

Scaling Access & Impact

Realizing the Power of EdTech

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The data underpinning this report come from interviews, surveys, site visits, and desk research by a team of researchers and EdTech practitioners led by RTI International, drawing on local expertise in each of the case study countries. The team conducted more than 100 interviews with teachers, school principals, education administrators, policymakers, and EdTech experts and entrepreneurs throughout September–December 2018. A separately available country report for each case study country provides further detail on the findings and data sources for each country snapshot below, in addition to the comprehensive descriptions found in the executive summary and full global synthesis report.

To receive the executive summary and detailed global and country reports, please email EdTech@omidyar.com.

About Omidyar Network

Omidyar Network is a philanthropic investment firm that invests in and helps scale innovative organizations to catalyze economic and social change. Established in 2004 by eBay founder Pierre Omidyar and his wife Pam, the organization has committed more than \$1.3 billion to for-profit companies and nonprofit organizations across multiple initiatives, including: Digital Identity, Education, Emerging Tech, Financial Inclusion, Governance & Citizen Engagement, and Property Rights.

To learn more, visit www.omidyar.com, and follow on Twitter [@omidyarnetwork](https://twitter.com/omidyarnetwork) #PositiveReturns.

Acronyms and Abbreviations

API	application programming interface
APJII	Indonesian Internet Service Provider Association (<i>Asosiasi Penyelenggara Jasa Internet Indonesia</i>)
ASEAN	Association of Southeast Asian Nations
B2C	business to consumer
B2G	business to government
BAN-SM	National Accreditation Body of Schools and Madrasahs (<i>Badan Akreditasi Nasional Sekolah</i>)
BEKRAF	Creative Economy Body (<i>Badan Ekonomi Kreatif Indonesia</i>)
EdTech	education technology
EP	equivalency program
GDP	gross domestic product
HDI	Human Development Index
ICT	information and communications technology
IDR	Indonesian Rupiah
INETA	Indonesian EdTech Association
IOU	Indonesia Open University
KIP	Indonesia Smart Card (<i>Kartu Indonesia Pintar</i>)
KIPIN ATM	Smart Kiosk (<i>Kios Pintar</i>) Assistant Teaching Machine
MoEC	Ministry of Education and Culture
PIP	Smart Indonesia Program (<i>Program Indonesia Pintar</i>)
Pustekom	Centre for Information and Communication Technology for Education (<i>Pusat Teknologi Informasi dan Komunikasi untuk Pendidikan</i>)
TOEFL	Test of English as a Foreign Language
TV	television
UNESCO	United Nations Educational, Scientific and Cultural Organization

Executive Summary

About this Series: Scaling Access & Impact: Realizing the Power of EdTech

There are 250 million learners around the world who have finished their schooling – yet aren't able to read or write well and lack the skills they will need to succeed in the 21st century. Additionally, around the globe are classrooms with tens of thousands of teachers struggling to close that educational gap – but lacking the access to tools and resources that will enable *them* to succeed.

The Brookings Institute described a 100-year gap,¹ the century it will take for the world's poor children to achieve educational parity with the wealthy at today's pace. Neither our world nor those learners can wait that long: We must find ways to close that gap quickly and efficiently, to allow all learners, educators, and educational systems to realize their full potential.

In pursuit of this goal, Omidyar Network's Education initiative began in 2009 to invest in innovations in education with such "leapfrog" potential and in 2014, specifically focused some of our investments on innovations powered by technology. Omidyar Network has since invested more than USD 150 million in promising global innovations in education across four continents.

Our efforts have been inspired by bold entrepreneurs as well as public, private, and social sector education leaders who are unleashing the human potential of a generation of learners through "Equitable EdTech." Omidyar Network defines Equitable EdTech as the promise of technology to be a great equalizer in improving quality education for learners in need. We have witnessed that Equitable EdTech models can bring students from several years behind to on grade level, while also shifting the norm from teacher-centered instruction to student-centered learning. We are therefore hopeful that the power of technology, when thoughtfully employed, can serve as a great equalizer in delivering quality education.

By enabling ubiquitous access and personalization, Equitable EdTech can close the gap for students while also empowering teachers to be more effective, especially when there is lack of access to high-quality schools, high-quality teacher training, rigorous curriculum, or appropriate interventions. Additionally, recent evidence demonstrates that these models can be both highly impactful and cost-effective.²

However, our experience has also taught us that scaling and sustaining Equitable EdTech requires much more than eager learners and motivated educators. It demands the alignment of multiple actors across sectors in local ecosystems. This report examines such ecosystems and how they combine the efforts of government and education leaders, investors and philanthropists, and innovators and entrepreneurs.

Specifically, we sought to:

- > **Identify the events, actions, and initiatives across public, private, and social sectors that have contributed to the equitable scaling of EdTech in these countries; and**
- > **Inform a public policy and investing agenda by identifying the highest-impact interventions that might contribute to EdTech scaling in other countries.**

Our hope is that the country-system examples we examined, including Chile, China, Indonesia, and the United States, will inspire these interdependent actors to collaborate on creating the enabling conditions for equitable impact of technology at scale in their regions. We also hope that the ecosystem model presented in this report will spark debate as well as attract new partners.

There are six reports in the *Scaling Access & Impact: Realizing the Power of EdTech* series, including:

- > **Executive Summary**
- > **Global Report**
- > **Country Report: Chile**
- > **Country Report: China**
- > **Country Report: Indonesia**
- > **Country Report: United States**

This report is the case study report for Indonesia. A separately available country report for each other case study country and a full global synthesis report are also being published.

Indonesia Country Report

In Indonesia, education technology (EdTech) has grown rapidly. This study found that increasingly pervasive access to technological infrastructure and mobile phone usage, visionary leadership and supportive government, the widespread use of social media, and strategic partnerships between stakeholders were key enabling elements of the ecosystem that facilitated this growth. Collaborations between government, schools, and EdTech providers are common, operating under oversight and leadership from a central EdTech authority (Pustekkom). The larger education community is starting to accept digital and connected technology's potential role in the learning process thanks to social media and television (TV) outreach. EdTech innovations developed by both the public and private sectors reach not only enrolled students but also out-of-school populations. The widespread adoption of information and communications technology (ICT) by target users and the general public in daily life has been a key enabler for scaling EdTech, providing a mechanism for direct sales. Despite these developments, the current challenge in Indonesia is to improve equitable access to quality education across the country, closing the gap between high- and low-performing schools. This challenge is well recognized by public and private stakeholders, including the international donor community.³ Thus, there is an additional opportunity for EdTech innovation to make a difference inside schools, where traditional methods have fallen short.

This study sought to understand the conditions that have thus far enabled EdTech initiatives to scale in Indonesia. Focusing on K–12 education, and drawing on interviews with 22 practitioners in the field, we found that Indonesia is paving the way for modern learning using digital and connected

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technology. As Indonesia overcomes the challenge of access to EdTech, the near future will require greater attention to its impact through research, evaluation, and evidence-based product design.

Exhibit 1 summarizes the key takeaways from the Indonesia country study and **Exhibit 2** presents a snapshot of Indonesia’s EdTech ecosystem.

Exhibit 1: Key Takeaways

Inspiring Proofpoint	Practice for Replication	Practice for Further Exploration
Even in large countries with challenging geography near universal access to internet can be within reach of all learners.	National agencies specialized in technology in Education can be instrumental in creating and disseminating content across multiple channels.	How to harness the enthusiasm for mobile apps, social media and EdTech outside of the classroom and channel it towards transformative use in school.

Exhibit 2: Indonesia EdTech Country Snapshot

Ecosystem Profile

EDTECH SUPPLY AND BUSINESS MODEL

EdTech supply is dominated by test preparation and tutoring apps designed for personal mobile phones. Social media drives cost efficiencies for marketing and distribution.

ENABLING INFRASTRUCTURE

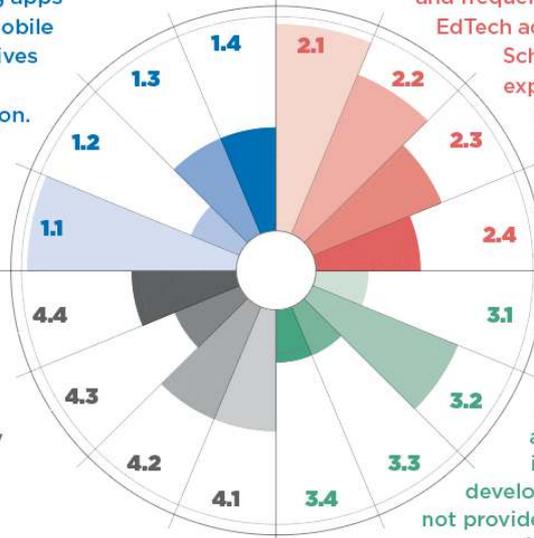
Mobile penetration, device ownership, and frequent use of social media drive EdTech adoption outside of schools. School-based infrastructure is expanding, making it possible for nearly all schools to be connected. EdTech lacks a priority focus.

HUMAN CAPACITY

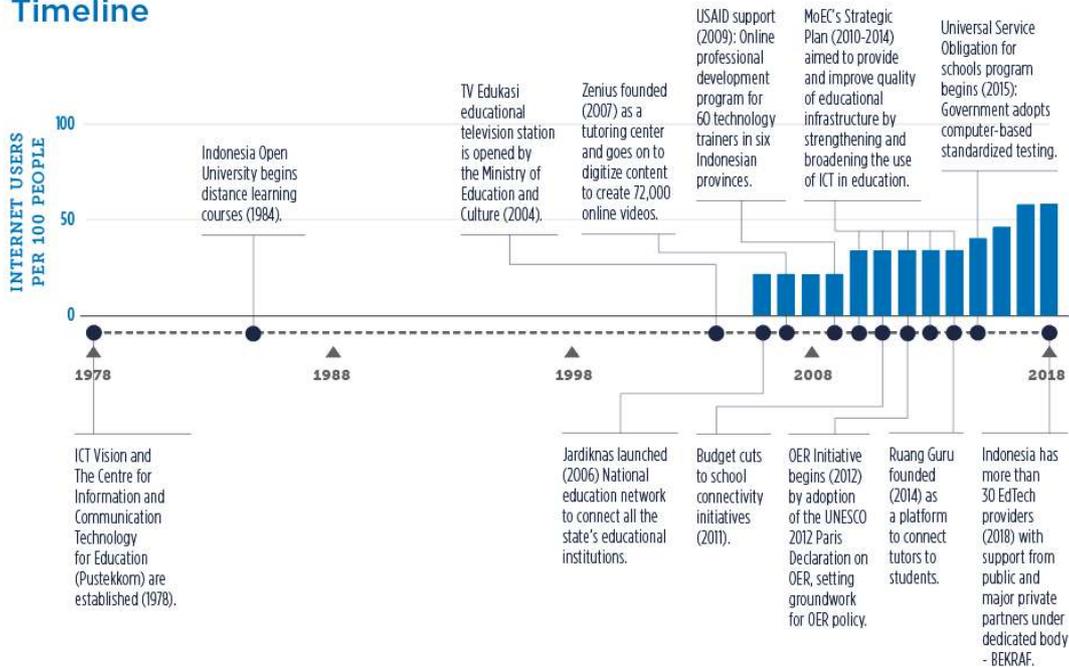
EdTech use is driven by personal digital literacy. Direct capacity building is limited, as is research, evaluation, and communication.

EDUCATION POLICY AND STRATEGY

National policy articulated an EdTech vision, including infrastructure and capacity development. National policy did not provide funding or accountability for EdTech implementation.



Timeline



Country Background

Society

Home to approximately 264 million people, Indonesia is the fourth most populous country in the world (Exhibit 3). This diverse country is now the world’s 16th largest economy and is projected to become one of the top 10 by 2025. However, its impressive economic growth has not yet translated into improved quality of life for all. The Human Development Index (HDI), developed by the United Nations Development Programme as a composite index of quality of life indicators such as health, education, and standard of living, ranks Indonesia 116th globally with an HDI score of 0.694. According to a recent Oxfam report, Indonesia had the world’s sixth highest levels of economic inequality. Yet, education outcomes have improved considerably over the past century; more than 95% of the population over the age of 15 can read, compared to 67% in 1980, and 44% of the population has at least completed lower secondary, compared to just 5% in 1971.

Indonesia is home to the largest number of billion-dollar (unicorn) tech startups in Southeast Asia, including the ride-sharing service Go-Jek, travel site Traveloka, and marketplaces Bukalapak and Tokopedia. This year, the Minister of Communication and Information Technology His Excellency Mr. Rudiantara predicted that education would be among the next sectors to produce a unicorn startup. The magnitude of the technology industry’s growth in Indonesia suggest that this country’s economy and infrastructure provide a fertile environment for tech-related startups, including EdTech initiatives.

This growth can be attributed in part to Indonesia’s growing middle class, which is expected to reach 141 million people by 2020. This middle- and upper-class consumer segment is most open to the adoption of digital and connected technology and willing to pay for it. Indeed, the Indonesian people’s enthusiasm to embrace digital and connected technology is undeniable. As a country with a very strong sense of community, Internet and social media have become an integral part of most Indonesian citizens’ lives. Hootsuite reported that some of the world’s most avid users of social media (e.g., Twitter, Facebook, Instagram, Line, YouTube) are from Indonesia; on average, these users spend more than 8 hours a day on the Internet (on various devices), of which nearly 3.5 hours are, on average, spent on social media.

Exhibit 3: Indonesia’s Demographics

World’s 16th largest economy	735,358 square miles of territory made up of 17,508 islands
GDP (2010) US 1,090 billion	300 ethnic groups; 700 languages
Population 264 million	Adult literacy rate of 95%

Education System

The education system in Indonesia is the fourth largest in the world, encompassing nearly 220,000 public and private schools, approximately 45.5 million students, and more than 2.7 million teachers (**Exhibit 4**). In 2016, compulsory education was extended to 12 years, commencing when students turn 6 years old. Education accounts for 20% of the national budget,⁴ representing just 3% of Indonesia’s gross domestic product (GDP); in terms of total spending on education, Indonesia sits at the median among Association of Southeast Asian Nations (ASEAN) countries.⁵ Government spending on education has increased, from Indonesian Rupiah (IDR) 416 trillion in 2017 to IDR 444 trillion today (approximately United States dollars [USD] 3.1 million) and is expected to increase by an additional 38.1% in 2019.⁶ In 2017, the World Development Indicators reported gross primary enrollment at 105% (up from 84% in 1970) and gross secondary school enrollment at 87.8% (up from 18% in 1970).⁷

Yet equitable access to education remains a challenge for certain groups, including the poor, remote islanders, and learners with different abilities. To catch up with high-performing countries, Indonesia must shift its focus from increasing access and attainment to improving the quality of learning. This is where EdTech could be particularly influential. In a country where high levels of inequality limit the ability of many to access quality education, EdTech solutions can facilitate positive learning outcomes, improve access to educational resources, and boost motivation and engagement, including among at-risk students.⁸ However, local and international EdTech companies alike must align products with the specificities of the Indonesian context. The following sections discuss some of the key characteristics of the Indonesian education system that may affect EdTech scale.

Exhibit 4: Education in Indonesia

2,731,283 teachers	220,000 public and private schools
45,423,094 students	45.5 million students
20% of national budget for education in 2018	Education spending is 3% of GDP

Decentralization

After President Suharto was overthrown in 1998 following a severe economic crisis, the newly formed democratic central government proposed a dramatic decentralization policy to spread responsibility and improve the delivery of services. As a result, managerial and financial responsibility for all levels of public education shifted to regional governments, mostly at the provincial and district levels. The central government continues to set the **National Education Standard**, which serves as the basis for the curriculum, planning, implementation, and monitoring of the educational practices in the country.

In this decentralized system, Indonesian schools are accountable to several different institutions as they are operated by regional governments but regulated at the federal level.

Standards and Curriculum

School curricula differentiate schools as “regular” schools or madrasah (Islamic) schools, both of which may be either public or private. The proportion of students served by regular schools far outnumbers those in madrasah, but most madrasahs are run by private foundations; as such, private schools account for approximately 48% of all primary and junior secondary schools.⁹ Regular schools are operated by the Ministry of National Education, while madrasahs are under the governance of the Ministry of Religious Affairs. Indonesia also has equivalency programs (EPs) for school-aged, out-of-school populations and post-school-age populations seeking remedial education and workplace skills. Public and private schools are held accountable through accreditation by the National Accreditation Body of Schools and Madrasahs (Badan Akreditasi Nasional Sekolah [BAN-SM]). Schools must meet the national standards and requirements related to infrastructure and student–teacher ratio (though many do not). Schools must submit reports to district offices about their programs, finances, and achievement according to the eight national standards of education. This complex network of authoritative bodies in the education system requires EdTech companies wishing to scale in Indonesia to successfully communicate and negotiate with many different stakeholders—central- and regional-level government, three ministries (see above plus the Ministry for Research and Technology, which is responsible for higher education institutions), and the BAN-SM—while also accounting for the different needs of regular vs. madrasah and public vs. private schools.

Standardized tests have been introduced in 9th and 12th grades to monitor the performance of students, teachers, schools, districts, and provinces; the data collected serve both a gatekeeping function to higher levels of education and as a way for the central government to monitor education quality. Many students experience intense pressure to perform well on these important exams. Over the last decade, this practice has inspired the proliferation of online test prep platforms to serve secondary students, such as Zenius Education, Ruang Guru, Quipper, Cerebrum, and Prime Mobile (see text box profiles).¹⁰ In 2015, Indonesian secondary schools began the transition from a traditional paper-based standardized national examination to the Computer-Based National Examination; implementation began with 556 schools in 2015, expanded to 30,577 schools by 2017, and continues to expand today.

Equity-Focused Model

The government has shown some willingness to improve equitable access to education. In addition to regular school operating funds, the government established the **Smart Indonesia Program** (*Program Indonesia Pintar* [PIP]) in 2016 to accelerate the implementation of universal secondary education, pilot the expansion of compulsory education to 12 years, and tackle the high levels of school drop-out (in 2017, more than 2 million school-aged children were out of school, according to the United Nations Educational, Scientific and Cultural Organization [UNESCO]).¹¹ With this program, the government

¹⁰ Specific products and companies mentioned are neither exhaustive nor an endorsement by the authors; they are only meant to be illustrative of the types of products on the market. See the text box at the end of this section for further details.

hopes to reduce the number of out-of-school children and improve access to compulsory education for all its citizens. This program is open to students from low-income backgrounds, whose families are provided with cash assistance ranging from IDR 450,000 (approximately USD 34) to IDR 1,000,000 (roughly USD 75) in the form of an ATM card called the Indonesia Smart Card (*Kartu Indonesia Pintar* [KIP]). This card can be used to purchase learning resources, including EdTech products (e.g., e-books, learning DVDs, subscriptions to eLearning platforms sold in bookstores). The availability of funding through these government equity initiatives contributes to the scaling certain EdTech resources. For example, Zenius Education scaled in part because their test prep DVDs and online subscription vouchers are sold throughout a major bookstore chain in Indonesia and thus eligible for purchase with a KIP card.

Infrastructure

Internet access and use in Indonesia are widespread and mostly affordable, but connection speeds are often low. The nation is home to 143.26 million Internet users, representing 55% of the total population, according to a report from the Indonesian Internet Service Provider Association (Asosiasi Penyelenggara Jasa Internet Indonesi [APJII]).¹² Seventy percent of Internet users are between 13 and 34 years old according to the same source. Additionally, there are 177.9 million unique mobile users, representing 67% of the population.¹³

The Internet is considered to be affordable for most of the population. According to the APJII report cited above, only 32% of respondents classified the fixed-line Internet price as expensive, and just 23% found mobile Internet data packages to be expensive. Indeed, mobile data prices in Indonesia are roughly 50% of those in neighboring ASEAN countries. This affordability is an enabling factor for EdTech companies that both facilitates their growth and improves the likelihood that they will reach the users who need educational support most—often those in lower socioeconomic categories.

Internet connections are provided by more than 300 commercial Internet service providers and network access points,¹⁴ including large-scale operators, such as PT Telkom (government owned) and PT Indosat, which manage their own network infrastructures. Although several remote areas in Indonesia are not yet connected to the Internet, the government aims to connect all 34 provinces and 514 cities/regencies with the completion of the Palapa Ring project. This 22,000-km network of undersea fiber-optic cable will provide fast broadband Internet to Indonesians in urban and rural areas across the country. This expansion of Internet access, combined with its affordability, will likely result in even more rapid increases in Internet users.

RUANG GURU: Established by two young foreign-educated Indonesians in 2014, Ruang Guru is a leading EdTech startup in Indonesia. Originally a marketplace for private tutors, Ruang has now built what they call the Ruang Guru ecosystem, aimed at transforming educational performance by offering a range of products and services. Their learning app is one of the most downloaded and used educational apps in both the App Store and Google Play Store in Indonesia. Ruang Guru raised seed round funding from East Ventures in 2014. A year later, they raised series A funding from Venturra Capital, and subsequently, UOB Venture Management joined to give them series B funding in 2018. To date, they claim to have reached more than 10 million registered users.

QUIPPER: Quipper provides eLearning, coaching, tutoring, and assessment services for K–12 education. Leveraging an online and offline services model, their products include learning management systems for students and teachers, a test prep platform, a video-based learning platform, offline consultation with real coaches and tutors, and a campus directory. Quipper was founded in the United Kingdom in 2010 and operates in four countries—Japan, the Philippines, Mexico, and Indonesia—with its headquarters in London. Quipper started operating in Indonesia in 2015. In April 2015, the company was acquired by Recruit, the Japanese conglomerate best known for its job placement service, for USD 39 million. As of November 2018, they claimed to have reached 34 provinces, 8,500+ schools, 96,000+ classes, 350,000+ teachers, and 7,500,000+ registered students in Indonesia.

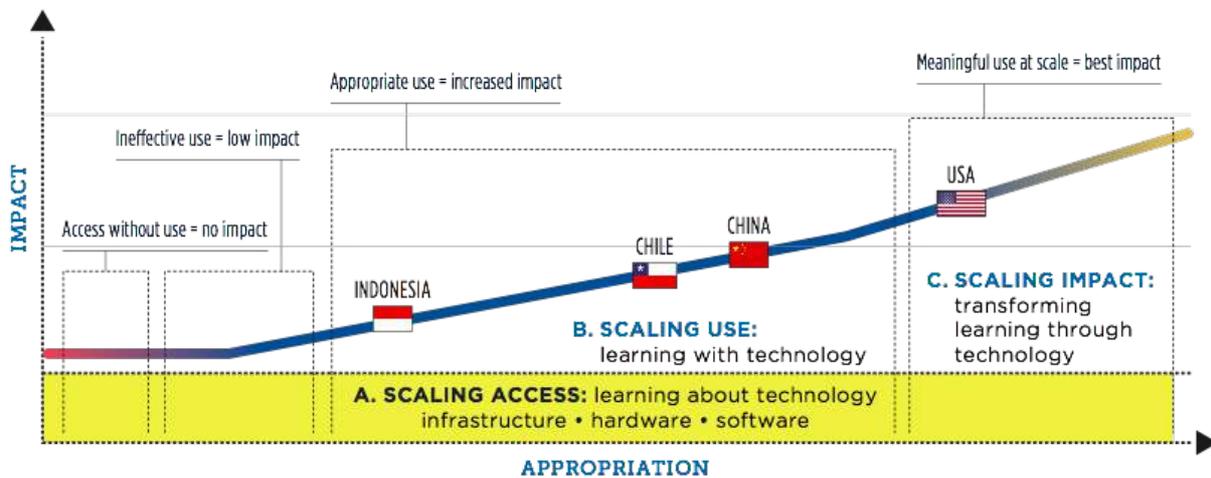
ZENIUS EDUCATION: Zenius Education focuses on video-based learning materials for elementary to high school students through their website, zenius.net and has created more than 81,500 learning videos. Between July and October 2018, their website received more than 26 million visitors. A privately funded company, Zenius Education claims to have reached more than 130,000 students between July 2017 and October 2018.

EdTech in Indonesia

This section looks at the evolution of EdTech scaling across three main phases of change in Indonesia—access, use, and impact—as illustrated in **Exhibit 5** (for a more comprehensive discussion of the Ecosystem Change Model, see the Global Report). A common error in EdTech is assuming that scaling a product will naturally result in its appropriate use. Scaling access (or even ‘opportunity to access’) does not equal use, nor does opportunity to use mean that the product will be used in a way that results in impact on learning outcomes at scale. The outcome of a strong EdTech ecosystem should be a steeper slope, indicating a more rapid transition to transformative use of technology.

This section describes several Indonesian examples of EdTech with a measure of success in scaling and identifies the factors that enabled this success.

Exhibit 5: Ecosystem Change Model



Scaling Access

Scaling access means there are EdTech products in the market, and users have the ability to adopt them because they have the technology (e.g., hardware, connectivity) to do so.

Government Initiatives

The Indonesian government has long been supportive of the use of technology in education to expand the reach of educational content. The Ministry of Education and Culture (MoEC) established the large-scale EdTech coordination and oversight body—the **Centre for Information and Communication Technology for Education** (*Pusat Teknologi Informasi dan Komunikasi untuk Pendidikan [Pustekkom]*)¹⁵—in 1978. *Pustekkom* originally focused on developing audiovisual materials for teaching and learning meant for radio and TV distribution but, since the 2000s, has begun to develop web-based multimedia materials.

In 2012, *Pustekkom* launched their web-based open educational resources platform, *Rumah Belajar*, which integrates with their TV channels (*TV Edukasi* and Education TV on Demand), radio channels (*Radio Suara Edukasi* and *Radio Edukasi*), and mobile learning app (*M-Edukasi*). This platform is designed to aggregate digital educational media, including worksheets that can be downloaded and printed and digital resources, such as e-books and videos. Approximately 52,000 schools, 128,000 teachers, and 300,000 students have used *Rumah Belajar* since its launch (*Pustekkom* representative, personal communication, November 1, 2018).

The national government has also shown commitment to investing in EdTech solutions in higher education. **Indonesia Open University (IOU)** was established in 1984 with distance education as its primary mode of learning and initially produced paper-based materials, audio cassettes (and later, CD/DVDs), and its own TV and radio channels. The expansion of Internet access has since allowed

IOU to host most of its tutorials through their online eLearning platform, E-Learning Universitas Terbuka.¹⁶ In addition, IOU continues to distribute content through their radio channel, UT Radio,¹⁷ and TV channel, UT-TV, which is also accessible as a YouTube channel.¹⁸ More than 62% (181,565) of IOU's students graduate through the Faculty of Education, and IOU continues to offer training to in-service teachers who lack the opportunity to attend face-to-face modes of higher education because of various geographical, financial, and time-related constraints.

The government has also supported basic access to EdTech by developing stronger technology infrastructure across the country to reach more remote schools. A key set of government initiatives are the **National Education Networks**, *Jardiknas* and SchoolNet, launched in 2006 and 2011, respectively. This computer network infrastructure is aimed at connecting school institutions, province/district/sub-district education offices and ICT Centers, and other educational institutions. As a computer network, *Jardiknas* contains various subsystems to support national education, including education data centralization, a digital library, and various e-learning courses. As of 2011, 32,678 schools were connected via either *Jardiknas* or SchoolNet.¹⁹

The year 2015, when computer-based standardized tests were introduced, also saw major partnerships and investment in EdTech (See Annex 2, Milestones in EdTech). For example, *Indosat Ooredoo* pledged USD 1 million over 5 years to provide tablets, digital content, cloud-based learning materials, and teacher training in five provinces in a partnership with two foundations.²⁰ At the same time, Microsoft pledged to provide software to all Indonesian schoolchildren.²¹ The government also introduced eLearning for the EPs, allowing students of all ages, including those who had dropped out of school, to prepare for and take the tests at any time, from anywhere in the country.

Also in 2015, the **Internet Universal Service Obligation (USO)** was established as a joint program between the MoEC and the Ministry of Communication and Information Technology to install and activate Internet at schools in remote areas. The achievements of these two programs are modest, reaching only approximately 1,500 schools, but nonetheless, they demonstrate the government's willingness to support initiatives that improve connectivity.

Achieving true universal access in Indonesia's challenging geography will require additional innovative solutions. One such solution is Wokbolic, an initiative started in 2012. The Wokbolic parabolic antenna, designed by a local ICT activist Onno Purbo, is an innovation that uses cooking woks and USB Wi-Fi pen drives to enable a wireless access range of up to 3 km. This type of 'DIY' innovation may be a first step to increasing Internet use and demand, but scaling equal and sufficient bandwidth access will require coordinated investments.

Private Investment

Indonesia has seen a significant level of investment in EdTech, particularly in the last 5 years. Major private investors, such as Venturra Capital, United Overseas Bank (UOB) Venture Management, CyberAgent Ventures, East Ventures, and PT Insight Investments, have contributed to the

ecosystem's growth. The nation is currently home to at least 30 startups (for-profit and non-profit) and 20 active tech incubator and accelerator programs run by such diverse bodies as Google, major local telecom companies (e.g., PT Telkom, PT Telkomsel, PT Indosat), the Indonesian Stock Exchange, and the national government under its newly established dedicated body, the Creative Economy Body (*Badan Ekonomi Kreatif Indonesia* [BEKRAF]). At this time, Indonesia is the largest EdTech market in Southeast Asia.

Pesona Edu²² succeeded in scaling in Indonesia and internationally by producing premium digital content for science and math. Since supporting early computer-based learning in 1986, they have launched a branch in Singapore to penetrate the global market and claim to have reached more than 7,500 schools in Indonesia and 2,500 schools in at least 30 countries worldwide. The cost to license one year of content for one subject is approximately USD 350. In Indonesia, a 2012 report indicated that 95% of sales are to public schools but that these sales reach just 3% of schools because of individual schools' limitations in hardware and connectivity.²³

The situation described in this section is illustrative of the first stage of the Ecosystem Change Model, where a foundation of infrastructure and EdTech products exists in the market but whether this foundation has translated into widespread, effective use in public government schools—particularly those serving marginalized learners—remains nascent. The next section looks at the second phase of the model in more detail.

Scaling Use

'Scaling use' is distinguished from 'scaling access' by emphasizing that just because one *can* access a product does not mean that one *will* do so. Progress toward EdTech use is considered observable when products show evidence of an active user base (such as subscriptions), and are facilitated for use in classrooms by trained educators, among others. There are also different levels of use, from basic to transformative, which depend on effective capacity building for EdTech integration. Indonesia is starting to demonstrate the use of EdTech at scale most notably through social media but also via partnerships for school-based integration, as described in this section.

Low Bandwidth Solutions

Efforts to spread internet access along with relevant hardware and content solutions represent an important step toward the use of technology for teaching and learning. However, connectivity remains slow in many parts of the country, averaging just 13.79 Mbps (9.82 Mbps for mobile phones).²⁴ To go beyond access to scaling the use of products, EdTech companies must design for low-bandwidth connections. Some companies, for example, have built 'offline' modes into their products, allowing data transfer when possible but still permitting use when a connection is unavailable or slow. For instance, EdTech entrepreneur *Pendidikan.id* has created an **offline digital library** called Smart Kiosk (*Kios Pintar*) Assistant Teaching Machine (KIPIN ATM), which has been used by many schools, including those in the rural eastern region of Indonesia.

One interviewee described the government's recent launch of a program to train mathematics teachers via their learning management system. The program attracted barely any participants as it required access to high bandwidth. In contrast, when a learning community was set up on Facebook and WhatsApp, teachers began to participate, meeting regularly to exchange strategies for mathematics instruction. Moreover, two other interviewees working with teachers noted the growing use of smartphones and social media in rural eastern Indonesia. When asked if they were connected to the Internet, the teachers said they were only connected to Facebook and WhatsApp on their smartphones. As in other countries, depending on the service provider, in Indonesia, a mobile data subscription generally comes with special access to one or two social media platforms. For example, Telkomsel has "data mode" and "free mode" for Facebook, and XL provides unlimited YouTube access.

Social Media

EdTech entrepreneurs are leveraging the abovementioned high level of mobile ownership and engagement of Indonesians with social media to scale the use of EdTech through online product marketing, mobile instructional applications, and social media communities of learners. Several interviewees emphasized the existence of a direct link between Indonesian people's engagement with social media and their strong sense of community, citing how Indonesian people love to talk and participate in communities both offline and online.

Social Media Marketing

Social media is considered an effective means to both increase public awareness of and engage communities on EdTech and also convert potential EdTech users into active ones. For example, some EdTech providers create WhatsApp/Telegram/Line/Facebook groups to reach students and create learning processes in addition to or rather than developing purpose-built website applications. For example, Budi Waluyo's *Sekolah TOEFL* initiative leverages Facebook and WhatsApp to share Test of English as a Foreign Language (TOEFL) study materials that can be accessed free of charge by anyone. Line Academy is a collaboration between Line Indonesia²⁵ and *Ruang Guru* to provide test preparation practice and tutoring to students; individuals can set up Line Academy accounts for free to access quizzes, games, and videos or to live chat with a tutor. Some Facebook groups run and organized by teachers reach upwards of 120,000 members.

EdTech companies also use social media as a marketing strategy, enabling them to reach consumers directly (e.g., *Ruang Guru*, Quipper) to attract new users. *Ruang Guru* and Quipper hire social media influencers with many followers to promote their products and also hire highly influential celebrities as guest teachers on their learning apps.

Zenius Education, one of the longest-serving EdTech companies in Indonesia, primarily uses inbound marketing to attract Internet users. This technique draws potential customers to products and services via social media platforms, blogs, and/or newsletters. To this end, Zenius Education has produced a substantial amount of free educational content that helps attract students to their products.

EdTech providers' social media followers are summarized in the heatmap in **Exhibit 6**. Among major Indonesian EdTech companies, *Ruang Guru*, Zenius Education, and Quipper have the most followers

across four major platforms. The leading educational YouTube channel in the Indonesian language, Kok Bisa!, attracted more than 1 million subscribers this year.

Exhibit 6: Indonesian EdTech Social Media Heatmap



K = Thousand
 M = Million
 Data taken on November 26, 2018

Source: This exhibit was produced by the authors for the purpose of this study, with publicly available data.

Social Media Integration

Social media can be used for marketing or as part of the instructional design. The non-profit organization Solve Education!²⁶ produces a free-of-charge educational game aimed at disadvantaged groups with access to medium-end Android smartphones, which are widely owned across Indonesia. Considering inbuilt social media elements as a must-have for the engagement and retention of users, the organization built social media elements, notably an instant messenger, into their product to dramatically increase their number of users. Additionally, Solve Education! created a virality coefficient to track the numbers of new user downloads of the app through “friend codes” shared through social media.

The power of social media was also cited by ecosystem stakeholders who are not entrepreneurs, who described social media as inevitable and crucial to the scaling process. One interviewee suggested that social media companies should provide access to their application programming interfaces (APIs), so they can be easily integrated into EdTech solutions.

²⁶ The author of this study has been the Director of Education and Development for Solve Education! since December 2017.

Partnerships

In the context of decentralized Indonesia, partnership models between the private sector and the government, schools, and other stakeholders are necessary to integrate EdTech in schools (unlike in direct business-to-consumer [B2C] sales, as described in the previous section). Regardless of how good an EdTech product may be, in the absence of strong relationships with the regional government or school administrators, scaling use in schools will be difficult. Most of the interviewees stated that to scale via business-to-government (B2G) sales, EdTech companies must communicate and negotiate with many government stakeholders while also accounting for the unique needs of different school types. Here, the term 'partnership' encompasses both business partnerships that intend to increase company revenue and non-profit partnerships that intend to create social change.

Business Partnerships and Coalitions

The Indonesian EdTech Association (INETA) is a newly established non-profit EdTech consortium that is the first of its kind in Indonesia. INETA's mission is to bridge the gap between EdTech providers, especially between for-profit and non-profit companies and the government. INETA seeks to bring together EdTech players in Indonesia, with the objective of lobbying the government and improving networking and public relations. They aim to connect students, learners, and schools with resources from the government, non-governmental organizations, and private companies. Most of the interviewees supported INETA's establishment, though some worried that the consortium failed to include many EdTech players because of their policy of only accepting locally owned companies and their expensive membership fees. Although it is too early to know what specific impact this consortium will have on the scaling ecosystem, many interviewees noted the demand for more objectivity and connectors in the sector. Most agreed that establishing a consortium could drive the EdTech ecosystem in Indonesia by acting as an independent body that collects and analyzes education-related data for EdTech players, especially the government. Consortia also have the potential to influence educational regulations and policy to create a more efficient education system, especially concerning government education spending.

When asked who would be the most influential or powerful stakeholders to partner with, interviewees named regional governments, citing *Ruang Guru's* strategy of B2G direct sales through government relation officers. Since 2014, *Ruang Guru* has negotiated with regional governments in 32 of Indonesia's 34 provinces. These partnerships have been profitable, given regional governments' ability to provide EdTech companies with access to schools. This access has allowed *Ruang Guru* to widely distribute vouchers sold to the government for their product. The voucher sales fall within a legal direct procurement limit for "small" purchases under IDR 200 million per transaction (approximately USD 17,000). The partnerships also include a package of educational content, virtual classes, the online-based test platform, and teacher training. As a result of this strategy, *Ruang Guru* is seen to dominate the K–12 EdTech market. Other EdTech products can be accessed through an e-catalogue²⁷ of approved products. (This catalogue is not limited to education or EdTech). If local governments purchase from the e-catalogue they can avoid a full tender process.

Though not at the same scale, other similar partnerships do exist. According to interviews with the MoEC's *Pustekom*, the central government has long been open to working alongside private

enterprises. Although it cannot endorse particular vendors to work with regional governments, the central government has attempted to nourish the ecosystem by arranging offline events and expos where EdTech providers can meet regional government officials, teachers, parents, and school administrators.

Scaling Impact

Finally, although EdTech products may be accessed and used—even in the most robust and transformational way—at scale, scaling *the impact* of EdTech is a function of how EdTech is adapted for use in different ways by different populations. As such, the impact on learning is what must be ‘scaled’ rather than just product use. This is the hardest phase of scaling to demonstrate, but specific efforts to evaluate and communicate impact, redesign and adapt products for different audiences, and establish mechanisms for choosing the right products for the right purposes are indicators that EdTech will be more likely to have equitable impact.

For example, by leveraging Indonesia’s widespread ownership of smartphones to target disadvantaged and out-of-school learners, Solve Education! reaches their target beneficiaries without a sales and marketing team. Solve Education! invites local communities and organizations to meet and discuss issues related to marginalized populations, presents their proposal to these organizations, implements a small pilot, and signs official agreements with individual organizations for larger-scale programs.

Inibudi.org is an open educational resources platform developed by educators in Indonesia to create and share free, curriculum-aligned content such as instructional videos for students and teachers. The platform engages communities and the general public in helping to distribute videos on DVDs or USB drives, particularly in hard-to-reach areas, or in raising awareness through events and social media outreach. The program has attracted funding from major organizations, including Google.org, to expand content and teacher training for improved reading instruction using their digital platform. An additional partnership between Inibudi.org and another EdTech platform—CubeNotes—brings instructional videos to after-school tutoring groups, especially those involving students from underprivileged families.

Another example highlighted in the interviews was Plan International’s²⁸ free-of-charge eLearning application *KitaKerja.id*. This joint program with the Ministry of Home Affairs targets marginalized youth in Indonesia, began in 2016, and will end in 2019. While developing their app, the program invited experts in education and computer science to advise and collaborate. These examples demonstrate that scaling impact requires unique and tailored solutions for distribution, teacher training, and integration into the classroom and that multistakeholder partnerships are instrumental

Summary

Exhibit 7 summarizes specific characteristics of the ecosystem that are associated with advancing along the Ecosystem Change Model in Indonesia.

Exhibit 7: The Role of Existing Ecosystem Elements in EdTech Scaling in Indonesia

Category	Scaling Access	Scaling Use	Scaling Impact
Education System	A broad digital development vision promotes equitable access to technology across Indonesia's geography. Multimedia and distance learning laid a foundation for EdTech initiatives. The relevant government body, <i>Pustekkom</i> , creates and coordinates EdTech content across platforms.	The integration of technology literacy into the national curriculum and the use of technology for assessments strongly enable scaling use. EdTech entrepreneurs must work through the decentralized system to scale B2G sales.	The central government creates standards that are implemented through the decentralized government; therefore, impact varies. No systematic method of sharing EdTech models of integration with proven impact is apparent. Tailored EdTech integration initiatives remain piecemeal and are implemented through local initiatives.
Enabling Infrastructure	Major publicly funded efforts to increase the information technology infrastructure across the country enable EdTech to scale in schools and outside of school. The widespread adoption of smartphones and mobile Internet in daily life enable easy transition to use for learning purposes.	The government's vision is to provide training and support to effectively use EdTech in the education system. However this vision is not yet fully implemented.	Maintenance and improvement of the infrastructure have been slow.
Human Capacity	Social and political pressure to achieve quality and equity in the education system has increased substantially. Sustained economic growth is occurring, and the political environment is stable.	Product innovation, partnerships, community engagements, coalitions, advocacy, and support facilitate scaling use.	Research and development evaluations are somewhat influential, but more evaluations of efficacy are needed.

Exhibit 7 suggests that Indonesia remains at the stage of rapidly expanding access to equitable use of EdTech, but further efforts are needed to expand training, research, and evaluation to improve the transformative impact of EdTech for all learners. This need is especially relevant for increasing the scale of EdTech use in public schools to the level achieved with out-of-school mobile applications.

The EdTech Scaling Ecosystem

Key Ecosystem Elements

The study revealed several elements of the ecosystem in Indonesia that enable EdTech scaling; these elements have been integrated into the overall EdTech Scaling Ecosystem Model (see **Annex 1**) as the components indicated in the text boxes.

Increasingly widespread access to technological infrastructure and mobile phone usage:

- > Technological infrastructure is clearly a prerequisite for EdTech company growth. Indonesia's increasingly widespread Internet connectivity and the completion of the Palapa Ring offer expanding opportunities for EdTech.
- > Mobile data in Indonesia is affordable and very widely used.

Widespread use of social media:

- > The effectiveness of scaling efforts in EdTech in Indonesia is largely related to companies' effective use of social media, made possible by Indonesia's particularly high level of Internet usage.
- > Two strategies for utilizing social media in EdTech scaling are commonly implemented: (1) using existing social media platforms to promote an EdTech product or facilitate learning and (2) integrating elements of social media into an EdTech product.

Visionary leadership and supportive government:

- > The Indonesian government has been supportive of efforts to improve equal access to infrastructure through the Palapa Ring and Internet USO projects.
- > Education policies are in place that support the use of technology in schools, such as computer-based national standardized tests and EPs.
- > A government-funded cash assistance program subsidizes EdTech products, including educational e-books, CDs/DVDs, and even online subscriptions to EdTech services.

Strategic partnerships between stakeholders:

2.1 Individuals are using personal devices and mobile services at home and in the community.

2.2 There is universal access to Internet throughout the population through wireless, wired, or other means

1.1 Businesses have a cost-efficient marketing, sales, and distribution mechanism for reaching customers, whether B2G or B2C.

2.3 There are school-specific networking infrastructure initiatives for affordable, reliable school connectivity.

3.1 A clear vision and strategy for EdTech from the highest level of the education system serves as a collective roadmap.

3.3 Education curriculum and policy include expectations for basic technology literacy for all teachers and students.

3.4 Equal opportunity sources of funding exist for EdTech purchases and implementation support.

4.3 Non-government coalitions and advocacy groups support quality EdTech scale up.

1.4 Mutually beneficial, cross-industry, public and private sector partnerships support access to, use of, and impact of EdTech products and services.

- > Given the decentralized nature of Indonesia's education system, to scale EdTech, communicating and negotiating with many different government stakeholders are required.
- > EdTech stakeholders collaborate on product co-design/co-development, research funding, and product development.
- > The partnership model can include both for-profit and non-profit partnerships.

Overlaps in these categories are apparent; the EdTech ecosystem is not just the sum of these component, but also the myriad ways in which these components interact in a self-sustaining and continuously improving system. For example, . Efforts to impact the ecosystem should pay attention to effects than changes in one activity may have on the ecosystem as a whole.

Ongoing Challenges for EdTech in Indonesia

Challenges that remain to be overcome to scale EdTech in Indonesia include the following:

- > **Data and evidence on the efficacy and effectiveness of EdTech in Indonesia are lacking.** Although companies' own data on usage and data collected from social media can provide insight into products' reach and popularity, this information cannot demonstrate whether the products are effectively and meaningfully improving student learning. Product effectiveness research would help EdTech entrepreneurs improve their products, help schools and teachers to choose the products that meet their needs, and help donors direct their support toward those EdTech products that are having the greatest impact. This information could also spur healthy competition between companies and provide inspiration for ideas leading to new startups.
- > **Intermittent to zero Internet connectivity exists in some areas.** However, limited connectivity has not proven to be an insurmountable hurdle. Some EdTech providers have tackled the lack of Internet connectivity by creating versions of their product for DVD (Zenius Education) or Dongle USB (*Ruang Guru*) or by using offline mode (*Pendidikan.id* and *Solve Education!*), allowing app data to be downloaded and uploaded when connected while allowing ongoing use when offline.
- > **More capacity building needs to be done.** Schools and teachers need more guidance on integrating technology in the classroom and selecting the right products to close the specific gaps impacting the learner population. Parents and children need to be aware of the benefits and dangers of social media use for personal enjoyment and educational purposes and also need strategies for selecting appropriate products.

Conclusions

EdTech access and basic use have grown rapidly in Indonesia. The study found that increasingly widespread access to technological infrastructure and mobile phone usage, visionary leadership and supportive government, the widespread use of social media, and strategic partnerships between stakeholders are key enabling elements of the ecosystem that facilitated this growth.

Investment in and senior-level support of large institutions, such as *Pustekkom* and IOU, demonstrate the Indonesian government's longstanding recognition that EdTech is a promising means for this large island-based country to overcome challenging geographic barriers and cater to the needs of its students. Over the last decade, the government has continued to invest in improving school connectivity and shifting elements of the system online (e.g., UNBK, EPs). The government's receptivity to EdTech solutions has been a key enabling factor in the rapid growth of the sector in

Indonesia. With consumer spending on mobile learning apps forecasted to reach USD 7.7 billion in 2019, the third highest in the world behind China and India,²⁹ EdTech companies will have access to both the resources and infrastructure needed to scale in Indonesia.

The continued development of Indonesia's infrastructure, with ever-increasing Internet, social media, and smartphone penetration, is a key component of the EdTech ecosystem in this country. Significant opportunities exist in Indonesia for the growth of EdTech companies, who will have access to more users than ever before, including some of the most remote populations and those in need of improved access to educational support.

Twenty-two education experts and major stakeholders were interviewed and provided insight into how such developments will contribute to the future of Indonesian education during the next 10 years. First, they anticipate a shift in public attitude toward learning and suggested that the trend toward personalized learning will influence learners to be more decisive and drive what they want to learn and how they want to learn it. Second, they expect teachers to reap the full benefits of education that can be customized for every student. Third, they believe that the design of EdTech products will cater to various learning needs and contexts. Lastly, most interviewees indicated that EdTech will likely become an integral part of the lives of Indonesians, just like social media. These changes will lead to enormous benefits for Indonesian learners and open up the potential for wide-ranging apps and devices to support human capital development in Indonesia.

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Annex 1. The EdTech Scaling Ecosystem Model

EDTECH SUPPLY AND BUSINESS MODELS

1.4 Mutually beneficial, cross-industry, public and private sector partnerships support access to, use of, and impact of EdTech products and services.

1.3 EdTech entrepreneurs have access to capital through appropriate business models, allowing them to survive and thrive.

1.2 There is an objective and simple way for users to select products that meet their needs.

1.1 Businesses have a cost-efficient marketing, sales, and distribution mechanism for reaching customers, whether business to government (B2G) or business to consumer (B2C).

4.4 There are multiple and varied ways of communicating product effectiveness research, evaluation, and user experience.

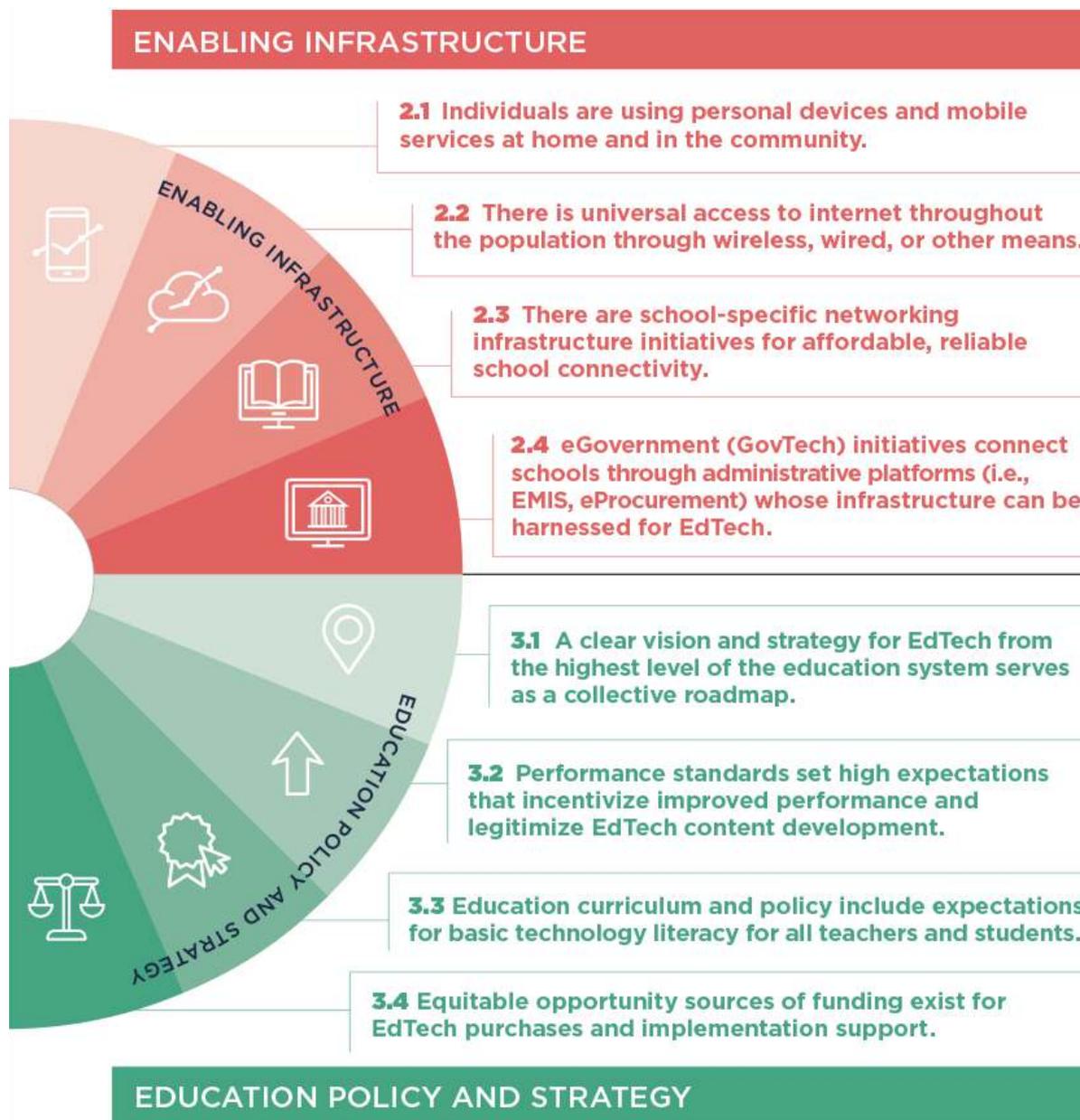
4.3 Nongovernment coalitions and advocacy groups support quality EdTech scale-up.

4.2 There are sufficient ongoing and equitable opportunities for stakeholder capacity building.

4.1 Local visionary leaders emerge to coalesce stakeholders around a bold common goal.



HUMAN CAPACITY



Endnotes

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