant Schools, Rumie and Worldreader.

Vodafone Foundation offers an educational lifeline in times of crisis

Launched in 2013, the Instant Network Schools (INS) programme is a joint collaboration between Vodafone Foundation and UNHCR⁵⁰ that gives young refugees, host communities and their teachers access to digital learning content and the internet, and helps improve the quality of education in some of the most marginalised communities in Africa.⁵¹ There are currently 36 Instant Network Schools in four countries reaching 86,500 refugee students⁵² and 100 teachers, and there are plans to expand to 300 schools for 500,000 refugees.

A holistic ecosystem that puts partnerships at the centre

Alignment with national education strategies and curricula: To ensure technologies were integrated smoothly in educational settings, Vodafone Foundation formed a partnership with UNHCR, which has a mandate to run the Instant Network Schools, and implement national strategies in host countries that gradually expose refugees to life outside refugee camps and train educators in ICT and teaching skills. Partnerships with ministries of education also ensured programmes aligned with the national curriculum, and a partnership with the NGO Learning Equality enabled Instant Network Schools to offer content tailored to refugees’ needs.

Energy supply and hardware: The group collaborated with an energy provider to ensure schools could provide technology sustainably, and partnerships with hardware providers, such as Huawei, have equipped 36 Instant Network Schools with tablets.

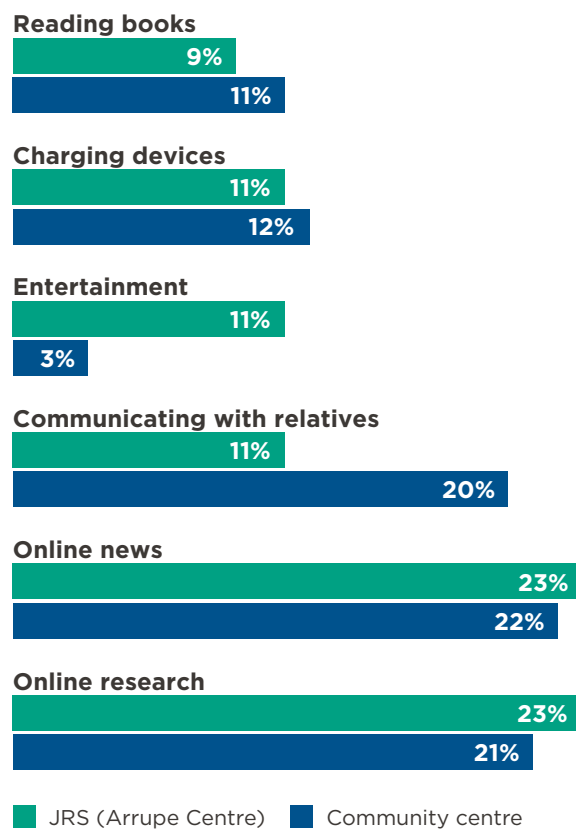
Learning strategies during COVID-19: Through a partnership with French tech company Milliweb,

provider of education software Numeritab,⁵³ teachers can create and broadcast courses and monitor students’ tablets. Compatible with Android tablets, the solution gives students instant access to created content and the ability to share their work and progress.

Instant Network Schools often provide one of the only opportunities for community members to access technology, and opening resources to the wider community has led to higher levels of digital inclusion and greater social cohesion, interaction and engagement. During COVID-19, community members have been able to stay in contact with family and friends and access information and opportunities. In the Kakuma Instant Network Schools in Kenya, about 20 per cent of community members used its digital tools in community centres to communicate with relatives or conduct research online (Figure 8).

Figure 8

Use of INS tools in community centres, Kakuma



Source: Vodafone Foundation

50 Vodafone UK News Centre (2 March 2015), Press Release: 15,000 Child Refugees to Benefit from Vodafone Foundation ‘Instant Classroom’.

51 Vodafone, “Instant Network Schools”.

52 Vodafone (16 December 2019), Press Release: Vodafone Foundation and UNHCR expand Instant Network Schools to benefit more than 500,000 young refugees.

53 Milliweb, “The Digital School Bag on Tablet”.

Initial impact assessment

A nine-month programme evaluation found that students at Instant Network Schools had a 61 per cent increase in ICT literacy and higher attendance rates. Teachers experienced a 125 per cent increase in ICT literacy, as well as greater confidence, improved planning and teaching methods and access to a wider range of information and materials.

Sustainability and long-term impact

To ensure Instant Network Schools has a sustainable impact, three needs must be met:

- **Consistent funding** to address infrastructure challenges and ensure hardware is maintained.
 - **Continuous training** to introduce teachers and students to new digital skills and help local INS staff take ownership of the programme.
 - **Building a strong learning culture** by applying a systematic approach across all networked sites and ensuring that the programme remains aligned with the needs of communities.⁵⁴
-

54 UNHCR Global Compact on Refugees, "Instant Network Schools Improving learning for 510,000 students".



deceding

6998	6999
6999	6999
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Case study

Use of frontier technologies and blended learning in Lebanon

With a goal to achieve quality education for all, [The International School of Innovation](#) was founded in 2015 in Lebanon by Dr. Mohamed Watfa, Associate Dean of the Faculty of Engineering and Information Sciences at the University of Wollongong in Dubai, and co-founder of the first Simulation and Smart System Research⁵⁵ in the United Arab Emirates. SHARED is a patented technology invented by Dr. Watfa that uses virtualisation software to deliver lessons to students in all grade levels, with a goal to grow the next generation of innovators. The following are key takeaways from an interview with Professor Watfa.

High-tech learning solutions are possible in low-resource environments

The first technology integrated in the school was SHARED,⁵⁶ a technology that can transform wooden desks into interactive computer systems. Virtualisation software can provide 15 computers per classroom using a single computer and projector. This learning model saves considerable costs for schools that cannot afford to buy one computer per student.

Blended learning before COVID-19 helped the school absorb the shock of the pandemic

The school was already using blended learning before COVID-19, including online office hours during weekends, recorded and interactive video lectures for review at the end of each week and online assessments. During the pandemic, interactivity was increased to keep students engaged mentally and psychologically.

Mobile and frontier technologies have optimised learning environments, both before and during COVID-19

Mobile technology: The school prides itself on its unique mobile app, which was developed in-house and has a multitude of unique features. The app combines existing smart infrastructure in the school with student activities, teaching and learning. This allows big data analytics and data collection of students' online

performance (usage and impact metrics). Gamification played a strong role in keeping students motivated.

AI and data: The learning solutions have proven effective and have had a major influence on teaching and learning overall. The use of data analytics enables teachers to identify potential risks and critical student cases, find correlations between different variables (attendance and performance for example), tailor curriculum and make learning more efficient. AI was also used for facial recognition, attendance and virtual tutors.

IoT: The school has a smart school infrastructure that uses sensors and cameras to enhance learning and the overall school experience. IoT was used to:

- Find patterns that affect student performance in specific subjects;
- Provide learning analytics, including for students at risk, and a learning objectives matrix for supervisors; and
- Detect emotion and monitor students who are happy or sad during different subjects.

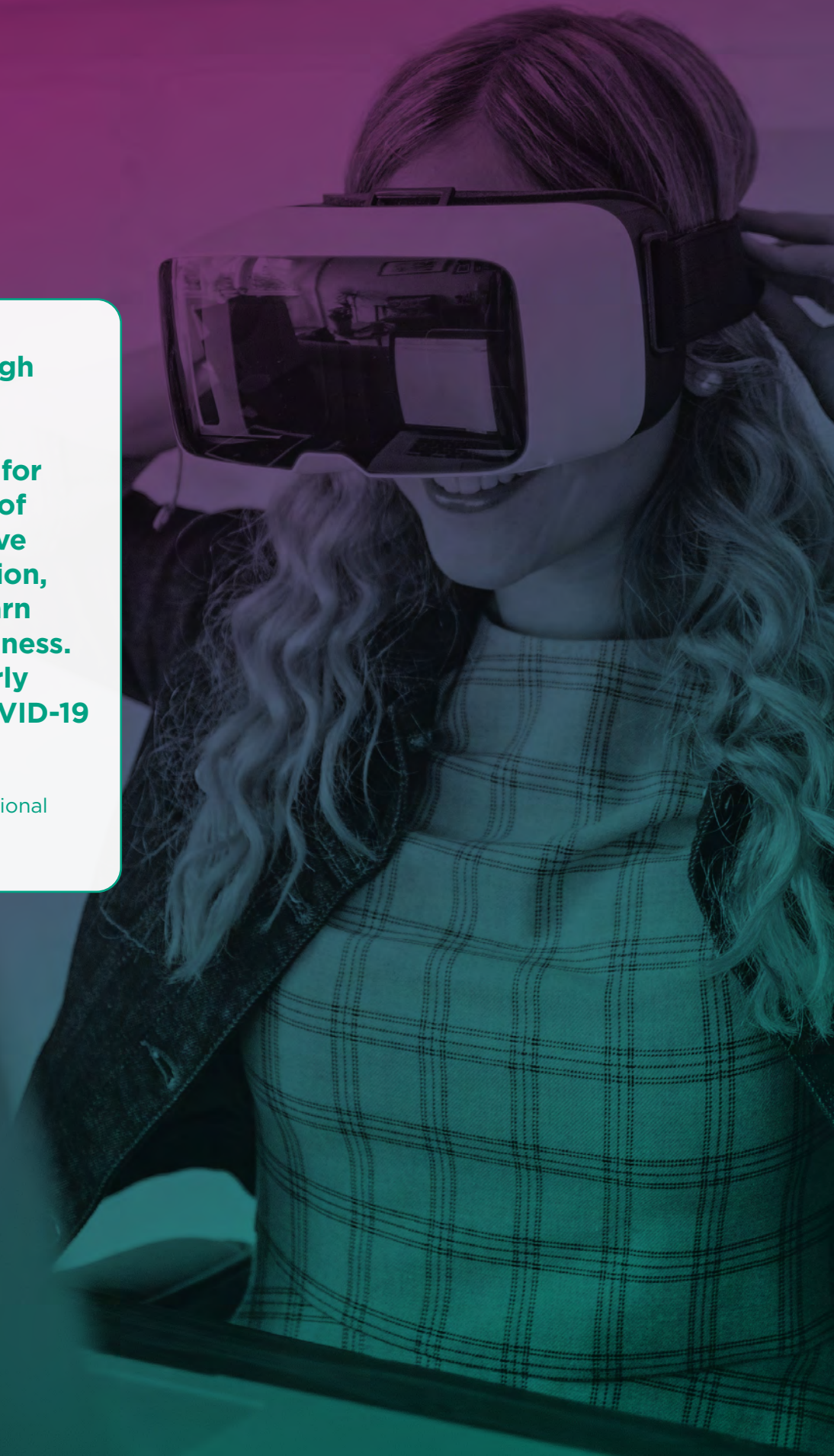
AR: Augmented reality is used regularly for remote learners at all grade levels. It has allowed students to interact digitally with printed worksheets, with the teacher augmented into the worksheets to answer students' questions.

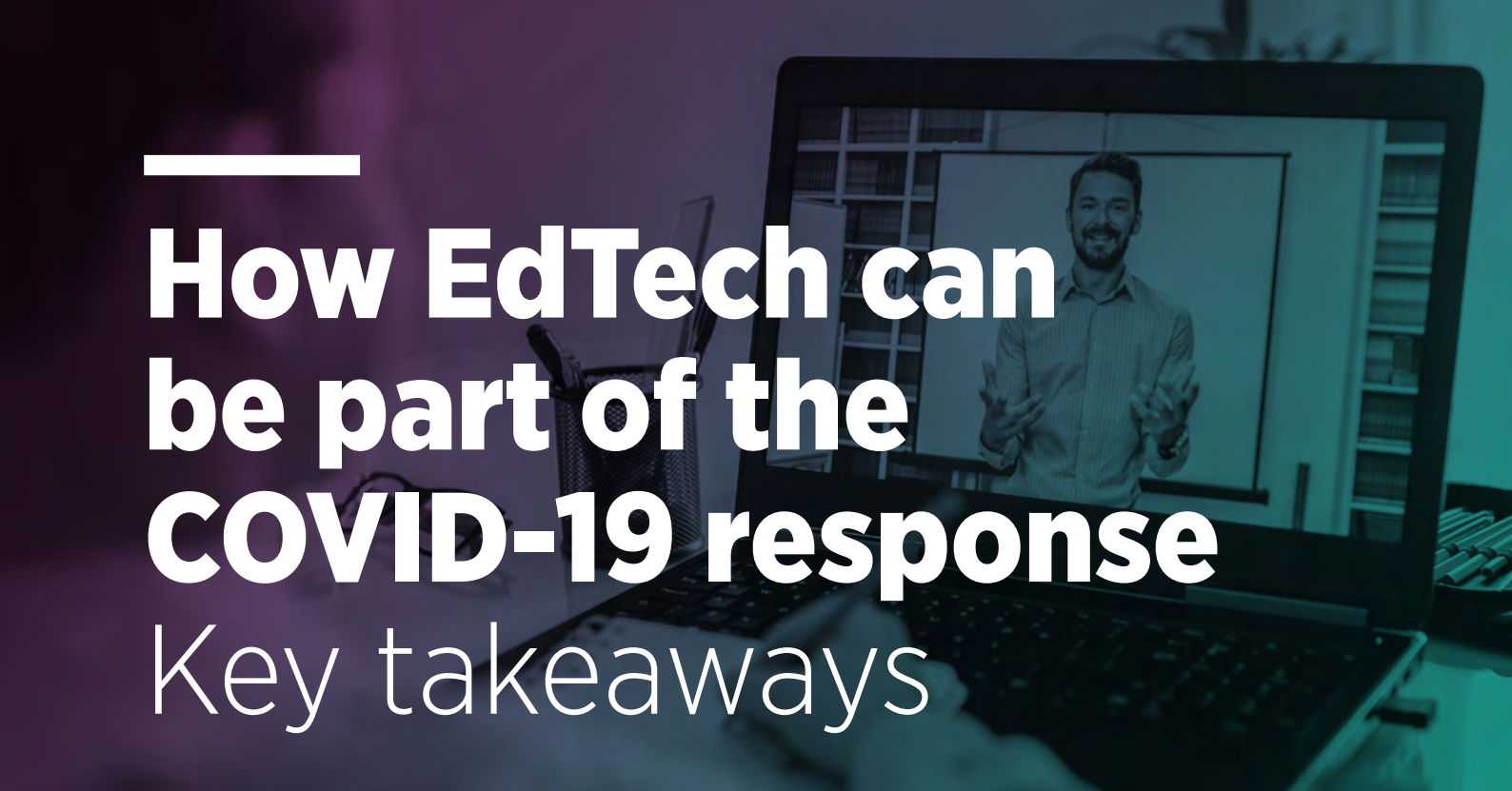
⁵⁵ University of Wollongong in Dubai, [Smart System, Robotics, Sensor Networks and Ubiquitous Computing](#).
⁵⁶ Naharnet Newsdesk, ['SHARED' the 11th Team to Qualify for this Year's MIT Semi-Finalist Round](#).



Education through technology can be 'gamified' to sustain learning for a longer period of time, and improve student motivation, eagerness to learn and competitiveness. This is particularly important in COVID-19 times.

— Dr. Mohamed Watfa,
founder of the International
School of Innovations





How EdTech can be part of the COVID-19 response

Key takeaways

Investments in training are urgent

There is an urgent need to train key stakeholders in the education system — educators, students, parents and solutions providers — in new learning modalities. The rapid deployment of EdTech solutions and the potential of blended learning formats make it urgent for teachers to continuously upskill and reskill. This is particularly crucial in LMICs where a range of challenges hinder new learning solutions. Adults and children will need to receive the necessary training to develop digital skills. Digital technology can enrich the learning experience for children; however, it is important to provide them with the necessary training. Parents also need guidance on how to make remote and blended learning successful and secure, including choosing the right providers and understanding the resources available. Although many government portals have centralised learning resources, educating parents to protect children learning online is critical.

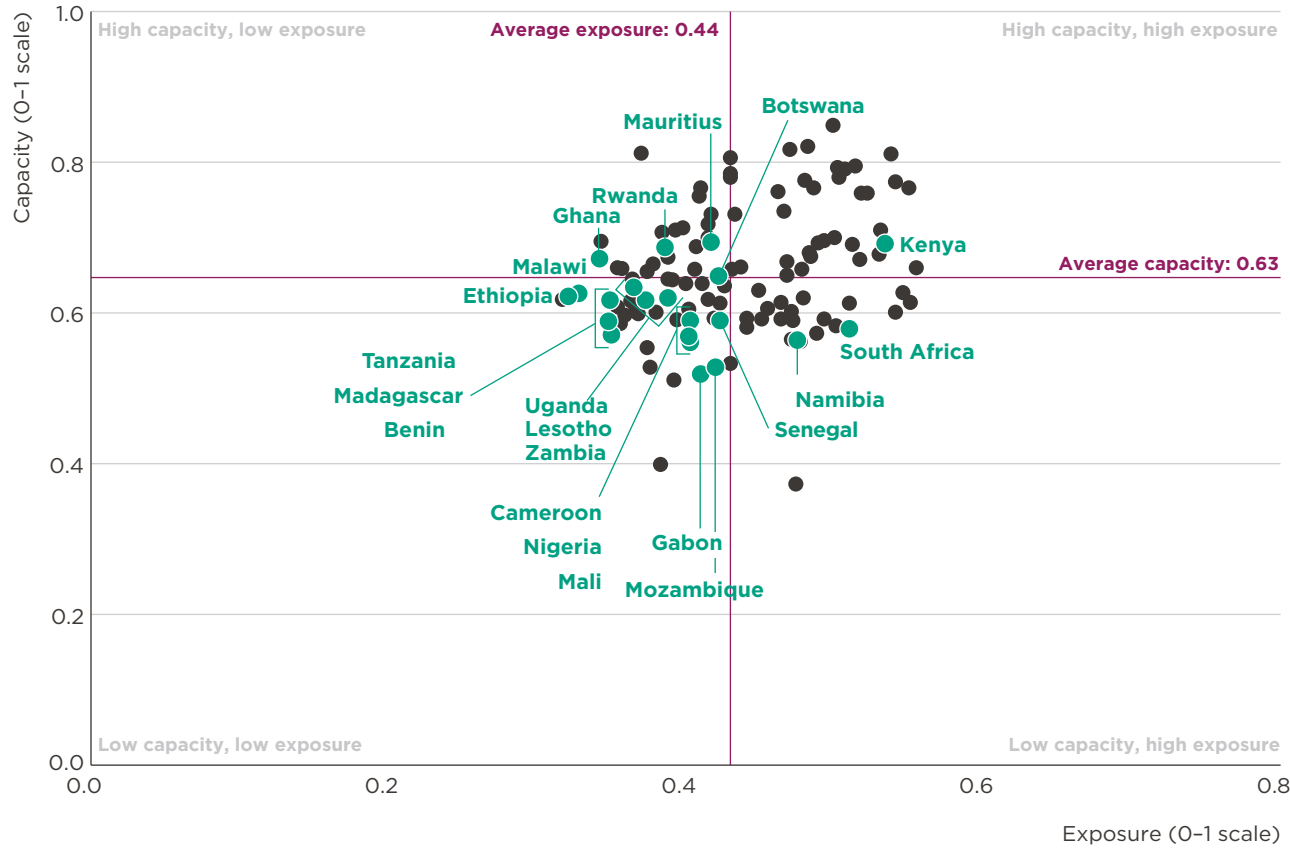
The next generation also needs to be trained for the future of work, which will be shaped by digital transformations in all sectors. In Africa, there is a major opportunity for the private sector to invest in the EdTech sector and help educators reimagine their syllabus to include job-ready skills. A recent World Economic Forum study⁵⁷ urges African educators to design ‘future-ready curricula’ that accelerate the acquisition of digital and STEM skills for youth. This research also found that Africa’s capacity to adapt to the requirements of future jobs⁵⁸ — measured by the impact of the latest technologies, local economic diversification and complexity, employee productivity and unemployment — is very low (Figure 9). As African economies begin to see more technology-driven labour market disruptions, the skills gap will need to be addressed.

⁵⁷ World Economic Forum (May 2017), *The Future of Jobs and Skills in Africa: Preparing the Region for the Fourth Industrial Revolution*.

⁵⁸ Relative to the region’s exposure to future trends. See: World Economic Forum (May 2017), *The Future of Jobs and Skills in Africa: Preparing the Region for the Fourth Industrial Revolution*.

Figure 9

Africa's capacity to adapt to the future of jobs, from low to high exposure



Source: The World Economic Forum

Spotlight

Microlearning by Rumie⁵⁹

Uninterrupted learning and skill building are challenging in times of crisis, especially in LMICs. Microlearning has helped students continue to learn and build skills during COVID-19. Toronto-based NGO [The Rumie Initiative](#) has been particularly active in this domain, offering free microlearning courses called [Bytes](#) that can be completed in under 10 minutes and are accessible offline.

Bytes offers universal access to learning and skill building

The Rumie Initiative was founded in 2013 to bring high-quality learning content to underserved communities. Using a bottom-up approach, the group strives to understand the needs of communities to provide them with “lifelong learning, employability and life skills”.

To achieve that goal and break down barriers to universal access, Rumie developed its microlearning solution Bytes, which is accessible from tablets, smartphones, desktops, iOS and Android via the [Rumie Learn](#) library. Bytes offers in-demand topics to learners using a skills-based approach, delivering information in short bursts of content that may result in [20 per cent more](#) information retention than longer training modules.

A sustainable content creation model

Bytes learning content is created by [individual volunteers](#), [corporate partners](#) and [community organisations](#) before being curated by Rumie’s community partners and shared locally. Rumie volunteers use the Rumie-Build platform to create Bytes on essential modern skills, such as digital literacy and mental health.

Partnerships for greater reach and impact

Through Bytes, Rumie has supported learners from underserved communities in over 30 countries, providing them with the opportunity to continue learning and gaining skills, even in lockdown.

In partnership with Roshan, Afghanistan’s mobile operator, the Rumie Initiative’s Books to Bytes⁶⁰ project provides access to educational materials to learners in the country without internet access via a low-cost device. Partnering with Roshan has allowed Rumie to tap into the operator’s subscriber base of seven million to quickly expand access to those who need it most.

During COVID-19, UNESCO listed Rumie’s learning platform as “highly effective and facilitative for students following studies remotely”.⁶¹ In August 2020, Rumie partnered with Amazon Web Services to co-create microlearning modules and empower underserved aspiring entrepreneurs. This partnership reflects Rumie’s commitment to providing continuity in learning and skill building to the underserved in times of global crisis.

59 A GSMA Mobile for Humanitarian Innovation Fund grantee.

60 MIT Solve, [The Rumie Initiative: A Books to Bytes Revolution for Education in Afghanistan](#).

61 Iliza, A. (13 May 2020), “Five online learning resourceful tools for students”, *The New Times*.

Collaboration and partnerships are essential for EdTech to be viable

Technology alone, without careful attention to how it is used, and by and for whom, can exacerbate existing inequities. This is particularly true in crisis situations. Since the onset of COVID-19, new coalitions, alliances and collaborations have rallied around a common goal to address the global education crisis.

Sustaining those efforts and fostering partnerships between all education stakeholders, from tech companies, start-ups and international organisations like OECD and UNESCO, to investors, governments and technology and energy providers, will enable a holistic strategy and maximise the chance of viable solutions. New policies that can guide educational organisations long after COVID-19 is contained should be developed on a global level. Adding EdTech to the conversation will require **substantial effort** from campaign coalitions, advocacy networks, think tanks, consultancies and business lobbying.⁶²

The following international organisations and multilateral partners have played a vital role in responding to interrupted schooling.

- UNESCO launched the **Global Education Coalition** to provide appropriate distance education for all learners, leverage high-tech, low-tech and no-tech approaches, identify equitable solutions and universal access, ensure coordinated responses and facilitate the return of students to school. To respond to both the immediate crisis and guide long-term transformation of the education system, the coalition has involved partners from civil society, the private sector and international organisations.
- The GSMA, World Bank, World Economic Forum and International Telecommunications Union (ITU) produced the Digital Development Joint Action Plan⁶³ and Call for Action. Launched in April 2020, this joint response to the COVID-19 pandemic promotes resilient networks and ensures digital services are accessible and affordable. The Joint Action Plan provides on-going support to the education sector's COVID-19 response. Partnerships between the private sector and academia are extremely valuable in building the capacity of universities in real world, data-based problem solving. This type of partnership will become more important in the transition to a post-COVID-19 education system, which will see more university courses move online.
- Other organisations, such as UNICEF, the WHO, World Bank, Global Partnership for Education, the OECD and the **EdTech Hub**,⁶⁴ have played an important role in promoting transformative agendas for education during the COVID-19 pandemic. The World Bank's **EdTech team** has catalogued global best practices in using EdTech for remote education and is collaborating with national ministries of education to build its capacity.
- Collaboration with mobile operators is vital to scaling EdTech solutions. Both start-ups and ministries of education have ramped up partnerships with mobile operators to increase access to digital services. Areas of collaboration include zero rating,⁶⁵ lifting data caps, tapping into Universal Service Funds,⁶⁶ **SMS learning systems**⁶⁷ and free SIM cards.⁶⁸

62 Williamson, B. (1 April 2020), "New pandemic edtech power networks", Code Acts in Education.

63 GSMA (24 April 2020), COVID-19 Crisis Response: Digital Development Joint Action Plan and Call for Action.

64 The EdTech Hub is a collaboration between the Overseas Development Institute, REAL Centre at the University of Cambridge, Results for Development, Open Development and Education, Brink, Jigsaw Consult, BRAC, Afrilabs and eLearning Africa. Donor support is provided by UK aid, the World Bank and the Bill & Melinda Gates Foundation.

65 Trucano, M. (16 March 2020), "Zero-rating educational content on the Internet", World Bank Blogs.

66 Mlanjira, D. (11 March 2020), "Macra sets up system to reach out to rural Malawi on access to ICT", Nyasa Times.

67 Trucano, M. (2 April 2020), "How ministries of education work with mobile operators, telecom providers, ISPs and others to increase access to digital resources during COVID19-driven school closures (Coronavirus)", World Bank Blogs.

68 Jacob, B. (14 April 2020), "Free e-learning SIM Cards for Eastern Cape Matrics", Dispatch LIVE.

Basic mobile channels and mass media will help scale solutions

Basic mobile channels can unlock learning opportunities

Even before the COVID-19 pandemic, mobile-based learning solutions were addressing some of the challenges facing education systems in LMICs, particularly in rural areas. Those same solutions can now be used to provide education to those who need it most. For example, Vodacom's Virtual Teacher,⁶⁹ introduced in South Africa in 2017, was used to overcome infrastructure and legacy issues by delivering interactive virtual teaching. This solution can now be used in remote learning settings, both during and after lockdown.

Start-ups that use the basic mobile channel for learning solutions often have a positive socio-economic impact because they can reach large numbers of people. Feature phones enable access to low-tech offline channels, such as SMS, voice, USSD and mobile money services, and have the greatest potential to reach those living at the bottom of the pyramid.

- EdTech start-up Eneza Education has enabled marginalised students in LMICs to access lessons and assessments from feature phones via SMS or USSD with daily or monthly subscriptions. Flexible enrolment, ease of use and seamless access make this type of solution a viable learning model in lockdown or a sustainable complement to regular schooling.
- In Kenya, a few EdTech start-ups have scaled regionally with low-cost solutions requiring minimal digital skills. For instance, eLimu (digitised curriculum content for upper primary students that integrates videos, games and sound/music in an affordable mobile app) grew from 500,000 users to 750,000 users after the COVID-19 outbreak.⁷⁰
- Inclusive education for learners with disabilities or displaced populations has been made possible by low-tech solutions adapted to their needs. For example, Kenyan start-up eKitabu distributes accessible digital content in local languages in 13 African countries via Orbit reader⁷¹ to help visually impaired learners read, and launched Studio KSL (Kenyan Sign Language) to help the deaf

community access sign language instructional videos and visual storybooks. These low-tech initiatives, accessible offline at no cost, help to make access to quality knowledge more equitable for learners with disabilities.

In more advanced economies, the few markets that sustained comprehensive education during school closures were ones that used available infrastructure in cohesive and centralised ways. For example, Turkey and China commenced nationwide broadcasts of lessons at the beginning of the COVID-19 crisis. In Turkey, **18 million** students from primary to high school received online and TV school lessons through the national **Education Information Network (EBA)** and public broadcaster TRT EBA.⁷² The EBA, the world's largest online education platform with over 20,000 pieces of interactive content, in partnership with a national broadcaster, has created a model that could be replicated in LMICs.

Partnerships with media broadcast can reach the masses

The COVID-19 pandemic prompted rapid deployment of EdTech learning solutions, many on stand-alone platforms. However, supporting students and their families effectively in times of crisis and providing the educational content they need, often requires a combination of several channels, particularly mass media and mobile.

Sesame Workshop,⁷³ the American non-profit educational organisation behind the TV show Sesame Street,⁷⁴ has successfully broadcast educational content for children since 1969. In 2018, Sesame Workshop entered a partnership with the International Rescue Committee (IRC)⁷⁵ to launch an early childhood development programme called Ahlan Simsim (Figure 10). Through a combination of IRC-led direct services and Sesame Workshop mass media, including a new Arabic-language Sesame Street that gives refugees and displaced children in Syria, Jordan, Lebanon and Iraq the chance to learn and receive support, the programme has been tackling the emotional distress of children living in crisis situations.

69 Vodacom (4 September 2017), *Virtual teaching becomes a reality through new education technology*.

70 eLimu: <https://e-limu.org/>

71 eKitabu (January 2020), "Accessible digital content for quality education", Tunaenda Digital Newsletter.

72 Okul Öncesi Eğitimi: <http://okuloncesi.eba.gov.tr/>

73 Sesame Workshop, "Ahlan Simsim".

74 Sesame Street: www.sesamestreet.org

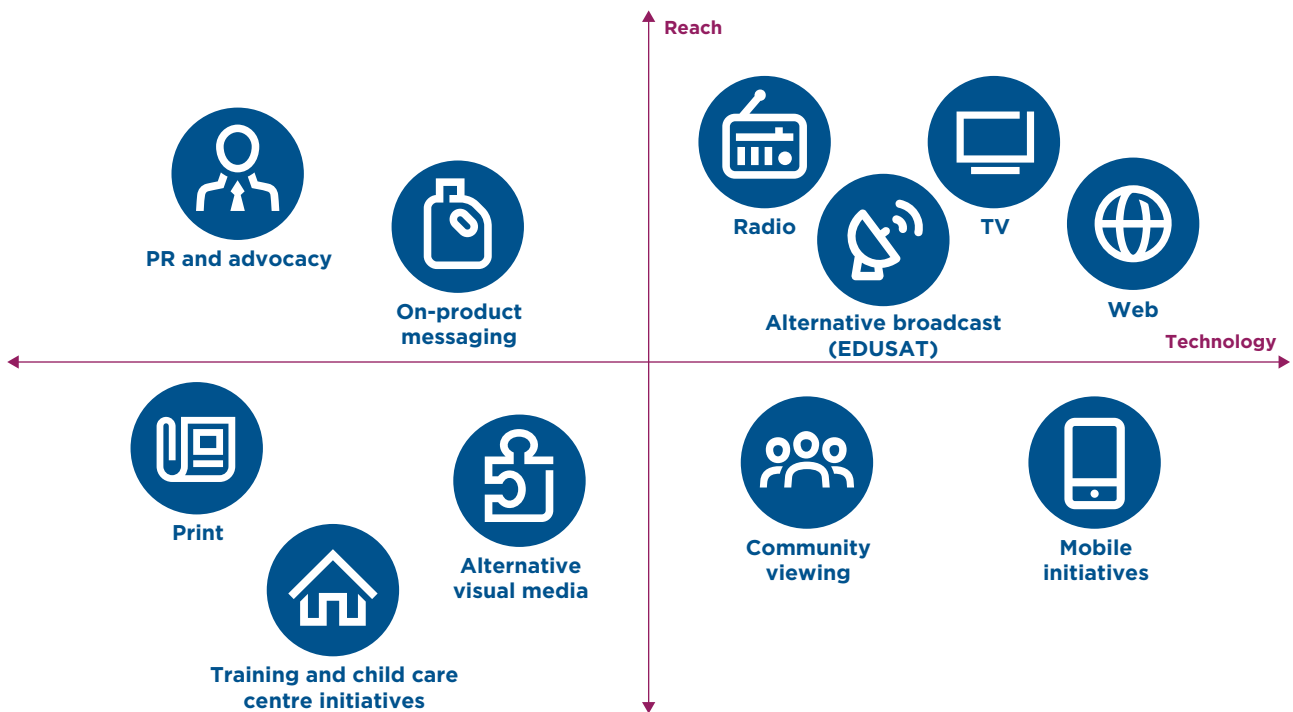
75 IRC (21 August 2017), *The IRC and Sesame Workshop bring education and hope to refugee children*.

Ahlan Simsim has adapted to use digital tools such as mobile to reach children and their caregivers through WhatsApp and SMS. “Caregivers have been receiving COVID-19 awareness messages, as well as play-based activities to support their children’s development — including social-emotional learning, hygiene and language skills”. In addition, the group has developed its digital content (learning videos, books and songs) online and via mobile to reach a wider audience, providing richer content and a customised learning experience.

In response to COVID-19, Sesame Workshop launched a special edition of Sesame Street in June,⁷⁶ aired in 13 languages across Latin America, Sub-Saharan Africa, Asia and the Middle East, to help children cope with the lockdown through learning activities, play and advice on how to manage “sadness and frustration”. Also available online, the 25-minute special expands children’s access to learning opportunities and support systems.

Figure 10

Sesame Workshop mobile partnership helps extend reach and impact⁷⁷



Source: Connected Living Asia Summit mEducation session

76 Reuters (17 June 2020), From Asia to Africa, ‘Sesame Street’ special tackles coronavirus pandemic.

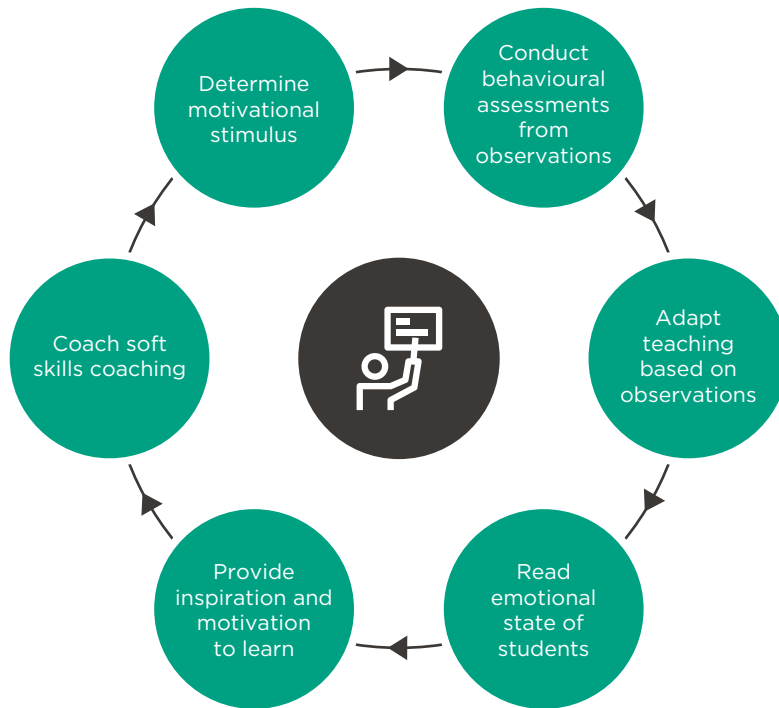
77 Stewart, A. (25 June 2013), “‘M’ is for Mobile! Sesame Street Educational Mobile Initiatives”, Connected Living Asia Summit mEducation Session.

Technology is not a replacement for schools

In-school education offers essential tools for life

Figure 11

The teacher at the centre of the learning journey



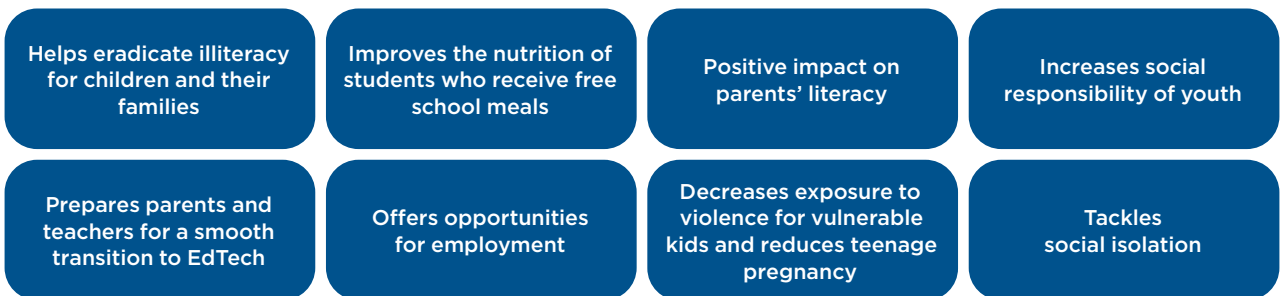
Source: GSMA Mobile for Development, based on Design for Learning

Research from the Institute of Education Sciences in the United States⁷⁸ suggests that full immersion in EdTech could lead to high drop-out rates, even in developed countries. Without a structured learning environment, teacher guidance and peer pressure, students do not have the necessary incentives to maintain acceptable learning levels (Figure 11). In LMICs, where socio-economic disparities and barriers to technology magnify the challenges, drop-out rates would be even higher.

Schools do more than teach

In LMICs, going to school helps to close the digital and gender divide, and provides various forms of support, from academic to social protection. For many children, school offers the only path out of a challenging environment.

School enrolment offers a range of benefits for children and youth in LMICs:⁷⁹



⁷⁸ de la Varre, C. et al. (15 July 2014), "Reasons for student dropout in an online course in a rural K-12 setting", *Distance Education*, 35(4), pp. 324-344.

⁷⁹ UNESCO (19 March 2020), Half of world's student population not attending school: UNESCO launches global coalition to accelerate deployment of remote learning solutions.

Digital solutions are a part of blended learning models

The switch to remote learning has created an opportunity in LMICs to accelerate the use of blended learning methods, which can help close literacy, digital and learning gaps. For education systems to become more resilient to future crises, a holistic learning ecosystem must be developed that integrates schools, teachers, parents and students, as well as remote learning solutions. Infusing digital tools in traditional schooling has the potential to strengthen education systems and bridge learning gaps in LMICs.

Blended learning, an education model that integrates online activities, low tech mobile and mass media solutions with traditional face-to-face teaching, will become a vital learning model going forward. Blended learning will also give weaker

education systems the opportunity to learn the lessons of deploying digital tools before and during COVID-19.

The education of tomorrow will need data

EdTech solutions, particularly mobile-based ones, are critical sources of data on a learner's usage and progression, and provides important indicators of the impact, reach and viability of the technology. EdTech actors that were particularly active in analysing and using the data generated in the back-end of their solutions are playing an important role in blended learning. Data privacy regulation will be key to ensuring that the right data is shared, with necessary consent and for ethical ends.



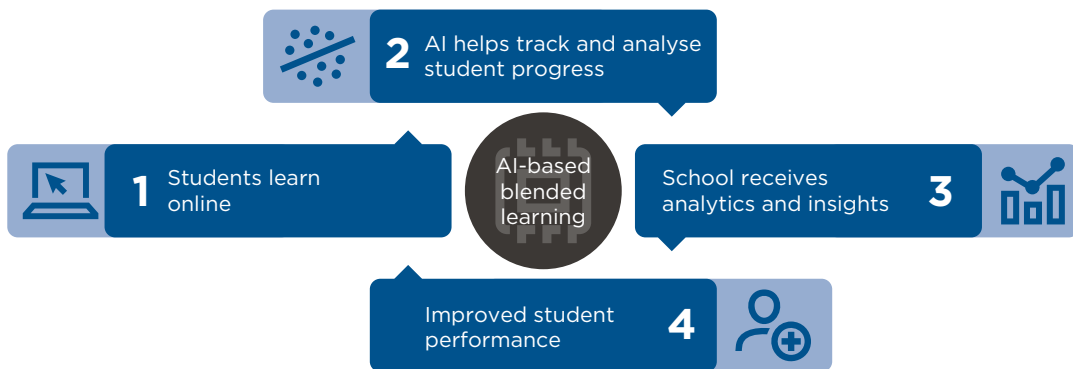
AI technology can help personalise learning

AI-enabled data analytics generated by online EdTech solutions can become essential information for schools (Figure 12).

- **M-Shule**, a personalised SMS-based learning platform for primary school students, has successfully integrated AI to help EdTech complement the traditional school system. The group delivers SMS-based lessons to students at home, uses AI to analyse student performance and reports back to schools and parents with recommendations. This helps educators and parents support a student’s progression and full immersion in blended learning. M-Shule uses the same data to improve its solution and customise learning to each student.
- **Ruangguru** uses AI to personalise learning based on grade level, achievements, engagement and course enrolment. The group plans to establish a progressive learning system in the next six months in which the solutions evolve alongside the students.
- **BYJU**, India’s first tutoring and online learning app provider for K12, puts AI and data analytics at the heart of its content creation to facilitate online learning in a blended education system. BYJU’s in-house analytics system uses the information gathered by its app to enhance the user experience, adapt to users’ specific needs and build up the data required to create a viable blended learning system.

Figure 12

AI can help strengthen the education system in blended learning settings



AI-based adaptive learning software was already helping to bridge learning gaps. Now, it can help identify the failures of new learning systems.

- **Mindspark**, an adaptive online tutoring system based in India, uses AI to identify learning gaps and build skill graph maps to inform adaptive learning methods. An experiment conducted over 4.5 months in India revealed that learners’ maths scores improved by 38 per cent and gender gaps were reduced by giving girls access to a “leveller” they would not otherwise experience.
- **Onecourse**, Onebillion’s learning software, helped to reduce the gender gap in reading and mathematics among first graders in Malawi over 14 months. The AI and algorithms integrated in Onecourse helped build literacy and numeracy skills gradually through an adaptive learning system and helped to equalise learning opportunities for boys and girls.

With the amount of data expected to be generated by EdTech solutions, developing policies and regulations on data ownership and use will be necessary to protect the privacy of students and teachers. Promoting ethical AI in both the education and private sector will be critical.

Analysing the usage, accessibility and impact of EdTech solutions will help education stakeholders assess their viability in a changing education systems. It will also provide an indication of how EdTech solutions can empower classrooms and help to achieve quality education for all.

Spotlight

Worldreader

Worldreader provides learners in LMICs with free access to a library of digital books via e-readers and mobile phones.⁸⁰ The group's back-end data, gathered through the BookSmart reading app, can help to understand how a child's reading behaviours predict reading outcomes.⁸¹ With 13 million readers in 47 countries using Worldreader's reading apps and about one million app interactions recorded each day (e.g. time spent reading, types of books read, browsing practices), the scale and depth of the information generated can play an important role in improving education systems in LMICs.

The data generated from its mobile app helps Worldreader analyse literacy, knowledge retention, social-emotional learning, school readiness and life-skills assessments. The following lessons have been learned from the data:

- In Jordan, automated reading behaviour data collected for the Tuta Tuta project helped Worldreader understand whether their community partners' approaches were helping to establish new reading behaviours at home.⁸²
- In Ghana, with the Inspire Us collection, back-end data provided important insights into the demographics of users engaging with the Women's Empowerment collection. Data and analytics enabled Worldreader to determine which books challenge traditional gender stereotypes among West African youth.⁸³
- In Kenya, where one of Worldreader's programmes worked to get more girls to read on their phones, back-end data helped identify clusters of readers.

Worldreader's data not only strengthens the practices of their partners, but also benefits the international education community. Based on engagement levels, organisations can better understand whether parents need support with digital literacy in a particular market, or detect (via search metrics) whether more books need to be acquired in a particular area. Local governments and national library systems can leverage the data to study the impact of digital reading on reading behaviours or digital reading adoption.⁸⁴

The greatest opportunity is feeding this data back to teachers. Partnerships with ministries of education in Ghana, Kenya, Jordan and India offer curriculum-based e-solutions and enable Worldreader to transition smoothly from digital to school-based settings. The development of tablet versions for school use enable students to learn from their classrooms and follow up on the same lesson from home by applying a unique learning code on their mobile phone. Worldreader is currently working on implementing this learning format in Uganda and India.

80 Worldreader: www.worldreader.org

81 Worldreader, "BookSmart".

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83 Garrahan, S. (7 October 2019), "10 Empowering Books From Our Inspire Us Collection", Worldreader Blog.

84 Worldreader: [Using digital reading data to improve international education](#)



Conclusion

School is not only a place to gain knowledge, but also to learn life skills. Enrolment in school from early childhood is critical to the social, emotional and intellectual development of a child, and provides a foundation for lifelong learning and well-being. For many, school is their only opportunity for safety, protection and nutrition.

Education systems around the world cannot afford another crisis. Now is the time to learn from the educational challenges presented by COVID-19 and prepare education systems for future potential shocks. Gradually digitising lessons and preparing teachers and students for remote learning will be key. However,

it is vital to ensure that the acceleration of digital does not exacerbate existing inequalities. As the world enters a unique phase in which blended learning will test the world's education systems, resilience, and reflection on lessons learned will help EdTech become a catalyst for universal quality education.

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